HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR THE GALLERIA DR. RIGHT-OF-WAY

BMI COMMON AREAS (EASTSIDE)
CLARK COUNTY, NEVADA

Prepared for:
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DECEMBER 2012

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, state and local statutes, regulations and ordinances. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

Ranajit Sahu January 22, 2013

Dr. Ranajit Sahu, C.E.M. (No. EM-1699, Exp. 10/07/2013) Date
BRC Project Manager

TABLE OF CONTENTS

FIGURES

TABLES

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

µg/L	microgram per liter
µm	micrometer
µg/m^3	microgram per cubic meter
Aa	alluvial aquifer
ADD	average daily dose
AOC3	Settlement Agreement and Administrative Order on Consent, Phase 3
ARR	asbestos-related risk
ASTM	American Society for Testing and Materials
ATSDR	Agency for Toxic Substances and Disease Registry
BCL	Basic Comparison Level
bgs	below ground surface
BMI	Basic Management, Inc.
BRC	Basic Remediation Company
CAMU	Corrective Action Management Unit
CD	compact disc
cm	centimeter
cm^3	cubic centimeter
CoH	city of Henderson
COPC	chemical of potential concern
CSF	cancer slope factor
CSM	conceptual site model
DAF	dilution attenuation factor
DBS&A	Daniel B. Stephens & Associates, Inc.
DOE	U.S. Department of Energy
DQIs	data quality indicators
DQOs	data quality objectives
DVSR	Data Validation Summary Report
EC	exposure concentration
ECI	Environmental Conditions Investigation
ERM	Environmetal Resources Management
FSSOP	Field Sampling and Standard Operating Procedures
GC/MS	gas chromatograph/mass spectrometry
GES	Geotechnical and Environmental Services
GiSdT®	Guided Interactive Statistical Decision Tools
HEAST	Health Effects Assessment Summary Tables
HHRA	Human Health Risk Assessment
HI	hazard index
HQ	hazard quotient

ACRONYMS AND ABBREVIATIONS (Continued)

IEUBK	Integrated Exposure Uptake Biokinetic Model
ILCR	incremental lifetime cancer risk
IRIS	Integrated Risk Information System
IRM	interim remedial measure
IUR	inhalation unit risk
J	USEPA data qualifier, which indicates an estimated value
LADD	lifetime average daily dose
LBCL	BCLs for protection of groundwater
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
LMS	linearized multi-stage
LOAEL	lowest-observed-adverse-effect-level
mg/kg-d	milligram per kilogram per day
mg/kg	milligram per kilogram
mg/L	milligram per liter
mg/m^3	milligram per cubic meter
MS/MSD	matrix spike/matrix spike duplicate
msl	mean sea level
NDEP	Nevada Division of Environmental Protection
NERT	Nevada Environmental Response Trust
NFAD	No Further Action Determination
NOAEL	no-observable-adverse-effect-level
ORNL	Oak Ridge National Laboratory
PAH	polynuclear aromatic hydrocarbon
PARCC	precision, accuracy, representativeness, comparability, and completeness
PCB	polychlorinated biphenyl
pCi/g	picoCurie per gram
PEF	particulate emission factor
PNNL	Pacific Northwest National Laboratories
PPRTVs	Provisional Peer Reviewed Toxicity Values
ppt	part per trillion
PQL	practical quantitation limit
QA/QC	quality assurance/quality control
Qal	Quaternary alluvium
QAPP	Quality Assurance Project Plan
R	rejected
RAGS	Risk Assessment Guidance for Superfund
RAS	Remedial Alternatives Study
RAWP	Removal Action Work Plan

ACRONYMS AND ABBREVIATIONS (Continued)

RfC	reference concentration
RfD	reference dose
RIB	Rapid Infiltration Basin
ROD	Record of Decision
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SIM	selective ion mode
SOP	Standard Operating Procedure
SPLP	synthetic precipitation leaching procedure
SQL	sample quantitation limit
SRC	Site-related chemical
SVOC	semi-volatile organic compound
TCDD	tetrachlorodibenzo-*p*-dioxin
TEF	toxicity equivalency factor
TEQ	toxicity equivalency
TIC	tentatively identified compound
TIMET	Titanium Metals Corporation
TMCf	Tertiary Muddy Creek Formation
TPH	total petroleum hydrocarbon
U	undetected
UCL	upper confidence limit
UJ	USEPA data qualifier, which indicates a non-detect estimated value
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
WRF	Water Reclamation Facility
WRS	Wilcoxon Rank Sum

EXECUTIVE SUMMARY

Basic Remediation Company LLC (BRC) has prepared this Human Health Risk Assessment (HHRA) and Closure Report for the Galleria Dr. Right-of-Way (Site) of the Basic Management, Inc. (BMI) Common Areas (Eastside) in Clark County, Nevada. The Site lies on and is a portion of the Galleria North and other (Phase I Development, Sunset North, and Eastside Main) sub-areas that have been defined within Eastside property. The purpose of this report is to support a request for a No Further Action Determination (NFAD) by the Nevada Division of Environmental Protection (NDEP) for the Site.

The HHRA evaluates the potential for adverse human health impacts that may occur as a result of potential exposures to residual concentrations of chemicals in soil, groundwater, and air following remediation of the Site. If the residual risks do not pose an unacceptable risk to human health and the environment, then an NFAD will be requested from the NDEP. Upon issuance of an NFAD by the NDEP, redevelopment of the Site is expected to proceed in a manner consistent with the Environmental Covenant (Instrument 201102030002818 Clark County Recorders Office) that is attached to the property. This report also describes the various remediation actions that were performed and presents the subsequent confirmation data collected in 2009 and 2010 at the Site.

BACKGROUND

An initial confirmation sampling investigation was conducted at the Site in 2009 in accordance with BRC's Sampling and Analysis Plans for the Galleria North and Upper Ponds sub-areas (SAPs, approved by the NDEP on December 12, 2008, and May 18, 2009, respectively), with follow-up sampling in 2010. The SAPs addressed sampling procedures such that remaining contaminants and their potential impacts to future Site uses (as discussed in Section 1.1 of the *BRC Closure Plan* for the BMI Common Areas [BRC, Environmental Resources Management (ERM), and Daniel B. Stephens & Associates, Inc. (DBS&A) 2007[1]]) can be determined. The Site investigation involved collection of soil matrix and surface flux samples from throughout the Site. The sampling plan performed for this purpose, as described in Section 4 of each SAP (BRC 2008, 2009a), was consistent with the approach presented in Section 2 of the *Statistical Methodology Report* (NewFields 2006). The *Statistical Methodology Report* describes the

[1] The *BRC Closure Plan* was finalized and approved by NDEP in 2007. Subsequent to this date, revisions were made to Section 9 of the *BRC Closure Plan* (Risk Assessment Methodology–Human Health). The latest revision to Section 9 is March 2010. No other sections of the *BRC Closure Plan* have been revised since 2007.

statistical methods that are used to confirm the final soils closure at each of the Eastside sub-areas of the BMI Common Areas. Several subsequent rounds of soil remediation and confirmation sampling were performed. The final number of samples collected was determined to be adequate for the completion of a statistically robust dataset upon which to perform an HHRA.

CONCEPTUAL SITE MODEL

The conceptual site model for the Site considers current and potential future land-use conditions. Currently, the Site is undeveloped. Current receptors that may be exposed to Site chemicals of potential concern (COPCs) include on-site trespassers, occasional on-site workers, and off-site residents. Future receptors identified as "on-site receptors" are defined as receptors located within the current Site boundaries (Figure 1), while future "off-site receptors" are those located outside the current Site boundaries. Under the prospective redevelopment plan, the Site is proposed for use primarily as the Galleria Drive roadway, including right-of-way and landscaping. Portions of the Site may subsequently be developed for other uses (e.g., low- and medium-density residential and retail/commercial). For the evaluation in this Closure Report, the focus is for the Galleria Drive roadway and right-of-way and the HHRA assumes future receptors will include outdoor maintenance workers and construction workers. Future closure plans will evaluate exposures associated with other receptors for areas developed outside the final roadway alignment and right-of-way for other uses, as necessary.

Due to the requirement for use of default reasonable maximum exposure parameters for future receptors, exposures to future receptors are greater than current exposures. Accordingly, only future receptors were assessed in the HHRA. Potential exposures to off-site residents were qualitatively evaluated. The HHRA conforms to the methodology included in Section 9 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010).

The entire Site will be enhanced by restoration and redevelopment once remediation is complete. Therefore, there is no exposure to ecological receptors, because the Site will be prepared for human use as a roadway.

DATA REVIEW AND USABILITY EVALUATION

A data review and usability evaluation was performed to identify appropriate data for use in the HHRA. The results of the data usability evaluation indicate that the data collected in 2009 and 2010 are adequate in terms of quality and quantity for use in a risk assessment.

HUMAN HEALTH RISK ASSESSMENT

An HHRA was conducted to determine if chemical concentrations in Site soils are either: (1) representative of background conditions; or (2) do not pose an unacceptable risk to human health and the environment under current and potential future use conditions. The HHRA followed the procedures outlined in U.S. Environmental Protection Agency (USEPA) and the NDEP guidance documents. As noted above, the HHRA also conforms to the methodology presented in Section 9 of the NDEP-approved *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010) and includes all COPCs for the Site. Radionuclides were not included as COPCs because they were consistent with background conditions. Results of the HHRA are summarized below.

TABLE ES-1: SUMMARY OF HUMAN HEALTH RISK ASSESSMENT CALCULATIONS

	Construction Worker	Maintenance (Outdoor) Worker
Site (Total) Non-Cancer HI[1]	0.56	0.096
Site (Total) Cancer Risk[2]	2×10^{-7}	1×10^{-6}
Asbestos Risk[3]	0 to 8×10^{-7}	0 to 2×10^{-7}

1 – HI = hazard index; the value presented is the total cumulative non-cancer HI.
2 – Cancer risk is the maximum theoretical upper-bound incremental lifetime cancer risk (ILCR).
3 – Asbestos risks represent the cumulative asbestos risks for chrysotile and amphibole fibers.

Outdoor air exposures to volatile organic compounds (VOCs) are evaluated on a sample-by-sample basis, per NDEP requirements, using the surface flux data measurements. Because of this, the minimum and maximum surface flux risks and HI estimates are summed with the soil risk and HI estimates to provide a range of cumulative risks and HIs. The risk estimates shown above incorporate the maximum surface flux risks. Primary risk contributors are discussed in the main body of the report.

EVALUATION OF UNCERTAINTIES

Risk estimates are values that have uncertainties associated with them. These uncertainties, which arise at every step of a risk assessment, are evaluated in the report to provide an indication of the uncertainty associated with a risk estimate. Uncertainties from different sources are compounded in the HHRA. Because the uncertainties are compounded and because the exposure assumptions and toxicity criteria used are considered conservative, the risk estimates calculated in this HHRA are likely to overestimate rather than underestimate potential risks. A detailed discussion of these uncertainties is provided in the Uncertainty Analysis (Section 7) of the report.

POTENTIAL IMPACTS TO GROUNDWATER

As noted in a letter dated September 17, 2012, from Greg Lovato, NDEP, to Mark Paris, BRC, HHRA reports for the project no longer evaluate the potential leaching impacts to groundwater for any sub-area. This issue will be addressed in the Eastside groundwater remedial alternatives study (GW RAS). As provided for in Section XVII of the Phase III Administrative Order on Consent, No Further Action Determinations issued for sub-areas are subject to continuing Work to address Water Pollution Conditions, Operation and Maintenance, maintenance of existing Institutional Controls, and/or Efficacy Review.

SUMMARY

Based on the results of the 2009/2010 sampling, the HHRA, and the conclusions presented there from in this report, exposures to residual levels of chemicals in soil at the Galleria Dr. Right-of-Way should not result in adverse health effects to any of the future receptors evaluated. As a result, an NFAD for the Galleria Dr. Right-of-Way is warranted, given the following provisos:

1. The NFAD does not pertain to groundwater. BRC retains the responsibility to address any environmental impacts to groundwater beneath the Site, pursuant to the *Settlement Agreement and Administrative Order on Consent, Phase 3* (NDEP 2006). As such, additional investigation may be necessary on the Site as it relates to BRC's responsibilities for groundwater. BRC must be granted access to the Site for activities such as well or soil boring installations or other investigative or remedial efforts.

2. The soils beneath 10 feet bgs of the Recorded Environmental Covenant (Instrument 201102030002818 Clark County Recorders Office) redevelopment grading plan for the Site have not been evaluated to date. Accordingly, the NFAD does not pertain to soil below the top 10 feet of the redevelopment grading plan for the Site. The property owner should note that these soils should not be disturbed without additional investigation or evaluation. BRC understands that this provision will be reflected in an Environmental Covenant for the Site.

3. The property owner should ensure that activities at the Site do not exacerbate existing, sub-surface, environmental conditions. The redevelopment grading plan (Figure 2) that has been prepared for redevelopment of the Site has been incorporated as an Environmental Covenant for the Site to control subsurface excavation.

4. Site use is otherwise suitable for purposes as a road right-of-way.

1.0 INTRODUCTION

Basic Remediation Company LLC (BRC) has prepared this Human Health Risk Assessment (HHRA) and Closure Report for the Galleria Dr. Right-of-Way (Site; Figure 1) of the Basic Management, Inc. (BMI) Common Areas (Eastside) in Clark County, Nevada. The purpose of this report is to support a request for a No Further Action Determination (NFAD) by the Nevada Division of Environmental Protection (NDEP) for the Site. As presented in Section XVII.1.a. of the *Settlement Agreement and Administrative Order on Consent: BMI Common Areas, Phase 3* (AOC3; NDEP 2006), the NDEP acknowledges that discrete Eastside areas may be issued an NFAD as remedial actions are completed for selected environmental media. Any such NFAD request shall identify the remedial actions and other work completed at the property in question, the results of such remedial actions and other work, the proposed land use(s), and the reasons supporting the eligibility of the property for an NFAD. This report provides this information for the Site.

BRC recognizes that the following conditions will be included in a Recorded Environmental Covenant (Instrument 201102030002818 Clark County Recorders Office) as a condition to receiving an NFAD from the NDEP:

1. The NFAD does not pertain to groundwater. BRC retains the responsibility to address any environmental impacts to groundwater beneath the Site, pursuant to the AOC3. As such, additional investigation may be necessary on the Site as it relates to BRC's responsibilities for groundwater. BRC must be granted access to the Site for activities such as well or soil boring installations or other investigative or remedial efforts.

2. The soils beneath 10 feet below ground surface (bgs) of the redevelopment grading plan for the Site have not been evaluated to date. Accordingly, the NFAD does not pertain to soil below the top 10 feet of the redevelopment grading plan for the Site. The property owner should note that these soils should not be disturbed without additional investigation or evaluation.

3. The property owner should ensure that activities at the Site do not exacerbate existing, sub-surface, environmental conditions. The grading plan (Figure 2), which has been prepared for redevelopment of the Site, has been incorporated as an Environmental Covenant for the Site to control subsurface excavation.

4. Site use is otherwise suitable for purposes as a road right-of-way.

As stated in Section VI of the NDEP's *Record of Decision, Remediation of Soils and Sediments in the Upper and Lower Ponds at the BMI Complex* (ROD; NDEP 2001), cleanup of the Site proceeded under Alternative 4B (soils transferred from the Site to a dedicated Corrective Action Management Unit [CAMU] within the BMI Complex),[2] as identified and described in Section 9 of the Remedial Alternatives Study (RAS) for the Eastside. The *Remedial Alternatives Study for Soils and Sediments in the Upper and Lower Ponds at the BMI Complex* (Environmental Resources Management [ERM] 2000) was submitted to the NDEP in March 2000. The RAS is documented via issuance of the ROD, dated November 2, 2001, by the NDEP.

This report is consistent in format with prior closure reports for other study areas, and incorporates comments received from the NDEP on those reports. Draft NDEP comments dated January 11, 2013 and BRC's response to these comments are included in Appendix A, as well as redline/strikeout text showing the revisions from the original version of the report. An electronic version of the entire report, as well as original format files (MS Word and MS Excel) of all text, tables, modeling, and risk calculations are included on the report compact disc (CD) in Appendix B.

1.1 PURPOSE OF THE RISK ASSESSMENT

The purpose of the HHRA is to evaluate the potential for adverse human health impacts that may occur as a result of potential exposures to residual concentrations of chemicals in soil, groundwater, and air following remediation, and to assess whether any additional remedial actions are necessary in order to request an NFAD from the NDEP to allow redevelopment of the Site to proceed. The results of the risk assessment provide risk managers an understanding of the potential human health risks associated with background conditions and additional risks associated with past Site activities.[3] Pending issuance of an NFAD by the NDEP, redevelopment of the Site is expected to proceed in a manner consistent with the Recorded Environmental Covenant attached to the property.

[2] Under this alternative, the Site could be developed in accordance with the current development plan and the recorded Environmental Covenant for the Site that assures appropriate management of soils beneath 10 feet bgs (post-graded), should they need to be disturbed in the future.

[3] The HHRA presents total Site-related risk. Background risk is the risk to which a population is normally exposed, and does not include risks from Site contamination. Total Site-related risk includes both incremental (Site only) and background risks. Because naturally occurring constituents are typically included in a risk assessment (i.e., metals and radionuclides) the total Site-related risk will have some element of total risk included. However, because risks are only calculated for a subset of metal and radionuclides, a 'total' risk is not calculated. In instances where the total Site-related risk is calculated to exceed a cancer risk of 10^{-5} (typically when radionuclides are included in the risk assessment calculations) or a non-cancer hazard index greater than 1.0, then a background risk, only including those naturally occurring constituents included in the risk assessment, will also be calculated to provide context to the risk assessment results.

As presented in Section 2.5 of the Sampling and Analysis Plans for the Galleria North and Upper Ponds Sub-Areas, BMI Common Areas (Eastside) Clark County, Nevada (BRC 2008, 2009a; hereinafter "SAPs"; approved by the NDEP on December 12, 2008, and May 18, 2008, respectively), the only remediation conducted at the Site prior to sampling in accordance with the SAPs involved tamarisk and debris removal. When the sampling conducted in accordance with the SAPs was performed, areas within the Site that warranted remediation were identified, as discussed in Section 3.3. These areas have been addressed. The overall goal of the risk assessment presented in this report, therefore, is to confirm that residual chemical concentrations are: (1) either representative of background conditions; or (2) do not pose an unacceptable risk to human health and the environment under current and potential future land use conditions. Findings of the HHRA are intended to support the Site closure process.

While, in general, human health protection, BRC's overall goal is to remediate Site soils such that they are suitable for residential uses, that is not appropriate nor necessary for this Site since its intended use is a roadway.

Project-specific risk level and remediation goals consistent with USEPA precedents and guidelines have been established, as summarized below. It should be noted that: (1) all comparisons to risk or chemical-specific goals are made on an exposure area basis consistent with likely exposure assumptions; and (2) these comparisons are demonstrated through the use of spatial statistical analysis to apply to each one-eighth-acre exposure area.

Human health risks are represented by estimated theoretical upper-bound cancer risks and non-cancer hazards derived in accordance with standard USEPA and NDEP methods. If the carcinogenic risks or non-cancer hazards exceed USEPA acceptable levels or NDEP risk goals, then remedial action alternatives must be considered. The acceptable risk levels defined by USEPA for the protection of human health, as identified in Section 9.1.1 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010), are:

- Post-NFAD chemical and radionuclide concentrations in Site soils are targeted to have an associated residual, cumulative theoretical upper-bound incremental lifetime cancer risk (ILCR) level point of departure of 10^{-6}. This is the target risk goal for the project. For cases where the NDEP identifies this goal to be unfeasible, it is BRC's understanding that the NDEP will re-evaluate the goal in accordance with USEPA (1991a) guidance. In no case will the residual, cumulative theoretical upper-bound carcinogenic risk levels exceed those allowed per USEPA guidance.

- Post-NFAD chemical concentrations in Site soils are targeted to have an associated cumulative, non-carcinogenic hazard index (HI) of 1.0 or less. If the screening HI is determined to be greater than 1.0, target organ-specific HIs will be calculated for primary and secondary organs. The final risk goal will be to achieve target organ-specific non-carcinogenic HIs of less than 1.0.

- Where background levels exceed risk level goals or chemical-specific remediation goals, metal concentrations and radionuclide activities in Site soils are targeted to have risks no greater than those associated with background conditions.

In addition to the risk goals discussed above, chemical-specific remediation goals have been established for lead and dioxins/furans. The target goal for lead is 400 milligrams per kilogram (mg/kg) for residential land use, which is a residential soil concentration identified by USEPA (based on the Integrated Exposure Uptake Biokinetic Model [IEUBK] model) as protective of any exposure scenario (USEPA 2004a).

For dioxins/furans and polychlorinated biphenyl (PCB) congeners, the USEPA toxicity equivalency (TEQ) procedure, developed to describe the cumulative toxicity of these compounds, is used. This procedure involves assigning individual toxicity equivalency factors (TEFs) to the 2,3,7,8 substituted dioxin/furan and PCB congeners. TEFs are estimates of the toxicity of dioxin-like compounds relative to the toxicity of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD), which is assigned a TEF of 1.0. Calculating the TEQ of a mixture involves multiplying the concentration of individual congeners by their respective TEF. One-half the detection limit is used for calculating the TEQ for individual congeners that are non-detect in a particular sample. The sum of the TEQ concentrations for the individual congeners is the TCDD TEQ concentration for the mixture. TEFs from USEPA (2010) are used.[4] Consistent with the Agency for Toxic Substances and Disease Registry (ATSDR) *Update to the ATSDR Policy Guideline for Dioxins and Dioxin-Like Compounds in Residential Soil* (2008a), the target goal for residential land use is the ATSDR screening value and the NDEP residential Basic Comparison Level (BCL; NDEP 2012) of 50 parts per trillion (ppt) TCDD TEQ.

[4] Consistent with the letter dated November 9, 2010, from Greg Lovato, NDEP, to Mark Paris, BRC. BRC will revise the *BRC Closure Plan* accordingly.

1.2 METHODOLOGY AND REGULATORY GUIDANCE

This risk assessment follows procedures outlined in USEPA *Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual* (RAGS; USEPA 1989), and conforms to Section 9 (Risk Assessment Methodology–Human Health) of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010) which was approved by the NDEP on July 16, 2007. Various NDEP guidance documents are also relied on for the risk assessment (as referenced throughout this report). In addition, the NDEP's BCLs (NDEP 2012) are used for comparison of Site characterization data to provide for an initial screening evaluation, assist in the evaluation of data usability, and aid in determination of extent of contamination. A full list of guidance documents consulted is provided in Section 6 and the References section at the end of this document.

This report also relies upon methodology and information provided in the NDEP-approved *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010). The main text of the *BRC Closure Plan* provides discussions of the following elements relative to the BMI Common Areas project as a whole:

- The project history, including cleanup goals and project objective (Closure Plan Sections 1 and 2);
- The list of Site-related chemicals (SRCs; Closure Plan Section 3);
- The conceptual site model (CSM) addressing potential contaminant sources, the nature and extent of chemical of potential concern (COPC) occurrence, and potential exposure pathways (Closure Plan Section 4; a CSM discussion specific to the Site is provided in Section 5 of this report);
- Data verification and validation procedures (Closure Plan Section 5);
- The procedures used to evaluate the usability and adequacy of data for use in the risk assessment (Closure Plan Sections 6 and 9 [2010 revision]);

- The data quality objectives (DQOs; Closure Plan Section 7[5]);

- The RAS process for the Site (Closure Plan Section 8);

- Risk assessment procedures that will be used for Site closure (Closure Plan Section 9 for human health [2010 revision] and Section 10 for ecological); and

- Data quality assessment (Closure Plan Section 5).

As discussed in this report, the risk assessment for the Site is conducted primarily using the data collected during implementation of the Site-specific SAPs and subsequent confirmation sampling events, which have been designed to produce data representative of the conditions to which current (non-remediation workers) and future users would be exposed.

1.3 REPORT ORGANIZATION

The closure report is composed of 11 sections, as outlined below:

- This section (Section 1) presents the purpose of the risk assessment and the methods used in this assessment.

- Section 2 presents Site background, the environmental setting for the Site, and a summary of previous investigations. Section 2 also presents the CSM for the risk assessment. This includes identification of potentially exposed populations, and the potential pathways of human exposure.

- Section 3 presents the confirmation data collected in 2009 and 2010, as well as discussions on the various remedial actions conducted at the Site.

- Section 4 presents data evaluation procedures, including statistical analysis of background concentrations, and data usability and quality.

- Section 5 presents the selection of COPCs recommended for further assessment, including comparisons of Site metals and radionuclides to background conditions.

[5] As noted in the *BRC Closure Plan*, per discussions with the NDEP, the DQO process is addressed, on an Eastside sub-area by sub-area basis (for soils), in the respective sub-area SAPs developed for each sub-area relating to the soils cleanup. Therefore, the DQO process for the Site is presented in the SAP and is not repeated here. This DQO process was incorporated in the data usability/data adequacy evaluation for the Site data used in the risk assessment.

- Section 6 presents the HHRA. This includes relevant statistical analyses, determination of representative exposure point concentrations, applicable fate and transport modeling, exposure assessment, toxicity assessment, and risk characterization.
- In Section 7, the uncertainties associated with the risk assessment are discussed.
- A summary of the risk assessment results is provided in Section 8.
- The data quality assessment for the risk assessment is presented in Section 9.
- A summary of the HHRA and Closure Report is provided in Section 10; and
- A list of references is provided in Section 11.

Smaller tables with supporting information are inserted in the text at the place of reference. The text is followed by the larger tables, and figures and appendices.

2.0 SITE DESCRIPTION

This section presents a description of the Site, including Site background and history, the environmental setting, and a summary of previous investigations. The area known as the “BMI Common Areas,” of which the Galleria Dr. Right-of-Way is a part, is delineated in Appendix A of the AOC3. The subject Site is near the BMI Industrial Complex, in Clark County, Nevada, approximately 13 miles southeast of Las Vegas, within the City of Henderson (CoH) corporate limits, northeast of the City Hall (Figure 1). The total extent of the Site is approximately 44 acres. The Site is a portion of the sub-areas within Eastside that was previously defined as the Galleria North and Upper Ponds sub-areas in Section 1 and Figure 1-2 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010). The Site is a curvilinear area south of the CoH northern Rapid Infiltration Basins (RIBs) and CoH Water Reclamation Facility (WRF), which roughly trends along the former Galleria North/Upper Ponds boundary. The Tuscany residential development is immediately north of the eastern third of the Site, and the Weston Hills residential development is approximately 800 feet north of the Site.

The Site is essentially undeveloped desert with the exception of a former effluent conveyance ditch, a portion of which traverses the western portion of the Site along the boundary shared with the City WRF. From 1942 through 1976, various plant wastewaters were discharged into this conveyance ditch (named the Beta Ditch). A segment of the Southern Nevada Water Authority (SNWA) Pittman Lateral pipeline passes south and adjacent to the Site. This east-west trending subsurface feature is a major water supply conduit for the Las Vegas Valley. In addition, other utilities such as City of Henderson sewer mains, reuse water mains, and portions of the Nevada Environmental Response Trust (NERT) groundwater treatment water main are also present in portions of the site. Since 1976, when wastewater discharge to the Beta Ditch ceased, the Site has been vacant and unused. A utility corridor transects the Site near the Beta Ditch. This utility corridor was granted an NFAD by the NDEP on September 4, 2009, and is excluded from the Site.

2.1 SITE HISTORY

Approximately 400 of the more than 2,200 acres comprising the BMI Common Areas contained a network of ditches, canals, flumes, and unlined ponds that were used for the disposal of aqueous waste from the original magnesium plant and, later, other industrial plants and the adjacent municipality. Effluent wastes discharged to the ponds of the BMI Common Areas from the war-time Basic Magnesium operations can be characterized as salts from the production process (chloride salts of a variety of metals and radionuclides), organic solids, and inorganic solids and dissolved components of various types. Chlorinated organic chemicals were included in the effluent. Notable processes that contributed to the waste stream from the plants that succeeded Basic Magnesium included effluents from the manufacture of the following types of products: chlorine and sodium hydroxide (caustic soda); a variety of chlorate and perchlorate compounds, and halogenated boron compounds; manganese dioxide; titanium and related compounds; and a variety of pesticides. Among these wastes were salts, organic and inorganic chemicals, and metals. A more detailed description of these processes and their effluents is found in Sections 2.2 and 2.3 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010).

2.2 ENVIRONMENTAL SETTING

The BMI Common Areas and Complex are located in Clark County, Nevada, and are situated approximately 2 miles west of the River Mountains and 1 mile north of the McCullough Range. The local surface topography slopes in a westerly to northwesterly direction from the River Mountains and in a northerly to northeasterly direction from the McCullough Range. Near the BMI Common Areas and Complex, the surface topography slopes north toward the Las Vegas Wash. The River Mountains and McCullough Range consist of volcanic rocks: dacite in the River Mountains and andesite in the McCullough Range (Umhoefer et al. 2010).

The Site (Figure 3) comprises approximately 44 acres of undeveloped land with little surface relief that is gently sloping to the northeast. The Site is currently undeveloped, except for the previously noted Beta Ditch segment along the western edge of the Site, and unused ponds. As depicted on Figure 3, the Site has no other features of historical use; this Site has historically been undeveloped and unused. The native soils are compacted, poorly sorted, non-plastic, light brown to red silty sand with varying amounts of gravel.

2.2.1 Site Location, Climate and Physical Attributes

The Site is in the northeastern quarter of Section 5, Township 22 South, Range 63 East Mount Diablo Base and Meridian. The Site is in the Las Vegas Valley, a broad alluvial valley that occupies a structural basin in the Basin and Range Physiographic Province. The valley is about 1,550 square miles in size, and the structural and topographical axis is aligned approximately northwest to southeast. The eastern edge of the valley is about 5 miles west of Lake Mead, a major multipurpose artificial reservoir on the Colorado River. The Las Vegas Valley is surrounded mostly by mountains, ranging from 2,000 to 10,000 feet higher than the valley floor.

The valley floor ranges in elevation from about 3,000 feet above mean sea level (msl), in the west at the mountain front, to 1,500 feet above msl, in the east at the Wash (Clark County GIS Management Office 2003). The surrounding mountain ranges are:

- Sheep Range to the north;
- Frenchman and Sunrise Mountains to the northeast;
- River Range to the east;
- McCullough Range to the south; and
- Spring Mountains and Sierra Nevada mountain range of California to the west.

The Site is within the CoH corporate limits, northeast of the City Hall, and approximately 13 miles southeast of the city of Las Vegas (Figure 1). At its closest point, the Site is approximately 1 mile south of the Las Vegas Wash. The Site is a curvilinear area located south of the CoH northern RIBs and CoH WRF, which roughly trends along the former Galleria North/Upper Ponds boundary. The Radio Nevada and Tuscany residential development are immediately north of the eastern third of the Site, and the Weston Hills residential development is approximately 800 feet north of the Site.

The Site is situated in a natural desert area, where evaporation/evapotranspiration rates are high, due to high temperatures, high winds, and low humidity. Precipitation in this area averages approximately 0.4 inch per month or 4.8 inches per year (Western Regional Climate Center 2008). As discussed in the *Sources/Sinks and Input Parameters for Groundwater Flow Model Revised Technical Memorandum* (DBS&A 2009), in arid settings, recharge from precipitation is typically a small percentage of annual precipitation. Based on values from Scanlon et al. (2006), recharge as a percentage of annual precipitation for the Site area was estimated to be between 0.1 and 5 percent. Recharge is thus estimated to be between 0.0048 and 0.24 inch per year.

According to the Southern Nevada Water Authority's document entitled *Extent and Potential Use of the Shallow Aquifer and Wash Flow in Las Vegas Valley, Nevada* (1996), annual potential evapotranspiration exceeds 86 inches. Pan evaporation data measured from 1985 through 1988 were as high as 17 inches per month; the months with the highest evaporation (May through September) coincide with those months with the highest intensity of rainfall (Law Engineering 1993). However, evaporation and evapotranspiration are functions of vegetation type and density and other Site-specific conditions (especially anthropogenic conditions). Therefore, Site-specific evaporation/evapotranspiration may vary from these regional conditions. These climatic parameters may be appreciably influenced by future redevelopment (e.g., vegetation removal, pavement extent, and construction).

Wind flow patterns are fairly consistent from one month to another, but vary slightly between measurement stations (McCarran International Airport and a station within the BMI Complex adjacent to the employee parking lot at the Titanium Metals Corporation [TIMET] plant entrance) adjacent to the BRC haul road. For the McCarran station, the prevailing wind direction is from the southwest. The TIMET station also showed a predominant wind direction from the southwest, with southeasterly components. Wind velocity at both locations tends to be the highest in the spring and early summer months (April through July).

2.2.2 Geology/Hydrology

As is common throughout the Las Vegas Valley, Site soils are primarily sand and gravel, with occasional cobbles. This is consistent with the depositional environment of an alluvial fan. The Site is located on alluvial fan sediments, with a surface that slopes to the north-northeast at a gradient of approximately 0.02 foot per foot towards the Las Vegas Wash. Regional drainage is generally to the east.

The uppermost strata beneath the Site consist primarily of alluvial sands and gravels derived from the River Mountains and from the volcanic source rocks in the McCullough Range, located southeast and southwest of the Site, respectively. These uppermost alluvial sediments were deposited within the last 2 million years and are of Quaternary Age, and are thus mapped and referred to as the Quaternary alluvium (Qal; Carlsen et al. 1991). The Qal is typically on the order of 50 feet thick at the Site with variations due, in part, to the non-uniform contact between the Qal and the underlying Tertiary Muddy Creek Formation (TMCf).

The TMCf underlies the Qal. The Muddy Creek formation, of which the TMCf is the uppermost part, is a lacustrine deposition from the Tertiary Age, and it underlies much of the Las Vegas Valley. It is more than 2,000 feet thick in places. The lithology of the TMCf underlying the Site is typically fine-grained (sandy silt and clayey silt), although layers with increased sand content are sporadically encountered. These TMCf materials have typically low permeability, with hydraulic conductivities on the order of 10^{-6} to10^{-8} centimeters per second (Weston 1993). The TMCf in the vicinity of the Site was encountered to the maximum explored depth of 430 feet bgs. Lithologic cross sections are shown on Figures 4 and 5.

Two distinct, laterally continuous water-bearing zones are present within the upper 400 feet of the Site subsurface: (1) an upper, unconfined water-bearing zone primarily within the Qal referred to herein as the alluvial aquifer (Aa); and (2) a deep, confined water-bearing zone that occurs in a sandier depth interval within the silts of the deeper TMCf. Both of these water-bearing zones contain high concentrations of total dissolved solids. Between these two distinct water-bearing zones, a series of saturated sand stringers was sporadically and unpredictably encountered during drilling.

The Aa is an unconfined, shallower, water-bearing zone that occurs across the Site. For the most part, water in the Aa occurs in the Qal. The water surface in the Aa generally follows topography, with the water surface sloping towards the Las Vegas Wash. The depth from the surface to first groundwater at the Site is approximately 34 to 64 feet bgs (Figure 3). Wells completed in the Aa are not highly productive, with sustainable flows typically less than 5 gallons per minute.

2.2.3 Surface Water

Surface water flow occurs for brief periods of time during periodic precipitation events. The Las Vegas Wash collects storm water, shallow groundwater, urban runoff, and treated municipal wastewater. It is the receiving water body for all major Las Vegas area discharges. In dry weather, flow in the Wash comprises mainly treated effluent from the Clark County Water Reclamation District City of North Las Vegas, City of Las Vegas Water Pollution Control Facility, and the City of Henderson WRF. The CoH contributes smaller amounts. Aggregate flow is in excess of 160 million gallons per day (Las Vegas Wash Coordination Committee 2000). Discharge from these sources is sufficient to maintain surface flows in the Wash throughout the year. In winter, low-intensity rains fall over broad areas; in the spring and fall, thunderstorms provide short periods of high-intensity rainfall. The latter creates high run-off conditions. Run-off is also affected by human development, which tends to (1) create conduits for surface water flow and (2) decrease infiltration into native soils by covering them with man-made structures or materials (e.g., pavement).

Under current conditions, it is unlikely that ephemeral surface waters generated within the Site will migrate via overland transport to the Las Vegas Wash from the Site due to the intervening presence of the CoH WRF, northern RIBs, and the Weston Hills and Tuscany developments between the Site and the Wash. However, the presence of the drainage ditches suggests the current potential for rainfall to be carried from those portions of the Site to the Wash. After redevelopment, when the ditches have been removed, there will be an even lower likelihood that ephemeral surface waters generated within the Site will migrate via overland transport to the Las Vegas Wash from the Site because of the proposed design of the future storm water facilities and the regional requirement that nuisance flows not be discharged directly into the Las Vegas Wash unless they do so under existing conditions. (Flows from future development do not meet this criterion.)

Groundwater seeps currently exist at various locations north of the BMI Common Areas near the Las Vegas Wash. No seeps currently exist within the Site. Evidence that they have existed within the Site in the past 70 years is equivocal. In the series of aerial photographs taken regularly over the 70-year period between 1941 and 2011, those from the mid- to late-1960s appear to show a dark feature that could be water. It is not possible to definitively interpret these photographs, and no photographs taken before or after this time period show the same dark feature. There is no chemical or hydrological evidence that seeps have existed on the Site. The estimated locations of any hypothesized historical seeps in the Site vicinity are depicted on Figure 3.

2.3 SUMMARY OF HISTORICAL INVESTIGATIONS

Several historical field investigations were conducted at the Site to characterize the nature and extent of chemical occurrence in Site soils and groundwater. Based on these sampling events, BRC identified portions of the Site that warranted remediation for protection of human health and the environment,[6] and subsequently performed remediation in those areas. The SAPs present a detailed analysis of data collected during the historical field investigations conducted at the Galleria North and Upper Ponds sub-areas. Of those investigations, the following sampling events included sampling within the Site boundaries:

- Supplemental soil investigation conducted in October 1999 (dataset 6d) in the Upper Ponds. These data were not collected under a formal NDEP-approved work plan. Data validation results are presented in the DVSR for dataset 6d (ERM 2006), which was approved by NDEP on October 10, 2006.

- Supplemental soil investigation conducted in May/June 2001 (dataset 20c). These data were not collected under a formal NDEP-approved work plan. Data validation results are

[6] It should be noted that this determination was based on comparison of chemical detections to then-applicable human-health risk-based screening levels.

presented in the DVSRs for dataset 20c (ERM 2007a), which same dataset was approved by the NDEP on February 5, 2007.

- Deep soil characterization conducted in June/July 2004 during monitoring well installation at one on-site location (SB-05-B) as part of the overall Eastside 2004 Hydrologic Characterization Investigation (dataset 27). The sampling results for the investigation activities were presented in the 2004 version of the *BRC Closure Plan*, which was not approved by NDEP. Data validation results are presented in the DVSR for dataset 27 (MWH 2006a), which was approved by NDEP on August 31, 2006.

- Discussions between BRC and NDEP after the unusually heavy rainstorms of 2004 resulted in the decision to collect surface soil samples at three locations where the Alpha Ditch joins the City of Henderson. Data validation results are presented in the DVSR for dataset 32 (MWH 2006b), which was approved by NDEP on September 26, 2006.

- Soil sampling was conducted in June/July 2007 (dataset 46) in association with an investigation to further assess groundwater conditions within the northeast portion of the Common Areas. Data validation results are presented in the DVSR for dataset 46 (ERM 2007b), which was approved by NDEP on December 5, 2007.

The Site-related data from the above investigations were also presented in Appendix B of the SAPs. During these investigations, soil samples at various depths were collected and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), organochlorine pesticides, organophosphorus pesticides, PCBs, chlorinated herbicides, dioxins/furans, aldehydes, glycols/alcohols, organic acids, metals, perchlorate, radionuclides, and/or asbestos. The data from these investigations have been validated, as noted above. Data validations are presented in the respective DVSRs for each of the datasets, and all have been approved by the NDEP.

Several of the samples collected during these historical investigations were composite samples and were collected at least 10 years ago; few of the previous samples were analyzed for all of the major chemicals or chemical families now mandated; several analyses used different analytical methods than established in the current analytical program for the BMI Common Areas; and spatial coverage of the Site was incomplete. Therefore, because of these various factors, the data collected as part of the SAPs (as discussed in Section 3) are considered more representative of current Site conditions[7] than data collected from previous investigations, and these recent 2009/2010 data are therefore relied upon for risk assessment purposes as described in this report.

2.4 HISTORICAL REMEDIAL ACTIVITIES

Prior to 2009, remedial activities had not been conducted within the Site boundaries. However, in 2007, BRC conducted a broad-scale removal of tamarisk plants and debris across the Eastside property. The tamarisk removal efforts in the Site were minor, and were primarily associated with the immediate vicinity of the former ditches (see Figure 3); these efforts involved removal of minimal amounts of Site soil incorporated in the plant roots. In March-April 2000, an interim remedial measure (IRM) was conducted in the adjacent Sunset North Commercial and Upper Ponds sub-areas. This IRM area is also shown on Figure 3.

2.5 CONCEPTUAL SITE MODEL

The CSM is a tool used in risk assessment to describe relationships between chemicals and potentially exposed human receptor populations, thereby delineating the relationships between the suspected sources of chemicals identified at the Site, the mechanisms by which the chemicals might be released and transported in the environment, and the means by which the receptors could come in contact with the chemicals. The CSM provides a basis for defining DQOs, guiding Site characterization, and developing exposure scenarios. The Site history, land uses, climate, physical attributes, including geology and hydrogeology, and various field investigations are described in Sections 2.1 through 2.4 of this HHRA. The history and environmental conditions of the BMI Common Areas are described in Sections 2 and 4 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010), and in the Sitewide CSM (in preparation).

The HHRA evaluates current and potential future land-use conditions. The Site is currently undeveloped. The potential on- and off-site receptors are currently trespassers, occasional on-site workers, and off-site residents. Exposures to current receptors are being managed through Site access control.

Under the prospective redevelopment plan, the Site will have a roadway land use, including right-of-way and landscaping. Portions of the Site may subsequently be developed for other uses (e.g., low- and-medium density residential and retail/commercial). For the evaluation in this

[7] This determination is also based on the data usability evaluation summarized in Section 4.2.

Closure Report, the focus is for the Galleria Drive roadway and right-of-way and the HHRA assumes future receptors will include outdoor maintenance workers and construction workers. Future closure plans will evaluate exposures associated with other receptors for areas developed outside the roadway for other uses, as necessary.

The entire Site will be enhanced by restoration and redevelopment once remediation is complete. Therefore, exposures to ecological receptors will be mitigated or removed. Future receptors identified as “on-site receptors” are defined as receptors located within current Site boundaries (Figure 1), while future “off-site receptors” are those located outside current Site boundaries. Many potential human receptors are possible at the Site in the period during and after redevelopment. The potentially exposed populations and their potential routes of exposure are discussed in Section 2.5.3.

The current development plan for the Site is shown on Figure 6 (note the right-of-way on this figure was prepared subsequent to the development plan shown). This is an example and actual features may change in the future. To construct the roadway and associated features, the land will be cut and/or filled, paved with roads, and nurtured with imported top soils[8] as needed. Figure 2 shows the Redevelopment Grading Plan for the Site, indicating which areas will be filled and which areas will be cut.

The CSM includes the planned redevelopment of the Site. All potential transfer pathways are included in the CSM. The human health aspects of the CSM for the Site are presented on Figure 7.

Numerous release mechanisms influence chemical behavior in environmental media. Under both current and future land use conditions at the Site, the principal release mechanisms involved are:

- Vertical migration in the vadose zone;
- Storm/surface water runoff into surface water and sediments;
- Fugitive dust generation and transport; and
- Vapor emission and transport.

[8] Imported soil data are not included in risk assessment calculations. However, the chemical data for fill material from a given site may be useful for evaluating sub-areas to receive fill from that site.

Although these release mechanisms are identified here, no quantitative modeling is presented in this section. Instead, those primary release mechanisms identified for particular receptors are presented in this section, and are quantitatively evaluated in Section 6.

2.5.1 Impacted Environmental Media

Environmental media at the Site consist of five categories: surface soil, subsurface soil, groundwater, indoor air, and ambient outdoor air. Samples relative to Site baseline conditions have been collected at the Site for soil. Generally, impacted soil is the source of chemical exposures for other media at the Site.

Because the background water quality of groundwater beneath the Site and in the surrounding area is generally poor (viz., high salt concentrations) and because BRC has placed Environmental Covenants in the form of a deed restriction to prevent future users from utilizing groundwater beneath the Site, the use of private water wells by residents, businesses, or parks for drinking water, irrigation water, or other non-potable uses (e.g., washing cars, filling swimming pools) will not occur in the post-redevelopment phase. Furthermore, there are no anticipated groundwater uses associated with the proposed roadway land use. Therefore, exposure pathways relating to this type of use are incomplete, as defined by USEPA (1989).

Although direct exposures to groundwater will not occur; indirect exposures are possible. The primary indirect exposure pathway from groundwater is the infiltration of VOCs from soil and groundwater to indoor air. In addition, residual levels of chemicals in soil may leach and impact groundwater quality beneath the Site.

2.5.2 Inter-Media Transfers

Exposure to Site chemicals may be direct, as in the case of impacted surface soil, or indirect following inter-media transfers. Impacted soil is the initial source for inter-media transfers at the Site, which can be primary or secondary. For example, upward migration of VOCs from impacted subsurface soil into ambient air thereby reaching a point of human inhalation represents a secondary inter-media transfer.

These inter-media transfers represent the potential migration pathways that may transport one or more chemicals to an area away from the Site where a human receptor could be exposed. Discussions of each of the identified potential transfer pathways are presented below. Figure 7 presents a conceptualized diagram of the inter-media transfers and fate and transport modeling for the Site.

Five initial transfer pathways for which chemicals can migrate from impacted soil to other media have been identified. The first of these pathways is volatilization from soil and upward migration from soil into ambient air. Ambient air can be both indoor and outdoor air. The pathway of volatilization from both soil and groundwater and upward migration into ambient air was evaluated using the surface flux measurements collected. The secondary transfer pathway is downward migration of chemicals from soil to groundwater. The third transfer pathway is migration of chemicals in surface soil via surface runoff to sediments or surface water bodies. However, as discussed in Section 2.2.3 because of the intervening City RIBs, it is unlikely that surface waters (which are ephemeral) will drain to the Las Vegas Wash from the Site. Therefore, the surface water pathway was not evaluated in this risk assessment. The fourth transfer pathway is on-site fugitive dust generation. Finally, chemicals in soil can be transferred to plants grown on the Site via uptake through the roots. However, the plant uptake pathway is only evaluated for residential receptors.

2.5.3 Potential Human Exposure Scenarios

The following subsections summarize land use and the human exposure scenarios that are assessed herein.

2.5.3.1 Current and Future Land Use

Current receptors that may use the Site include trespassers, occasional on-site workers, and off-site residents. Current exposures to native soils at the Site are minimal, but exposures to future receptors will be much greater. For example, future receptors evaluated in the HHRA include on-site workers who are assumed to be exposed to soil at the Site for 250 days per year for 25 years, which is much greater than any current exposure scenario. In addition, as discussed above, exposures to current receptors are limited through Site access control. Therefore, a current land use scenario is not quantitatively evaluated in this risk assessment.

USEPA risk assessment guidance (1989) states that potential future land use should be considered in addition to current land use when evaluating the potential for human exposure at a site. As indicated above, under the prospective redevelopment plan, the Site will be used for a roadway. The entire Eastside property will be redeveloped in several phases. Throughout the redevelopment process, the sub-areas of the Site will be redeveloped sequentially. Future receptors identified as "on-site receptors" are defined as receptors located within the current Site boundaries (Figure 1), while future "off-site receptors" are those located outside the current Site boundaries. "On-site receptors" are those future receptors that will be located within the Site under evaluation. "Off-site receptors" are those future receptors that will be located outside the Site under evaluation that may have complete exposure pathways associated with sources within the Site. As noted above, remediation of the Site is to on-site outdoor/construction worker standards. Consequently, risks to off-site receptors are addressed qualitatively in this risk assessment.

2.5.3.2 Identification of Potentially Exposed Populations and Pathways

Many potential human receptors are possible at the Site in the period during and after redevelopment. The potentially exposed populations and their potential routes of exposure are presented on Figure 7 and summarized below. For a complete exposure pathway to exist, each of the following elements must be present (USEPA 1989):

- A source and mechanism for chemical release;
- An environmental transport medium (i.e., air, water, soil);
- A point of potential human contact with the medium; and
- A route of exposure (e.g., inhalation, ingestion, dermal contact).

As presented in Section 9 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010), the following are the primary exposure pathways for each of the potential receptors following remediation and redevelopment at the Site.

- Outdoor maintenance workers
  - Incidental soil ingestion*
  - External exposure from soil†
  - Dermal contact with soil
  - Outdoor inhalation of dust*‡
  - Outdoor inhalation of VOCs from soil and groundwater

- Construction workers
  - Incidental soil ingestion*
  - External exposure from soil†
  - Dermal contact with soil

Basic Remediation COMPANY

- Outdoor inhalation of dust*‡
- Outdoor inhalation of VOCs from soil and groundwater

*Includes radionuclide exposures
†Only radionuclide exposures
‡Includes asbestos exposures

Although trespassers/recreational users and downwind off-site residents are another potential receptor identified in the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010), exposures for these receptors are less than those evaluated above. As noted in Sections 9.1.1 and 9.7.1 of the *Closure Plan*, potential exposures for trespassers/recreational users will only be evaluated in areas of the BMI Common Areas that are designated as recreational end use (specifically the Western Hook-Open Space sub-area shown on Figure 1). Also, as noted in Section 9.5.4 of the *Closure Plan*, off-site dust levels based on USEPA's model are much lower than those generated for on-site, construction-related activities. Therefore, risks evaluated for an on-site construction worker, as performed in this HHRA, are considered protective of off-site residents.

3.0 CONFIRMATION DATA PROCESS AND SUMMARY

Based on the historical data for the Site, no remediation was proposed prior to implementing the sampling prescribed in the SAPs. Decisions for excavation during SAP implementation were based on the initial data (discussed below) in accordance with the Risk Assessment Methodology provided in the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010). The following is the initial scope of work for investigating the Site and meeting the SAP objectives. Much of the discussion below regarding confirmation soil sampling is taken from the *Statistical Methodology Report* (NewFields 2006).

3.1 INITIAL CONFIRMATION SOIL SAMPLING

As per Section 2 of the *Statistical Methodology Report*, the initial confirmation sampling at the Site was conducted on the basis of combined random and biased (judgmental) sampling, as follows:

- **Stratified Random Locations:** For this purpose, the Site was covered by a 3-acre cell grid network. Within each 3-acre cell, a sampling location was randomly selected. Sampling locations were randomly selected within both full and partial grid cells if they were greater than 50 percent of the total grid cell area (based on the project-wide grid cell network and the Site boundaries; those partial grid cells that contain less than 50 percent of their area within the Site were included in the adjacent sub-area SAPs). The main objective of this stratified random sampling was to provide uniform coverage of each Site within Eastside property.

- **Biased Locations:** Additional sampling locations were selected within or near small-scale contamination points of interests, including but not limited to previous debris locations, ponds, and berms. For this purpose, the randomly selected location within a corresponding 3-acre cell was adjusted to cover a nearby point of interest. In the event that currently unknown impacted areas were identified during remediation, the presence of these areas were drawn to the NDEP's attention, the need for additional biased sampling points to address those areas was evaluated, and the sampling program modified as needed.

A Site reconnaissance was performed in July and August 2008 to check for environmentally significant features such as debris piles or stained soil. Nine debris piles were observed within the Site boundaries during the reconnaissance (identified as station numbers 1, 2, 3, 16, 29, 35, 36, 39, and 42 and described in the Galleria North SAP and noted on Figure 8 of this HHRA). Biased sampling locations were selected at each of the debris piles/soil staining location. In some cases, random sampling locations were shifted slightly to address the debris locations. A final reconnaissance was performed prior to sampling to check for any additional environmentally significant features since the initial reconnaissance; if found, these additional features would also have been sampled. No such features were found. Biased sampling was also conducted along the length of the Alpha and Beta Ditches, at approximately 200-foot linear spacing (four locations within the Site). Figure 8 and accompanying Table 3-1 (see Tables section) show the sampling locations within the Site. Rationale for each of the biased sampling locations is presented below:

- GNC1-JS08 and -JS17 were included to provide coverage within debris areas observed at the Site;
- GNC1-JD01 through -JD03 were included to provide additional coverage within the Alpha Ditch;
- GNC1-JD06 was included to provide additional coverage within the Beta Ditch;
- GNC1-JP02, -JP04, -JP05, -JP06, and UPC1-JP11 were included to provide additional coverage within the former ponds; and
- GNC1-JB02, -JB03, -JB06, and -JB07 were included to provide additional coverage within the berms of the former ponds.

Elevated detections of dioxins/furans/PCB congeners were reported in initial SAP samples collected from the southern half of the Galleria North sub-area. In response, additional biased samples were collected, four of which (GNC1-JA02, GNC1-JA03, GNC1-JA09, and GNC1-JA10) were within the Site, for dioxins/furans/PCB congener analyses in August 2009. These sampling locations were outside the boundaries of soil removal actions initially performed in accordance with the *Removal Action Work Plan* (RAWP, BRC 2009b) (Section 3.3.1).

The following discusses the multi-depth soil samples that were collected and analyzed for the SRC list at each selected location. Samples were collected at:

1. Existing surface (0 foot bgs) and 10 feet bgs for sample locations in relatively flat (ungraded) locations;
2. Existing surface (0 foot bgs), post-grading surface (post-redevelopment as shown on Figure 2), and post-grade 10 feet bgs for sample locations with substantial grading (that is,

cut depths greater than 2 feet[9]) and the uppermost sampled soil is expected to be used as surface fill;

3. Existing surface (0 foot bgs) and 10 feet bgs for sample locations with minimal grading (that is, cut depths less than 2 feet) and the uppermost sampled soil is expected to be used as surface fill (at any Eastside location); and

4. Existing surface (0 foot bgs) and 10 feet bgs for sampling locations in an area expected to be covered by fill material.

The analytical sample results were then divided into surface (0- to 2-foot depth), subsurface (2- to 10-foot depth), and deep (>10-foot depth) layers, according to the following rules:

- **Rule 1: IF** the sample was collected in a relatively flat (ungraded) part of the Site (i.e., an area not targeted for substantial grading), **THEN** the depth of the collected soil sample is used to designate its soil layer grouping.

- **Rule 2: IF** the sample was collected in a part of the Site targeted for substantial grading, **AND** the sampled soil is located in an area expected to be covered by fill material (e.g., exposed excavated surfaces of ponds), **THEN** the current surface soil sample is classified as a surface (0- to 2-foot depth) sample, and the soil layer grouping of the remaining deeper sampled soil is determined based on the difference between its elevation and the final (post-graded) surface elevation in that part of the Site.

- **Rule 3: IF** the sample is collected in a part of the Site targeted for substantial grading, **AND** the cut depth is expected to be greater than 2 feet, **AND** the sampled soil is expected to be used as surface fill (e.g., soil within a berm), **THEN** the current surface soil sample is classified as a fill material sample, a final (post-graded) surface sample is classified as a surface (0- to 2-foot depth) sample, and the soil layer grouping of the remaining deeper sampled soil is determined based on the difference between its elevation and the final (post-development, graded) surface elevation in that part of the Site.

- **Rule 4: IF** the sample is collected in a part of the Site targeted for substantial grading, **AND** the cut depth is expected to be less than 2 feet, **AND** the sampled soil is expected to be used

[9] Because sample collection was over a 2- to 3-foot depth interval, locations with an anticipated cut depth less than 3 feet were only sampled at the surface and one post-grade subsurface depth. The sample depth designation (e.g., 10 feet bgs) is based on the center depth of the sample collection interval.

as surface fill (e.g., soil within a berm), **THEN** the current surface soil sample is classified as both a fill material sample and as a surface (0- to 2-foot depth) sample, and the soil layer grouping of the remaining deeper sampled soil is determined based on the difference between its elevation and the final (post-graded) surface elevation in that part of the Site.

A schematic example of these rules is shown on Figure 9. The Redevelopment Grading Plan for the Site is shown on Figure 2.[10] The sample-specific collection depths are presented in Table 3-1 (Tables section).

As noted above, soil samples were generally collected over a 2- to 3-foot depth interval. This was because of volume of soil required for completion of all analyses. The 10 feet bgs (and deeper) samples were collected in 2- to 3-foot intervals centered on 10 feet (or centered on the deeper sampling depth as indicated in Table 3-1). Confirmation samples, which usually have a shortened analyte list, were collected over a smaller sampling interval. Contamination by the historical manufacturing processes upgradient is usually found predominantly in surface soils. The objective of remedial actions at the Site was to remove surface soils that were impacted by surface releases of off-site chemicals. Therefore, higher concentrations are expected—and have been generally observed—in surface samples. However, to adequately characterize the vertical extent of possible contamination, one or more deeper samples were also collected at each sampling location, as described above.

As discussed in Section 6.1.1, given the potential for change to the prospective grading plan, these samples were classified into two different exposure depths: surface and all (surface and subsurface) depths. These different soil exposure depth classifications are considered to represent all possible exposure potential for all receptors, and thus a reasonable worst-case scenario has been assessed.

Although some samples are designated as Fill samples, the grading across the Site is anticipated to be primarily shallow grading with limited ‘cut’ areas. The separate evaluation of fill data is done primarily to determine if fill material from a particular sub-area can be used elsewhere. Given the limited amount of cut areas across the Site, the few samples designated as ‘Fill,’ that more fill areas exist than cut areas, and that the limited amount of fill material will likely be used with the Site, the separate evaluation of the fill data was not conducted for the Site.

[10] Note that the grading plan is reflected in an Environmental Covenant for the Site as a condition to receiving an NFAD from NDEP.

Initial sampling for the Site was conducted in January and February 2009. All soil samples were tagged in the database with numeric designations of their corresponding assigned soil layer grouping based on the rules presented above. During these initial sampling events (Table 3-1), 70 soil samples were collected from 28 locations (including field duplicates, but not including deep samples collected for soil physical parameter data).[11] This included 13 "random"[12] and 15 "biased" sample locations. At these locations, BRC initially collected 28 surface samples[13] (one at each location, and duplicates at eight locations in accordance with the duplicate frequency specified in the *BRC Quality Assurance Project Plan* (QAPP; BRC and ERM 2009a) and 34 subsurface soil samples. Eleven of the surface soil samples also represent Fill samples. All sampling results are presented electronically on the report CD in Appendix B, and in Tables B-1 through B-12.

3.2 CHEMICALS SELECTED FOR ANALYSIS

The analyte list for soil samples collected during the initial 2009 investigation comprised the BRC project SRC list, and was consistent with the analytical program presented in Section 3 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010)[14] and Table 3-2 (Tables section), with the following exceptions for this Site:

- Asbestos and dioxins/furans were only analyzed for in surface soil samples.[15]
- USEPA Method 8141A for organophosphorus pesticides was not conducted. There have been only 47 detections of these compounds in over 10,000 soil sample records (<0.5 percent) from throughout the Eastside. The few detections are well below the NDEP BCLs.

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[11] Note that in Table 3-4, which summarizes the analyses performed on Site samples, the number of samples reported in that table for a given analysis does not always equal 70. This is due to (1) inclusion in the final dataset of supplemental samples collected to assess the extent of chemical impacts in certain areas; (2) certain analytes were not included in the subsurface samples, as noted in the following section; some samples were remediated for particular analytes, and confirmation samples collected, and (3) rejected data are not included in the statistical summary in Table 3-4.

[12] As noted before, in some cases, random sampling locations were shifted slightly to address debris locations.

[13] During the original sampling and analysis event, the only modifications to the original scope of services were eliminating sample location GNC1-JD03 due to conflicts with underground utilities. However, asbestos sampling was conducted as a separate sampling event, for surface samples only; therefore, this sample location was sampled and analyzed for asbestos only.

[14] Specific analytes and analyte-specific reporting limits for each analysis are listed in Table 4 of the QAPP.

[15] Note that all samples collected at the Site were discrete samples, with the exception of asbestos samples, which were composite samples collected as per the NDEP-approved Standard Operating Procedure [SOP]-12 as provided in the *Field Sampling and Standard Operating Procedures* [FSSOP; BRC, ERM and MWH 2009]).

- USEPA Method 8151A for chlorinated herbicides was not conducted. There have been no detections of these compounds in over 1,400 soil sample records from throughout the Eastside. Detection limits are below the NDEP BCLs.

- HPLC Method for organic acids was not conducted. There have been only three detections of these compounds in 567 soil sample records (<0.5 percent) from throughout the Eastside. Moreover, the NDEP has not established BCLs for these compounds.

- USEPA Method 8015B for non-halogenated organics (e.g., methanol and glycols) was not conducted. There have been only five detections of these compounds in 420 soil sample records (1 percent) from throughout the Eastside. The few detections have been well below the NDEP BCLs.

- USEPA Method 8015 for total petroleum hydrocarbons (TPH) was not conducted. There have been only three detections of these compounds in over 299 soil sample records (1 percent) from throughout the Eastside. The few detections have been below 100 mg/kg, which is the typical low-end aesthetic threshold used for these compounds There are no indications of possible TPH source areas (e.g., abandoned vehicles, dumping of oils/ hydraulic fluids) at the Site. While TPH was not analyzed for, its components were via other methods. In addition, TPH cannot be included in a risk assessment while its components can.

- Consistent with the current project analyte list, the following radionuclides were analyzed for: radium-226, radium-228, thorium-228, thorium-230, thorium-232, uranium-233/234, uranium-235/236, and uranium-238.

The soil analyte list consisted of 286 of the 418 compounds (including water-only parameters) on the project SRC list. The analytical and preparatory methods (Table 3-2) used in accordance with the SAPs adhered to the most recent version of the BRC QAPP (BRC and ERM 2009a; see Section B4, Table 4 of that document). As noted in Section 3.6, the analyte list for surface flux samples was composed of the list specified in the NDEP-approved Standard Operating Procedure (SOP)-16,as provided in the *Field Sampling and Standard Operating Procedures* (FSSOP; BRC, ERM and MWH 2009). Surface flux samples were analyzed for VOCs by USEPA Method TO-15 full scan, plus selective ion mode (SIM) analyses for a subset of the analytes.

3.3 INTERMEDIATE SAMPLING AND CLEANUP

3.3.1 2009 Removal Action

All initial data were reviewed and a determination made, in consultation with the NDEP, as to whether localized soil removals were warranted. In September 2009, BRC submitted a RAWP (BRC 2009b) to the NDEP. This RAWP was approved by the NDEP on September 22, 2009. The overall goal of the RAWP was to present a cleanup strategy for the Site that effectively minimized, to the extent feasible, the human health risks associated with the identified soil in the impacted areas of the Site.

The following six remediation areas were initially proposed for the Site:

- Alpha Ditch location GNC1-JD01 (metals exceedances);
- Upper Pond location GNC1-BC20 (dioxin/furan exceedances);
- Upper Pond locations GNC1-JP04, -BC23, -JP02 (dioxin/furan and metals exceedances);
- Upper Pond location GNC1-JP05 (dioxin/furan exceedances);
- Upper Pond location GNC1-JP03 (dioxin/furan exceedances); and
- Upper Pond locations GNC1-BC28 and -JS17 (dioxin/furan exceedances).

Remediation was proposed by excavation and removal of impacted soils to the CAMU. The extent of the excavations is depicted on Figure 10.

The non-ditch remediation areas were developed based on a Thiessen map overlaid across the Site. Thiessen maps are constructed from a series of polygons formed around each sampling location. Thiessen polygons are created so that every location within a polygon is closer to the sampling location in that polygon than any other sampling location. These polygons do not take into account the respective concentrations at each location. These polygons were used as the basis for the areal extent of remediation for each of the non-ditch locations with elevated dioxins/furans/PCB congeners or metals levels.

For the ditch location, the remediation area was centered about the initial sampling locations that triggered remediation. The extent of excavation at this area was a 50-foot-wide segment of the ditch, extended such that the limits of excavation reached half the distance to the adjacent ditch samples to the north and south.

Following remediation, confirmation surface soil samples were collected at each of the original sample locations associated with the remediation area polygons and ditch segments described above[16]. All sampling locations are shown on Figure 11. The analyte list was composed of those chemicals that triggered the remediation at each sampling location. These included dioxins/furans/PCB congeners and metals.

3.3.2 2010 Removal Action

Following the review of data collected from the 2009 remedial action, two additional remediation areas were identified for the Site (Figure 10). These areas were part of a larger remediation plan for the northern portion of the entire Eastside property. BRC did not submit a formal work plan to the NDEP for conducting remediation at these areas, but discussed the planned excavations with the NDEP in June 2010. These additional remediation areas were as follows:

- Additional scraping was conducted at Alpha Ditch location GNC1-JD01 to address elevated metal detections; and

- Excavation was conducted at Beta Ditch location GNC1-JD06 to address elevated metal detections.

As before, the analyte list was composed of those chemicals that triggered the remediation at each sampling location (i.e., metals).

3.4 FINAL CONFIRMATION DATASET

Post-scrape analyses associated with follow-up rounds of remediation focused on the constituents triggering that additional remediation and, therefore, did not include the full suite analyses of the original analytical program. Analytical results from the original SAPs dataset were retained for all constituents except those that were re-analyzed after additional scraping. The final confirmation dataset included the following sampling results:

- SAP sampling data, retaining the results that were not superseded by subsequent sampling;

[16] The naming convention for confirmation samples uses the same sample identification as the initial (pre-remediation) sample, with an updated numerical prefix. For example, confirmation samples associated with GNC1-JD01 are named GNC2-JD01 (after one round of confirmation sampling) or GNC3-JD01 (after a second scrape and round of confirmation sampling).

- Data generated after intermediate sampling and remediation (retaining the results that were not superseded by subsequent sampling); and

- Additional samples collected for confirmation after completion of remediation activities.

The soil dataset was subjected to a series of statistical analyses to determine representative exposure concentrations for the sub-area, as described in Sections 4 and 5 of the NDEP-approved *Statistical Methodology Report* (NewFields 2006). Consistent with the project *Statistical Methodology Report*, kriging or geostatistical analysis was not performed on the data because each measurement was assumed to be equally representative for that chemical at any point in each sub-area of the Eastside property. Hence, calculation of the 95 percent upper confidence limit (UCL) by exposure area directly from the data is considered reasonable.

As discussed in Section 4, all data have been validated. Results of all confirmation sampling and analysis are presented in Appendix B, and electronically on the report CD in Appendix B, as is the dataset used in the HHRA for the Site. All confirmation sampling locations for the Site are shown on Figure 11. Table 3-3 provides a matrix of which analytical suite was analyzed for in each of the samples collected from the Site. Geotechnical and Environmental Services (GES) conducted all fieldwork at the Site. The GES field reports, including boring logs, for each investigation are provided electronically in Appendix C (included on the report CD in Appendix B).

3.5 FINAL CONFIRMATION DATA SUMMARY

Using the compound-specific information presented in Table 2 of the QAPP (BRC and ERM 2009a), the comparison levels for each chemical included in the investigation were compiled for comparison to Site data. Specific soil comparison levels used for this effort were as follows:

- NDEP BCLs for outdoor worker soil (NDEP 2012);

- NDEP BCLs for protection of groundwater (LBCL), assuming dilution attenuation factors (DAF) of 1 and 20 (NDEP 2012); and

- The maximum background concentration (for metals and radionuclides only), derived from the shallow Qal McCullough background soil dataset presented in Section 5.[17]

A DAF of 1 is used when little or no dilution or attenuation of soil leachate concentrations is expected, and a DAF of 20 may be used when significant attenuation of the leachate is expected due to Site-specific conditions. For the Site, the LBCLs based on a DAF of 1 were used for discussion purposes. Data for the Site, including the number of instances in which chemical concentrations exceed each of the comparison levels, are listed in Table 3-4,[18] and summarized below. It is important to note that these comparisons are used to provide for an initial screening evaluation, assist in the evaluation of data usability, and determine the extent of contamination. They are not used for decision-making purposes or as an indication of the risks associated with the Site.

Aluminum

Aluminum was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). All of the detections were lower than the 100,000 mg/kg BCL, but were higher than the 75 mg/kg $LBCL_{DAF1}$. One sample from 10 feet bgs at GNC1-BC18 (18,700 mg/kg) exceeded the 15,300 mg/kg maximum shallow Qal McCullough background level.

Arsenic

Arsenic was detected in 65 of the 69 soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). All of the detections were higher than the 1.77 mg/kg BCL and the 1 mg/kg $LBCL_{DAF1}$, and 15 of the detections were higher than the maximum shallow Qal McCullough background level (7.2 mg/kg), as listed in Table 3-5 below.

TABLE 3-5: ARSENIC DETECTIONS GREATER THAN BACKGROUND

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)	Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JB02	15	7.3 J+	UPC1-BB32	0	8.4 J+
GNC1-JS17	0	7.7	GNC3-JD01C	0	8.8

[17] This value, for the shallow Qal McCullough background dataset, is used for comparison only; as discussed in Section 5.1, background comparisons were performed for the Site dataset using statistical tests.

[18] Pre-scrape data for the target constituents are not included in Table 3-4. That is, these have been replaced by post-scrape data; however, pre-scrape data for the non-target constituents are included in Table 3-4. Because of this, the total number of analyses does not always coincide with the total number of analyses reported in the tables in Appendix B, which include all data, regardless of status.

TABLE 3-5: ARSENIC DETECTIONS GREATER THAN BACKGROUND

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JD06	10	7.7
GNC1-BB16	10	7.8 J+
UPC1-BB33	10	7.8 J+
GNC1-BC22	0	7.9
GNC1-JA10	0	7.9 J+
GNC1-JS17	10	8

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JD02	0	8.8 J+
GNC1-JS08	0	9.6
GNC1-BC16	10	10.8 J+
GNC1-JA03	0	13.3 J+
GNC1-BC18	10	14.2 J+

In addition, arsenic was reported as a non-detection in four samples (surface soil confirmation samples GNC1-BC16, GNC1-BB16, and GNC1-BC18 and duplicate); the associated analytical reporting limits (5.2 and 5.3 mg/kg) are higher than the comparison levels and it is not known whether arsenic is present at concentrations above the comparison levels at this location. However, these analytical reporting limits were sufficiently low to indicate that none of these four samples contained arsenic at concentrations above background.

Barium

Barium was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 100,000 mg/kg BCL; however, all of the detections exceeded the 82 mg/kg $LBCL_{DAF1}$; and three of the detections, each from 10 feet bgs, at UPC1-BB32 (921 J mg/kg), GNC1-JP04 (1270 J+ mg/kg), and GNC1-BC18 (1,300 J mg/kg) were higher than the maximum shallow Qal McCullough background level (836 mg/kg).

Chromium (VI)

Chromium (VI) was detected in 27 of the 69 soil samples in which it was analyzed for 35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 1,360 mg/kg BCL. One surface sample from UPC1-JP22 (2.1 mg/kg) was slightly higher than the 2 mg/kg $LBCL_{DAF1}$. This detection was also above the maximum shallow Qal McCullough background level (0.32 mg/kg). The analytical reporting limits for non-detections were lower than the BCL and $LBCL_{DAF1}$.

Cobalt

Cobalt was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 337 mg/kg BCL, but all detections were higher than the 0.495 mg/kg $LBCL_{DAF1}$. However, all of the detections were lower than the maximum shallow Qal McCullough background level (16.3 mg/kg).

Copper

Copper was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 42,200 mg/kg BCL; however, one detection from GNC1-BC29 (63.7 mg/kg) at the surface was higher than both the 45.8 mg/kg $LBCL_{DAF1}$ and the 30.5 mg/kg maximum shallow Qal McCullough background level.

Iron

Iron was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 100,000 mg/kg BCL, but all detections were higher than the 7.56 mg/kg $LBCL_{DAF1}$. Of these, 11 detections were higher than the 19,700 mg/kg maximum shallow Qal McCullough background level, as listed in Table 3-6.

TABLE 3-6: IRON DETECTIONS GREATER THAN BACKGROUND

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
UPC1-BB28	0	20,900
GNC3-JD01C	0	21,300
GNC1-JB02	0	21,500 J
GNC1-JP05	0	21,600 J
GNC1-BC22	11	21,800
GNC2-JD06	0	21,900

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JP05	11	21,900 J
GNC2-JP04C	0	22,000 J
GNC1-JB02	5	22,200 J
GNC1-BC22	0	24,100
GNC1-BC18	10	24,100 J

Lithium

Lithium was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 2,270 mg/kg BCL; however, six detections were higher than the 21.9 mg/kg $LBCL_{DAF1}$, as listed in Table 3-7 below. Of these, four detections were higher than the maximum shallow Qal McCullough background level (26.5 mg/kg).

TABLE 3-7: LITHIUM DETECTIONS GREATER THAN $LBCL_{DAF1}$

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)	Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JD01	13	22.8 J+	GNC1-JD02	0	30.5 J+
GNC1-BC18	10	25.2 J+	GNC3-JD01C	0	32
GNC1-BC16	10	29.7 J+	GNC1-BB16	10	35.4 J+

Magnesium

Magnesium was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 100,000 mg/kg BCL, but all detections were higher than the 973 mg/kg $LBCL_{DAF1}$. However, all but one of the magnesium detections were lower than the 17,500 mg/kg maximum shallow Qal McCullough background level. That exceedance (19,700 mg/kg) was associated with a soil sample collected from 10 feet bgs at GNC1-BC18.

Manganese

Manganese was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). Of these detections, none were higher than the 24,900 mg/kg BCL; however, all detections were higher than the 1.3 mg/kg $LBCL_{DAF1}$. All of the manganese detections were lower than the 1,090 mg/kg maximum shallow Qal McCullough background level.

Nickel

Nickel was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of these detections exceeded the 21,800 mg/kg BCL; all except one were higher than the 7 mg/kg $LBCL_{DAF1}$. However, all of the detections were lower than the maximum shallow Qal McCullough background level for nickel (30 mg/kg).

Nitrate

Nitrate was detected in all 69 soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-3). None of the detections were higher than the 100,000 mg/kg BCL; however, 30 of the detections were higher than the 7 mg/kg $LBCL_{DAF1}$, as listed in Table 3-8.

TABLE 3-8: NITRATE DETECTIONS GREATER THAN $LBCL_{DAF1}$

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
UPC1-BB28	8	7.8
UPC1-BB32	0	7.8 J
GNC1-BC29	10	8.8
GNC1-JS17	0	9.1
GNC1-JB06	0	10.4
UPC1-JP11	10	10.6
GNC1-JB02	15	10.7
GNC1-JS08	10	10.9
GNC1-JP05	11	14.2
GNC1-BC22	11	15.3
GNC1-JB03	7	15.5
GNC1-JP02	10	17
UPC1-BB31	0	20
GNC1-BC28	11	21.3
GNC1-JB06	16	22

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JB06	6	23.4
GNC1-BC16	10	24.2
GNC1-JB02	5	25.7
GNC1-JB07	18	28.4
GNC1-JS17	10	29.6
GNC1-BC27	10	39.5
GNC1-JD02	0	40.3
GNC1-JP04	10	42.1
UPC1-BB28	18	46.4
GNC1-BC16	0	58
GNC1-JD01	0	61.4
UPC1-BB32	0	74.3 J
GNC1-JB07	8	75.2
GNC1-JP06	13	149
GNC1-JP06	3	202

Perchlorate

Perchlorate was detected in 60 of the 69 soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-3). None of the detections were higher than the 795 mg/kg BCL; however, 55 of the detections were higher than the 0.0263 mg/kg $LBCL_{DAF1}$, as listed in Table 3-9.

TABLE 3-9: PERCHLORATE DETECTIONS GREATER THAN $LBCL_{DAF1}$

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JP04	0	0.0273 J
GNC1-BC27	0	0.0284 J
GNC1-BC18	0	0.0297 J
GNC1-BC29	0	0.0314 J
GNC1-JS17	0	0.0345 J
GNC1-JS17	10	0.0348 J
GNC1-JB07	0	0.0373 J
GNC1-JP02	0	0.0378 J
GNC1-BC27	0	0.0423
GNC1-BC28	0	0.043
GNC1-BC23	0	0.0537
GNC1-BC28	11	0.0592
GNC1-JP06	13	0.0622
GNC1-JP05	0	0.0628
UPC1-BB28	0	0.0637
GNC1-JP02	0	0.0657
GNC1-BB16	0	0.067
GNC1-JP06	0	0.0688 J
GNC1-BC27	10	0.0715
GNC1-JB07	8	0.075

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JP06	3	0.155
GNC1-BB16	10	0.16
GNC1-JB02	15	0.234
GNC1-BC22	0	0.241 J+
GNC1-BC16	0	0.265
UPC1-JP11	0	0.469
GNC1-JB06	0	0.588
GNC1-BC21	0	0.856
UPC1-JP11	10	0.99
GNC1-JP04	10	1.04
GNC1-JB06	6	1.28
UPC1-BB31	0	1.35
GNC1-BC23	10	1.4
GNC1-JD01	0	1.46
GNC1-JS08	10	1.75
GNC1-JP05	11	1.9
GNC1-JP02	10	2.04
GNC1-JD06	10	2.18
GNC1-BC21	10	3.15
GNC1-BC22	11	3.28 J+

TABLE 3-9: PERCHLORATE DETECTIONS GREATER THAN LBCL$_{DAF1}$

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JD01	13	0.0767
GNC1-JB03	7	0.084
UPC1-BB33	0	0.0908 J-
UPC1-BB28	0	0.0971
GNC1-JP04	0	0.124 J
GNC1-JD02	10	0.125
GNC1-BC29	10	0.14
GNC1-JB02	5	0.147
UPC1-BB32	0	3.52
GNC1-JD02	0	3.58
GNC1-JB06	16	3.69
GNC1-JD01	3	3.77
UPC1-BB32	0	3.82
GNC1-JS08	0	5.76
GNC1-BC16	10	26.1

Selenium

Selenium was detected in one of the 69 soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). That detection (0.33 J+ mg/kg in a soil sample collected from the surface at UPC1-BB33) was lower than the 5,680 mg/kg BCL, but it was higher than the 0.3 mg/kg LBCL$_{DAF1}$. However, this detection was lower than the 0.6 mg/kg maximum shallow Qal McCullough background level. The analytical reporting limits for the non-detections (0.4 mg/kg standard reporting limit) were lower than the BCL; however, they were higher than the LBCL$_{DAF1,}$ such that exceedances would not necessarily have been observed.

Thallium

Thallium was detected in one of the 69 soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). That detection (1.1 mg/kg in a soil sample collected from the surface at GNC3-JD01C) was lower than the 79.5 mg/kg BCL, but, it was higher than the 0.4 mg/kg LBCL$_{DAF1}$. However, this detection was lower than the 1.8 mg/kg maximum shallow Qal McCullough background level. The analytical reporting limits for the non-detections (0.75 mg/kg standard reporting limit) were lower than the BCL; however they were higher than the LBCL$_{DAF1}$, such that exceedances would not necessarily have been observed.

Other Inorganics

As seen in Table 3-4 (Tables section) and Tables B-3 and B-4 in Appendix B, several inorganic constituents in addition to those listed above were routinely detected in soil samples. None of these additional inorganic constituents were detected at concentrations in excess of either the BCL or the LBCL$_{DAF1}$. In all cases, with the exception of antimony (0.315 mg/kg standard reporting limit higher than the 0.3 mg/kg LBCL$_{DAF1}$), the analytical reporting limits for these additional inorganic constituents were generally lower than the BCL and $LBCL_{DAF1}$, so exceedances of these screening levels would have been reported if present.

Organochlorine Pesticides

Organochlorine pesticides were analyzed for in 69 soil samples (35 surface and 34 subsurface samples; Table B-5). Several constituents were detected in at least one sample. The reported detections were lower than the screening levels with the following exceptions:

- beta-BHC was reported in six samples at concentrations higher than the 0.00596 mg/kg $LBCL_{DAF1}$, as listed in Table 3-10.

TABLE 3-10: BETA-BHC DETECTIONS GREATER THAN $LBCL_{DAF1}$

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)	Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JP02	0	0.0066 J+	GNC1-JP06	0	0.011
UPC1-BB28	0	0.0067	UPC1-BB28	0	0.013
GNC1-JS17	0	0.0081 J+	GNC1-JP06	0	0.017

- One dieldrin detection, associated with a surface soil sample at GNC1-JD01 (0.0025 J mg/kg) was higher than the 0.0002 mg/kg $LBCL_{DAF1.}$

The standard analytical reporting limits for most organochlorine pesticides were lower than the comparison levels.

Volatile Organic Compounds

VOCs were analyzed for in 69 soil samples (35 surface and 34 subsurface samples; Table B-10). As seen in Table 3-4 and Table B-10, the following 26 VOCs were detected in at least one sample:

- 1,2,4-Trimethylbenzene
- 1,2-Dichlorobenzene
- 1,3,5-Trimethylbenzene
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- Acetone
- Freon-11
- Isopropylbenzene
- m,p- Xylene
- Methyl ethyl ketone
- Nonanal
- n-Propylbenzene

- Benzene
- Bromobenzene
- Chlorobenzene
- Chloromethane
- Dichloromethane
- Ethanol
- Ethylbenzene
- o-Xylene
- sec-Butylbenzene
- Styrene
- tert-Butylbenzene
- Toluene
- trans-1,3-Dichloropropene
- Xylenes (total)

Dichloromethane was detected the most frequently in 39 percent of the samples. None of the detections were above the BCL. With the exception of dichloromethane, the VOC detections were also lower than the $LBCL_{DAF1}$. Dichloromethane was detected in 27 soil samples listed in Table 3-11 at concentrations in excess of the 0.001 $LBCL_{DAF1}$.

TABLE 3-11: DICHLOROMETHANE DETECTIONS GREATER THAN $LBCL_{DAF1}$

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JB06	6	0.0014 J
GNC1-BC18	0	0.0071
GNC1-BC16	10	0.0087
GNC1-JS08	10	0.0098
GNC1-BC22	0	0.0099
GNC1-BC18	0	0.01
GNC1-JB03	17	0.01
GNC1-JB07	8	0.01
GNC1-BC22	11	0.011
GNC1-JB03	0	0.011
GNC1-JB03	7	0.011
GNC1-JB02	0	0.012
GNC1-JB03	0	0.012
GNC1-JB06	0	0.012
GNC1-JD02	10	0.012
GNC1-JD06	0	0.012
GNC1-JP02	0	0.012 J
GNC1-JB02	5	0.013
GNC1-JB02	15	0.013
GNC1-JB07	0	0.013
GNC1-JD01	3	0.013
GNC1-JD02	0	0.013
GNC1-JP02	10	0.013
GNC1-BB16	10	0.014
GNC1-JD01	13	0.014
GNC1-BB16	0	0.015
GNC1-BC21	10	0.016

It should be noted that the analytical reporting limits for dichloromethane were often higher than the $LBCL_{DAF1}$; therefore, concentrations in excess of this comparison level, if present, could have potentially gone unreported. For the other VOCs, the standard reporting limits were lower than the BCL and $LBCL_{DAF1}$.

Semi-Volatile Organic Compounds

SVOCs were analyzed for in 69 soil samples (35 surface and 34 subsurface samples; Table B-9). As seen in Table 3-4 and Table B-9, only one SVOC, bis(2-ethylhexyl)phthalate, was detected.

The detection was associated with one sample and was lower than the BCL and the $LBCL_{DAF1}$. For SVOC non-detects, the standard reporting limits were lower than the BCL, except for dichloromethyl ether, which routinely had analytical reporting limits higher than the BCL.

For several other SVOC non-detections, the analytical reporting limits are higher than the $LBCL_{DAF1}$, and it is unknown whether these constituents are present in those samples at concentrations in excess of the $LBCL_{DAF1}$. The constituents with reporting limits routinely higher than the $LBCL_{DAF1}$ are as follows:

- 2,2'-Dichlorobenzil
- 2,4,6-Trichlorophenol
- 2,4-Dichlorophenol
- 2,4-Dinitrophenol
- 2,4-Dinitrotoluene
- 2,6-Dinitrotoluene
- 3,3'-Dichlorobenzidine
- bis(2-chloroethyl)Ether
- Hexachloroethane
- Isophorone
- Nitrobenzene
- n-Nitrosodi-n-propylamine
- p-Chloroaniline
- Pentachlorophenol

Dioxins and Furans

For dioxins/furans, as discussed in Section 1.1, the USEPA TEQ procedure, developed to describe the cumulative toxicity of these compounds, is used. Dioxins and furans were analyzed for in 43 surface soil samples[19] (Table B-2). All of the individual dioxins and furans congeners analyzed were reported as detections in at least one sample. None of the samples analyzed had calculated TCDD TEQ concentrations in excess of the NDEP BCL of 50 ppt. $LBCL_{DAF1}$ values have not been established for dioxin/furans, thus the potential for impacts to groundwater quality due to their presence could not be assessed by comparisons to the $LBCL_{DAF1}$.

[19] This tally includes field duplicates and confirmation samples.

Polychlorinated Biphenyls

PCBs were analyzed for in 37 surface soil samples[20] (individual PCB congeners) (Table B-7). All of the PCB congeners, except PCB 77 and PCB 81, were detected in at least one sample. BCL values have not been established for individual congeners. PCB congeners are included in the calculation of the TCDD TEQ, and are evaluated in this manner, not on an individual congener basis. $LBCL_{DAF1}$ values have not been established for individual PCB congeners.

Polynuclear Aromatic Hydrocarbons

PAHs were analyzed for in 69 soil samples (35 surface and 34 subsurface samples; Table B-6); each PAH, except acenaphthene and acenaphthylene, was detected in at least one soil sample. The PAH detections did not exceed either the BCL or the $LBCL_{DAF1}$ where established. The standard PAH analytical reporting limits were lower than the BCL and the $LBCL_{DAF1}$, thus concentrations in excess of these comparison levels, if present, would have been reported.

Aldehydes

Aldehydes were analyzed for in 69 soil samples (35 surface and 34 subsurface samples; Table B-9). Acetaldehyde was detected in seven samples, and formaldehyde was detected in 41 samples. None of the detections exceeded the BCL. The analytical reporting limits were lower than the BCL, thus concentrations in excess of the BCL, if present, would have been reported. $LBCL_{DAF1}$ values have not been established for these compounds.

Radionuclides

Radionuclides were detected in all 70 of the soil samples analyzed (36 surface, 34 subsurface samples; Table B-8). Exceedances of comparison levels for radionuclides are shown in Table 3-4 for the eight radionuclides currently included in the project analyte list (radium-226, radium-228, thorium-228, thorium-230, thorium-232, uranium-233/234, uranium-235/236, and uranium-238). Of those activities greater than comparison levels, the majority are lower than the maximum shallow Qal McCullough background activity, as shown in Table 3-4. As seen in that table, radium-226, radium-228, thorium-228, and thorium-232 were reported at activities higher than comparison levels and background. Those BCL/background exceedances are listed in Table 3-12 below.

[20] This tally includes field duplicates and confirmation samples.

TABLE 3-12: RADIONUCLIDE DETECTIONS GREATER THAN BCL AND BACKGROUND

Radionuclide	Sample ID	Depth (ft bgs)	Reported Value (pCi/g)
Radium-226	GNC1-BB16	10	2.37
Radium-226	GNC1-JD01	13	2.42
Radium-228	GNC1-JD01	3	3.37
Thorium-228	GNC1-BC18	0	2.3
Thorium-228	GNC1-JP02	10	2.37

Radionuclid e	Sample ID	Depth (ft bgs)	Reported Value (pCi/g)
Thorium-228	UPC1-JP11	0	2.42
Thorium-228	GNC1-JS17	0	2.52
Thorium-228	GNC1-JP05	0	2.8
Thorium-228	GNC1-JS08	0	3.15

The above detections were also higher than the $LBCL_{DAF1}$. $LBCL_{DAF1}$/background exceedances were also observed for Thorium-232, which was higher than 0.0029 pCi/g $LBCL_{DAF1}$ and 2.23 pCi/g maximum background activity in three samples; from 7 feet bgs at GNC1-JB03 (2.24 pCi/g); and from the surface at both GNC1-BC28 (2.42 pCi/g) and GNC1-JS17 (2.93 pCi/g).

As presented in NDEP guidance (NDEP 2009a), as part of the process used to evaluate radionuclide data for the BMI Common Areas, BRC assessed whether radionuclides are in secular equilibrium. As discussed in Section 5.1, secular equilibrium is an indication of background conditions.

The data indicate that radionuclides are in secular equilibrium at the Site. Specifically, the mean radioactivities for the Thorium-232 decay chain (i.e., thorium-232, radium-228, and thorium-228) are comparable (1.4, 1.6, and 1.6 pCi/g, respectively). Similarly, the mean values for the uranium-238 decay chain (uranium-238, uranium-233/234, thorium-230, and radium-226) are also comparable, ranging from 0.92 to 1.2 pCi/g. All of the mean values are lower than their respective maximum background activity levels. A quantitative evaluation of secular equilibrium is presented in Section 5.1.

Summary of Soil Exceedances

As summarized above and in the associated data tables (Table 3-4 and Appendix B), some BCL and $LBCL_{DAF1}$ exceedances are currently observed in Site soils. The following constituents were reported at concentrations higher than the BCL and the maximum shallow Qal McCullough background level (where applicable):

- Arsenic (15 samples)
- Radium-226 (2 samples)
- Radium-228 (1 sample)
- Thorium-228 (6 samples)

The following constituents were reported at concentrations higher than the $LBCL_{DAF1}$ and the maximum shallow Qal McCullough background level (where applicable):

- Aluminum (1 sample)
- Arsenic (15 samples)
- Barium (3 samples)
- Chromium (VI) (1 sample)
- Copper (1 sample)
- Iron (11 samples)
- Lithium (4 samples)
- Magnesium (1 sample)
- Beta-BHC (6 samples)
- Dieldrin (1 sample)
- Radium-226 (2 samples)
- Radium-228 (1 sample)
- Thorium-228 (6 samples)
- Thorium-232 (3 samples)
- Dichloromethane (27 samples)

BRC's evaluation of the data revealed that there are no soil samples that exhibited elevated concentrations of multiple metals or other analytes. The limited number of BCL and $LBCL_{DAF1}$ exceedances indicates that there is a low likelihood of adverse impacts to human health and the environment due to residual chemical concentrations in Site soils. Consistent with the methodology in the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010), an HHRA was conducted to further evaluate this possibility, as discussed in subsequent sections of this report.

3.6 SURFACE FLUX SAMPLING

Concurrent with the confirmation soil sampling, BRC implemented surface flux sampling across the Site. This sampling conformed to the most recent NDEP-approved version of SOP-16 (BRC, ERM, and MWH 2009). The sampling procedure for the effort included the USEPA surface emission isolation flux chamber (flux chamber) sampling to support an air pathway analysis for the Site.

It should be noted that while radon samples were collected, they are not included in this HHRA for the following reason: BRC submitted a technical memorandum to the NDEP (BRC 2010), in which the results of recent radon testing performed in groundwater and indoor air samples were presented. Based on the findings of this memorandum, the NDEP concluded that HHRAs for

Eastside property sub-areas do not need to evaluate the pathway of radon migration from groundwater to indoor air for sub-areas with a separation distance of at least 15 feet between any current or future building structure base and the high water table (letter dated November 9, 2010, from Greg Lovato, NDEP, to Mark Paris, BRC). Based on this conclusion and given the depth to groundwater at the Site is at least 25 feet bgs, the intrusion of radon into indoor air is not evaluated in the HHRA. Furthermore, as discussed in Section 5.1, other radionuclides are consistent with background levels, which indicate that radon should also be consistent with background, naturally occurring levels in soil.

The flux chamber sample collection rationale was based on the project goal of obtaining a representative dataset of air emissions per sub-area. Flux chamber samples were collected from 11 locations (Figure 11): 5 random sampling locations and 6 biased locations (and one duplicate). This density of sample collection is considered adequate for sub-area characterization given the biased nature of the sample locations, the size of the sub-area, and the number of sample locations suggested by the USEPA (1986) in the flux chamber User's Guide for assessing zones of homogeneous site properties.

The analyte list for surface flux samples is composed of the list provided in the most recent NDEP-approved version of SOP-16 (BRC, ERM, and MWH 2009). This analyte list is provided in Table 3-13, and consists of the USEPA Method TO-15 full scan, plus SIM analyses for a subset of the analytes. The analytical results are summarized in Table B-11 (Appendix B), and the principal investigator Report of Findings (which includes descriptions of sampling procedures) is provided in Appendix D (included on the report CD in Appendix B).[21] It should be noted that, in addition to VOC data for the Site, the flux chamber report also contains data for the remainder of the Galleria North and Upper Ponds sub-areas outside the Site boundaries. Data collected from outside the Site boundaries are not included in this HHRA. A data summary for the flux chamber sample results is provided in Table 3-14.

As seen in Tables 3-14 and B-11, numerous VOCs were detected in at least one surface flux sample. The most commonly detected constituents were carbon tetrachloride and chloroform which were detected in 100 percent of the samples using the SIM method; and benzene and dichloromethane which were detected in 56 percent of the samples using the SIM method. Nearly all of the detections were qualified with "J" flags, indicating the reported concentrations

[21] Note that this report was prepared prior to data validation; therefore, data qualifiers may differ from those in the remainder of this report.

were estimated. The highest concentrations were of 1,2,4-trichlorobenzene (1.86 $\mu g/m^2,min^{-1}$ at GNC1-JP04) and hexachlorobutadiene (1.37 $\mu g/m^2,min^{-1}$ at GNC1-JP04).

As discussed in Section 4, all data have been validated. The HHRA surface flux dataset for the Site is included on the report CD in Appendix B. Surface flux sample locations are shown on Figure 11.

3.7 LEACHATE DATA

No samples collected within the Site during the initial sampling event included synthetic precipitation leaching procedure (SPLP) analysis.[22] However, two samples were collected in the vicinity of the Site. These samples were collected from location GNC1-BC17 at 10 feet bgs, and GNC1-JP03 at 12 feet bgs. These soil samples were analyzed for aldehydes, general chemistry and ions, metals, organochlorine pesticides, PAHs, radionuclides, and SVOCs. As noted in the SAPs, these constituents are considered those of greatest concern for potential migration and impacts to groundwater. Data associated with these SPLP samples are summarized in Appendix B, Table B-12. For reference, Table B-12 includes constituent-specific comparison levels (viz., NDEP's residential water BCLs and USEPA Maximum Contaminant Levels). As summarized in Table B-12, there were few detections in these leachate samples. All of the detections were inorganic constituents (i.e., general chemistry and ions, metals and radionuclides); organic compounds were not detected, with the exception of phenanthrene and pyrene, which were both detected in GNC1-BC17. Of these detections, only perchlorate in GNC1-BC17 (0.134 milligrams per liter [mg/L]) was higher than its comparison level.

[22] SPLP analysis was prepped per USEPA Method 1312 - West solution pH 4.95 with 60/40 weight sulfuric/nitric acid.

4.0 DATA EVALUATION

This section describes the procedures used to evaluate the acceptability of data for use in the risk assessment. Overall quality of sample results is a function of proper sample management. Management of samples began at the time of collection and continued throughout the analytical process. SOPs were followed to ensure that samples were collected and managed properly and consistently and to optimize the likelihood that the resultant data are valid and representative.

The primary objective of the data review and usability evaluation was to identify appropriate data for use in the HHRA. The analytical data were reviewed for applicability and usability following procedures in USEPA's *Guidance for Data Usability in Risk Assessment (Part A)* (1992a) and *Risk Assessment Guidance for Superfund: Volume I* (1989), and the NDEP's *Supplemental Guidance for Assessing Data Usability for Environmental Investigations at the BMI Complex and Common Areas* (2008a). A quality assurance/quality control (QA/QC) review of the analytical results was conducted during the sampling events. According to the USEPA Data Usability Guidance, there are six principal evaluation criteria by which data are judged for usability in risk assessment. The six criteria are:

- Reports to risk assessor (availability of information associated with Site data);
- Documentation;
- Data sources;
- Analytical methods and detection limits;
- Data review; and
- Data quality indicators (DQIs), including precision, accuracy, representativeness, comparability, and completeness (PARCC).

A summary of these six criteria for determining data usability is provided below. In addition to the six principal evaluation criteria, the NDEP's Data Usability Guidance includes a step for data usability analysis, which is discussed after these six USEPA evaluation criteria. Data usability evaluation tables are provided electronically in Appendix E (included on the report CD in Appendix B).

4.1 CRITERION I – REPORTS TO RISK ASSESSOR (AVAILABILITY OF INFORMATION ASSOCIATED WITH SITE DATA)

The usability analysis of the site characterization data requires the availability of sufficient data for review. The required information is available from documentation associated with the Site data and data collection efforts. Data have been validated as described in the following DVSRs, which are provided electronically in Appendix F:

- *Data Validation Summary Report, Galleria North Sub-Area Soil Investigations, January-March 2009; July-August 2009 (Dataset 60)* (BRC and ERM 2010a), approved by the NDEP on June 14, 2010;

- *Data Validation Summary Report, Sunset North Commercial and Galleria North Sub-Areas 2nd Round Confirmation Soil Investigations – September 2009, December 2009, January 2010 and May 2010 (Dataset 60a)* (BRC and ERM 2010b), approved by the NDEP on September 10, 2010;

- *Data Validation Summary Report, Upper Ponds Sub-Area Soil Investigation –October-November 2009; January-February 2010 (Dataset 63)* (BRC and ERM 2010c), which was approved by the NDEP on July 16, 2010;

- *Data Validation Summary Report, Eastside North Surface Flux Investigations (Remaining Sub-Areas), July-August 2010 (Dataset 71)* (BRC and ERM 2011), approved by the NDEP on July 25, 2011; and

- *Data Validation Summary Report, 2010 Eastside North Confirmation Soil Investigations – April through September 2010 – Part I (Dataset 72a)* (BRC and ERM 2010d), approved by the NDEP on December 21, 2010.

The information sources and the availability of such information for the data usability process are as follows:

- A Site description provided in this report and the NDEP-approved SAPs identifies the location and features of the Site, the characteristics of the vicinity, and contaminant transport mechanisms.

- A Site map with sampling locations is provided on Figure 11.

- Sampling design and procedures were provided in the NDEP-approved SAPs.
- Analytical methods and sample quantitation limits (SQLs) are provided in the dataset file included on the report CD in Appendix B.
- A complete dataset is provided in the dataset file included on the report CD in Appendix B.
- A narrative of qualified data is provided with each analytical data package; the laboratory provided a narrative of QA/QC procedures and results. These narratives are included as part of the DVSRs (BRC and ERM 2010a,b,c,d, 2011).
- QC results are provided by the laboratory, including blanks, replicates, and spikes. The laboratory QC results are included as part of the DVSRs (BRC and ERM 2010a,b,c,d, 2011).
- Data flags used by the laboratory were defined adequately.
- Electronic files containing the raw data made available by the laboratory are included as part of the DVSRs (BRC and ERM 2010a,b,c,d, 2011).

4.2 CRITERION II – DOCUMENTATION REVIEW

The objective of the documentation review is to confirm that the analytical results provided are associated with a specific sampling location and collection procedure, using available documentation. For the purposes of this data usability analysis, the chain-of-custody forms prepared in the field were reviewed and compared to the analytical data results provided by the laboratory to ensure completeness of the dataset as discussed in the DVSRs (BRC and ERM 2010a,b,c,d, 2011). Based on the documentation review, all samples analyzed by the laboratory were correlated to the correct geographic location at the Site, as shown on Figure 11. The samples were collected in accordance with the SAPs and RAWP (BRC 2008, 2009a,b), and the SOPs developed for the BMI Common Areas as provided in the FSSOP (BRC, ERM, and MWH 2009). Field procedures included documentation of sample times, dates, and locations; other sample-specific information such as sample depth was also recorded. Information from field forms generated during sample collection activities was imported into the project database.

The analytical data were reported in a format that provides adequate information for evaluation, including appropriate QC measures and acceptance criteria. Each laboratory report describes the analytical method used, provides results on a sample-by-sample basis along with sample-specific SQLs, and provides the results of appropriate QC samples such as laboratory control spike samples, sample surrogates and internal standards, and matrix spike samples. All laboratory reports, except for asbestos, were prepared as provided by the documentation required by USEPA's Contract Laboratory Program (USEPA 2003a, 2004b,c) which includes chain-of-custody records, calibration data, QC results for blanks, duplicates, and spike samples from the field and laboratory, and all supporting raw data generated during sample analysis were also included. Reported analytical results were imported into the project database.

Measurement of asbestos was conducted consistent with the NDEP's *Technical Guidance for the Calculation of Asbestos-Related Risk in Soils* (2009b). The recommended method for providing asbestos data that are useful for risk assessment purposes was performed by EMSL Analytical, Inc., in Westmont, New Jersey. Although this laboratory is not currently certified in Nevada, it does have State of California and U.S. accreditation for asbestos analysis. Because many of the QC procedures associated with other analyses do not apply to asbestos analysis (e.g., laboratory blanks, duplicates and spikes), data validation of the asbestos laboratory reports involved a somewhat lesser level of effort than for other analyses (consistent with the NDEP's *Technical Guidance for the Calculation of Asbestos-Related Risk in Soils*).

4.3 CRITERION III – DATA SOURCES

The review of data sources is performed to determine whether the analytical techniques used in the site characterization process (i.e., SAP sampling) are appropriate for risk assessment purposes. The data collection activities specified in the SAP were developed to characterize a broad spectrum of chemicals potentially present on the Site, including asbestos, aldehydes, general chemistry and ions, VOCs, SVOCs, metals, dioxins/furans, PAHs, organochlorine pesticides, radionuclides, and PCBs (SRCs and analyses performed under SAP implementation are listed in Table 3-2, and Table 3-13 for surface flux samples).[23] Because of the soil removals that have occurred on the Site, data collected prior to SAP implementation had significant gaps and inconsistencies in analytical methodology, and as discussed in Section 2, those historical data are not evaluated further in the data usability process, or the HHRA. Only post-remediation data collected under the SAP (and subsequent RAWPs) are being used in the HHRA, and these were subjected to the formal data usability evaluation described in this section. Figure 11 demonstrates that samples collected in accordance with the SAP are situated across the entire

[23] Although radon samples were collected and analyzed for the Site, radon has been evaluated through a separate process and is not considered further in the data usability process (see Section 3.6).

Site; analyses associated with these samples are summarized in Tables 3-2 (soil) and 3-13 (surface flux).

The State of Nevada is in the process of certifying the laboratories used to generate the analytical data. As such, standards of practice in these laboratories follow the quality program developed by the Nevada Revised Statutes and are within the guidelines of the analytical methodologies established by the USEPA. Based on the review of the available information, the data sources for chemical and physical parameter measurements are adequate for use in a risk assessment.

4.4 CRITERION IV – ANALYTICAL METHODS AND DETECTION LIMITS

In addition to the appropriateness of the analytical techniques evaluated as part of Criterion III, it is necessary to evaluate if the detection limits are low enough to allow adequate characterization of risks. At a minimum, this data usability criterion can be met through the determination that routine USEPA and U.S. Department of Energy (DOE) reference analytical methods were used in analyzing samples collected from the Site. The USEPA and DOE methods that were used in conducting the laboratory analysis of soil and surface flux samples are identified in the dataset file included on the report CD in Appendix B. Each of the identified methods is considered the most appropriate method for the respective constituent class and each was approved by the NDEP as part of the SAPs and RAWP (BRC 2008, 2009a,b). As recommended by NDEP's guidance on *Detection Limits and Data Reporting* (NDEP 2008b), the laboratory reported SQL was used in evaluating detection limits.

Laboratory practical quantitation limits (PQLs) were based on those outlined in the reference method, the SAP (BRC 2008), and the project QAPP. In accordance with respective laboratory SOPs, the analytical processes included performing instrument calibration, laboratory method blanks, and other verification standards used to ensure QC during the analyses of collected samples.

The range of SQLs achieved in field samples was compared to NDEP BCLs (NDEP 2012). As seen in the summary of the Site dataset provided in Tables 3-4 (soil) and 3-14 (surface flux), of the standard analytes, only three constituents had SQLs that exceeded their respective residential soil BCLs. The SQLs exceedances of NDEP BCLs are discussed below.

- The arsenic SQL in 4 of 69 sample analyses was higher than the BCL; this constituent was detected in all of the other samples tested. These 4 results were qualified due to laboratory blank contamination and the reporting limits were raised to the PQL.

- Organics with SQLs higher than the BCL were n-nitrosodi-n-propylamine in 33 of 69 samples, and dichloromethyl ether in all 69 samples analyzed. Neither of these compounds was detected in any samples. The n-nitrosodi-n-propylamine SQL was only slightly higher than the BCL. The dichloromethyl ether SQL is greater than 200 times the BCL and a reduction in the SQL is not likely to be easily achieved by the laboratory. Therefore, the analytical SQLs are considered adequate for risk assessment purposes.

As discussed in the *2008 Supplemental Shallow Soil Background Report* (BRC and ERM 2009b), there are differences in SQLs among datasets that may affect data comparability for datasets comprised primarily of non-detect values. For these datasets, left-censored data can result in difficulties in differentiating whether datasets are actually different or merely an artifact of detection limits.

4.5 CRITERION V – DATA REVIEW

The data review portion of the data usability process focuses primarily on the quality of the analytical data received from the laboratory. Soil and surface flux sample data were subject to data validation. DVSRs were prepared as separate deliverables (BRC and ERM 2010a,b,c,d, 2011; Appendix F). The analytical data were validated according to the internal procedures using the principles of USEPA National Functional Guidelines (USEPA 1999, 2004d, 2005a, 2008) and were designed to ensure completeness and adequacy of the dataset. Additionally, the DVSRs were issued utilizing the NDEP's two *Supplemental Guidance on Data Validation* documents (NDEP 2009c,d). Any analytical errors and/or limitations in the data have been addressed and an explanation for data qualification provided in the respective data tables. The results of ERM's data review for these issues are presented in the DVSRs and are summarized below.

Only one data point was rejected (a benzyl alcohol result for UPC1-BB33-0). The rejection was due to a very low matrix spike/matrix spike duplicate (MS/MSD) recovery and does not reflect a larger concern for this compound, sample, or method. Data qualifications are discussed in the subsections that follow.

4.5.1 Holding Time Exceedances / Sample Condition Qualifications

Holding time refers to the period of time between sample collection and the preparation and/or analysis of the sample. The accuracy of analytical results may depend upon analysis within specified holding times and sample temperature. In general, a longer holding time is assumed to result in a less accurate measurement due to the potential for loss or degradation of the analyte over time. Sample temperature is of greatest concern for VOCs that may volatilize from the sample at higher temperatures. As described in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), sample results were reviewed for compliance with the method-prescribed preparation and analysis holding times.

USEPA guidance for validation allows professional judgment to be used in evaluating qualification due to holding time exceedances. Sample results that were generated after the required holding time but less than two times after the holding time were qualified as estimated (J- or UJ-flagged). If the samples were prepared after two times the holding time was exceeded, non-detect results were qualified as rejected (R). However, no data were qualified as rejected (R). Qualifications to 24 samples were made on the basis of exceeded holding times (see Table 2-2 of DVSR 60 [BRC and ERM 2010a]; Appendix F), as follows:

- Hexavalent chromium results for 13 soil samples in two laboratory data packages (TestAmerica data packages F9A290238 [GNC1-JS08-0 and GNC1-JS08-10, 3 days beyond the method-prescribed 4-day period], F9A290222 [GNC1-BB16-0, GNC1-BB16-10, GNC1-BC16-0, GNC1-BC16-10, GNC1-BC18-0, GNC1-BC18-0-FD, GNC1-BC18-10, GNC1-JD01-13, GNC1-JD01-3, GNC1-JD02-0, and GNC1-JD02-10, 1 day beyond the method-prescribed 4-day period]), were qualified due to holding time exceedances. The results were qualified as estimated with a potential low bias "J-" for detections or "UJ" for non-detections.

- Total cyanide results associated with 11 soil samples in one laboratory data package (TestAmerica data package F9B050269 [GNC1-BC27-0, GNC1-BC27-0-FD, GNC1-BC27-10, GNC1-BC28-0, GNC1-BC28-11, GNC1-BC29-0, GNC1-BC29-10, GNC1-JP05-0, GNC1-JP05-11, GNC1-JS17-0, and GNC1-JS17-10]) were associated with analyses performed 2 days outside the method-prescribed holding time. The results were qualified as estimated with a potential low bias "J-" for detections or "UJ" for non-detections.

As noted in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), all samples were received at the laboratory within the required temperatures range of 4°±2° Celsius. No sample results were qualified based on sample temperatures or other sample preservation issues.

4.5.2 Blank Contamination

Blanks are artificial samples designed to evaluate the nature and extent of contamination of environmental samples that may be introduced by field or laboratory procedures. Field and laboratory blanks, consisting of contaminant-free water, were prepared and analyzed as part of standard QA/QC procedures to monitor for potential contamination of field equipment, laboratory process reagents, and sample containers. As presented in the DVSRs (BRC and ERM 2010a,b,c,d, 2011) 457 results were qualified as undetected (U) or and 9 results were qualified as estimated (J+) due to laboratory or field blank contamination, as discussed below. Detections of constituents qualified as non-detections due to comparable detections in laboratory or field blanks are known as "censored" data, and are presented in Tables 2-5 and 2-6 of DVSR 60, Tables 2-4 and 2-5 of DVSR 60a, Tables 2-4 and 2-5 of DVSR 63, Tables 2-3 and 2-4 of DVSR 71, and Tables 2-3 and 2-4 of DVSR 72a (Appendix F). In these cases, non-detections are represented in the database as "<[*the PQL*]" in the case of inorganics detected below the PQL, or as "<[*result value*]" for all others.[24]

These censored data are summarized in Appendix E, Table E-14 (included on the report CD in Appendix B) by compound class. As seen in that table, analytes were initially reported as detections in samples, but were later qualified as non-detections based on the presence of comparable concentrations of that analyte in blank samples. As seen in Appendix E, compounds most often censored for soil results included the following:

- Mercury (47 samples)
- Cadmium (27 samples)
- Molybdenum (22 samples)
- 1,2,4-Trimethylbenzene (51 samples)
- Acetone (33 samples)
- Cyanide (26 samples)

Table 4-1 presents the metals most likely to be affected by this issue:

TABLE 4-1: METALS MOST FREQUENTLY CENSORED DURING BLANK SAMPLE EVALUATION

Metal	Number of Detect	Number of Samples	Number of Censored Results	Max Non-Detect (mg/kg)	NDEP Residential BCL (mg/kg)
Antimony	0	69	11	2.6	31
Cadmium	32	69	27	0.27	38.9
Mercury	10	69	47	0.0364	23.5
Molybdenum	39	69	22	2.6	391
Selenium	1	69	15	2.6	391

[24] Although NDEP has issued recent guidance regarding qualifying data due to blank contamination (NDEP 2011); BRC has addressed this issue in the *Technical Memorandum – BRC Comments on NDEP Blank Contamination Guidance* (BRC 2011) and, consistent with this Technical Memorandum, discussions with the NDEP, no changes were made to the Site dataset. This issue is also further discussed in the Uncertainty Analysis (Section 7).

This table demonstrates that while the number of censored results is high compared to the number of detections, the censored values are still much lower than residential soil BCLs.

4.5.3 Sample/Duplicate Differences Outside Permissible Range or Greater than Permissible Values

During the data validation process, sample/duplicate results are evaluated to determine whether differences in those results suggest potential issues with data quality. Specifically, the analyst evaluates the following:

- MS/MSD relative percent difference (RPDs), to determine if the RPDs are outside acceptance limits;
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) RPDs, to determine if the RPDs are outside acceptance limits;
- Sample/field duplicate results to determine if differences are greater than the permissible value; and
- Sample/laboratory duplicate results to determine if differences are greater than the permissible value.

4.5.3.1 Qualifications Due to MS/MSD Recoveries Outside Acceptance Criteria

As discussed in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), inorganic constituent results for 698 sample results were qualified as estimated (either UJ for non-detections or J for detections; "+" or "–" added to denote potential high or low bias, respectively) based on MS/MSD recoveries. There was one rejection for benzyl alcohol associated with MS/MSD recoveries. The qualifications applied on the basis of MS/MSD recoveries were as follows:

- One ammonia result GNC1-BC28-0 was qualified as estimated with a low bias due to a recovery below than the acceptance criterion.
- One chloride result UPC1-JP11-0 was qualified as estimated with a high bias due to a recovery greater than the acceptance criterion.
- One cyanide result UPC1-JP11-0 was qualified as estimated non-detect with a low bias due to a recovery below than the acceptance criterion.

- One nitrate result GNC1-JB03-0 was qualified as estimated with a high bias due to a recovery greater than the acceptance criterion.

- One nitrite result UPC1-JP11-0 was qualified as estimated with a high bias due to a recovery greater than the acceptance criterion.

- The perchlorate results for the following two soil samples were qualified as estimated with a high bias due to a recovery greater than the acceptance criteria: GNC1-BC22-0 and GNC1-BC22-11. In addition, perchlorate results for the following two soil samples were qualified as estimated with a low bias due to a recovery less than the acceptance criteria: UPC1-BB33-0 and UPC1-BB33-10.

- The hexavalent chromium results for the following six soil samples were qualified as estimated with a high bias due to a recovery greater than the acceptance criteria: GNC1-JP06-0, GNC1-JP06-0-FD, GNC1-JP06-3, GNC1-JP06-13, GNC1-JP02-10, and GNC1-BC22-11.

- One sulfate result UPC1-JP11-0 was qualified as estimated with a high bias due to a recovery greater than the acceptance criterion.

- One Total Kjeldahl Nitrogen result UPC1-JP11-0 was qualified as estimated due to recoveries both greater than and less than the acceptance criterion.

- Metals results for soil samples in various laboratory data packages were qualified due to recoveries outside the acceptance criteria, as summarized in Table 4-2 below.

TABLE 4-2: METALS SAMPLES QUALIFIED DUE TO MS/MSD RECOVERIES OUTSIDE ACCEPTANCE CRITERIA

Laboratory Data Package	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Lithium	Magnesium	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Strontium	Thallium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc
F9A290222		+	+		+	+	+	+	+	+	+	-		+			+				+				+	+
F9A290238	-		+												+		+						-			
F9B020113	-		+				+	+			-				+											+
F9B050269	-					+					-						+								-	+
F9B110228	-		+												+				+				-			
F9B120113	-	+			+	+		+	+				+	+			+						-		+	+
F9B130146	-				+	+		+	+		+				+		+								+	+

TABLE 4-2: METALS SAMPLES QUALIFIED DUE TO MS/MSD RECOVERIES OUTSIDE ACCEPTANCE CRITERIA

Laboratory Data Package	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Lithium	Magnesium	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Strontium	Thallium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc
F9B140120	-				+	-			-						+		+						-		-	-
F9B180129	-				+	-			-						+								-		-	-
F9C030231	-				+	-		-	-								+						-		-	
F9H140144	-	+	- & +		+			+	+			-			+				-			+	-	+	+	+
F9J290179	-											-			-				-				-			
F9J300129		+		+	+	+	+	+	+			-	+		+	+	+	+						+	+	+
F9J310162				+	+	+	+	+	+			-	+		+	+	+				+			+	+	+
F9K040437		+					+		+				+		+	+	+	-	+		+			+		
F9K210455	-		-									-											-			
F0A080516		+	+		+	+		+	+	+			+		+	+	+	+	+	+				+	+	+
F0H030409	-		+								+				+								-			

+ = Recovery greater than the acceptance limits
- = Recovery less than the acceptance limits
Blank entry signifies that the recovery was within the acceptance limits

Appendix E, Table E-11 (included on the report CD in Appendix B) lists the samples and associated analytes exhibiting MS/MSD percent recoveries below the laboratory control limits. In cases in which the recoveries were higher than the acceptance criteria, the results have the potential of being similarly biased high, and using these data in the HHRA could result in risks being calculated that are higher than would be associated with actual Site conditions. Of more concern for the HHRA is underestimation of risk, which could be associated with the use of data that are biased low.

As indicated in that table (Table E-11), reported detections and non-detects for soil data were flagged as estimated ("J-" or "UJ," respectively) due to low MS/MSD recoveries (i.e., from 30 to 74 percent for metals)[25]. Non-detects associated with "very low" MS/MSD recoveries (i.e., less than 30 percent for metals), are generally rejected as unusable. No MS/MSD recoveries were that low and associated with non-detect inorganic results.

[25] If additional validation criteria (aside from the MS/MSD recoveries) did not suggest a low bias for a given result, the sample result was flagged with "J" (no bias inferred).

The data flagged as estimated based on low MS/MSD recoveries were subjected to further review in terms of data usability for the Site, as discussed in Section 4.6.2.3.

4.5.3.2 Qualifications due to LCS/LCSD Recoveries Outside Acceptance Criteria

Organic and inorganic constituents for 11 soil results and one flux result were qualified as estimated (either UJ for non-detections or J for detections; "+" or "–" added to denote potential high or low bias, respectively) based on LCS/LCSD recoveries. The qualifications applied on the basis of LCS/LCSD recoveries are summarized in Table 4-3.

TABLE 4-3: RESULTS QUALIFIED DUE TO LCS/LCSD RECOVERIES OUTSIDE ACCEPTANCE CRITERIA

Sample ID	Lab ID	Analyte	Result	Unit	Recovery	Limits
GNC1-BB16-0	F9A290222013	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	78 J-	pg/g	78%	79-140
GNC1-BC16-0	F9A290222001	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	78 J-	pg/g	78%	79-140
GNC1-BC18-0	F9A290222003	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	6.2 J	pg/g	78%	79-140
GNC1-BC18-0-FD	F9A290222007	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	78 J-	pg/g	78%	79-140
GNC1-BC21-0	F9B020113007	Cobalt	8.5 J+	mg/kg	119.3%	81-119
GNC1-BC21-10	F9B020113008	Cobalt	8.8 J+	mg/kg	119.3%	81-119
GNC1-JD01-0	F9A290222010	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	78 J-	pg/g	78%	79-140
GNC1-JD02-0	F9A290222008	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	78 J	pg/g	78%	79-140
GNC1-JS08-0	F9A290238008	Cyanide, Total	<0.52 UJ	mg/kg	83%	85-115
GNC1-JS08-10	F9A290238009	Cyanide, Total	<0.52 UJ	mg/kg	83%	85-115
UPC1-BB33-10	240047010	Benzyl alcohol	<345 UJ	µg/kg	19%	31-100
GNC1-BB16	62	Trichloroethene	<0.101 UJ	$\mu g/m^3$	65%/58%	70-130

As noted above, recoveries below the lower laboratory limits are of the most concern in terms of data usability. Appendix E, Table E-11 (included on the report CD in Appendix B) lists the samples and associated analytes exhibiting LCS/LCSD percent recoveries below the lower laboratory control limit. No results were rejected as unusable based on very low LCS/LCSD recovery. The data flagged as estimated based on low LCS/LCSD recoveries were subjected to further review in terms of data usability for the Site, as discussed in Section 4.6.2.3.

4.5.3.3 Qualifications due to Sample/Field Duplicate Differences Outside Acceptance Criteria

The following eight soil field duplicates were collected during the sampling activities

- GNC1-BC18-0-FD
- GNC1-BC27-0-FD
- GNC1-JA02-FD
- GNC1-JB03-0-FD
- GNC1-JP02-0-FD
- GNC1-JP04-0-FD
- GNC1-JP06-0-FD
- GNC2-JB03C-0-DUP

- UPC1-BB28-0 DUP
- UPC1-BB32-0 DUP

In addition, the following surface flux field duplicate was also collected during the sampling activities: GNC1-JP02-R.[26]

Field duplicate differences in excess of acceptance limits were noted in eight field duplicate pairs of soil samples. The differences are presented in Appendix E, Table E-12 (included on the report CD in Appendix B). All associated data were flagged as estimated (J/UJ). No data were rejected on the basis of sample/field duplicate differences.

4.5.3.4 Qualifications due to Sample/Laboratory Duplicate Differences Outside Acceptance Criteria

Of the samples representing post-remediation conditions (i.e., excluding those data points associated with samples from soil intervals subsequently removed from the Site), 16 samples had sample/laboratory duplicate differences greater than the permissible values (i.e., 1 pCi/g for radionuclides and RPD > 20 percent criteria for cation exchange capacity). These samples are listed in Table 4-4.

TABLE 4-4: RESULTS QUALIFIED DUE TO SAMPLE/LABORATORY DUPLICATE DIFFERENCES OUTSIDE ACCEPTANCE CRITERIA

Field Sample ID	Lab Sample ID	Analyte	Result	Unit	RPD or Difference
GNC1-BC21-0	223713006	Radium-228	1.18 J	pCi/g	Difference=1.166
GNC1-BC21-10	223713007	Radium-228	1.68 J	pCi/g	Difference=1.166
GNC1-JS08-0	F9A290238008	Cation Exchange Capacity	15.6 J	meq/100g	RPD=22
GNC1-JS08-10	F9A290238009	Cation Exchange Capacity	16.9 J	meq/100g	RPD=22
UPC1-BB28-0	240310005	Thorium-230	1.24 J	pCi/g	Difference=1.089
UPC1-BB28-0	240310005	Thorium-232	1.71 J	pCi/g	Difference=1.001
UPC1-BB28-0 DUP	241673012	Uranium-238	0.501 J	pCi/g	Difference=1.029
UPC1-BB28-18	240310007	Thorium-230	1.2 J	pCi/g	Difference=1.089
UPC1-BB28-18	240310007	Thorium-232	0.934 J	pCi/g	Difference=1.001
UPC1-BB28-8	240310006	Thorium-230	0.901 J	pCi/g	Difference=1.089
UPC1-BB28-8	240310006	Thorium-232	1.3 J	pCi/g	Difference=1.001
UPC1-BB31-0	240152004	Thorium-232	1.01 J	pCi/g	Difference=1.05
UPC1-BB31-11	240152005	Thorium-232	0.889 J	pCi/g	Difference=1.05
UPC1-BB32-0	240152001	Thorium-232	1.15 J	pCi/g	Difference=1.05
UPC1-BB32-0 DUP	240152002	Thorium-232	1.29 J	pCi/g	Difference=1.05

[26] The Galleria North Right-of-Way Site includes a sub-set of the entire Galleria North sub-area and a small portion of the Upper Ponds sub-area. Field duplicates noted in this section do not reflect the total number of field duplicates collected during either sub-area sampling events.

TABLE 4-4: RESULTS QUALIFIED DUE TO SAMPLE/LABORATORY DUPLICATE DIFFERENCES OUTSIDE ACCEPTANCE CRITERIA

Field Sample ID	Lab Sample ID	Analyte	Result	Unit	RPD or Difference
UPC1-BB32-10	240152003	Thorium-232	1.47 J	pCi/g	Difference=1.05
UPC1-JP11-0	239948005	Thorium-230	2.13 J	pCi/g	Difference=1.030
UPC1-JP11-10	239948006	Thorium-230	1.27 J	pCi/g	Difference=1.030

The above data flagged as estimated (J) based on sample/laboratory duplicate differences were subjected to further review in terms of data usability for the Site, as discussed in Section 4.6.2.3.

4.5.4 Internal Standards Outside Acceptance Criteria

Internal standards are prepared for certain organic gas chromatograph/mass spectrometry (GC/MS) and inductively coupled plasma/mass spectrometry analyses by adding compounds similar to target compounds of interest to sample aliquots. Internal standards are used in the quantitation of target compounds in the sample or sample extract. The evaluation of internal standards involved comparing the instrument response and retention time from the target compounds in the sample with the response and retention time of specific internal standards added to the sample extract prior to analysis.

As presented in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), no sample results were rejected based on internal standards. The following results were qualified due to internal standard exceedances:

- PCB results for 3 soil samples (GNC1-JD06-0, GNC1-BC27-0-FD, and GNC1-JD01-0);
- VOC results for 3 surface flux samples (GNC1-BB16, GNC1-JB07, and GNC1-JS08); and
- VOC results for 12 soil samples, as listed in Table 4-5.

TABLE 4-5: VOC SOIL SAMPLE RESULTS QUALIFIED DUE TO INTERNAL STANDARDS OUTSIDE ACCEPTANCE CRITERIA

Laboratory Data Package #	Sample ID	
F9A290222	GNC1-BB16-0	GNC1-BB16-10
	GNC1-BB18-0-FD	GNC1-JD01-0
	GNC1-JD01-13	GNC1-JD01-3
	GNC1-JD02-0	GNC1-JD02-10
F9B050269	GNC1-BC28-0	
F9A300184	GNC1-BC21-0	GNC1-BC21-10
F9A290238	GNC1-JS08-0	

- Dioxins/furans results for three soil samples, as listed in Table 4-6.

TABLE 4-6: DIOXIN/FURAN SOIL SAMPLE RESULTS QUALIFIED DUE TO INTERNAL STANDARDS OUTSIDE ACCEPTANCE CRITERIA

Laboratory Data Package #	Sample ID	
F9A290222	GNC1-BC18-0	GNC1-BC18-0-FD
	GNC1-JD02-0	

4.5.5 Surrogate Percent Recoveries Outside Laboratory Control Limit

As discussed in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), surrogate spikes were added to each of the samples submitted for organic analysis to monitor potential interferences from the matrix. Results associated with unacceptable surrogate recoveries were qualified as estimated (J+ or UJ). Generally, when surrogate recoveries are less than 10 percent, associated non-detect results are qualified as rejected (R) because false negatives are a possibility. No sample results were rejected due to surrogate recoveries. The soil samples listed in Table 4-7 were qualified due to surrogate recovery exceedances.

TABLE 4-7: RESULTS QUALIFIED DUE TO SURROGATE RECOVERIES OUTSIDE LABORATORY CONTROL LIMIT

Sample ID	Lab ID	Analysis	Recovery	Acceptable Range
GNC1-BC23-0	F9B110228005	Organochlorine pesticides	168%	61-150
GNC1-BC29-0	F9B050269006	Organochlorine pesticides	225%	61-150
GNC1-JB06-0	F9B140120013	Organochlorine pesticides	158%, 203%	61-150
GNC1-JD01-0	F9A290222010	Organochlorine pesticides	205%	61-150
GNC1-JD01-0	F9A290222010	VOCs	58%,57%	65-143, 73-131

TABLE 4-7: RESULTS QUALIFIED DUE TO SURROGATE RECOVERIES OUTSIDE LABORATORY CONTROL LIMIT

Sample ID	Lab ID	Analysis	Recovery	Acceptable Range
GNC1-JP02-0	F9B130146009	Organochlorine pesticides	298%	61-150
GNC1-JP02-0-FD	F9B130146010	Organochlorine pesticides	298%	61-150
GNC1-JP04-0-FD	F9B110228020	Organochlorine pesticides	184%	61-150
GNC1-JP05-0	F9B050269015	Organochlorine pesticides	179%	61-150
GNC1-JS17-0	F9B050269008	Organochlorine pesticides	163%	61-150
UPC1-BB33-0	F9J300129011	VOCs	157%,184%	80-131, 77-138

In addition, two surface flux samples (GNC1-JP02 and GNC1-JP04) were qualified due to surrogate recovery exceedances, both higher than the acceptable range.

Appendix E (included on the report CD in Appendix B) lists the samples and associated analytes exhibiting surrogate percent recoveries below the laboratory control limits. As seen in that appendix, with the exception of the VOC results for GNC1-JD01-0, the recoveries outside the acceptance criteria were higher than the upper laboratory control limit. The GNC1-JD01-0 VOC results were subjected to further review in terms of data usability for the Site, as discussed in Section 4.6.2.3.

4.5.6 Calibrations Outside Laboratory Control Limits

Requirements for instrument calibration ensure that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of analytical run. Continuing calibrations checks document satisfactory maintenance and adjustment of the instrument on a day-to-day basis. As presented in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), certain data were qualified due to initial or continuing calibration issues. Of specific concern, are analytes with a final qualifier indicating a low bias due to calibration. In the following tables, the percentage of analyte recovered is based on the percent difference of the actual amount and recovered amount reported from the continuing calibration. As the percentage decreases, the potential for false negatives increases.

Table 4-8 summarizes the SVOC results that were qualified due to evaluation of calibration control limits.

TABLE 4-8: SUMMARY OF SVOC RESULTS QUALIFIED DUE TO CALIBRATIONS OUTSIDE LABORATORY CONTROL LIMIT

Analyte	# of Samples Qualified	Percent of Qualified Non-Detect	Percentage of Analyte Recovered as Indicated by Outlier
1,4-Dioxane	2	100%	67%
3,3'-Dichlorobenzidine	2	100%	74%
3-Nitroaniline	34	100%	55-74%
4-Nitroaniline	27	100%	59-72%
4-Nitrophenol	12	100%	74%
Acetophenone	2	100%	69%
Aniline	11	100%	72%
Benzenethiol	1	100%	74%
Benzoic Acid	8	100%	55-72%
Benzyl alcohol	16	100%	74-75%
bis(2-Chloroethyl) ether	11	100%	74%
bis(2-Chloroisopropyl) ether	11	100%	73%
bis[p-Chlorophenyl]disulfide	2	100%	72%
Carbazole	22	100%	54-74%
Hexachlorocyclopentadiene	35	100%	47-73%
Hydroxymethyl phthalimide	12	100%	64-74%
Octachlorostyrene	2	100%	69%
p-Chlorobenzenethiol	9	100%	73-74%
Phthalic Acid	49	100%	45-74%
p-Nitroaniline	13	100%	63-70%

Note: The control limits are 75-125% (%D $\leq$ 25%)

Table 4-9 summarizes the organochlorine pesticide results that were qualified due to calibrations.

TABLE 4-9: SUMMARY OF ORGANOCHLORINE PESTICIDE RESULTS QUALIFIED DUE TO CALIBRATIONS OUTSIDE LABORATORY CONTROL LIMIT

Analyte	# of Samples Qualified	Percent of Qualified Non-Detect	Percentage of Analyte Recovered as Indicated by Outlier
2,4-DDD	2	0%	116%
4,4-DDD	1	0%	119%
4,4-DDE	13	0%	115-127%
4,4-DDT	25	60%	75-121%
Alpha-BHC	1	0%	118%
Beta-BHC	2	0%	115-118%
Dieldrin	1	0%	118%
Endrin aldehyde	1	0%	116%
Gamma-Chlordane	1	0%	118%
Heptachlor	5	100%	83-84%
Methoxychlor	23	87%	76-118%
Toxaphene	5	100%	51-84%

Note: The control limits are 80-120% (%D $\leq$ 20%)

Table 4-10 summarizes the organochlorine pesticide results that were qualified due to calibrations.

TABLE 4-10: SUMMARY OF DIOXIN/FURAN RESULTS QUALIFIED DUE TO CALIBRATIONS OUTSIDE LABORATORY CONTROL LIMIT

Analyte	# of Samples Qualified	Percent of Qualified Non-Detect	Percentage of Analyte Recovered as Indicated by Outlier
2,3,7,8-TCDF	4	0%	137%

Note: The control limits are 70-130% (%D ≤ 30%)

Table 4-11 summarizes the VOC results that were qualified in soil samples due to calibrations.

TABLE 4-11: SUMMARY OF VOC SOIL RESULTS QUALIFIED DUE TO CALIBRATIONS OUTSIDE LABORATORY CONTROL LIMIT

Analyte	# of Samples Qualified	Percent of Qualified Non-Detect	Percentage of Analyte Recovered as Indicated by Outlier
Acetone	5	0%[27]	136-145%
Acetonitrile	15	100%	69-75%
Bromomethane	11	100%	71%
Chloroethane	11	100%	75%
Freon 12	16	100%	71%
Methyl iodide	16	100%	71%

Note: The control limits are 75-125% (%D ≤ 25%)

In addition, low instrument response was noted for acetonitrile, 2-butanone, and ethanol as indicated by the relative response factor.

Table 4-12 summarizes the VOC results that were qualified in surface flux samples due to calibrations.

TABLE 4-12: SUMMARY OF VOC SURFACE FLUX SAMPLE RESULTS QUALIFIED DUE TO CALIBRATIONS OUTSIDE LABORATORY CONTROL LIMIT

Analyte	# of Samples Qualified	Percent of Qualified Non-Detect	Percentage of Analyte Recovered as Indicated by Outlier
1,1-Dichloroethene	1	100%	65%
1,1,2,2-Tetrachloroethane	2	100%	53%
1,2,3-Trichloropropane	10	100%	34-64%
1,2,4-Trichlorobenzene	11	82%	41-64%
1,2,4-Trimethylbenzene	4	100%	65%
1,2-Dichlorobenzene	10	90%	58-70%
1,3-Dichlorobenzene	6	100%	61-67%
1,4-Dichlorobenzene	7	86%	60-70%
2-Methyl-1-propanol	9	100%	45-66%
2-Hexanone	2	50%	69%
Acetone	8	63%	46-64%
Acetonitrile	4	100%	46-64%
Benzene	4	0%[28]	46-67%

[27] This analyte was detected and qualified due to a high bias from calibration, however, the results were also qualified as non-detected due to blank contamination.

TABLE 4-12: SUMMARY OF VOC SURFACE FLUX SAMPLE RESULTS QUALIFIED DUE TO CALIBRATIONS OUTSIDE LABORATORY CONTROL LIMIT

Analyte	# of Samples Qualified	Percent of Qualified Non-Detect	Percentage of Analyte Recovered as Indicated by Outlier
Benzyl chloride	10	90%	38-67%
Bromoform	3	100%	64-67%
Carbon disulfide	3	67%[28]	59-68%
Cymene	4	75%	56-65%
Dibromochloromethane	1	0%	149%
Dibromochloropropane	12	100%	28-68%
Dichloromethane	1	100%	70%
Ethanol	11	73%	45-69%
Heptane	1	0%	132%
Hexachlorobutadiene	11	91%	55-70%
Isopropylbenzene	4	75%	61-65%
Naphthalene	4	100%	53-70%
n-Butylbenzene	8	88%	51-64%
n-Propylbenzene	4	75%	66-70%
sec-Butylbenzene	4	75%	60-66%
Tert-Butylbenzene	8	88%	54-66%
Trichloroethene	7	29%[28]	56-67%

Note: The control limits are 70-130% (%D $\leq$ 30%)

4.5.7 Tentatively Identified Compounds

For the GC/MS methods, a list and estimated concentrations for tentatively identified compounds (TICs) was provided by the laboratory if detected. Most of the reported TICs were identified as "unknown" or "unknown aldol condensate." Others were as follows:

.beta.-Sitosterol
1,1,2,2-Tetrachloroethane
28-Nor-17.alpha.(H)-hopane
4-Thiazolemethanol, 2-(4-chlorophenyl)-
9-Octadecenamide, (z)-
Androst-2,16-diene
Androstane
Diacetone alcohol
Eicosane
Erucylamide
Heneicosane
Hentriacontane
Heptacosane, 1-chloro-
Hexadecanamide
n-Dodecane
n-Tridecane
Nonacosane
Nordihydroguaiaretic acid
Octacosane
Octadecanamide
Pentadecanamide, 15-bromo-
Tetradecanamide

Only one of the detected TICs—1,1,2,2-tetrachloroethane—has associated toxicity criteria. Others do not. Reported TICs such as siloxanes and amides are indicative of column breakdown

[28] This analyte was detected and qualified due to a high bias from calibration, however, the some or all results were also qualified as non-detected due to blank contamination.

and saturated fatty acids. Diacetone alcohol is a ketone and is also likely indicative of column breakdown. With the exception of the 1,1,2,2-tetrachloroethane, androstane, diacetone alcohol, beta-sitosterol, and nordihydroguaiaretic acid, the above named compounds are indicative of column breakdown and are not likely to be Site-related. The 1,1,2,2-tetrachloroethane are included in the VOC analysis USEPA Method 8260B. Androstane is a steroid. It has been detected as TIC in other samples; however, the source is unknown. Nordihydroguaiaretic acid is a chemical associated with the creosote bush. The range of the creosote bush includes Nevada and it is likely associated with Site-related plants. Beta-sitosterol is a plant sterol and could be present due to organic matter collected along with the soil sample.

4.5.8 Data Review Summary

For 2,796 of the 19,359 analytical results in the final HHRA dataset, quality criteria were not met and various data qualifiers were added to indicate limitations and/or bias in the data. The definitions for the data qualifiers, or data validation flags, used during validation are those defined in SOP-40 (BRC, ERM, and MWH 2008) and the project QAPP (BRC and ERM 2009a). Of the 2,796 qualified sample results, only one was rejected. Sample results are rejected based on findings of serious deficiencies in the ability to properly collect or analyze the sample and meet QC criteria. Only rejected data are considered unusable for decision-making purposes and rejected analytical results are not used in the HHRA.

As noted above, only one sample result (a benzyl alcohol result for UPC1-BB33-0) was rejected in the Site dataset and excluded from the HHRA for the reasons previously noted. Other data points were excluded from the risk assessment not due to data quality issues, but for one of the following reasons: the sample was reanalyzed by the laboratory or the sample location was removed during a removal action.

4.6 CRITERION VI – DATA QUALITY INDICATORS

DQIs are used to verify that sampling and analytical systems used in support of project activities are in control and the quality of the data generated for this project is appropriate for making decisions affecting future activities. The DQIs address the field and analytical data quality aspects as they affect uncertainties in the data collected for site characterization and risk assessment. The DQIs include PARCC. The project QAPP provides the definitions and specific criteria for assessing DQIs using field and laboratory QC samples and is the basis for determining the overall quality of the dataset. Data validation activities included the evaluation of PARCC parameters, and all data not meeting the established PARCC criteria were qualified during the validation process using the guidelines presented in the National Functional Guidelines for Laboratory Data Review for Organics, Inorganics, and Dioxin/Furans (USEPA 1999, 2004d, 2005a, 2008).

4.6.1 Evaluation of Data Precision

Precision is a measure of the degree of agreement between replicate measurements of the same source or sample. Precision is expressed by RPD between replicate measurements. Replicate measurements can be made on the same sample or on two samples from the same source. Precision is generally assessed using a subset of the measurements made. The precision of the data was evaluated using several laboratory QA/QC procedures. Based on BRC's review of the results of these procedures, the general level of precision for the Site data and the background data (BRC and ERM 2009b) does not appear to limit the usability of a particular analyte, sample, method, or dataset as a whole.

4.6.2 Evaluation of Data Accuracy

Accuracy measures the level of bias that an analytical method or measurement exhibits. To measure accuracy, a standard or reference material containing a known concentration is analyzed or measured and the result is compared to the known value. Several QC parameters are used to evaluate the accuracy of reported analytical results, including:

- Holding times and sample temperatures;
- Calibration limits;
- LCS percent recovery;
- MS/MSD percent recovery;
- Spike sample recovery (inorganics);
- Surrogate spike recovery (organics); and
- Blank sample results.

Detailed discussions of specific exceedances to precision and accuracy (with tables) are provided in the DVSRs (BRC and ERM 2010a,b,c,d, 2011) and data qualified as a result of this evaluation are presented with qualifiers in the data usability tables in Appendix E (included on the report

CD in Appendix B). As presented in Section 4.5, only one sample result (a benzyl alcohol result for UPC1-BB33-0) was rejected in the Site dataset and excluded from the HHRA. The remaining results were considered sufficiently accurate for risk assessment purposes, as discussed below.

4.6.2.1 Holding Time Exceedances/Sample Condition

There is a potential for analyte loss if the holding time for a sample is exceeded. As discussed in Section 4.5.1, holding times were exceeded in 13 soil samples for hexavalent chromium analysis (less than 19 percent of the samples analyzed for that constituent), and in 11 samples for cyanide analysis (less than 16 percent of the samples analyzed). All 24 samples were qualified as estimated. Reported results were also significantly less than their respective BCLs. Based on the limited holding time issues, there is a limited potential for a low bias to the hexavalent chromium or cyanide datasets for Site soils.

As presented in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), all Site samples with temperature requirements were received at the laboratory within the required range of 4°±2° Celsius. No sample results were qualified based on sample temperatures or due to lack of proper preservation.

4.6.2.2 Calibration Violations Indicating a Low Bias

The instrument calibration checks that resulted in a low bias are summarized in the tables presented in Section 4.5.6. Two SVOC analytes (hexachlorocyclopentadiene and phthalic acid), and nine TO-15 surface flux analytes (1,2,3-trichloropropane, 1,2,4-trichlorobenzene, 2-methyl-1-propanol, acetone, acetonitrile, benzene, benzyl chloride, dibromochloropropane, and ethanol) had recoveries below 50 percent in some samples. 2-Methyl-1-propanol, benzyl chloride, and dibromochloropropane were qualified in all samples due to calibration violations. All three compounds were non-detect in all samples. They are evaluated further in the Uncertainty Analysis (Section 7) of the report. For the other non-detect analytes with SQLs, the maximum SQLs were compared to the residential soil BCL. It is unlikely, even with a potential for a false negative, that the bias could affect the result to such a degree that the analyte is present at the Site in excess of the BCL.

4.6.2.3 MS/MSD or LCS/LCSD Recoveries below Acceptance Criteria

During the data usability review, results associated with MS/MSD and/or LCS/LCSD recoveries that were only slightly lower than the lower acceptance limit (i.e., 50 to 75 percent recoveries for inorganics) were accepted as usable without further evaluation. Samples with lower percent recoveries (i.e., recoveries lower than 50 percent for inorganics and one-half the lower limit or 30 percent, whichever is greater, for organics) were reviewed more closely to assess if it was appropriate to use them in the HHRA. Inorganic results with MS/MSD recoveries less than 50 percent [29] were as follows:

- Benzyl alcohol in one soil sample in GEL data package 240047 (a non-detection) which was rejected due to extremely low recoveries;
- Perchlorate results for two soil samples in GEL data package 240047 (both detections);
- Antimony results for seven soil samples in TestAmerica data packages F9A290238 and F0H030409 (all non-detections);
- Sodium results in three soil samples in TestAmerica data package F9K040437 (all detections);
- Strontium results in two soil samples in TestAmerica data package F9H140144 (both detections);
- Tungsten results in two soil samples in TestAmerica data package F0H030409 (both non-detections); and
- Mercury results for 12 soil samples in TestAmerica data packages F9H140144, F9J290179, F9J300129, F9J310162, and F9K210455 (9 of 12 results were non-detections).

Given the small number of samples involved, these data points are not likely to have a significant effect on risk assessment. Furthermore, benzyl alcohol and antimony were not detected in any Site soil samples and it is unlikely that they were present in the samples listed above.

As noted in Section 4.5.3, a LCS/LCSD recoveries lower than the lower laboratory control limit was observed for benzyl alcohol soil sample (UPC1-BB33-10), a non-detection, a single trichloroethene flux sample (GNC1-BB16), two cyanide samples (GNC1-JS08-0 and GNC1-JS08-10), both non-detections, and for six detections of 1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin (TestAmerica data package F9A290222). Because the trichloroethene, cyanide, and dioxin recoveries (65/58, 83 and 78 percent, respectively) were only slightly lower than the

[29] Only samples associated with MS/MSD results in which both recoveries were below 50 percent are listed.

lower laboratory control limit (70, 85 and 79 percent, respectively), no concerns were identified regarding their usability. The recovery for benzyl alcohol, 19 percent, was less than ½ the lower limit, 31 percent. Since this recovery is associated with a single sample, no concerns were identified regarding this results' usability.

4.6.2.4 Surrogate Percent Recoveries below Laboratory Control Limit

As noted in Section 4.5.5, surrogate recoveries lower than the lower laboratory control limit were observed for VOCs in one laboratory batch (TestAmerica data package F9A290222). Because the recoveries in this analytical batch (58 and 57 percent) were not substantially lower than the lower laboratory control limit (65 and 73 percent, respectively), no concerns were identified regarding their usability.

4.6.2.5 Blank Contamination

As noted in Section 4.5.2, certain detections were flagged during the data review as being non-detections or estimated with a high bias due to laboratory or field blank contamination. If the associated constituent qualified as being a non-detection was, in fact, present in the samples related to the affected blank sample, revising its status to non-detect could result in risk underestimation. In the dataset for the Site, 457 results were censored due to blank contamination. Affected analytes are listed in Table 4-13.

TABLE 4-13: SUMMARY OF ANALYTES CENSORED DURING BLANK SAMPLE EVALUATION

Analyte	# of Censored Results	Analyte	# of Censored Results	Analyte	# of Censored Results
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	1	Carbon disulfide	1	PCB 118	4
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1	Carbon disulfide (Flux)	1	PCB 156	2
1,2,4-Trimethylbenzene	51	Chloroform	2	PCB 167	2
1,2-Dichlorobenzene	3	Chloromethane (Flux)	2	PCB 189	2
1,2-Dichlorobenzene (Flux)	1	Chromium [VI]	7	Radium-226	2
1,3,5-Trimethylbenzene	4	Cyanide	26	Radium-228	1
1,3-Dichlorobenzene	2	Dibromochloropropane (Flux)	3	Selenium	15
1,3-Dichlorobenzene (Flux)	1	Dichloromethane	17	Silver	5
1,4-Dichlorobenzene	2	1,2-Dibromoethane	2	Styrene	17
1,4-Dichlorobenzene (Flux)	1	Ethylbenzene	4	Sulfate	2
Acetone	30	Fluoride	5	Tetrachloroethene (Flux)	5
Acetone (Flux)	2	Formaldehyde	9	Thallium	5
Acetonitrile (Flux)	1	Heptane	1	Tin	3

TABLE 4-13: SUMMARY OF ANALYTES CENSORED DURING BLANK SAMPLE EVALUATION

Analyte	# of Censored Results		Analyte	# of Censored Results		Analyte	# of Censored Results
Ammonia [as N]	12		M,p-Xylene	2		Toluene	1
Antimony	11		Mercury	47		Toluene (Flux)	1
Arsenic	4		2-Butanone (Flux)	2		Total Kjeldahl Nitrogen [TKN]	2
Benzene (Flux)	13		Molybdenum	22		Total Organic Carbon	2
Beryllium	8		Nitrite	1		Trichloroethene (Flux)	6
bis(2-Ethylhexyl) phthalate	2		Octachlorodibenzodioxin	3		Tungsten	6
Boron	9		Orthophosphate	20		Uranium-238	2
Bromide	3		o-Xylene	1		Xylenes (Total)	1
Cadmium	27		PCB 105	4			

The constituents for which this potential concern has the most bearing in risk assessment are those in soil samples for which the detections are close to or exceed either (1) background conditions, or (2) relevant human health comparison levels (e.g., the NDEP BCLs). As determined during that evaluation, qualification of detections as non-detections based on blank contamination is not likely to have an appreciable effect on the risk estimates, as discussed below.

Censored results that are less than the maximum background concentration and the residential soil BCL have a negligible impact on risk assessment findings. If a portion of the result reflects an actual site concentration, then the uncertainty related to the censored result is low. However, data censored at values at or above background or the residential soil BCLs, may pose a potential underestimation of human health risks. Therefore, censored results at values in excess of the residential soil BCL (or the maximum background concentration, if higher) were evaluated further. With the exception of arsenic and three radionuclides, none of the soil data censored due to blank contamination were in excess of the BCLs. The four analytes with censored results greater than the BCLs are listed in Table 4-14.

TABLE 4-14: ANALYTES CENSORED DURING BLANK SAMPLE EVALUATION WITH RESULTS GREATER THAN BCLs

Analyte	Range of Censored Results	BCL	Maximum Background Concentration
Arsenic (4 censored results)	3.3 to 5.1 mg/kg	0.39 mg/kg	7.2 mg/kg
Radium-226 (2 censored result)	0.885 to 0.996 pCi/g	0.0071 pCi/g	2.36 pCi/g
Radium-228	0.897 pCi/g	0.013 pCi/g	2.92 pCi/g

TABLE 4-14: ANALYTES CENSORED DURING BLANK SAMPLE EVALUATION WITH RESULTS GREATER THAN BCLs

Analyte	Range of Censored Results	BCL	Maximum Background Concentration
(1 censored result)			
Uranium-238 (2 censored results)	0.531 to 0.88 pCi/g	0.46 pCi/g	2.37 pCi/g

All of the above-listed censored data were lower than the maximum background concentration. Therefore, these censored data do not represent a significant potential for risk underestimation.

Surface flux data are not comparable with BCLs. Benzene was associated with 13 censored data points (of 12 surface flux samples[30]); the remaining censored analytes were associated with five or fewer surface flux samples. Benzene was detected at 12 of 12 surface flux locations, but was qualified as non-detect in 9 of 12 for the full scan analysis. For the SIM analysis, benzene was detected at 9 of 9 surface flux locations, but was qualified as non-detect in 4 of 9. Widespread blank contamination was noted for the full scan surface flux analysis of benzene. Benzene has been detected in groundwater across the BMI Complex. Since benzene was also detected in the SIM analysis (and not censored as frequently), risk estimates were calculated for benzene based on the SIM analysis results. Therefore, there is likely little effect on the final risk estimates for the Site. Benzene is discussed further in the Uncertainty Analysis (Section 7) of this report.

4.6.2.6 Data Usability Summary

As discussed above, because the qualifications with the potential for low bias were small in number, the data usability evaluation determined it was unlikely that they could lead to significant risk underestimation. Furthermore, the small amount of rejected data points (one benzyl alcohol result) does not represent a significant data gap in terms of risk assessment.

4.6.3 Evaluation of Data Representativeness

Representativeness is the degree to which data accurately and precisely represent a characteristic of the population at a sampling point or an environmental condition (USEPA 2002a). There is no standard method or formula for evaluating representativeness, which is a qualitative term. Representativeness is achieved through selection of sampling locations that are appropriate

[30] Twelve locations were analyzed using TO-15 full scan and nine were also analyzed using TO-15 SIM.

relative to the objective of the specific sampling task, and by collection of an adequate number of samples from the relevant types of locations. The sampling locations at the Site were based on both systematic sampling with random point placement within each grid cell, as well as focused samples collected from specific areas to further investigate potential areas of concern.

The samples were analyzed for a broad spectrum of chemical classes across the Site. Samples were delivered to the laboratory in coolers with ice to minimize the loss of analytes. In a few instances, such as samples being analyzed slightly beyond the holding time, the representativeness of the associated data is in question; however, there were limited instances of this, as discussed in Section 4.5.1. As previously noted, no sample results were qualified based on sample temperatures or preservation.

Sample specific results are discussed in the DVSRs. A discussion of representativeness for the background dataset is provided in each of the background investigation reports.

4.6.4 Evaluation of Data Completeness

Completeness is commonly expressed as a percentage of measurements that are valid and usable relative to the total number of measurements made. Analytical completeness is a measure of the number of overall accepted analytical results, including estimated values, compared to the total number of analytical results requested on samples submitted for analysis after review of the analytical data. Some of the data were eliminated due to data usability concerns. The percent completeness for the Site is 99.99 percent and includes the surface flux chamber data. The percent completeness for the soil-only dataset is 99.99 percent. The percent completeness for the background dataset used in the HHRA is 99.4 percent.

4.6.5 Evaluation of Data Comparability

Comparability is a qualitative characteristic expressing the confidence with which one dataset can be compared with another. The desire for comparability is the basis for specifying the analytical methods; these methods are generally consistent with those used in previous investigations of the Site. The comparability goal is achieved through using standard techniques to collect and analyze representative samples and reporting analytical results in appropriate units. The ranges of detected sample results from the current investigation are generally comparable to recent results at the Eastside, as well as to the Site background datasets (Section 5).

One exception may be uranium-235/236, which has reported activities that are somewhat elevated compared to background and other reported isotopes of uranium. This difference may be because the Site dataset's radionuclide analyses were performed at a different laboratory than the background dataset. The laboratory that performed the Site radionuclide analysis has indicated that the activities for uranium-235/236 hover around the noise level of the instrument and secular equilibrium is still achieved. Therefore, activities at the noise level of the instrument may vary between the instruments used at either laboratory.

There are differences in SQLs among datasets that may affect data comparability for datasets comprised primarily of non-detect values. Examples of the differences in SQLs at the Site and in shallow background for several analytes with low detection frequency are provided in Table 4-15.

TABLE 4-15: LOW DETECTION ANALYTES EXHIBITING SQL DIFFERENCES BETWEEN BACKGROUND AND SITE SAMPLES

Analyte	Background Min SQL	Background Max SQL	Site Min SQL	Site Max SQL[31]
Antimony	0.3298	0.3298	0.225	2.6
Boron	3.2	3.2	2.99	52
Mercury	0.0072	0.0072	0.005	0.0364
Selenium	0.1579	0.1579	0.225	2.6
Thallium	0.5428	0.5428	0.105	1

All results in units of mg/kg.

Cumulative probability plots and side-by-side boxplots for the background and Site datasets are included in Appendix G. For these datasets, left-censored data can result in difficulties in differentiating whether datasets are actually different or merely an artifact of detection limits. Note that for constituents with SQLs that meet project limit requirements, comparisons between Site and background may be less important as these left-censored data are likely to indicate conditions that pose an "acceptable" risk and further evaluation is not necessary.

4.7 DATA ANALYSIS

Data validation and usability evaluations tend to look at the data on a result-by-result basis. The data analysis step is intended to take a step back and look at the dataset as a whole. The intent of this is to identify any anomalies or unusual data trends that may indicate potential laboratory

[31] The SQLs reported here may differ from the detection limits reported elsewhere (e.g., background comparisons). Detection limits may be raised due to blank contamination.

issues. This is performed by reviewing summary statistics, cumulative probability plots and side-by-side boxplots, or other visual aids. The soil dataset used for the HHRA is summarized in tabular format in Table 3-4. While it is not feasible to present all the detected analytes in a graphical format, cumulative probability plots and side-by-side boxplots are provided in Appendix G for the analytes included in the background comparisons (that is, metals and radionuclides). No anomalies in the dataset were identified.

As discussed in Section 4.5, the data validation process resulted in numerous sample results being qualified as estimated, with only the above-listed results being rejected. Sample results qualified as estimated are likely to be quantitatively biased to some degree; estimated analytical results are used in the HHRA. Data qualified as anomalous, as defined in the DVSRs, refers to data that were qualified ("U") due to blank contamination, and are used in the HHRA. These data usability decisions follow the guidelines provided in the *Guidance for Data Usability in Risk Assessment (Part A)* (USEPA 1992a).

For the HHRA, all soil data associated with post-remediation conditions that were not rejected during data validation, replaced by reanalysis results, or removed during a soil removal action were included. Some data were qualified as estimated due to recoveries being outside the acceptance criteria. In cases where the recoveries were higher than the acceptance criteria, the results have the potential of being similarly biased high, and using these data in the risk assessment could result in risks being calculated that are higher than would be associated with actual Site conditions. Of more concern for the HHRA is underestimation of risk, which could be associated with the use of data that are biased low. Results associated with the following QA/QC issues could lead to results that are biased low, and were subjected to further scrutiny during the data usability evaluation:

- Results associated with holding time exceedances;
- Detections qualified during the data review as being non-detections due to laboratory or field blank contamination;
- Results associated with calibration violations indicating a low bias;
- Results associated with MS/MSD or LCS/LCSD recoveries below acceptance criteria; and/or
- Results associated with surrogate percent recoveries below laboratory control limits.

Such data, which are listed above in Section 4.5, were evaluated during the data usability process to determine whether it was appropriate to use them in the risk assessment. The data usability evaluation determined that the estimated results listed in Section 4.5 were appropriate for use in the risk assessment and that the rejected data did not constitute significant data gaps and/or were not otherwise likely to lead to an underestimation of risk, as discussed in Section 4.6.2.

5.0 SELECTION OF CHEMICALS OF POTENTIAL CONCERN

The broad suite of analytes sampled for was the initial list of potential COPCs at the Site. However, to ensure that a risk assessment focuses on those substances that contribute the greatest to the overall risk (USEPA 1989); the following procedures were used to eliminate analytes as COPCs for quantitative evaluation in the risk assessment:[32]

- Identification of chemicals with detected levels similar to background concentrations (where applicable) (Section 5.1);
- Chemicals that are considered essential nutrients (Section 5.2); and
- Chemicals with maximum concentrations below risk-based comparison levels (i.e., below one-tenth of the residential soil BCLs)[33] (Section 5.3).

Following USEPA guidance (1989), compounds reliably associated with Site activities based on historical information were not eliminated from the risk assessment, even if the results of the procedures given in this section indicate that such elimination is possible. The procedures for evaluating COPCs relative to background conditions and further selection of COPCs based on the other procedures are presented below.

5.1 EVALUATION OF CONCENTRATIONS/ACTIVITES RELATIVE TO BACKGROUND CONDITIONS

Some chemicals at the Site, particularly metals and radionuclides, are known to be naturally occurring constituents of soils and groundwater. A risk assessment should consider the contribution of background concentrations to overall Site risks, as differentiated from those concentrations associated with historical Site operations or regional anthropogenic conditions. Therefore, it is necessary to establish Site-specific background conditions to support the risk assessment.

[32] Note that these procedures for selection of COPCs deviate somewhat from those presented in the *BRC Closure Plan*, but are consistent with discussions between BRC and NDEP and their consultants in a December 9, 2010, meeting. BRC will use these procedures for all subsequent risk assessments. BRC intends to revise the *BRC Closure Plan* accordingly to make it consistent with these procedures.

[33] Although the Site land use will not be residential, per discussions with the NDEP, residential soil BCLs are used for the selection of COPCs.

Based on discussions and as agreed upon by both BRC and the NDEP, background data recommended for the Site is the shallow Qal McCullough background dataset.[34] The lithology for the Site and surrounding area is shown on Figure 12. Therefore, comparison of Site-related soil concentrations to background levels was conducted using the shallow Qal McCullough background dataset presented in the *Background Soil Compilation Report* (BRC and ERM 2010e). The background dataset used is included in the dataset file on the enclosed report CD in Appendix B.

Background comparisons were performed using the Quantile test, Slippage test, the *t*-test, and the Wilcoxon Rank Sum (WRS) test with Gehan modification. The Guided Interactive Statistical Decision Tools (GiSdT®) library (Neptune and Company 2009) run from within the R statistical computer software program was used to perform all background comparison statistics. A weight-of-evidence approach is utilized to interpret the results of these analyses. If the detection frequency in both Site and background datasets is greater than 40 percent, then the following rationale is used for evaluation: (1) where one or two results fail one or more of the statistical tests, the remaining testing and statistical information (boxplots, summary statistics) are reviewed to support decision-making regarding whether or not the chemical should be considered consistent with background (as described by the rationale in the table below); and (2) where three or more statistical tests fail, the constituent is considered inconsistent with background. If the detection frequency is less than 40 percent in either the background or Site datasets, then the constituent is evaluated based on boxplots and summary statistics.

For samples with primary and field duplicate results, the Site sample and field duplicate[35] are treated as independent samples and both are included in all subsequent data analyses, regardless of whether one or both are non-detect. This is considered appropriate because field duplicate samples represent a discrete and unique measurement of soil chemical conditions proximal to the primary sample (unlike split samples). The field duplicates were compared to the primary sample during the course of data validation. The variances were not out of the line with the variance in results across the Site. Therefore, as distinct soil chemical measurements, they are treated as unique samples in the analyses.

[34] As noted in a letter dated September 17, 2012, from Greg Lovato, NDEP, to Mark Paris, BRC, the 2003 soil background dataset collected by Environ for the City of Henderson is not used for background soil comparison purposes.
[35] Field duplicates are shown in Appendix B and indicated with the "FD" qualifier under the column entitled "Sample Type."

The shallow Qal McCullough background dataset was compared to the Site HHRA dataset as a whole. The results of the background comparison evaluation are presented in Table 5-1 (Tables section), and summarized in Table 5-2 below.

TABLE 5-2: SUMMARY OF STATISTICAL BACKGROUND COMPARISON EVALUATION

Chemical	Greater than Background?	Basis
Aluminum	**YES**	Multiple tests
Antimony	NO	Multiple tests; ND in Site data
Arsenic	**YES**	Multiple tests
Barium	**YES**	Multiple tests
Beryllium	NO	Multiple tests
Boron	NO	Multiple tests; ND in Site data
Cadmium	**YES**	Multiple tests
Calcium	NO	Multiple tests
Chromium	**YES**	Multiple tests
Chromium (VI)	**YES**	Quantile Test
Cobalt	NO	Multiple tests
Copper	**YES**	Multiple tests
Iron	**YES**	Multiple tests
Lead	**YES**	Multiple tests
Lithium	**YES**	Multiple tests
Magnesium	NO	Multiple tests
Manganese	**YES**	Multiple tests
Mercury	**YES**	WRS Test
Molybdenum	**YES**	Multiple tests
Nickel	NO	Multiple tests
Potassium	**YES**	Multiple tests
Selenium	**YES**	Multiple tests
Silver	**YES**	Quantile Test
Sodium	NO	Multiple tests

TABLE 5-2: SUMMARY OF STATISTICAL BACKGROUND COMPARISON EVALUATION

Chemical	Greater than Background?	Basis
Strontium	**YES**	Multiple tests
Thallium	**YES**	WRS Test
Tin	**YES**	Multiple tests
Titanium	**YES**	Multiple tests
Tungsten	**YES**	Multiple tests
Uranium	NO	Multiple tests
Vanadium	**YES**	Multiple tests
Zinc	**YES**	Multiple tests
Radium-226	NO	Multiple tests
Radium-228	NO	Multiple tests
Thorium-228	NO	Multiple tests[1]
Thorium-230	NO	Multiple tests
Thorium-232	NO	Multiple tests
Uranium-233/234	NO	Multiple tests
Uranium-235/236	NO	All other radionuclides (and uranium) not greater than background; all results near noise level of instrument
Uranium-238	NO	Multiple tests

[1]Although background comparison results for thorium-228 do not pass the slippage test; all other background comparison test pass, as do all background tests for other radionuclides (except for uranium-235/236 as noted in the table). In addition, radionuclides are in secular equilibrium, therefore, thorium-228 is not considered to be greater than background at the Site.

Cumulative probability plots and side-by-side boxplots[36] were also prepared and are included in Appendix G. These plots give a visual indication of the similarities and differences between the Site and background datasets. The results of this comparison indicate that a number of metals are statistically significant (greater than) with respect to background levels. Due to the large number of sample data in both the Site and background datasets, even small differences between the two are identified as statistically significant. For example, although there were small differences in

[36] Site and background boxplots were segregated by depth (and all data). This is different than how the data were segregated in the development of exposure point concentrations as presented in Section 6.1.

median concentrations, cobalt, copper, and nickel were found to be statistically greater than background, as shown in Table 5-3.

TABLE 5-3: EXAMPLE DIFFERENCES IN SITE AND BACKGROUND MEDIAN CONCENTRATIONS FOR CHEMICALS STATISTICALLY GREATER THAN BACKGROUND

Metal	Difference[1]
Copper	2.0 mg/kg
Lithium	4.0 mg/kg
Zinc	7.0 mg/kg

1 These differences in median concentrations were small relative to both background median concentrations and residential soil BCLs.

It should be noted that statistically significant differences may not represent scientifically and technically relevant differences.

Secular Equilibrium for Radionuclides. For radionuclides, secular equilibrium exists when the quantity of a radioactive isotope remains constant because its production rate (due to the decay of a parent isotope) is equal to its decay rate. In theory, if secular equilibrium exists, the parent isotope activity should be equivalent to the activity of all daughter radionuclides. Pure secular equilibrium is not expected in environmental samples because of the effect of natural chemical and physical processes. However, approximate secular equilibrium is expected under background conditions (NDEP 2009e). Both the thorium-232 and uranium-238 chains were determined to be in approximate secular equilibrium following equivalence testing outlined in the NDEP's *Guidance for Evaluating Secular Equilibrium at the BMI Complex and Common Areas February* (NDEP 2009e). The results of the equivalence testing for secular equilibrium are provided in Table 5-4.

TABLE 5-4: SECULAR EQUIVALENCE TESTING RESULTS

Chain	Equivalence Test		Secular Equilibrium?	Mean Proportion			
	Delta	*p*-value		Ra-226	Th-230	U-233/234	U-238
U-238	0.1	0.0004	Yes	0.2373	0.2922	0.2423	0.2282
				Ra-228	Th-228	Th-232	
Th-232	0.1	<0.0001	Yes	0.3457	0.3424	0.3119	

Therefore, since no radionuclides failed any background tests and all are in secular equilibrium, all radionuclides are considered to be similar to background. Radionuclides are therefore not evaluated further in the HHRA.

5.2 ESSENTIAL NUTRIENTS

An essential nutrient is a chemical required for normal body functioning that either cannot be synthesized by the body at all, or cannot be synthesized in amounts adequate for good health, and thus must be obtained from a dietary source. USEPA (1989) states that "Chemicals that are (1) essential human nutrients, (2) present at low concentrations (i.e., only slightly elevated above naturally occurring levels), and (3) toxic only at very high doses (i.e., much higher than those that could be associated with contact at the Site) need not be considered further in the quantitative risk assessment. Examples of such chemicals are calcium, iron, magnesium, potassium, and sodium." As discussed with and approved by the NDEP[37] and consistent with guidance and standard practices, no further quantitative evaluations are required for these essential nutrients.

5.3 COMPARISON TO RESIDENTIAL SOILS BCLs

BCLs for residential soils are chemical-specific, risk-based concentrations in soils that are protective of a residential land use scenario (NDEP 2012).As discussed with and approved by the NDEP (see footnote 35), if the maximum detected concentration for a constituent is less than one-tenth of the residential soil BCL, then no further quantitative evaluation is required for that constituent. For those constituents with 100 percent non-detect values, if the maximum non-detect concentration[38] for a constituent is less than one-tenth of the residential soil BCL, no further evaluation will be conducted. If the maximum non-detect concentration is greater than one-tenth of the residential soil BCL, no further quantitative evaluation will be conducted; however, a discussion is provided in the Uncertainty Analysis (Section 7) for these constituents.

Consistent with the Closure Plan, if the TCDD TEQ concentrations do not exceed the NDEP residential BCL of 50 ppt for any sample within the Site,[39] dioxins/furans are not retained as COPCs. Therefore, because this criterion is met for the Site, dioxins/furans are not considered COPCs, and are not evaluated further in the HHRA. Lead was also not evaluated further in the HHRA since all concentrations were below its target goal of 400 mg/kg for residential land use.

The results of comparisons to one-tenth of the residential soil BCL are presented in Table 5-5 (Tables section), and summarized in Table 5-6 below.

[37] Meeting with NDEP on December 9, 2010.
[38] The non-detect value is equal to the SQL.
[39] See Section 2.5 for a discussion on future land use for the Galleria Dr. Right-of-Way.

TABLE 5-6: RESULTS OF COMPARISON TO RESIDENTIAL SOILS BCLs

Chemical	Maximum Concentration Greater than 1/10th BCL?	Notes
Perchlorate	**YES**	
Aluminum	**YES**	
Arsenic	**YES**	
Lithium	**YES**	
Manganese	**YES**	
Thallium	**YES**	
Vanadium	**YES**	
All other metals/inorganics	NO	
Benzo(a)pyrene	**YES**	
Dibenzo(a,h)anthracene	**YES**	
All other organic compounds	NO	

Note: Only metals and radionuclides greater than background (Section 5.1) were included in the comparison to one-tenth of the residential soil BCL.

Two organic compounds and seven inorganic compounds were found to exceed their respective one-tenth of the residential soil BCL.

5.4 SUMMARY OF SELECTION OF COPCS

The procedures for COPC selection were discussed above. Results of the selection of COPCs, including the rationale for excluding chemicals as COPCs, are presented in Table 5-7.

These procedures apply to soil results. Outdoor air exposures for VOCs are evaluated on a sample-by-sample basis, per NDEP requirements, using the surface flux data measurements. Because of this, elimination of COPCs from the surface flux data is not done. Instead, every chemical detected in an individual surface flux location is included in the evaluation for that location. Therefore, the maximum surface flux risk estimates are summed with the soil risk estimates to provide an upper-bound risk for each receptor.

6.0 HUMAN HEALTH RISK ASSESSMENT

This section presents the HHRA of all COPCs identified in Section 5 for all receptors of concern via all complete pathways. The methods used in the risk assessment follow standard USEPA guidance. Specifically, the methods used in the risk assessment followed basic procedures outlined in the USEPA's *Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual* (USEPA 1989). Other guidance documents consulted include:

- *Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual. Supplemental Guidance: Standard Default Exposure Factors* (USEPA 1991b).
- *Guidelines for Exposure Assessment* (USEPA 1992b).
- *Soil Screening Guidance: Technical Background Document* (USEPA 1996).
- *Exposure Factors Handbook, Volumes I-III* (USEPA 1997).
- *Soil Screening Guidance for Radionuclides* (USEPA 2000).
- *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (USEPA 2002b).
- *Technical Support Document for a Protocol to Assess Asbestos-Related Risk. Final Draft* (USEPA 2003b).
- *Child-Specific Exposure Factors Handbook* (USEPA 2006).
- *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)* (USEPA 2004e).
- *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)* (USEPA 2009).

Various NDEP guidance documents are also relied on for the HHRA. These include:

- *Supplemental Guidance for Assessing Data Usability for Environmental Investigations at the BMI Complex and Common Areas in Henderson, Nevada* (NDEP 2008a).
- *Guidance for Evaluating Secular Equilibrium at the BMI Complex and Common Areas* (NDEP 2009a).

- *Technical Guidance for the Calculation of Asbestos-Related Risk in Soils for the Basic Management Incorporated (BMI) Complex and Common Areas* (NDEP 2009b, 2010).

- *Supplemental Guidance on Data Validation* (NDEP 2009c,d).

- *Guidance for Evaluating Radionuclide Data for the BMI Plant Sites and Common Areas Projects* (NDEP 2009e).

The risk assessment is a deterministic risk assessment, meaning that single values based on conservative assumptions are used for all modeling, exposure parameters, and toxicity criteria. These conservative estimates compound each other so that the calculated risks likely exceed the true risks at the Site.

The method used in the risk assessment consists of several steps. The first step is the calculation of exposure point concentrations representative of the particular area, for each medium of concern. This step includes fate and transport modeling to predict concentrations that may be present when direct measurements are not available. The second step is the exposure assessment for the various receptors present in the particular areas. The next step is to define the toxicity values for each COPC. The final step is risk characterization where theoretical upper-bound cancer risks and non-cancer HIs are calculated.

6.1 DETERMINATION OF EXPOSURE POINT CONCENTRATIONS

A representative exposure concentration is a COPC-specific and media-specific concentration value. In risk assessment, these exposure concentrations are values incorporated into the exposure assessment equations from which potential baseline human exposures are calculated. As described below, the methods, rationale, and assumptions employed in deriving these concentration values follow USEPA guidance and reflect Site-specific conditions.

Chemical, physical, and biological processes may affect the fate and transport of chemicals in water, soil, and air. Chemical processes include solubilization, hydrolysis, oxidation-reduction, and photolysis. Physical processes include advection and hydrodynamic dispersion, volatilization, dispersion, and sorption/desorption to soil, sediment, and other solid surfaces. Biological processes include biodegradation, bioaccumulation, and bioconcentration. All of these processes are dependent upon the physical and chemical properties of the chemicals, the physical and chemical properties of the soil and water, and other environmental factors such as temperature, humidity, and the conditions of water recharge and movement. The net effect of these environmental factors is a time-dependent reduction of chemical concentrations in water, soil, and air. The determination of exposure point concentrations for media other than soil take into account chemical-specific physical parameters and inter-media transfers as discussed below. All modeling input parameters, calculations and results are presented in Appendix H (included on the report CD in Appendix B).

6.1.1 Soil

Due to the uncertainty associated with determining the true average concentration at a site, where direct measurements of the site average are infeasible and unavailable, the USEPA recommends using the lower of the maximum detected concentration or the 95 percent UCL as the concentration of a chemical to which an individual could be exposed over time (USEPA 1992b). For the 95 percent UCL concentration approach, the 95 percent UCL was computed to represent the area-wide exposure point concentrations. The 95 percent UCL is a statistic that quantifies the uncertainty associated with the sample mean. If randomly drawn subsets of Site data are collected and the UCL is computed for each subset, the UCL equals or exceeds the true mean roughly 95 percent of the time. The purpose for using the 95 percent UCL is to derive a conservative, upper-bound estimate of the mean concentration, which takes into account the different concentrations to which a person may be exposed at the Site. That is, an individual will be exposed to a range of concentrations that exist at an exposure area, from non-detect to the maximum concentration, over an entire exposure period.

A 95 percent UCL was calculated using the summary.stats() function in the GiSdT® package (Neptune and Company 2009) in R (R Core Team 2012). Section 5.1 outlines the treatment of sample locations with field duplicates prior to the 95 percent UCL statistical calculations described in this section. For these calculations, chemical non-detect results are assigned a value of one-half the SQL. The formulas for calculating the 95 percent UCL COPC concentration (as the representative exposure concentration) are presented in USEPA (1992c, 2002c) and GiSdT® (Neptune and Company 2009). Three UCL methods are employed in the GiSdT® library. They include the Student's t UCL, the bootstrap percentile UCL, and the bootstrap BCa UCL. The maximum UCL of these three methods was used as the exposure point concentration, unless the maximum UCL of the three methods was greater than the maximum detected concentration. In these cases, the maximum detected concentration was selected as the exposure point concentration.

The representativeness of the 95 percent UCLs for the exposure area, that is, a Sitewide mean concentration is valid for all receptors at the Site, is further supported by the intensity plot figures included in Appendix I. Figures for each of the COPCs are included in Appendix I (in addition to figures developed for all metals). A figure is also presented for TCDD TEQ. Although not COPCs for the Site, TCDD TEQ is a primary chemical of interest for the project. Based on the results of the background comparison tests, a review of the probability plots, boxplots, and distribution and intensity plot figures, data across the Site are assumed to be uncorrelated, that is, there is no discernable spatial correlation.[40] Although there may be spatial correlation of data across the Site, it has not been observed. Thus, the assumption is made for statistical testing purposes that the data are not spatially correlated.[41] This results in lower p-values and hence a greater number of statistical differences than would be the case if spatial correlation were accounted for. Ignoring correlation therefore causes conservatism, and the need to further evaluate spatial correlation is not warranted. Therefore consistent with the project *Statistical Methodology Report* (NewFields 2006), each measurement is assumed to be equally representative for that chemical at any point in the Site and calculation of the 95 percent UCL is appropriate. The data were also reviewed for the presence of hot spots, and as discussed in Section 3.5, no potential hot spots were identified at the Site.

Representative exposure concentrations for soil are based on the potential exposure depth for each of the receptors. For all receptors, two different exposure depths are considered, based on the sample depth rules schematic presented in Section 3: all data (surface and subsurface) and data classified as surface soil only. These different soil exposure classifications are considered to represent all possible exposure potential for all receptors, based on the future grade and use of Site soils. Ninety-five percent UCLs are calculated for both exposure depth scenarios. To be conservative, the higher of the two values was used in the risk estimates for each COPC. The 95 percent UCL for each COPC is presented in Table 6-1 (Tables section). For indirect exposures, this concentration was used in fate and transport modeling.

[40] Although the Statistical Methodology Report states that confirmation measurements of each chemical in a given soil layer will be used to compute variograms, as noted in the text above, this was not conducted for the Site, which is a deviation from the *BRC Closure Plan* methodology.
[41] Some variability of the data is expected, if there was perfect homogeneity then only one sample would be needed to represent the Site. This natural variability is demonstrated by the background datasets for the project. As shown on the probability and boxplots in Appendix G, the data generally follow a normal distribution, and their variability are similar to the background data.

The exposure point concentrations for asbestos (USEPA 2003b, NDEP 2009b) were based on the pooled analytical sensitivity of the dataset. The asbestos data and analytical sensitivities are presented in Table 6-2. Therefore, asbestos exposure point concentrations are determined differently than those for the other COPCs. The pooled analytical sensitivity is calculated as follows:

$$\textit{Pooled Analytical Sensitivity} = 1/\left[\sum_i \textit{(1/analytical sensitivity for trial i)}\right]$$

Two estimates of the asbestos concentration were evaluated, best estimate and upper bound, as defined in the draft methodology (USEPA 2003b). The best estimate concentration is similar to a central tendency estimate, while the upper bound concentration is comparable to a reasonable maximum exposure estimate. The pooled analytical sensitivity is multiplied by the number of chrysotile or amphibole structures to estimate concentration:

$$\text{Estimated Bulk Concentration } (10^6 \text{ s/gPM10}) = \text{Long fiber count} \times \text{Pooled analytical sensitivity}$$

For the best estimate, the number of fibers measured across all samples is incorporated into the calculation above. The upper bound of the asbestos concentration was also evaluated. It is calculated as the 95 percent UCL of the Poisson distribution mean, where the Poisson mean was estimated as the total number of structures detected across all samples. In Microsoft Excel, the following equation may be employed to calculate this value:

95 percent UCL of Poisson Distribution Mean = CHIINV(1-upper confidence percentile, 2 × (Long fiber count + 1))/2

This value is then multiplied by the pooled analytical sensitivity to estimate the upper bound concentration. The intent of the risk assessment methodology is to predict the risk associated with airborne asbestos. In order to quantify the airborne asbestos concentration, the estimated dust levels or particulate emission factors (PEFs) were used:

$$\text{Estimated Airborne Concentration } (\text{s/cm}^3) = \text{Estimated bulk concentration } (10^6 \text{ s/gPM10}) \times \text{Estimated dust level } (\text{ug/cm}^3)$$

Further explanation of the asbestos risk calculations and estimates are provided in the NDEP's Technical Guidance for the Calculation of Asbestos-Related Risk in Soils (2009b) and Workbook for the Calculation of Asbestos-Related Risk in Soils (2010).

6.1.2 Outdoor Air from Surface Flux

Concentrations of volatile constituents (VOCs and certain SVOCs) in soil and groundwater that may infiltrate through the ground to ambient air are estimated using USEPA surface emission isolation flux chamber (flux chamber) measurements collected at the Site in accordance with USEPA guidance (USEPA 1986) and the Flux Chamber SOP-16 (BRC, ERM, and MWH 2008). The flux chamber is used to measure the emission rates from surfaces emitting gas species. Use of the flux chamber reduces the need for modeling surface flux rates, which potentially reduces the uncertainty in the air representative exposure concentrations and the risk characterization. As noted in Section 5.4, indoor air exposures are evaluated on a sample by sample basis, per NDEP requirements, using the surface flux data measurements. Every chemical detected in an individual surface flux location is included in the evaluation for that location.

Outdoor surface flux data are divided by the dispersion factor for volatiles (Q/C_{vol} for Las Vegas; from USEPA 2002b) for use in the outdoor air exposure pathway. The same dispersion factor is used for all scenarios. The dispersion factor for the construction worker is not adjusted to account for soil intrusion activities. Outdoor air concentrations based on the surface flux data measurements are shown in the electronic air calculation files in Appendix H (included on the report CD in Appendix B) and are summarized in Table 6-3. In all cases the maximum of the two flux chamber measurements (TO-15 full scan and TO-15 SIM) is used.

6.1.3 Outdoor Air

Long–term exposure to COPCs bound to dust particles is evaluated using the USEPA's PEF approach (USEPA 2002b). The PEF relates concentrations of a chemical in soil to the concentration of dust particles in the air. The Q/C (Site-Specific Dispersion Factor) values in this equation are for Las Vegas, Nevada (Appendix D of USEPA 2002b). The equation used is:

$$PEF = Q/C_{wind} \ \text{x} \ \frac{3{,}600 \text{ sec/hr}}{0.036 \text{ x } (1 - V) \text{ x } (U_m / U_t)^3 \text{ x } F(x)}$$

where:

PEF = Particulate emission factor (m^3/kg)

Q/C_{wind} = Inverse of the ratio of the geometric mean air concentration to the emission flux at the center of a square source (g/m^2-s per kg/m^3)

V = Fraction of vegetative cover (unitless)

U_m = Mean annual windspeed (m/s)
U_t = Equivalent threshold value of windspeed at 7m (m/s)
F(x) = Function dependent on U_m/U_t derived using USEPA (1985) (unitless)

and:

$$Q/C_{wind} = A \times \exp \frac{(\ln A_{site} - B)^2}{C}$$

where:

A_{site} = Source Area (acre)
A, B, C = Air Dispersion Constants for LV (unitless)

The dust model and parameters utilized to generate the PEF are presented in Table 6-4.

The USEPA guidance for dust generated by construction activities (USEPA 2002b) was used for assessing short-term construction worker exposures:

$$PEF = \frac{1}{\left(\left(\frac{1}{PEF_{sc}}\right) + \left(\frac{1}{PEF_{sc\_road}}\right)\right)}$$

where:

PEF_{sc} = Subchronic particulate emission factor for construction activities (m^3/kg)
PEF_{sc_road} = Subchronic particulate emission factor for unpaved road traffic (m^3/kg)

Input soil concentrations for the model are the exposure point concentrations as described above. The construction dust model and all relevant equations and parameters utilized to generate the construction worker PEF from this guidance are provided in Table 6-5. Site-specific surface soil moisture data were collected in January, February, and August. The average of the surface soil data is 4.31 percent. This is considered an adequate representation of the annual average; therefore, this value is used for the percent moisture in dry road surface parameter instead of the NDEP model default value. Outdoor air concentrations based on soil data for all receptors are shown in Table 6-6.

6.2 EXPOSURE ASSESSMENT

In a risk assessment, the possible exposures of populations are examined to determine if the chemicals at a site could pose a threat to the health of identified receptors. The risks associated with exposure to chemicals depend not only on the concentration of the chemicals in the media, but also on the duration and frequency of exposure to those media. For example, the risks associated with exposure to chemicals for 1 hour a day are less than those associated with exposure to the same chemicals at the same concentrations for 2 hours a day. Potential health impacts from chemicals in a medium can occur via one or more exposure pathways. The exposure assessment step of a risk assessment combines information regarding impacted media at a site with assumptions about the people who could come into contact with these media. The result is an estimation of a person's potential rate of contact with impacted media from the Site. The intake rates are evaluated in the risk characterization step to estimate the risks they could pose.

In this section, assumptions regarding people's activities, such as the frequency with which a person could come into contact with impacted media, are discussed. Finally, the daily doses at the points of potential human contact were estimated using these assumptions, the models described in Section 6.1, and the chemical concentrations reported for soil and surface flux samples collected from the Site.

6.2.1 Exposure Parameters

In this section, the assumptions regarding the extent of exposure are presented for each of the exposure pathways for each medium of concern at the Site. Table 6-7 presents each of the exposure parameters used in the risk assessment for each receptor and each pathway. Many of the assumptions regarding the extent of exposure are default factors developed by USEPA's Superfund program. Default values were modified to reflect Site-specific conditions, where possible. The exposure parameters used in the risk assessment were those defined in Tables 9-2 through 9-5 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010).

6.2.2 Quantification of Exposure

In this section, the concentrations of COPCs at the points of potential human exposure are combined with assumptions about the behavior of the populations potentially at risk to estimate the dose of COPCs that may be taken in by the exposed individuals. Later, in the risk characterization step of the assessment, the doses are combined with toxicity parameters for COPCs to estimate whether the calculated intake levels pose a threat to human health.

The method used to estimate the average daily dose (ADD) for non-carcinogens COPCs via each of the complete exposure pathways is based on USEPA (1989, 1992b) guidance. For carcinogens, lifetime ADD (LADD) estimates are based on chronic lifetime exposure, extrapolated over the estimated average lifetime (assumed to be 70 years). This establishes consistency with cancer slope factors (CSFs), which are based on chronic lifetime exposures. For non-carcinogens, ADD estimates are averaged over the estimated exposure period. ADDs and LADDs were calculated for each exposure scenario using the following generic equation:

$$Dose = \frac{C \times IR \times ED \times EF}{BW \times AT \times 365\ d/yr}$$

where:

Dose	=	ADD for non-carcinogens and LADD for carcinogens (in mg/kg-day)
C	=	chemical concentration in the contact medium (e.g., mg/kg soil)
IR	=	intake rate (e.g., mg/day soil ingestion and dermal contact [requires a conversion factor of 10^{-6} kg/mg];
ED	=	exposure duration (years of exposure)
EF	=	exposure frequency (number of days per year)
BW	=	average body weight over the exposure period (kilograms)
BIO	=	relative bioavailability (unitless)
AF	=	absorption fraction (percent)
AT	=	averaging time; same as the ED for non-carcinogens and 70 years (average lifetime) for carcinogens

Risk estimates for inhalation exposures follow USEPA's *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)* (USEPA 2009). That is, the concentration of a chemical in air is used as the exposure metric (e.g., mg/m^3), rather than inhalation intake of a chemical in air based on inhalation rate and body weight (e.g., mg/kg-day). The generic equation for calculating inhalation exposures is:

$$EC = \frac{C_{air} \times ET \times ED \times EF}{AT}$$

where:

EC	=	exposure concentration (in mg/m^3)
C_{air}	=	chemical concentration in air (in mg/m^3)
ET	=	exposure time (hours per day)
ED	=	exposure duration (years of exposure)
EF	=	exposure frequency (number of days per year)
AT	=	averaging time; same as the ED for non-carcinogens and 613,200 hours (i.e., 70 years; average lifetime) for carcinogens

Pathway-specific equations for calculating ADDs and LADDs are provided in Table 9-6 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010). For conservatism, the relative oral bioavailability (BIO) of all COPCs was assumed to be 100 percent, except for arsenic. Consistent with the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010), an arsenic oral bioavailability of 30 percent is used.

Chemical-specific dermal absorption values from USEPA guidance (USEPA 2004e [Part E RAGS]) were used in the risk assessment. USEPA does not recommend absorption factors for VOCs based on the rationale that VOCs from the soil are volatilized on skin and exposure is accounted for via inhalation routes. In addition, RAGS Part E (USEPA 2004e) states "For inorganics, the speciation of the compound is critical to the dermal absorption and there are too little data to extrapolate a reasonable default value." Therefore, dermal absorption factors are also not used for inorganics. The NDEP and its consultants have concurred with this decision.

Exposure levels of potentially carcinogenic and non-carcinogenic chemicals are calculated separately because different exposure assumptions apply (i.e., ADD for non-carcinogens and LADD for carcinogens). Exposure levels are estimated for each relevant exposure pathway (i.e., soil, air, and water), and for each exposure route (i.e., oral, inhalation, and dermal). Daily doses for the same route of exposure are summed. The total dose of each chemical is the sum of doses across all applicable exposure routes. As noted previously, radionuclides are consistent with background concentrations and are not addressed in this HHRA.

6.2.3 Asbestos

Although final USEPA guidance is unavailable at this time, USEPA recommends that site-specific risk assessments be performed for asbestos (USEPA 2004f). Risks associated with asbestos in soil are evaluated using the NDEP's *Technical Guidance for the Calculation of*

Asbestos-Related Risk in Soils (2009b) and *Workbook for the Calculation of Asbestos-Related Risk in Soils* (2010), and the draft methodology proposed by USEPA (2003b). This methodology is an update of the method described in *Methodology for Conducting Risk Assessments at Asbestos Superfund Sites-Part 1: Protocol* and *Part 2: Technical Background Document* (Berman and Crump 1999a,b). Because the risk assessment methodology for asbestos is unlike that for other COPCs, asbestos risks are evaluated separately from other chemical risks.

The intent of the risk assessment methodology is to predict the amount of airborne asbestos, which causes an unacceptable risk to a human receptor. Asbestos concentrations are measured in soil, and are then used to predict airborne asbestos concentrations using a dust emissions model. Asbestos data are collected from the top 2 inches of soil. While asbestos might exist below the top 2 inches of soil due to soil turnover, the concentrations in the surface soil are likely to be greater than concentrations beneath the surface, and the exposure pathway is to near-surface soils. Therefore, the "shallow" surface soils asbestos concentration estimate is used to represent the potential exposure to asbestos.

To interpret measurements of asbestos in soils, it is necessary to establish the relationship between the asbestos concentrations observed in soils and concentrations that will occur in air when such soil is disturbed by natural or anthropogenic forces. This is because asbestos is a hazard when inhaled (see, for example, Berman and Crump 2001; USEPA 2003b). Indeed, the Modified Elutriator Method (Berman and Kolk 2000), which was the method employed to perform the analyses presented in this report, was designed specifically to facilitate prediction of airborne asbestos exposures based on bulk measurements (see, for example, Berman and Chatfield 1990).

Briefly, the Modified Elutriator Method incorporates a procedure for isolating and concentrating asbestos structures as part of the respirable dust fraction of a sample, and analytical measurements are reported as the number of asbestos structures per mass of respirable dust in the sample. This turns out to be precisely the dimensions required to combine such measurements with published dust emission and dispersion models to convert them to asbestos emission and dispersion models. These models can be combined with measurements from the Modified Elutriator Method to predict airborne exposures and assess the attendant risks.

6.3 TOXICITY ASSESSMENT

This section describes the toxicity of the COPCs at the Site. Numerical toxicity values were developed for use in the calculation of the hazard quotients (HQs; for non-carcinogens) and risks (for carcinogens).

6.3.1 Toxicity Values

Toxicity values, when available, are published by the USEPA in the on-line Integrated Risk Information System [IRIS]; USEPA 2012). CSFs (in units of milligrams per kilogram per day [mg/kg-d]$^{-1}$) are chemical-specific and experimentally derived potency values that are used to calculate the risk of cancer resulting from exposure to potentially carcinogenic chemicals. Inhalation unit risks (IURs) represent the upper-bound excess lifetime cancer risk from continuous exposure to a chemical at a concentration of 1 microgram per cubic meter (µg/m^3). A higher value implies a more potent carcinogenic potential. Reference dosages (RfDs) are experimentally derived "no-effect" levels used to quantify the extent of toxic effects other than cancer due to exposure to chemicals (in units of mg/kg-d). Similarly, a reference concentration (RfC) is the derived "no-effect" concentration for a lifetime of continuous inhalation exposure (in units of milligrams per cubic meter [mg/m^3]). With RfDs or RfCs, a lower value implies a more potent toxicant. These criteria are generally developed by USEPA risk assessment work groups and listed in the USEPA risk assessment guidance documents and databases. Available toxicity values for all Site COPCs used in the risk assessment were obtained using the following hierarchy for selecting toxicity criteria (based on USEPA 2003c):

1. IRIS;
2. USEPA's Provisional Peer Reviewed Toxicity Values (PPRTVs);
3. National Center for Environmental Assessment (or other current USEPA sources);
4. Health Effects Assessment Summary Tables (HEAST);
5. USEPA Criteria Documents (e.g., drinking water criteria documents, drinking water Health Advisory summaries, ambient water quality criteria documents, and air quality criteria documents);
6. ATSDR toxicological profiles;
7. USEPA's Environmental Criteria and Assessment Office; and

8. Peer-reviewed scientific literature.

In addition, toxicity criteria and toxicological surrogates recommended by the NDEP are used in the risk assessment. Toxicity criteria are consistent with those used in the development of the NDEP's BCLs (NDEP 2012), unless newer values are available from USEPA. Toxicity criteria have not been developed by BRC for elements or compounds that do not have criteria published in the above sources.

Although USEPA has developed toxicity criteria for the oral and inhalation routes of exposure, it has not developed toxicity criteria for the dermal route of exposure. USEPA has proposed a method for extrapolating oral toxicity criteria to the dermal route in the *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)* (USEPA 2004e). USEPA states that the adjustment of the oral toxicity factor for dermal exposures is necessary only when the oral-gastrointestinal absorption efficiency of the chemical of interest is less than 50 percent (due to the variability inherent in absorption studies). For COPCs to which dermal exposure might occur at the Site, the oral-gastrointestinal absorption efficiencies are greater than 50 percent, except for total chromium, hexavalent chromium, mercury, nickel, and vanadium. Therefore, the USEPA indicated adjustment of the oral toxicity criteria to generate dermal criteria was performed for these COPCs.

6.3.2 Non-Carcinogenic Health Effects

For non-carcinogenic health effects, USEPA assumes that a dose threshold exists, below which adverse effects are not expected to occur. A chronic RfD or RfC of a chemical is an estimate of a lifetime daily dose to humans that is likely to be without appreciable deleterious non-carcinogenic health effects. To derive an RfD or RfC, a series of professional judgments is made to assess the quality and relevance of the human or animal data and to identify the critical study and the most critical toxic effect. Data typically used in developing the RfD or RfC are the highest no-observable-adverse-effect-levels (NOAELs) for the critical studies and effects of the non-carcinogen. For each factor representing a specific area of uncertainty inherent in the extrapolation from the available data, an uncertainty factor is applied. Uncertainty factors generally consist of multiples of 10, although values less than 10 are sometimes used.

Four major types of uncertainty factors are typically applied to NOAELs in the derivation of RfDs or RfCs. Uncertainty factors of 10 are used to (1) account for the variability between humans, (2) extrapolate from animals to humans, (3) account for a NOAEL based on a subchronic study instead of a chronic study, and (4) extrapolate from a lowest-observed-adverse-effect-level (LOAEL) to a NOAEL, if necessary. In addition, a modifying factor can be used to account for adequacy of the database. Typically, the modifying factor is set equal to one.

To obtain the RfD or RfC, all uncertainty factors associated with the NOAEL are multiplied together, and the NOAEL is divided by the total uncertainty factor. Therefore, each uncertainty factor adds a degree of conservatism (usually one order of magnitude) to the RfD or RfC. An understanding of the uncertainties associated with RfDs or RfCs is important in evaluating the significance of the HIs calculated in the risk characterization portion of the risk assessment. When available, sub-chronic RfDs or RfCs were used to evaluate construction worker exposures. The COPCs in this assessment with USEPA-established oral/dermal and inhalation RfDs or RfCs are presented in Tables 6-8 and 6-9, for surface flux and soil COPCs, respectively.

6.3.3 Carcinogenic Health Effects

USEPA develops CSFs and IURs from chronic animal studies or, where possible, epidemiological data. Because animal studies use much higher doses over shorter periods of time than the exposures generally expected for humans, the data from these studies are adjusted, typically using a linearized multi-stage (LMS) mathematical model. To ensure protectiveness, CSFs/IURs are typically derived from the 95th percentile UCL of the slope, and thus the actual risks are unlikely to be higher than those predicted using the CSF/IUR, and may be considerably lower. The COPCs in this assessment with USEPA-established oral/dermal and inhalation CSFs/IURs are presented in Tables 6-8 and 6-10, for surface flux and soil COPCs, respectively.

6.3.4 Asbestos

Asbestos toxicity criteria were obtained from Table 8-1 of Berman and Crump's (2001) document and Tables 8-2 and 8-3 in the USEPA (2003b) guidance. The toxicity criteria vary based on fiber type, endpoint (lung cancer, mesothelioma, or combined) and percent of fibers longer than 10 micrometers (µm) and less than 0.4 µm in width. For this risk assessment the toxicity criteria were based on a combined endpoint of lung cancer and mesothelioma averaged over the smokers and non-smokers of the population, with the assumption that 50 percent of fibers are greater than 10 µm in length. The resulting unit risk factors (structures/cubic centimeter) are presented in Appendix H (included on the report CD in Appendix B). A complete discussion on issues associated with risk estimates for asbestos is presented in the NDEP's *Technical Guidance for the Calculation of Asbestos-Related Risk in Soils* (2009b).

6.4 RISK CHARACTERIZATION

In the last step of a risk assessment, the estimated rate at which a receptor intakes a chemical is compared with information about the toxicity of that COPC to estimate the potential risks posed by exposure to the COPC. This step is known as risk characterization. The methods used for assessing cancer risks and non-cancer adverse health effects are discussed below.

6.4.1 Methods for Assessing Cancer Risks

In the risk characterization, carcinogenic risk is estimated separately as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to chemicals and asbestos. Carcinogenic risks for chemicals were evaluated by multiplying the estimated average exposure rate (i.e., LADD calculated in the exposure assessment) by the chemical's CSF or IUR. The CSF converts estimated daily doses averaged over a lifetime to incremental risk of an individual developing cancer. Because cancer risks are averaged over a person's lifetime, longer-term exposure to a carcinogen results in higher risks than shorter-term exposure to the same carcinogen, if all other exposure assumptions are constant. Theoretical risks associated with low levels of exposure in humans are assumed to be directly related to an observed cancer incidence in animals associated with high levels of exposure while the IUR converts estimated exposure concentrations averaged over a lifetime to incremental risk of an individual developing cancer. According to USEPA (1989), this approach is appropriate for theoretical upper-bound ILCRs of less than 1×10^{-2}. The following equations were used to calculate COPC-specific risks and total risks:

$$Risk = EC \times IUR \quad or \quad LADD \times CSF$$

where:

LADD	=	lifetime average daily dose (mg/kg-d)
EC	=	exposure concentration (mg/m^3)
IUR	=	inhalation unit risk (mg/m^3)$^{-1}$
CSF	=	cancer slope factor (mg/kg-d)$^{-1}$

and:

$$Total\ Carcinogenic\ Risk = \Sigma\ Individual\ Risk$$

It is assumed that cancer risks for different chemicals and from multiple exposure routes are additive, which introduces a protective bias in the result of the cancer risk assessment.

Carcinogenic risk estimates were compared to the USEPA acceptable, incremental risk range of 1 in 10,000 (10^{-4}) and 1 in 1 million (10^{-6}) and the NDEP's acceptable, incremental level of 10^{-6}. If the estimated incremental risk falls within or below this risk range, the chemical is considered unlikely to pose an unacceptable carcinogenic risk to individuals under the given exposure conditions. A risk level of 1×10^{-5} (1 E-5) represents an incremental probability of one in 100,000 that an individual could develop cancer from exposure to the potential carcinogen under a defined set of exposure assumptions.

6.4.2 Methods for Assessing Non-Cancer Health Effects

Non-cancer adverse health effects are estimated by comparing the estimated average exposure rate (i.e., ADDs estimated in the exposure assessment) with an exposure level at which no adverse health effects are expected to occur for a long period of exposure (e.g., the RfDs or RfCs). ADDs (or exposure concentrations [ECs]) and RfDs (or RfCs) are compared by dividing the ADD by the RfD (or EC by the RfC) to obtain the ADD:RfD (EC:RfC) ratio, as follows:

$$HQ = \frac{EC}{RfC} \ or \ \frac{ADD}{RfD}$$

where:

HQ	=	hazard quotient
ADD	=	average daily dose (mg/kg-d)
EC	=	exposure concentration (mg/m^3)
RfD	=	reference dose (mg/kg-d)
RfC	=	reference concentration (mg/m^3)

The ADD-to-RfD (EC-to-RfC) ratio is known as an HQ. If a person's average exposure is less than the RfD or RfC (i.e., if the HQ is less than 1), the chemical is considered unlikely to pose a significant non-carcinogenic health hazard to individuals under the given exposure conditions. Unlike carcinogenic risk estimates, an HQ is not expressed as a probability. Therefore, while both cancer and non-cancer risk characterizations indicate a relative potential for adverse effects to occur from exposure to a chemical, a non-cancer adverse health effect estimate is not directly comparable with a cancer risk estimate.

If more than one pathway is evaluated, the HQs for each pathway are summed to determine whether exposure to a combination of pathways poses a health concern. This sum of the HQs is known as an HI.

$$Hazard\ Index = \Sigma\, Hazard\ Quotients$$

Any HI less than 1.0 indicates the exposure is unlikely to be associated with a potential health concern. If the HI is greater than 1.0, then the HQs are summed by the specific target organs affected by a particular chemical or chemicals. This is also summed across pathways and chemicals. Target organs are identified primarily by the source of the toxicity criteria (e.g., IRIS). Since a chemical may affect more than one organ, in addition to the source of the toxicity criteria Oak Ridge National Laboratory's (ORNL) Risk Assessment Information System's toxicity profiles were also searched for target organ information (ORNL 2012).

6.4.3 Methods for Assessing Asbestos Risks

For assessing asbestos risks, Table 8-2 (Based on Optimum Risk Coefficients) of USEPA (2003b) was used. Table 8-2 presents best estimate risks optimized based upon separation of fiber type, size and endpoint (mesothelioma/lung cancer), thereby reducing apparent variation between the studies utilized. The values in Table 8-2 are used because they are the authors' "best" estimates of potency based upon all the available data (whereas the "conservative values" presented in Table 8-3 present only the most conservative, and best "behaved" data). As described in USEPA (2003b), because the asbestos risks to male and female smokers/non-smokers are different, population averaged risks are evaluated based on Eqn. 8-1 of USEPA (2003b):

$$URF = 0.5 \times ((0.786 \times (NSM + NSF)) + ((0.214 \times (SM + SF)) \times CF$$

where:

URF	=	Population Averaged Unit Risk Factor (risk per fibers/cubic centimeter [cm^3])
NSM	=	risk for male non-smokers
NSF	=	risk for male non-smokers
SM	=	risk for male smokers
SF	=	risk for female smokers
CF	=	factor to convert risk from risk per 100,000 to risk per 1,000,000

This equation considers male smokers, male non-smokers, female smokers, and female non-smokers. In addition, because both chrysotile and amphibole have been detected at the BMI Common Areas, both amphibole and chrysotile fibers are evaluated in the risk assessments, regardless of if either was detected within an exposure area (as calculated using the 95 percent UCL of the mean of the assumed underlying Poisson distribution).

The basic equation for assessing inhalation cancer risk for asbestos is analogous to that recommended by USEPA for other inhalation carcinogens. As shown in Equation 11 of *Risk Assessment Guidance for Superfund, Part F* (USEPA, 2009) inhalation cancer risk is the product of an IUR factor and an exposure concentration. The exposure concentration is a function of the asbestos air concentration, the length of time an individual is exposed, and the averaging time for which carcinogenic effects are evaluated for the unit risk factor. This calculation of asbestos related risk (ARR) is also consistent with application of Berman and Crump (2003) to risk calculations described in Berman (2003a,b; 2005). The risk equation used in performing an asbestos inhalation risk assessment is:

$$ARR = \frac{C_{air} \times URF \times ET \times EF \times ED}{AT}$$

where:

C_{air}	=	air concentration of asbestos (f/cm^3) (fibers per centimeter cubed)
ET	=	exposure time (hours/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
AT	=	averaging time (hours)
URF	=	unit risk factor (risk per f/cm^3)

Asbestos risk estimates are compared to the USEPA acceptable, incremental risk range for carcinogens of 1 in 10,000 (10^{-4}) and 1 in 1 million (10^{-6}) and the NDEP's acceptable, incremental level of 10^{-6}, although the risk estimates represent the probability of death from mesothelioma or lung cancer rather than the probability of contracting cancer. If the estimated asbestos risk falls within or below this risk range, asbestos is considered unlikely to pose an unacceptable risk to individuals under the given exposure conditions. A risk level of 1×10^{-5} (1 E-5) represents a probability of one in 100,000 that an individual could die from contracting mesothelioma or lung cancer from exposure to asbestos under a defined set of exposure assumptions.

6.4.4 Risk Assessment Results

The calculation of theoretical upper-bound ILCRs and non-cancer health effects are presented by receptor in Tables 6-11 and 6-12 and are discussed in Section 8. These tables present the theoretical upper-bound ILCRs and non-cancer health effects calculations for construction worker and maintenance (outdoor) worker receptors. The risk of death from lung cancer or mesothelioma as a consequence of exposure to asbestos on a Sitewide basis is presented in Table 6-13. All calculation spreadsheets are provided in Appendix H (included on the report CD in Appendix B).

7.0 UNCERTAINTY ANALYSIS

Risk estimates are values that have uncertainties associated with them. These uncertainties, which arise at every step of a risk assessment, are evaluated to provide an indication of the uncertainty associated with a risk estimate. Risk assessments are not intended to estimate the true risk to a receptor associated with exposure to chemicals in the environment. In fact, estimating the true risk is impossible because of the variability in the exposed or potentially exposed populations. There are always gaps in knowledge because a true exposure for every individual human being cannot be measured. Therefore, risk assessment is a means of estimating the probability that an adverse health effect (e.g., cancer, impaired reproduction) will occur in a receptor to assist in decision-making regarding the protection of human health. The use of conservative values for a majority of the assumptions in risk assessments helps guard against the underestimation of risks.

Risk estimates are calculated by combining Site data, assumptions about individual receptor's exposures to impacted media, and toxicity data. The uncertainties in this HHRA can be grouped into four main categories that correspond to these steps:

- Uncertainties in environmental sampling and analysis;
- Uncertainties in fate and transport modeling (discussed in Section 9);
- Uncertainties in assumptions concerning exposure scenarios; and
- Uncertainties in toxicity data and dose-response extrapolations.

General uncertainties associated with the HHRA for the Site are summarized in Table 7-1. In this table, "Low," "Moderate," and "High" are qualitative indicators as to whether the source of uncertainty will likely have a small, medium, or large effect on the risk calculations, respectively. In general, the scenarios and parameters evaluated and used in this HHRA are considered conservative based on how the Site will be developed. This is a large source of potential conservative bias in this HHRA. Additional discussion on the uncertainties associated with the HHRA is provided below.

7.1 ENVIRONMENTAL SAMPLING

The HHRA for the Site was based on the sampling results obtained from investigations conducted in 2009 and 2010. Errors in sampling results can arise from the field sampling, laboratory analyses, and data analyses.

The environmental sampling at the Site is one source of uncertainty in the evaluation. However, the number of sampling locations and events is large, widespread and spatially distributed, with consistent analytical results (i.e., no hot spots), and sampling was performed using approved procedures; therefore, the sampling and analytical data are sufficient to characterize the impacts and the associated potential risks.

Because of the surface soil removal undertaken for certain chemicals, the new surface layer of the Site could have different chemical concentrations than those measured prior to soil removal. Because only the trigger constituents were reanalyzed for in the post-scrape samples, the original measured surface soil data at the Site for all other chemicals was retained for further evaluation. However, it is reasonable to assume that the concentrations are now lower for some chemicals (e.g., metals, if due to contamination), because of the removal of some soil.

The laboratory data are another potential source of uncertainty. Maximum SQLs for 1,2-diphenylhydrazine, 3,3-dichlorobenzidine, bis(2-chloroethyl) ether, dichloromethyl ether, hexachlorobenzene, and n-nitrosodi-n-propylamine exceeded one-tenth their respective residential soil BCL. These chemicals were not evaluated quantitatively in the HHRA as they were not detected in any Site samples. This may result in an underestimation of risk.

Three surface flux (EPA TO-15) analytes (2-Methyl-1-propanol, benzyl chloride, and dibromochloropropane) were qualified in all samples due to calibration recoveries below 50 percent. All three compounds were non-detect in all samples. This may result in an underestimation of risk.

Widespread blank contamination was noted for the full scan surface flux analysis of benzene. Benzene was associated with 13 censored data points (of 12 surface flux samples[42]). Benzene was detected at 12 of 12 surface flux locations, but was qualified as non-detect in 9 of 12 for the full scan analysis. For the SIM analysis, benzene was detected at 9 of 9 surface flux locations, but was qualified as non-detect in 4 of 9. Benzene has been detected in groundwater across the

[42] Twelve locations were analyzed using TO-15 full scan and nine were also analyzed using TO-15 SIM.

BMI Complex. The highest detected flux is 0.0531 μm^3,min^{-1}, while the highest censored result is nearly two times that result at 0.0939 μm^3,min^{-1}. The ILCR for the maintenance worker associated with a surface flux of 0.0939 μm^3,min^{-1} would be 1×10^{-8}. Therefore, censoring this data is not resulting in a significant underestimation of risk.

The types of analyses were chosen based on historical knowledge of the Site and BMI Common Areas. The data validation and data usability evaluations provided documentation that the HHRA database is adequate to support HHRA conclusions (Section 4 and Appendix E). Based on the data validation and data usability, the risk estimates are likely to be overestimated rather than underestimated.

NDEP has issued recent guidance regarding qualifying data due to blank contamination (NDEP 2011b). As noted in the guidance, NDEP requires that data validated before June 2011and impacted by blank contamination be discussed in any report that uses such data. In so doing, a semi-quantitative comparison of the potential differences between approaches taken previously and the requirements specified in the guidance will be described and explained. The discussion below provides this semi-quantitative comparison for data impacted by blank contamination for the Site.

All data for the Site were collected and validated prior to June 2011; therefore, data were qualified using existing USEPA and NDEP guidance. The issue of blank contamination is not one that affects the typical primary risk drivers for the project, including those for the Site. The primary risk drivers for the Site are aluminum, arsenic, lithium, manganese, thallium, and vanadium, only two of which, arsenic and thallium had blank contamination issues. There were only four arsenic results and five thallium results, out of 69 each for the Site, affected by blank contamination, with initial reported values slightly less than the qualified values used in the HHRA. Therefore, the impact of these samples on the background comparison statistics for arsenic and thallium is unlikely to be significant. The following other metals had samples qualified due to blank contamination: antimony (11 samples), beryllium (8 samples), boron (9 samples), cadmium (27 samples), chromium (VI) (7 samples), mercury (47 samples), molybdenum (22 samples), selenium (15 samples), silver (5 samples), tin (3 samples), and tungsten (6 samples). Given the number of samples qualified due to blank contamination for several of these, this may have an impact on the background comparison statistics. However, in all cases the maximum detected concentrations for these metals are less than one-tenth their respective BCLs (and their maximum non-detect concentrations are also less than one-tenth their BCLs). Therefore, this issue has no material effect on the selection of COPCs and the results of the HHRA for the Site.

Although background comparison results for thorium-228 do not pass the slippage test; all other background comparison test pass, as do all background tests for other radionuclides (except for uranium-235/236 as noted in Table 5-2). In addition, radionuclides are in secular equilibrium, therefore, thorium-228 is not considered to be greater than background at the Site. Therefore, this issue should have no material effect on the selection of COPCs and the results of the HHRA for the Site.

Uncertainties are also introduced into the risk assessment by assumptions that are made regarding the grading plan. As described in Section 3.1, the grading plan affects the interpretation of the data in terms of assigning samples to the surface or the subsurface. This was done to avoid the situation in which current surface samples might not be included in the evaluation of exposures to future surface soils. The data were subdivided by depth intervals as described in Section 3.1, and the maximum of the UCLs for the two subsets of data was used as the exposure point concentration. There is some uncertainty in the choice of subsetting on the concentrations of interest, and there is a potential small overestimation of risk by choosing the maximum of the two UCLs as the exposure point concentration. The effects are likely to be small given the data, since there is not much variation in the different UCLs.

7.2 ESTIMATES OF EXPOSURE

The selection of exposure pathways is a process, often based on best professional judgment, which attempts to identify the most probable potentially harmful exposure scenarios. In a risk assessment, it is possible that risks are not calculated for all of the exposure pathways that may occur, possibly causing some underestimation of risk.

7.2.1 Aggregation of Exposure Areas

Although land use is not residential, default residential exposure areas are 1/8th-acre in size. However, sampling has not been performed at the frequency of guaranteeing at least one sample per every 1/8th-acre exposure area. Instead, sampling has been performed at the scale of approximately once every 3 acres. This is considered sufficient if the concentration distribution for COPCs appears similar across the Site. To the extent that this assumption is not valid the risk assessment might underestimate risks. However, considering the sampling protocols employed and the physical remediation activities performed, the risk estimates are considered both reasonable from this perspective and unlikely to have resulted in an underestimation of risk at the Site.

7.2.2 Types of Exposures Examined

In an evaluation, risks are sometimes not calculated for all of the exposure pathways that may occur, possibly causing some underestimation of risk. However, in this case, all principal potential exposure pathways were evaluated. In this assessment, risks were estimated for future outdoor worker receptors. Risks for the most likely routes of exposure to these receptors were estimated. For example, risks to workers were estimated for soil ingestion, skin contact with soil, and inhalation of outdoor air (including dust generation). Although it is possible that other exposure routes could exist (e.g., downwind off-site residents), these exposures are expected to be lower than the risks associated with the pathways considered.

7.2.3 Intake Assumptions Used

The risks calculated depend largely on the assumptions used to calculate the rate of COPC intake. For this assessment, standard default values developed by USEPA are used for reasonable maximum exposures frequency and exposure duration for all receptors. These estimates are conservative values, and the possibility that they underestimate the risk is low. The uncertainties associated with particular parameters used in this risk assessment are described below.

The amount of COPCs the human body absorbs may be different from the amount of a COPC contacted, and the percentage absorbed may vary from one person to another. In this HHRA, with the exception of arsenic, absorption of ingested and inhaled COPCs is conservatively assumed to be 100 percent.

Current USEPA guidance (USEPA 2004e) states that "There are no default dermal absorption values presented for volatile organic compounds nor inorganic classes of compounds. The rationale for this is that in the considered soil exposure scenarios, volatile organic compounds would tend to be volatilized from the soil on skin and should be accounted for via inhalation routes in the combined exposure pathway analysis. For inorganics, the speciation of the compound is critical to the dermal absorption and there are too little data to extrapolate a reasonable default value." While USEPA guidance does not specifically state that this pathway should be dismissed, consistent with the approach utilized in current USEPA guidance, the risk estimates in this HHRA do not include a dermal absorption value for VOCs or inorganics (unless a specific value has been identified). Thus, the risks presented in this assessment could be underestimated as a result.

The construction activity dust emissions did not take into account dust control measures that would reduce the amount of dust generated to below those levels used in the HHRA. The Clark County Department of Air Quality and Environmental Management has dust control permitting requirements, and an inhalable particulate matter action level of 50 $\mu g/m^3$. The construction activity dust emissions predicted and used in the HHRA exceeded this level. Therefore, dust suppression activities would need to be implemented, thus reducing dust levels and exposures.

The dispersion factor for the construction worker is not adjusted to account for soil intrusion activities. Because these activities may cause increased air concentrations than that evaluated, risks to VOCs in soil may be underestimated for this receptor. However, VOCs are primarily associated with groundwater, this potential underestimation is considered low.

7.3 TOXICITY ASSESSMENT

The availability and quality of toxicological data is another source of uncertainty in the risk assessment. Uncertainties associated with animal and human studies may have influenced the toxicity criteria. Carcinogenic criteria are classified according to the amount of evidence available that suggests human carcinogenicity. In the establishment of the non-carcinogenic criteria, conservative safety factors, known as uncertainty and modifying factors, are used.

7.3.1 COPCs Lacking Toxicological Data

Toxicity criteria have not been established for some of the chemicals detected at the Site. These chemicals were not quantitatively evaluated in the HHRA. For example, potassium is an analyte for which no USEPA toxicity criteria have been established. The health effects and levels of concern for potassium in soil are not known. While not including potassium may have resulted in a low degree of underestimation of quantitative Site risk estimates, the available toxicological information suggests that this underestimation will not likely affect the decisions made relative to Site risks.

Because of the inconclusive nature of TICs as potentially SRCs, non-cancer surrogate toxicity criteria were not applied. Non-cancer surrogate toxicity criteria were not applied to the inorganic chemicals because of the complexity of ion and metal toxicity. A quantitative estimation of risk was not conducted for these COPCs. Thus, the risks presented in this assessment could be underestimated as a result.

For the surface flux results, a few organic chemicals detected (e.g., n-heptane, 2-hexanone, cymene) do not have toxicity criteria available. Surrogate toxicity criteria were applied for these chemicals. Thus, the risks presented in this assessment could be under- or overestimated as a result.

7.3.2 Uncertainties in Animal and Human Studies

Extrapolation of toxicological data from animal tests is one of the largest sources of uncertainty in a risk assessment. There may be important, but unidentified, differences in uptake, metabolism, and distribution of chemicals in the body between the test species and humans. For the most part, these uncertainties are addressed through use of conservative assumptions in establishing values for RfDs, RfCs, CSFs, and IURs, which results in the likelihood that the risk is overstated.

Typically, test animals are administered high doses (e.g., maximum tolerated dose) of a chemical in a standard diet or in air. Humans are generally exposed to much lower doses in the environment, which may affect the toxicity of the chemical. In these studies, test animals, often laboratory rodents, are exposed daily to the chemical agent for various periods of time up to their 2-year lifetimes. Humans have an average 70-year lifetime and may be exposed either intermittently or regularly for an exposure period ranging from weeks to a full lifetime. Because of these differences, it is not surprising that extrapolation error is a large source of uncertainty in a risk assessment.

7.3.3 Non-Carcinogenic Toxicity Criteria

In the establishment of the non-carcinogenic criteria, conservative safety factors, known as uncertainty factors, are used. Most of the chronic non-carcinogenic toxicity criteria that were located in the IRIS database have uncertainty factors of 1,000. This means that the dose corresponding to a toxicological effect level (e.g., LOAEL) is divided by 1,000 to deem a safe, or “reference,” dose. The purpose of the uncertainty factor is to account for the extrapolation of toxicity data from animals to humans and to ensure the protection of sensitive individuals.

7.3.4 Sub-Chronic Non-Carcinogenic Toxicity Criteria

Construction worker exposures are evaluated for an exposure duration of 1 year, which is more representative of a sub-chronic exposure rather than a chronic exposure. As such, where available, sub-chronic RfDs were used to characterize non-cancer effects for the construction worker. However, for many COPCs, a sub-chronic RfD was not available and the chronic RfD was used. This likely presented an overestimation of non-cancer health risks to the construction worker.

7.3.5 Carcinogenic Toxicity Criteria

Uncertainty due to extrapolation of toxicological data for potential carcinogens tested in animals to human response is commonly the case for potentially carcinogenic chemicals. USEPA frequently uses the LMS model, or other non-threshold low-dose extrapolation models, to extrapolate the toxicological data to estimate human response. These low-dose extrapolation models assume that there is no threshold for carcinogenic substances; that is, exposure to even one molecule, fiber, or picocurie of a carcinogen is sufficient to cause cancer. This is a highly conservative assumption, because the body has several mechanisms to protect against cancer.

The use of the LMS model to extrapolate is a well-recognized source of significant uncertainty in the development of carcinogenic toxicity criteria and, subsequently, theoretical carcinogenic risk estimates. At high levels of exposure, there may indeed be a risk of cancer regardless of whether or not the effect occurs via a threshold mechanism. An animal bioassay cannot determine what happens at low levels of exposure, however, which are generally typical of human exposure levels.

At low levels of exposure, the probability of cancer cannot be measured but must be extrapolated from higher dosages. To do this, test animals are typically exposed to carcinogens at levels that are orders of magnitude greater than those likely to be encountered by humans in the environment. It would be difficult, if not impossible, to perform animal experiments with a large enough number of animals to directly estimate the level of risk at the low exposure levels typically encountered by humans. Thus, to estimate the risk to humans exposed at low levels, dose-response data derived from animals given high dosages are extrapolated downward using mathematical models such as the LMS model, which assumes that there is no threshold of response. The dose-response curve generated by the model is known as the maximum likelihood estimate. The slope of the 95 percent lower confidence interval (i.e., upper-bound limit) curve, which is a function of the variability in the input animal data, is taken as the CSF. CSFs are then used directly in cancer risk assessment.

The U.S. federal government, including USEPA itself, has acknowledged the limitations of the high-to-low dose extrapolation models, particularly the LMS model (USEPA 1991c). In fact, this aspect of cancer risk assessment has been criticized by many scientists (including regulatory scientists) in recent years. USEPA has recently released revised cancer risk assessment guidelines (USEPA 2005c).

Even for genotoxic (i.e., non-threshold) substances, there are two major sources of bias embedded in the LMS model: (1) its inherent conservatism at low doses and (2) the routine use of the linearized form in which the 95 percent upper confidence interval is used instead of the unbiased maximum likelihood estimate. The inherent conservatism at low doses is due in part to the fact that the LMS model ignores all of the numerous biological factors that argue against a linear dose-response relationship for genotoxic effects (e.g., DNA repair, immunosurveillance, toxicokinetic factors).

Several other factors inherent in the LMS model result in overestimated carcinogenic potency: (1) any exaggerations in the extrapolation that can be produced by some high dose responses (if they occur) are generally neglected; (2) UCLs on the actual response observed in the animal study are used rather than the actual response, resulting in upper-bound low dose extrapolations, which can greatly overestimate risk; and (3) non-genotoxic chemicals (i.e., threshold carcinogens) are modeled in the same manner as highly genotoxic chemicals.

7.3.6 Uncertainties with the Asbestos Risk Assessment

For the risk assessment, asbestos concentrations were presented two ways, as a best estimate and upper bound based upon the UCL of the mean of the Poisson distribution. Asbestos risk estimates are highly dependent on the number of samples to increase or decrease the pooled analytical sensitivity. That is, a larger number of non-detect samples with similar individual analytical sensitivity results in a lower pooled analytical sensitivity and subsequently a lower estimated ARR, whereas a smaller number of non-detect samples results in a higher ARR. Uncertainty is, thus, reduced as more samples are collected.

7.4 CUMULATIVE EFFECT OF UNCERTAINTIES

Uncertainties from different sources are compounded in the HHRA. For example, if a person's daily intake rate for a chemical is compared to an RfD to determine potential health risks, the uncertainties in the concentration measurements, exposure assumptions, and toxicities are all expressed in the result. Because the exposure assumptions and toxicity criteria are considered conservative, the risk estimates calculated in this HHRA are likely to overestimate rather than underestimate potential risks.

8.0 SUMMARY OF RESULTS

This HHRA has evaluated potential risks to human health associated with chemicals and asbestos detected in soil at the Galleria Dr. Right-of-Way located within the BMI Common Areas in Clark County, Nevada. All calculation spreadsheets for this HHRA are presented in Appendix H (on the report CD in Appendix B), including calculations of chemical theoretical upper-bound ILCRs and non-cancer health effects and asbestos risk calculations.

The risk estimates are based on reasonable maximum exposure scenarios, which results in estimates of the potential reasonable maximum, or high-end, risks associated with the Site. The calculated chemical theoretical upper-bound ILCRs and HIs are presented in Table 6-11and 6-12 for construction worker, and maintenance (outdoor) worker receptors, respectively. Asbestos estimated risk of death from lung cancer or mesothelioma on a Sitewide basis are presented in Table 6-13.

8.1 CONSTRUCTION WORKERS

For chemical exposures, the total cumulative non-cancer HI for construction worker receptors at the Site is 0.56 (including the surface flux air risk estimates) (Table 6-11), with metals soil exposures via the oral ingestion pathway being the primary contributors. The HI does not exceed the target HI of 1.0. As a result, BRC did not evaluate target organ or background non-cancer HI values.

The maximum theoretical upper-bound ILCR for construction worker receptors at the Site is 2×10^{-7} (including the surface flux air risk estimates see Table 6-11) with arsenic soil exposures via the oral ingestion pathway the primary contributor. The theoretical upper-bound ILCRs are all below the low end of the risk goal of 1×10^{-6}.

The estimated risks for death from lung cancer or mesothelioma for asbestos exposures to construction workers were below 1×10^{-6}. For construction workers receptors, the best estimate and upper bound concentrations for chrysotile fibers are 0 and 5×10^{-9}; and 2×10^{-7} and 8×10^{-7} for amphibole fibers (Table 6-13). These estimated risks are below the low end of the risk goal of 1×10^{-6}. The upper-bound estimated risk of death from lung cancer or mesothelioma is estimated based on the 95 percent UCL of the count of the number of fibers detected, assuming a Poisson distribution for the count.

8.2 MAINTENANCE (OUTDOOR) WORKERS

For chemical exposures, the total cumulative non-cancer HI for commercial (outdoor) worker receptors at the Site is 0.096 (including the surface flux air risk estimates) (Table 6-12), with metals soil exposures via the oral ingestion pathway being the primary contributors. The HI does not exceed the target HI of 1.0. As a result, BRC did not evaluate background non-cancer HI values.

The maximum theoretical upper-bound ILCR for commercial (outdoor) worker receptors at the Site is 1×10^{-6} (including the surface flux air risk estimates see Table 6-12) with the soil theoretical upper-bound ILCRs for arsenic via the oral ingestion and dermal contact pathways the primary contributor. The theoretical upper-bound ILCRs are all below the low end of the risk goal of 1×10^{-6}.

The estimated risks for death from lung cancer or mesothelioma for asbestos exposures to maintenance (outdoor) workers were below 1×10^{-6}. For maintenance (outdoor) worker receptors, the best estimate and upper bound concentrations for chrysotile fibers are 0 and 1×10^{-9}; and 5×10^{-8} and 2×10^{-7} for amphibole fibers (Table 6-13). These estimated risks are below the low end of the risk goal of 1×10^{-6}.

9.0 DATA QUALITY ASSESSMENT

Sample size calculations were conducted for 11constituents (arsenic, benzo(a)pyrene, beta-BHC, total chromium, hexavalent chromium, thorium-228, formaldehyde, lead, perchlorate, 2,3,7,8-TCDD, and vanadium) for the Site. Rationale for the inclusion of these constituents in the sample size calculations is provided below:

- Arsenic – a chemical of primary concern for the overall project, often exceeding comparison levels;
- Benzo(a)pyrene – a COPC representative of SVOCs and PAHs with several detected results and a low residential BCL;
- beta-BHC – a COPC representative of organochlorine pesticides with several detected results and a low residential BCL;
- Chromium – the metal (besides arsenic) with the most exceedances of background concentrations;
- Hexavalent chromium – a metal with several results in excess of background concentrations resulting in high sample variability;
- Thorium-228 – a radionuclide with several results in excess of background concentrations resulting in high sample variability;
- Formaldehyde – the non-dioxins/furans/PCB congeners organic chemical with the highest number of detected results;
- Lead – a metal with a single high value in comparison to other results across the Site;
- Perchlorate – an inorganic chemical that is a primary risk contributor;
- 2,3,7,8-TCDD – a chemical of primary concern for the overall project; and
- Vanadium – a metal with several results in excess of background concentrations resulting in high sample variability.

The formula used here for calculation of sample size is based on a non-parametric test (the Wilcoxon signed rank test), and on simulation studies performed by Pacific Northwest National

Laboratories (PNNL 2009) that formed the basis for an approximate formula that is based on the normal distribution. Essentially, the formula is the one that would be used if a normal-based test were being performed, but an adjustment is made (multiply by 1.16) to account for the intent to perform a non-parametric test. The formula is as follows:

$$n = 1.16\left[\frac{s^2}{\Delta^2}(z_{1-\alpha} + z_{1-\beta(\mu)})^2 + 0.5z_{1-\alpha}^2\right]$$

where:

n	=	number of samples
s	=	estimated standard deviation of concentrations/fibers
Δ	=	width of the gray region (the difference between the threshold value stated in the null hypothesis and the point at which β is specified)
α	=	significance level or Type I error tolerance
β (μ)	=	Type II error tolerance; and
z	=	quantile from the standard normal distribution

For each chemical, inputs for the calculations include an estimate of the variance from the measured data, a desired significance level, and desired power of the test that must be specified at a concentration of interest (which determines the tolerable difference from the threshold value). For arsenic, the Site mean concentration exceeds its BCL based on the target cancer risk level of 10^{-6}. It is not appropriate to apply this calculation where the threshold value is less than the mean concentration. Therefore, the maximum shallow background concentration was used for its threshold value. The calculations provided here cover a range of Type I and Type II error tolerances, and the point at which the Type II error is specified. Results are presented in Table 9-1. In this table, various combinations of input values are used, including values of α of 5, 10, and 15 percent; values of β of 15, 20, and 25 percent; and a gray region of width 10, 20, and 30 percent of the threshold level. It is clear from Table 9-1 that the number of samples collected is adequate for the Site. That is, all calculated adequate sample numbers are less than those actually collected at the Site for use in the HHRA.

Note also that there are 30 samples collected for amphibole asbestos analysis. Amphibole was detected in one of these samples and because of the number of samples collected, the ARRs are at or less than 1×10^{-6}. Consequently, sufficient samples have been collected to address ARRs.

10.0SUMMARY

BRC has prepared this HHRA and Closure Report for the Site. The purpose of this report is to request an NFAD by the NDEP. The NDEP acknowledges that discrete portions of the Eastside may be issued an NFAD as remedial actions are completed for selected environmental media (NDEP 2006). The portion of the Eastside for which the NFAD is being requested based on this HHRA and Closure Report is shown in red on Figure 1. The legal description of the Site is provided in Appendix K.

The HHRA evaluated the potential for adverse human health impacts that may occur as a result of potential exposures to residual concentrations of chemicals in soil, groundwater, and air following remediation, and assessed whether any additional remedial actions are necessary in order to obtain an NFAD from the NDEP to allow redevelopment of the Site to proceed. The results of the risk assessment provide risk managers with an understanding of the potential human health risks associated with background conditions and additional risks associated with past Site activities.

For human health protection, and given the proposed land use for the Site, BRC's goal is to remediate the Site soils such that they are suitable for use as a road right-of-way. Human health risks are represented by estimated theoretical upper-bound cancer risks and non-cancer hazards derived in accordance with standard USEPA and NDEP methods. If the carcinogenic risks or non-cancer hazards exceed USEPA acceptable levels or NDEP risk goals, then remedial action alternatives must be considered. Findings of the HHRA are intended to support the Site closure process. The major findings of this report are the following:

- Data collected for use in the HHRA are adequate and usable for their intended purpose;
- All relevant and reasonable exposure scenarios and pathway have been evaluated; and
- Construction worker and maintenance (outdoor) worker cancer and non-cancer risk estimates are within or below the risk goals for the project.

Therefore, based on the results of the HHRA, and the conclusions in this report, exposures to residual levels of chemicals in soil at the Galleria Dr. Right-of-Wayshould not result in adverse health effects to all future receptors. Therefore, BRC concludes that an NFAD for the Galleria Dr. Right-of-Way is warranted and requests that the NDEP issue the NFAD (see Appendix K for the legal description of the Site).

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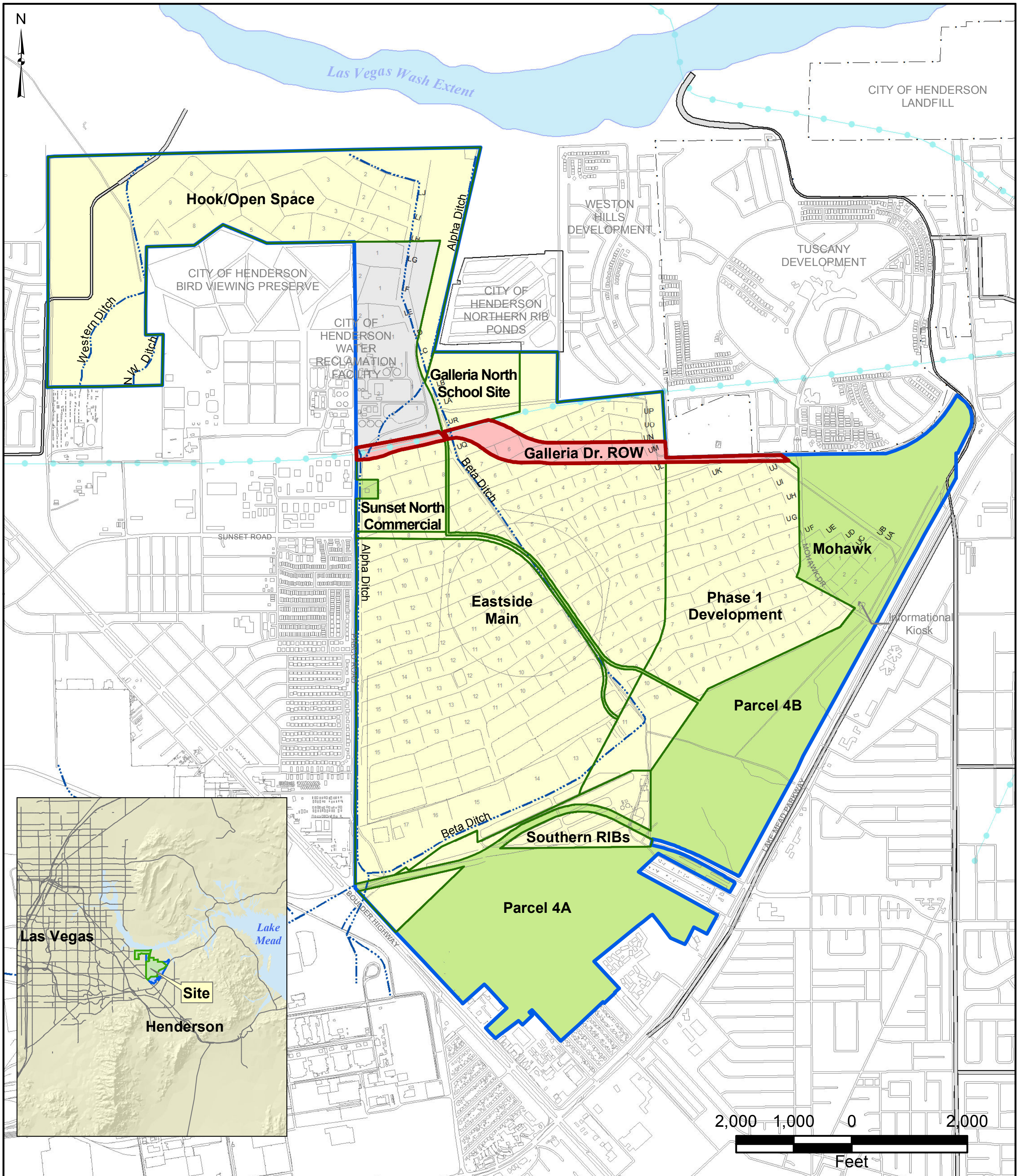
FIGURES



Site AOC3 Boundary

Ditches

Flood Conveyance Channels

Laterals

Galleria Dr. Right-of-Way

Eastside Sub-Areas

NFA Areas

CoH WRF*

*Not part of the Closure Plan for soils.

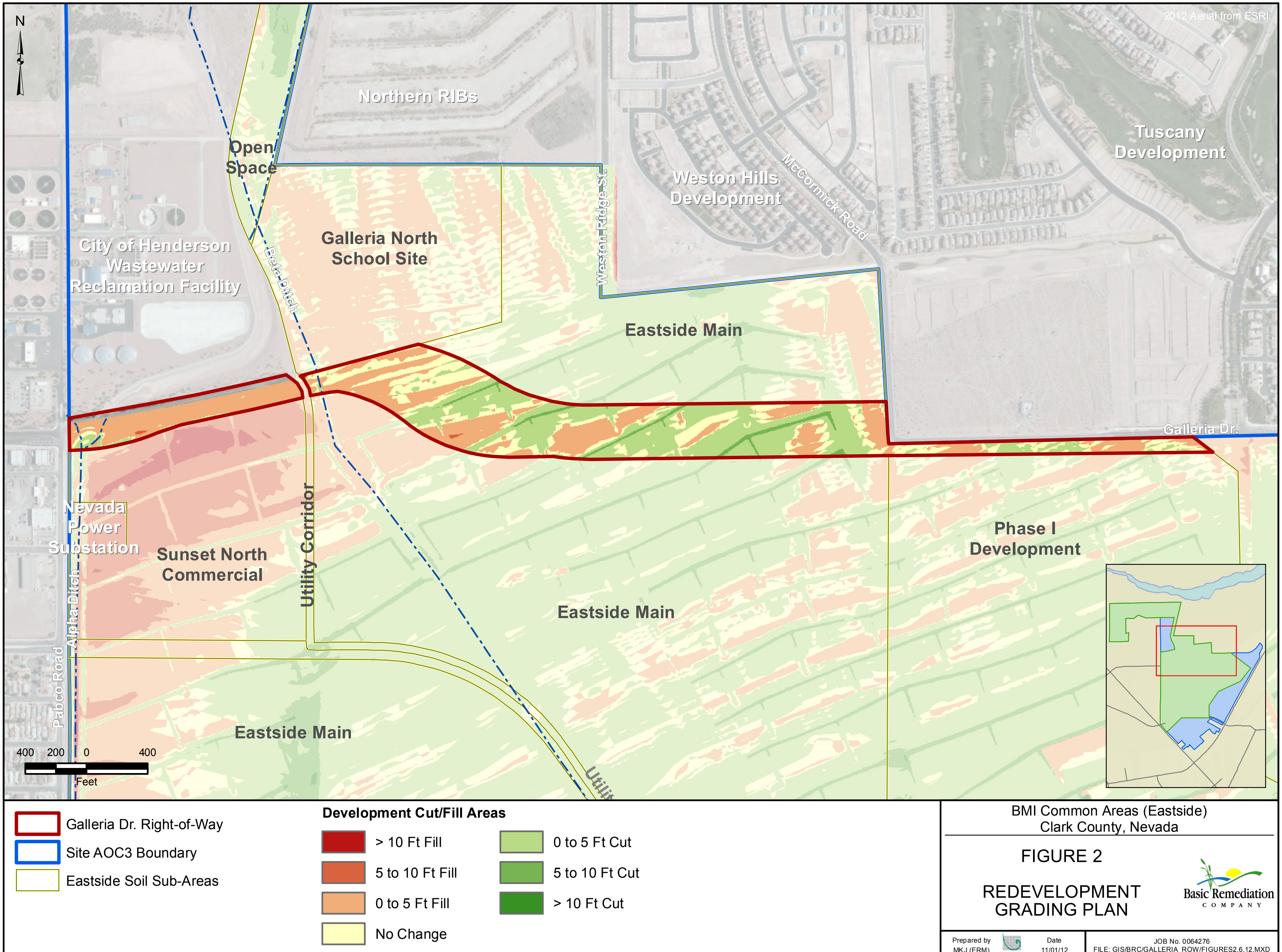
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE 1

GALLERIA DR. RIGHT-OF-WAY LOCATION

Basic Remediation Company

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/FIGURE_1.MXD



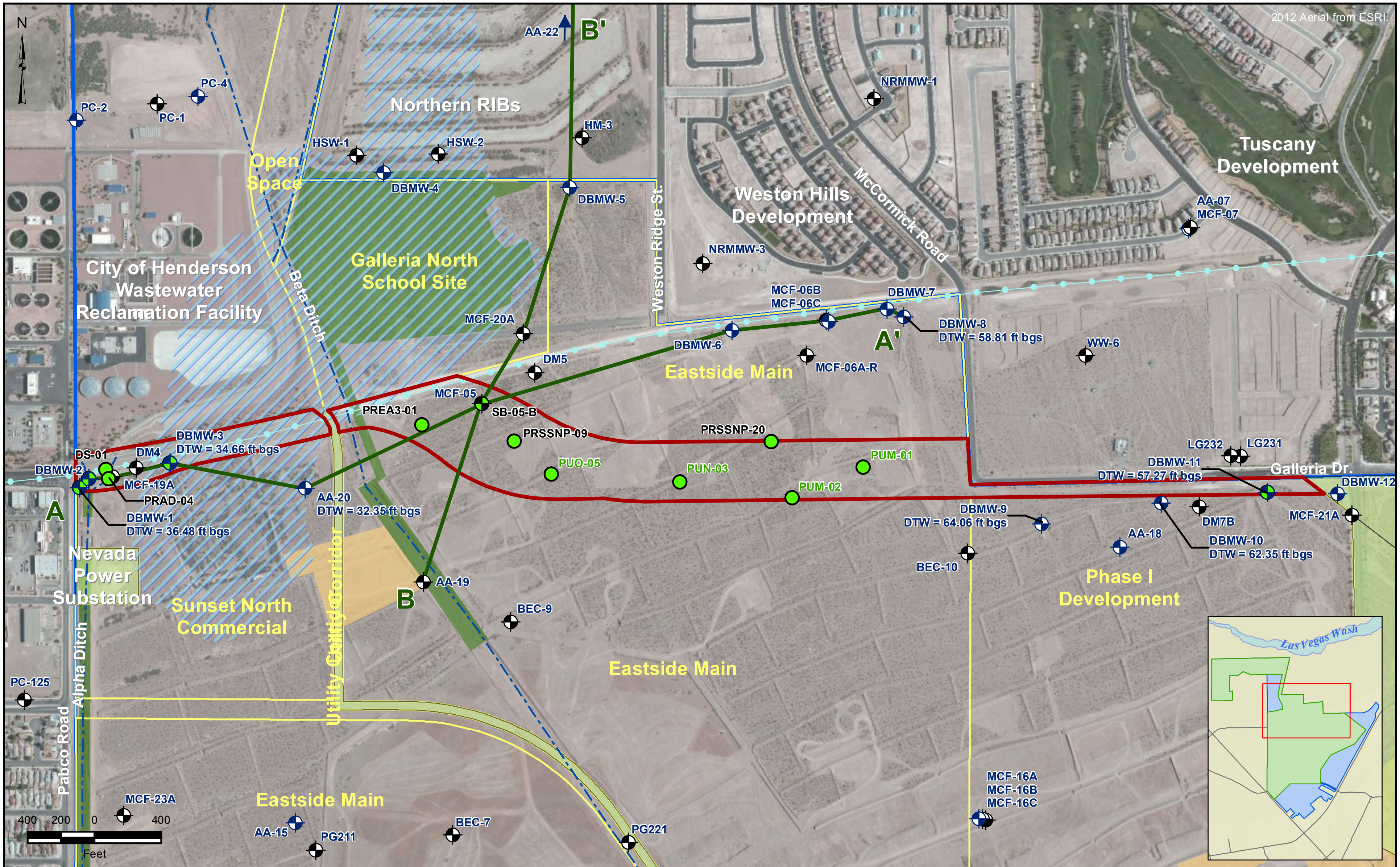
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE 2

REDEVELOPMENT GRADING PLAN

Basic Remediation COMPANY

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/FIGURES2,6,12.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Interim Remedial Measure Areas

Approximate Historical Seep Area

Tamarisk Removal Area

NFA Areas

Pittman Lateral

Historical Soil Sample Location

Monitoring Wells

Alluvial Wells with Groundwater Data

Other Monitoring Wells

PRSSNP-09 - Discrete Sample
PUM-01 - Composite Sample

BMI Common Areas (Eastside)
Clark County, Nevada

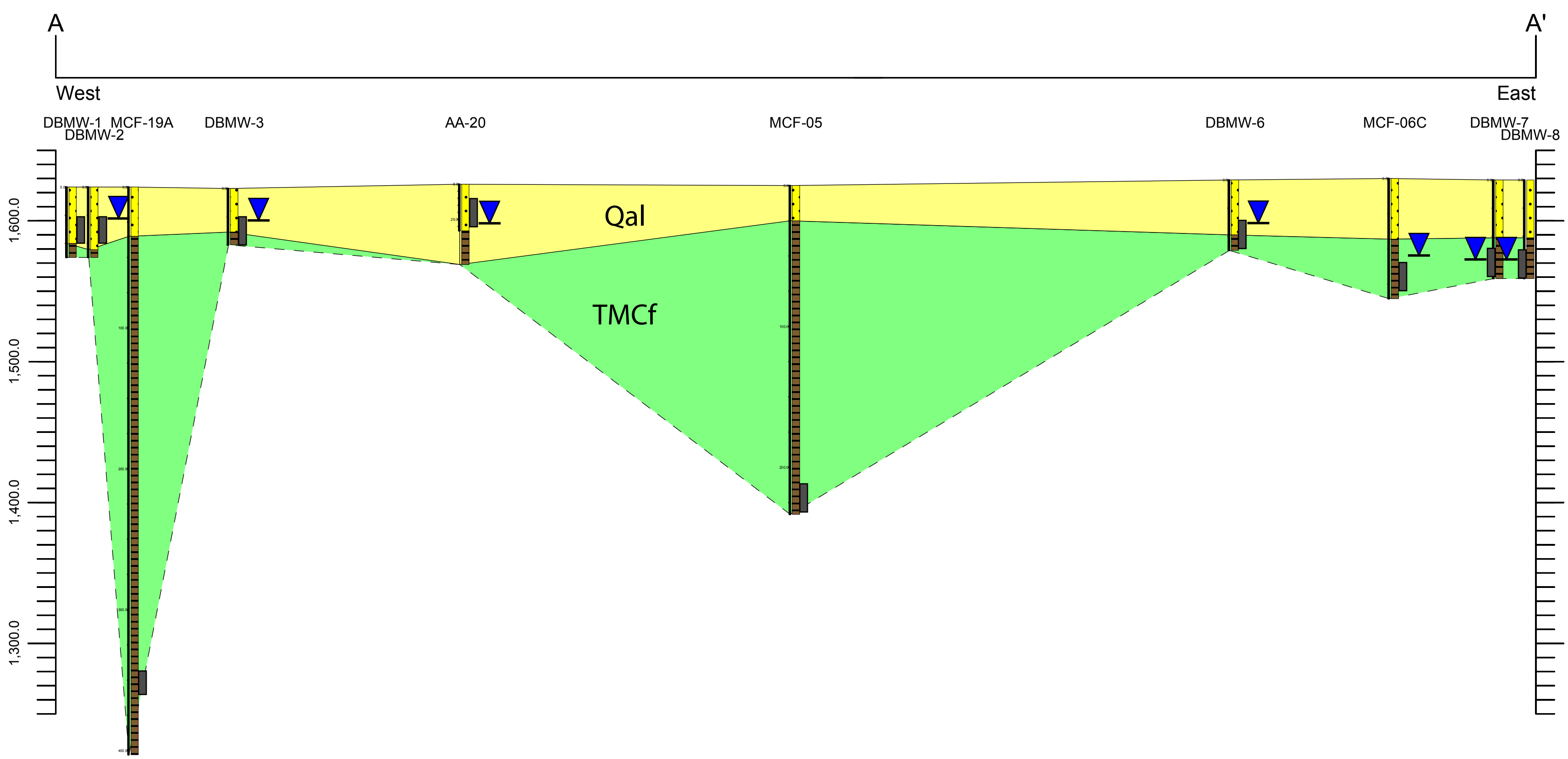
FIGURE 3

SITE PLAN WITH HISTORICAL SOIL SAMPLE LOCATIONS AND MONITORING WELLS

Basic Remediation COMPANY

Prepared by		Date	JOB No. 0064276
MKJ (ERM)	ERM	11/01/12	FILE: GIS/BRC/GALLERIA_ROW/FIGURE_3.MXD

Cross-Section A-A'



= Screen Interval
= Qal Water Level
= Qal = Quaternary alluvium
= TMCf = Tertiary Muddy Creek formation

Vertical Scale = 5x Horizonal Scale

For soil lithology details, please see the individual boring logs.

See Figure 2 for cross-section location.

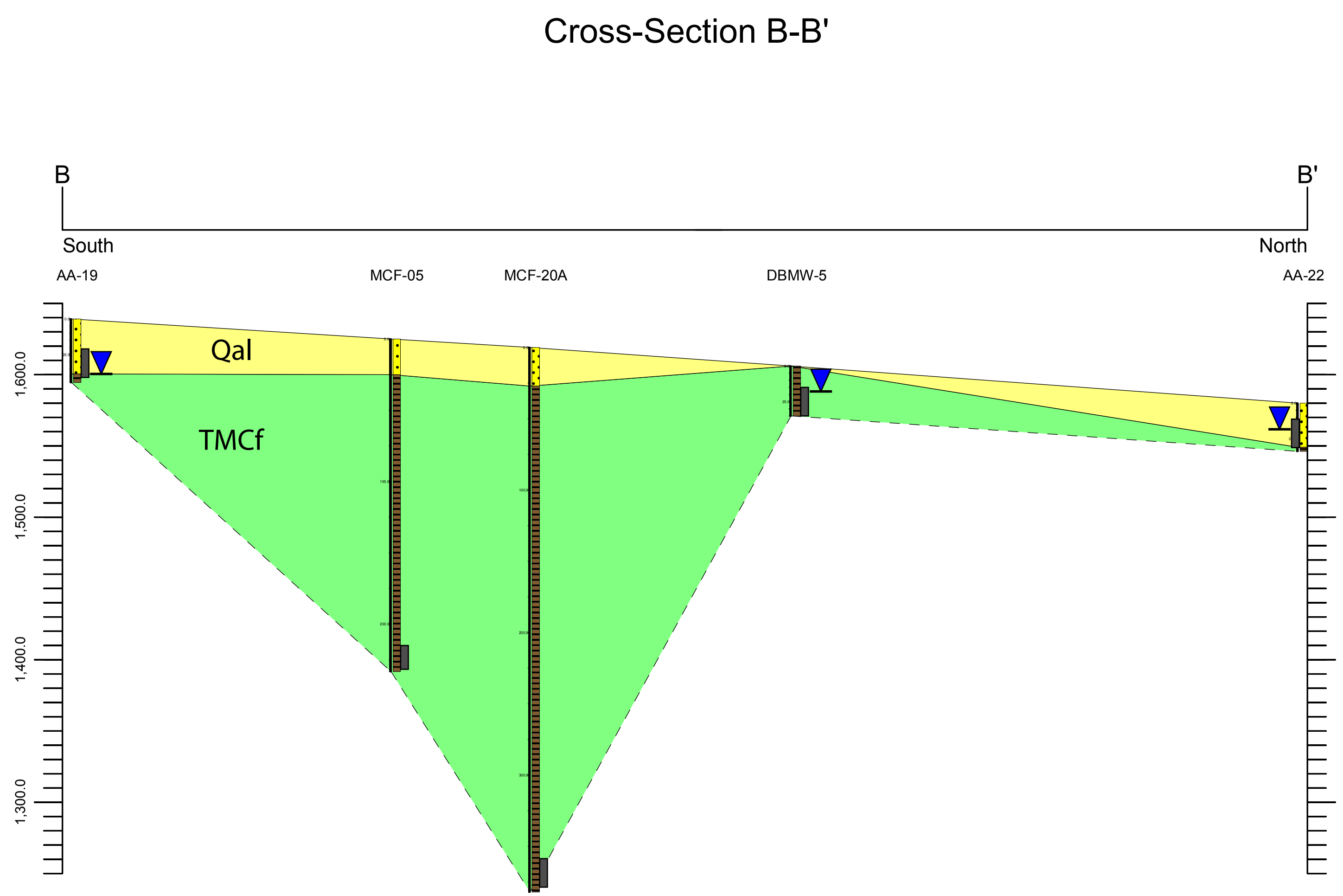
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE 4

GALLERIA DR. RIGHT-OF-WAY
CROSS-SECTION A-A'

Basic Remediation COMPANY

Prepared by MKJ (ERM)	Date 11/01/12	JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/FIGURE4.AI



= Screen Interval

= Qal Water Level

= Qal = Quaternary alluvium

= TMCf = Tertiary Muddy Creek formation

Vertical Scale = 5x Horizonal Scale

For soil lithology details, please see the individual boring logs.

See Figure 2 for cross-section location.

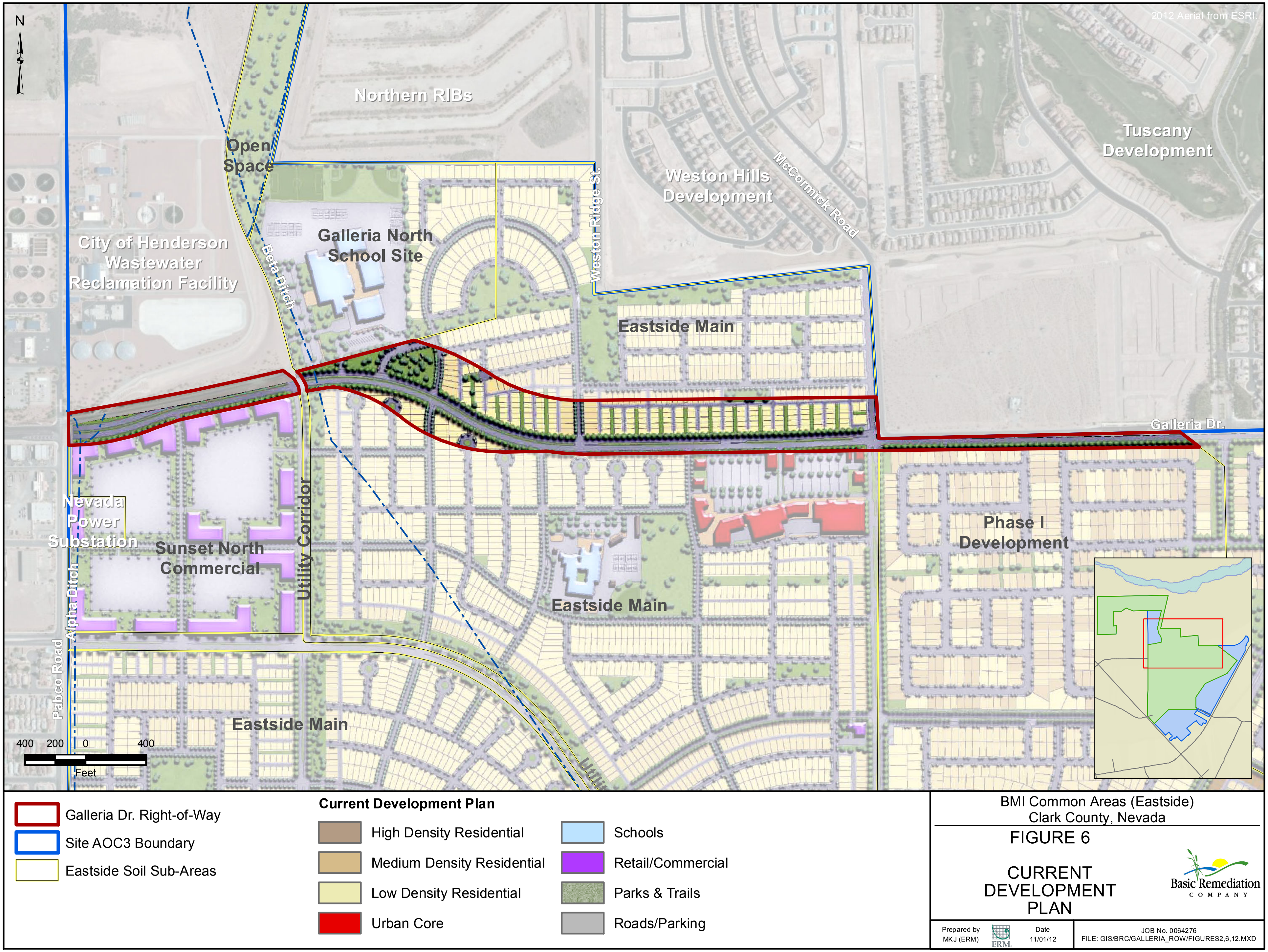
BMI Common Areas (Eastside)
Clark County, Nevada

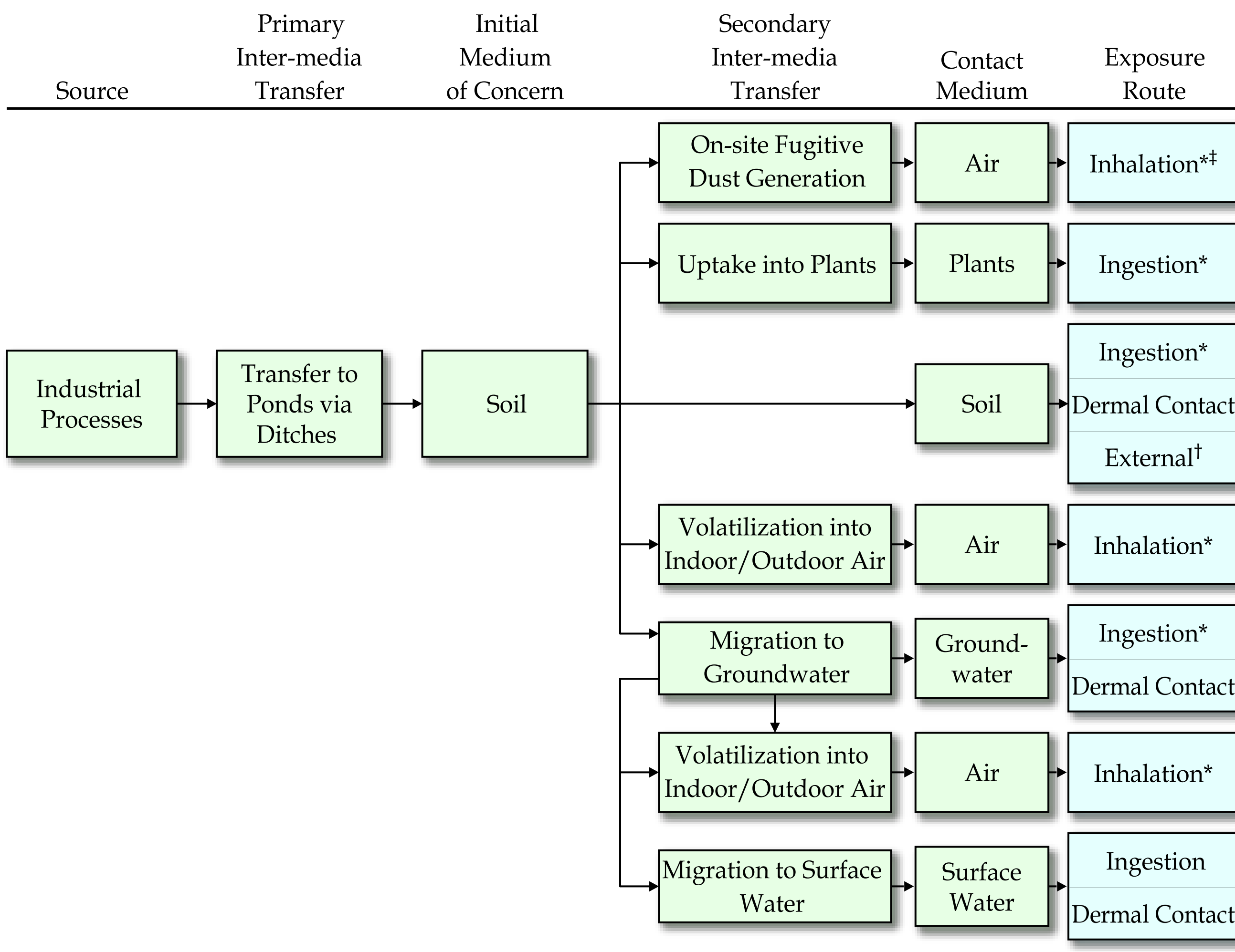
FIGURE 5

GALLERIA DR. RIGHT-OF-WAY
CROSS-SECTION B-B'

Basic Remediation COMPANY

Prepared by MKJ (ERM)	Date 11/01/12	JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/FIGURE5.AI


N
2012 Aerial from ESRI
Northern RIBs
Tuscany Development
Open Space
Weston Hills Development
McCormick Road
Weston Ridge St.
City of Henderson Wastewater Reclamation Facility
Beta Ditch
Galleria North School Site
Eastside Main
Galleria Dr.
Nevada Power Substation
Sunset North Commercial
Utility Corridor
Phase I Development
Eastside Main
Alpha Ditch
Pabco Road
Eastside Main
400 200 0 400
Feet
Galleria Dr. Right-of-Way
Site AOC3 Boundary
Eastside Soil Sub-Areas
Current Development Plan
High Density Residential
Medium Density Residential
Low Density Residential
Urban Core
Schools
Retail/Commercial
Parks & Trails
Roads/Parking
BMI Common Areas (Eastside)
Clark County, Nevada
FIGURE 6
CURRENT DEVELOPMENT PLAN
Basic Remediation COMPANY
Prepared by MKJ (ERM)
ERM
Date 11/01/12
JOB No. 0064276
FILE: GIS/BRC/GALLERIA_ROW/FIGURES2,6,12.MXD



Contact Medium	Exposure Route	Adult and Child Resident	Construction Worker	Indoor Commercial Worker	Outdoor Maintenance Worker	Trespasser/ Recreational User
		Potential Future Human Receptors				
Air	Inhalation*‡	□	■	□	■	□
Plants	Ingestion*	□	□	□	□	□
Soil	Ingestion*	□	■	□	■	□
Soil	Dermal Contact	□	■	□	■	□
Soil	External†	□	■	□	■	□
Air	Inhalation*	□	■	□	■	□
Ground-water	Ingestion*	□	□	□	□	□
Ground-water	Dermal Contact	□	□	□	□	□
Air	Inhalation*	□	■	□	■	□
Surface Water	Ingestion	□[1]	□	□	□	□[1]
Surface Water	Dermal Contact	□[1]	□	□	□	□[1]

□ - Incomplete or insignificant exposure pathway.

■ - Complete or potentially complete exposure pathway.

Note: All potential exposure pathways are shown; however, a particular pathway shown as complete may be incomplete depending on the COPCs evaluated in the human health risk assessment.

[1]Potentially complete exposure pathway following discharge to Las Vegas Wash and Lake Mead.

*Includes radionuclide exposures.

†Only radionuclide exposures.

‡Includes asbestos exposures.

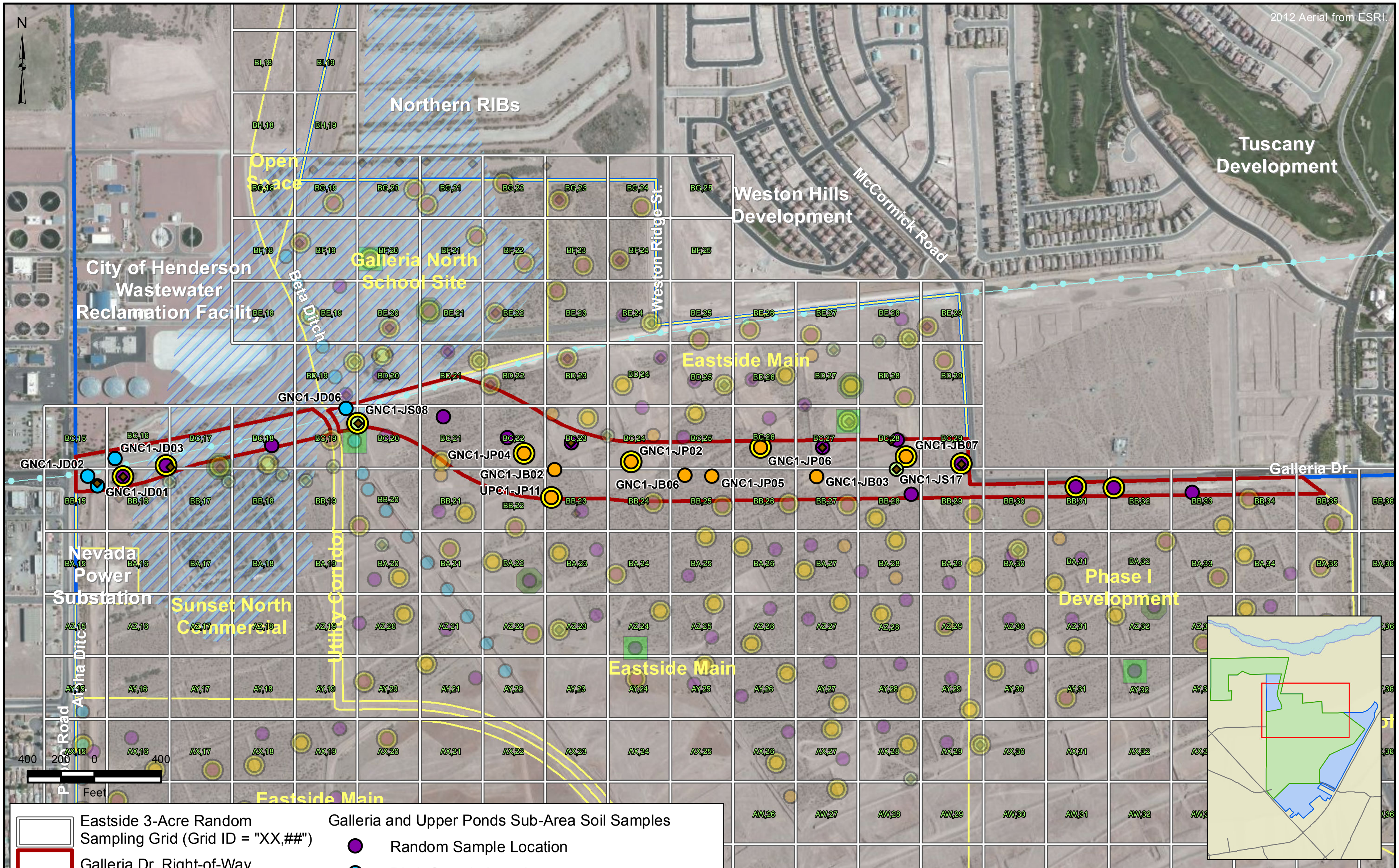
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE 7

CONCEPTUAL SITE MODEL DIAGRAM FOR POTENTIAL HUMAN EXPOSURES

Basic Remediation COMPANY

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/FIGURE7.AI



	Eastside 3-Acre Random Sampling Grid (Grid ID = "XX,##")
	Galleria Dr. Right-of-Way
	Site AOC3 Boundary
	Eastside Soil Sub-Areas
	Approximate Historical Seep Area
	2008 Survey Debris Locations

Galleria and Upper Ponds Sub-Area Soil Samples

- Random Sample Location
- Ditch Sample Location
- Debris Sample Location
- Other Biased Sample Locations (Ponds/Berms)
- Surface Flux Sample Location
- Deep Sample Location (to GW).
- SPLP Sample Location (Subsurface)

Note: Sample ID's are shown for ditch, debris, berm, and pond sample locations. Sample ID's for random samples correspond to the grid cell ID.

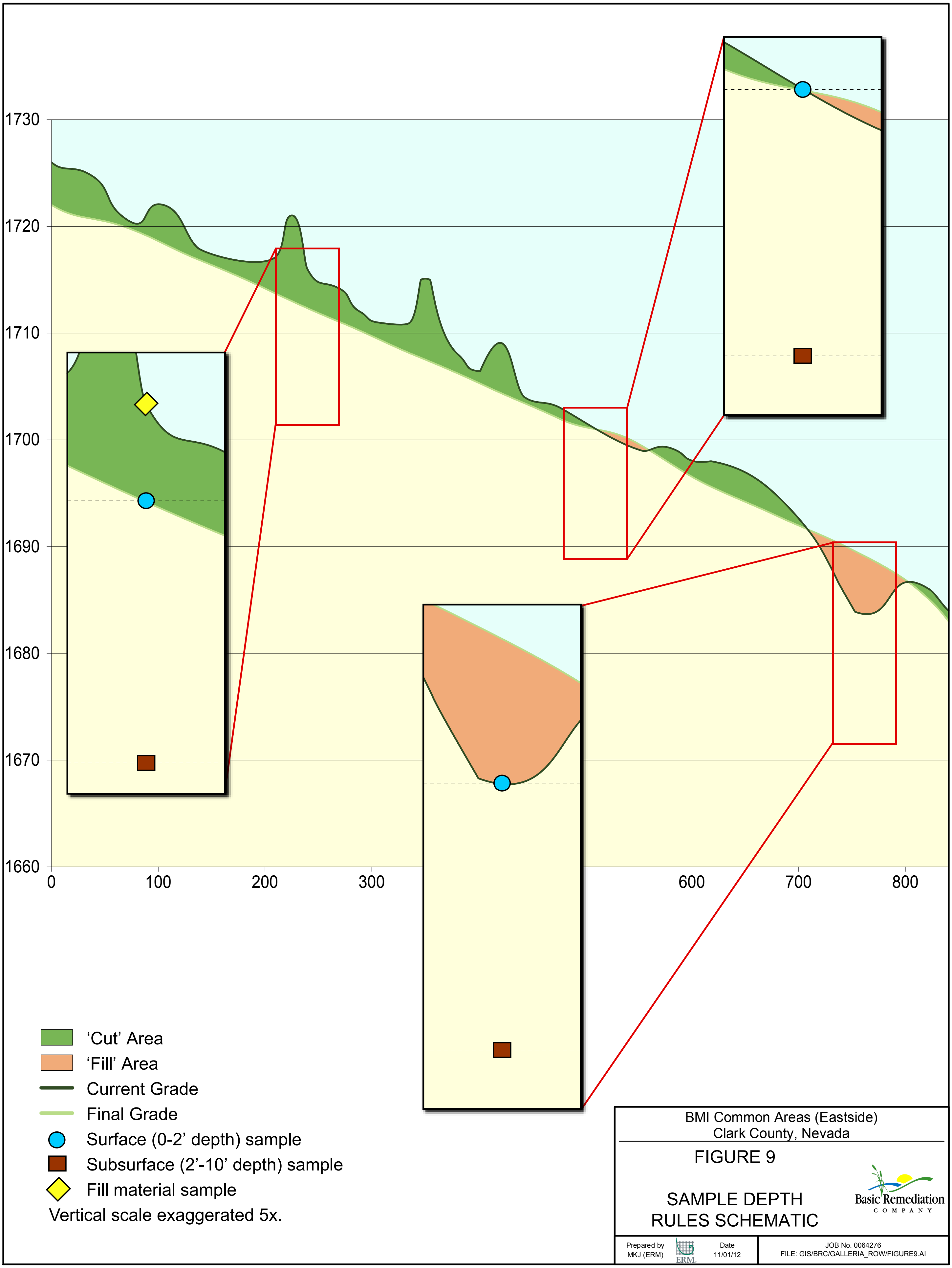
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE 8

INITIAL SOIL AND SOIL VAPOR FLUX SAMPLING LOCATIONS

Basic Remediation COMPANY

Prepared by MKJ (ERM)	ERM	Date 11/01/12	JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/FIGURE_8.MXD



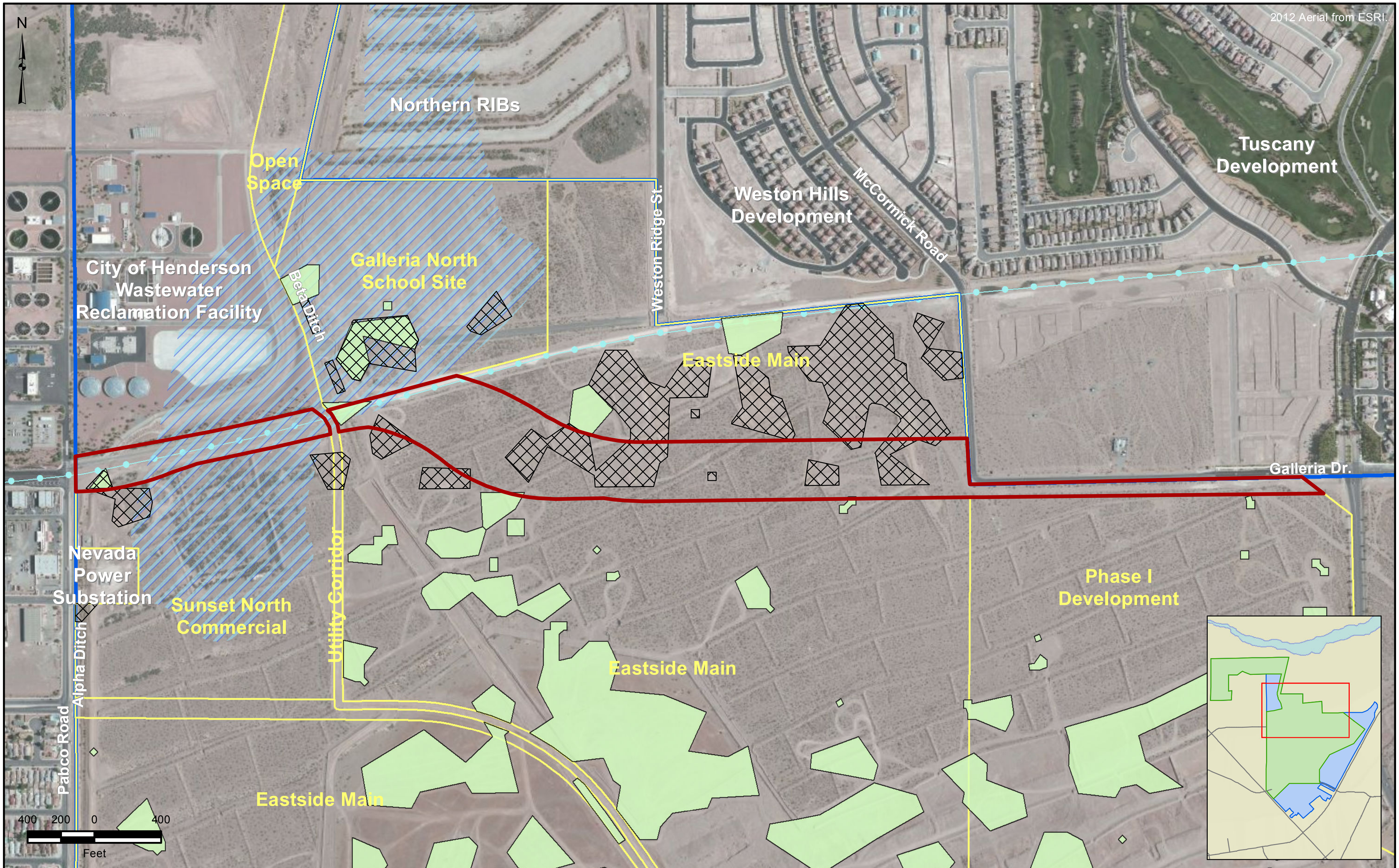
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE 9

SAMPLE DEPTH
RULES SCHEMATIC

Basic Remediation COMPANY

Prepared by MKJ (ERM)	ERM	Date 11/01/12	JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/FIGURE9.AI



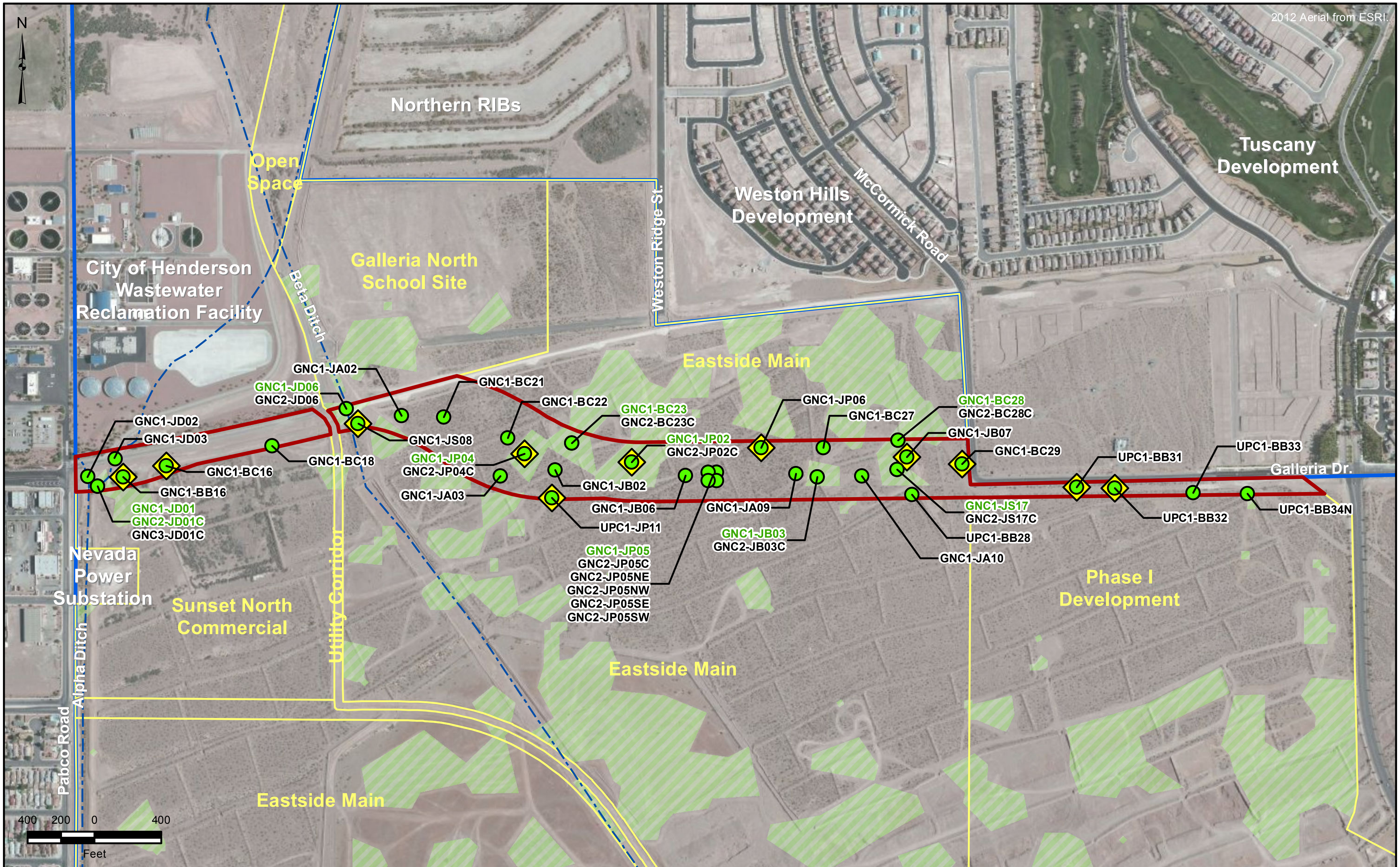
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE 10

GALLERIA DR. RIGHT-OF-WAY SOIL REMEDIATION AREAS

Basic Remediation COMPANY

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/FIGURE_10.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Soil Sample Location(1)

Surface Flux Sample Location

GNC1-JD01 - Scraped Sample Location
GNC1-BC21 - Existing Sample Location

(1) Although soil removal would affect the concentrations of all analytes, confirmatory sampling only analyzed for the constituent suites that triggered the soil removal. Therefore, in the absence of post-scrape data, the pre-scrape data are used for all other analytes in the human health risk assessment (see text).

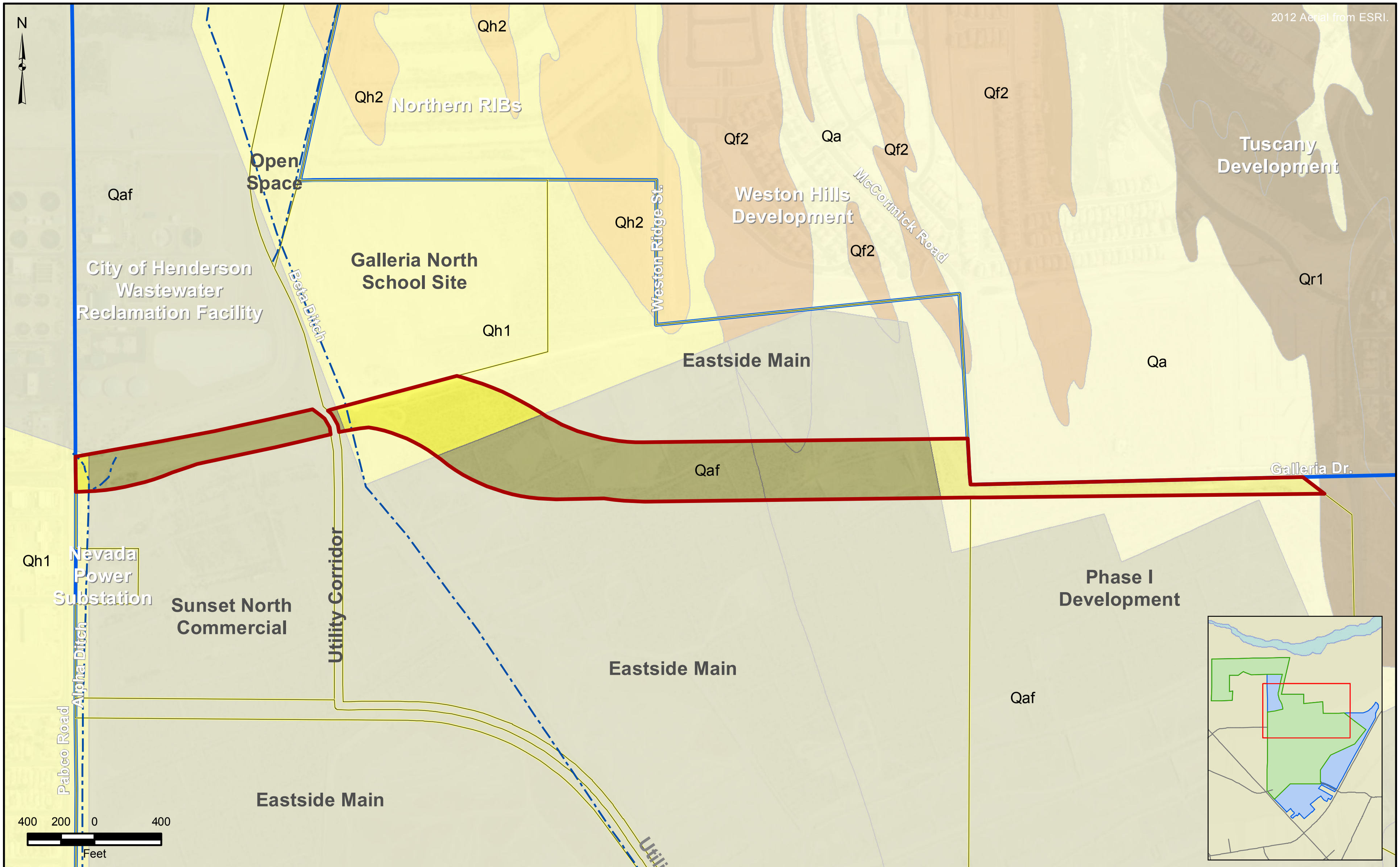
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE 11

FINAL SOIL AND SOIL VAPOR FLUX SAMPLING LOCATIONS

Basic Remediation COMPANY

Prepared by MKJ (ERM)	ERM	Date 11/01/12	JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/FIGURE 11.MXD



Galleria Dr. Right-of-Way
Site AOC3 Boundary
Eastside Soil Sub-Areas

Lithology
- Qa-Mixed
- Qaf-Disturbed
- Qh1-McCullough
- Qh2-McCullough
- Qf2-McCullough/River
- Qr1-River

BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE 12

GALLERIA DR. RIGHT-OF-WAY LITHOLOGIES

Basic Remediation COMPANY

Prepared by MKJ (ERM)	Date 11/01/12	JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/FIGURES2,6,12.MXD

TABLES

TABLE 3-1
SAMPLE-SPECIFIC COLLECTION DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample Location	Sample Type	Grading Plan		Sample Depth 1	Sample Depth 2	Sample Depth 3
Initial Sampling Event						
GNC1-BB16	Random with Flux	Fill	+4	0 (Surface)	10 (Subsurface)	--
GNC1-BC16	Random with Flux	Fill	+1	0 (Surface)	10 (Subsurface)	--
GNC1-BC18	Random	Fill	+4	0 (Surface)	10 (Subsurface)	--
GNC1-BC21	Random	--	0	0 (Surface)	10 (Subsurface)	--
GNC1-BC22	Random	Cut	-1	0 (Fill/Surface)	11 (Subsurface)	--
GNC1-BC23	Random	--	0	0 (Surface)	10 (Subsurface)	--
GNC1-BC27	Random	--	0	0 (Surface)	10 (Subsurface)	--
GNC1-BC28	Random	Cut	-1	0 (Fill/Surface)	11 (Subsurface)	--
GNC1-BC29	Random with Flux	Fill	+3	0 (Surface)	10 (Subsurface)	--
GNC1-JB02	Berm	Cut	-5	0 (Fill/Surface)	5 (Surface)	15 (Subsurface)
GNC1-JB03	Berm	Cut	-7	0 (Fill/Surface)	7 (Surface)	17 (Subsurface)
GNC1-JB06	Berm	Cut	-6	0 (Fill/Surface)	6 (Surface)	16 (Subsurface)
GNC1-JB07	Berm with Flux	Cut	-8	0 (Fill/Surface)	8 (Surface)	18 (Subsurface)
GNC1-JD01	Ditch	Cut	-3	0 (Fill/Surface)	3 (Surface)	13 (Subsurface)
GNC1-JD02	Ditch	--	0	0 (Surface)	10 (Subsurface)	--
GNC1-JD03[(1)]	Ditch	Fill	+3	0 (Surface)	10 (Subsurface)	--
GNC1-JD06	Ditch	--	0	0 (Surface)	10 (Subsurface)	--
GNC1-JP02	Pond with Flux	--	0	0 (Surface)	10 (Subsurface)	--
GNC1-JP04	Pond with Flux	--	0	0 (Surface)	10 (Subsurface)	--
GNC1-JP05	Pond	Cut	-1	0 (Fill/Surface)	11 (Subsurface)	--
GNC1-JP06	Pond with Flux	Cut	-3	0 (Fill/Surface)	3 (Surface)	13 (Subsurface)
GNC1-JS08	Debris with Flux	Fill	+1	0 (Surface)	10 (Subsurface)	--
GNC1-JS17	Debris	--	0	0 (Surface)	10 (Subsurface)	--
UPC1-BB28	Random	Cut	-8	0 (Fill/Surface)	8 (Surface)	18 (Subsurface)
UPC1-BB31	Random with Flux	Cut	-1	0 (Fill/Surface)	11 (Subsurface)	--
UPC1-BB32	Random with Flux	--	0	0 (Surface)	10 (Subsurface)	--
UPC1-BB33	Random	Fill	+1	0 (Surface)	10 (Subsurface)	--
UPC1-JP11	Pond with Flux	Fill	+1	0 (Surface)	10 (Subsurface)	--
Confirmation/Supplemental Sampling Events						
GNC1-JA02	Supplemental	--	0	0 (Surface)	--	--
GNC1-JA03	Supplemental	Fill	+4	0 (Surface)	--	--
GNC1-JA09	Supplemental	Cut	-2	0 (Fill/Surface)	--	--
GNC1-JA10	Supplemental	Cut	-1	0 (Fill/Surface)	--	--
GNC2-BC23C	Confirmation	--	0	0 (Surface)	--	--

TABLE 3-1
SAMPLE-SPECIFIC COLLECTION DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample Location	Sample Type	Grading Plan	Sample Depth 1	Sample Depth 2	Sample Depth 3
GNC2-BC28C	Confirmation	Cut -1	0 (Fill/Surface)	--	--
GNC2-JB03C	Confirmation	Cut -7	0 (Fill/Surface)	--	--
GNC2-JD01C	Confirmation	Cut -3	0 (Fill/Surface)	--	--
GNC2-JD06	Confirmation	-- 0	0 (Surface)	--	--
Confirmation/Supplemental Sampling Events					
GNC2-JP02C	Confirmation	-- 0	0 (Surface)	--	--
GNC2-JP04C	Confirmation	-- 0	0 (Surface)	--	--
GNC2-JP05C	Confirmation	Cut -1	0 (Fill/Surface)	--	--
GNC2-JP05NE	Confirmation	Cut -1	0 (Fill/Surface)	--	--
GNC2-JP05NW	Confirmation	Cut -1	0 (Fill/Surface)	--	--
GNC2-JP05SE	Confirmation	Cut -1	0 (Fill/Surface)	--	--
GNC2-JP05SW	Confirmation	Cut -1	0 (Fill/Surface)	--	--
GNC2-JS17C	Confirmation	-- 0	0 (Surface)	--	--
GNC3-JD01C	Confirmation	Cut -3	0 (Fill/Surface)	--	--
UPC1-BB34N	Confirmation	-- 0	0 (Surface)	--	--

Note: Because sample collection will be over a two to three foot depth interval, sample locations with an anticipated cut depth less than three feet only sampled at the surface and one post-grade subsurface depth.
Depths are in feet bgs (current grade).
(1) During the original sampling and analysis event the only modifications to the original scope of services were eliminating sample location GNC1-JD03 due to conflicts with underground utilities. However, asbestos sampling was conducted as a separate sampling event, for surface samples only; therefore, this sample location was sampled and analyzed for asbestos only.

TABLE 3-2
SITE-RELATED CHEMICALS AND INITIAL SAMPLE ANALYSES AND DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Preparation Method	Analytical Method	Compound List	CAS Number	Sample Depth (from Table 3-1)		
					Depth 1	Depth 2/3	Deep
Ions	**EPA 300.0**	**EPA 300.0**	Bromide	24959-67-9	✓	✓	(d)
			Chlorate	14866-68-3	✓	✓	(d)
			Chloride	16887-00-6	✓	✓	(d)
			Fluoride	16984-48-8	✓	✓	(d)
			Nitrate (as N)	14797-55-8	✓	✓	(d)
			Nitrite (as N)	14797-65-0	✓	✓	(d)
			Orthophosphate	14265-44-2	✓	✓	(d)
			Sulfate	14808-79-8	✓	✓	(d)
	EPA 314.0	**EPA 314.0**	Perchlorate	14797-73-0	✓	✓	(d)
Chlorinated Compounds	**EPA 551.1**	**EPA 551.1**	Chloral	75-87-6	(e)	(e)	(d)
			Dichloroacetaldehyde	79-02-7	(e)	(e)	(d)
Polychlorinated Dibenzodioxins/ Dibenzofurans	**EPA 8290**	**EPA 8290**	1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	✓	(b)	(b)
			1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	✓	(b)	(b)
			1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	✓	(b)	(b)
			1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	✓	(b)	(b)
			1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	✓	(b)	(b)
			1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	✓	(b)	(b)
			1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	✓	(b)	(b)
			1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	✓	(b)	(b)
			1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	✓	(b)	(b)
			1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	✓	(b)	(b)
			1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	✓	(b)	(b)
			1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	✓	(b)	(b)
			1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	✓	(b)	(b)
			2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	✓	(b)	(b)
			2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	✓	(b)	(b)
			2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	✓	(b)	(b)
			2,3,7,8-Tetrachlororodibenzo-p-dioxin	1746-01-6	✓	(b)	(b)
Asbestos	**Elutrator**	**Elutriator/TEM**	Asbestos	1332-21-4	✓	(c)	(c)
General Chemistry Parameters	**EPA 350.1**	**EPA 350.2**	Ammonia (as N)	7664-41-7	✓	✓	(d)
	EPA 9012A	**EPA 9010/9014**	Cyanide (Total)	57-12-5	✓	✓	(d)
	NA	**EPA 9045C**	pH in soil	pH	✓	✓	✓
	EPA 376.1/376.2	**EPA 376.1/376.2**	Sulfide	18496-25-8	✓	✓	(d)
	Mod. EPA 415.1	**Mod. EPA 415.1**	Total inorganic carbon	7440-44-0	✓	✓	(d)
	EPA 351.2	**EPA 351.2**	Total Kjeldahl nitrogen (TKN)	TKN	✓	✓	(d)
	EPA 9060	**EPA 415.1**	Total organic carbon (TOC)	7440-44-0	✓	✓	✓

TABLE 3-2
SITE-RELATED CHEMICALS AND INITIAL SAMPLE ANALYSES AND DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Preparation Method	Analytical Method	Compound List	CAS Number	Sample Depth (from Table 3-1)		
					Depth 1	Depth 2/3	Deep
Metals	**EPA 3050M**	**EPA 6020/6010B**	Aluminum	7429-90-5	✓	✓	(d)
			Antimony	7440-36-0	✓	✓	(d)
			Arsenic	7440-38-2	✓	✓	(d)
			Barium	7440-39-3	✓	✓	(d)
			Beryllium	7440-41-7	✓	✓	(d)
			Boron	7440-42-8	✓	✓	(d)
			Cadmium	7440-43-9	✓	✓	(d)
			Calcium	7440-70-2	✓	✓	(d)
			Chromium	7440-47-3	✓	✓	(d)
			Cobalt	7440-48-4	✓	✓	(d)
			Copper	7440-50-8	✓	✓	(d)
			Iron	7439-89-6	✓	✓	(d)
			Lead	7439-92-1	✓	✓	(d)
			Lithium	1313-13-9	✓	✓	(d)
			Magnesium	7439-95-4	✓	✓	(d)
			Manganese	7439-96-5	✓	✓	(d)
			Molybdenum	7439-98-7	✓	✓	(d)
			Nickel	7440-02-0	✓	✓	(d)
			Niobium	7440-03-1	(e)	(e)	(d)
			Palladium	7440-05-3	(e)	(e)	(d)
			Phosphorus	7723-14-0	(e)	(e)	(d)
			Platinum	7440-06-4	(e)	(e)	(d)
			Potassium	7440-09-7	✓	✓	(d)
			Selenium	7782-49-2	✓	✓	(d)
			Silicon	7440-21-3	(e)	(e)	(d)
			Silver	7440-22-4	✓	✓	(d)
			Sodium	7440-23-5	✓	✓	(d)
			Strontium	7440-24-6	✓	✓	(d)
			Sulfur	7704-34-9	(e)	(e)	(d)
			Thallium	7440-28-0	✓	✓	(d)
			Tin	7440-31-5	✓	✓	(d)
			Titanium	7440-32-6	✓	✓	(d)
			Tungsten	7440-33-7	✓	✓	(d)
			Uranium	7440-61-1	✓	✓	(d)
			Vanadium	7440-62-2	✓	✓	(d)
			Zinc	7440-66-6	✓	✓	(d)
			Zirconium	7440-67-7	(e)	(e)	(d)

TABLE 3-2
SITE-RELATED CHEMICALS AND INITIAL SAMPLE ANALYSES AND DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Preparation Method	Analytical Method	Compound List	CAS Number	Sample Depth (from Table 3-1)		
					Depth 1	Depth 2/3	Deep
Metals (continued)	**EPA 3060A**	**EPA 7196A**	Chromium (VI)	18540-29-9	✓	✓	(d)
	EPA 7471A	**EPA 7470/7471A**	Mercury	7439-97-6	✓	✓	(d)
Organophosphorous Pesticides	**EPA 8141A**	**EPA 8141A**	Azinphos-ethyl	264-27-19	(a)	(a)	(a)
			Azinphos-methyl	86-50-0	(a)	(a)	(a)
			Carbophenothion	786-19-6	(a)	(a)	(a)
			Chlorpyrifos	2921-88-2	(a)	(a)	(a)
			Coumaphos	56-72-4	(a)	(a)	(a)
			Demeton-O	298-03-3	(a)	(a)	(a)
			Demeton-S	126-75-0	(a)	(a)	(a)
			Diazinon	333-41-5	(a)	(a)	(a)
			Dichlorvos	62-73-7	(a)	(a)	(a)
			Dimethoate	60-51-5	(a)	(a)	(a)
			Disulfoton	298-04-4	(a)	(a)	(a)
			EPN	2104-64-5	(a)	(a)	(a)
			Ethoprop	13194-48-4	(a)	(a)	(a)
			Ethyl parathion	56-38-2	(a)	(a)	(a)
			Fampphur	52-85-7	(a)	(a)	(a)
			Fenthion	55-38-9	(a)	(a)	(a)
			Malathion	121-75-5	(a)	(a)	(a)
			Methyl carbophenothion	953-17-3	(a)	(a)	(a)
			Methyl parathion	298-00-0	(a)	(a)	(a)
			Mevinphos	7786-34-7	(a)	(a)	(a)
			Naled	300-76-5	(a)	(a)	(a)
			O,O,O-Triethyl phosphorothioate (TEPP)	297-97-2	(a)	(a)	(a)
			Phorate	298-02-2	(a)	(a)	(a)
			Phosmet	732-11-6	(a)	(a)	(a)
			Ronnel	299-84-3	(a)	(a)	(a)
			Stirophos (Tetrachlorovinphos)	22248-79-9	(a)	(a)	(a)
			Sulfotep	3689-24-5	(a)	(a)	(a)
Chlorinated Herbicides	**EPA 8151A**	**EPA 8151A**	2,4,5-T	93-76-5	(a)	(a)	(a)
			2,4,5-TP (Silvex)	93-72-1	(a)	(a)	(a)
			2,4-D	94-75-7	(a)	(a)	(a)
			2,4-DB	94-82-6	(a)	(a)	(a)
			Dalapon	75-99-0	(a)	(a)	(a)
			Dicamba	1918-00-9	(a)	(a)	(a)

TABLE 3-2
SITE-RELATED CHEMICALS AND INITIAL SAMPLE ANALYSES AND DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Preparation Method	Analytical Method	Compound List	CAS Number	Sample Depth (from Table 3-1)		
					Depth 1	Depth 2/3	Deep
Chlorinated Herbicides (continued)	**EPA 8151A**	**EPA 8151A**	Dichloroprop	120-36-5	(a)	(a)	(a)
			Dinoseb	88-85-7	(a)	(a)	(a)
			MCPA	94-74-6	(a)	(a)	(a)
			MCPP	93-65-2	(a)	(a)	(a)
Organic Acids	**HPLC**	**HPLC**	4-Chlorobenzene sulfonic acid	98-66-8	(a)	(a)	(a)
			Benzenesulfonic acid	98-11-3	(a)	(a)	(a)
			O,O-Diethylphosphorodithioic acid	298-06-6	(a)	(a)	(a)
			O,O-Dimethylphosphorodithioic acid	756-80-9	(a)	(a)	(a)
Nonhalogenated Organics	**EPA 8015B**	**EPA 8015B**	Ethylene glycol	107-21-1	(a)	(a)	(a)
			Ethylene glycol monobutyl ether	111-76-2	(a)	(a)	(a)
			Methanol	67-56-1	(a)	(a)	(a)
			Propylene glycol	57-55-6	(a)	(a)	(a)
Organochlorine Pesticides	**EPA 3550B**	**EPA 8081A**	2,4-DDD	53-19-0	✓	✓	(d)
			2,4-DDE	3424-82-6	✓	✓	(d)
			4,4-DDD	72-54-8	✓	✓	(d)
			4,4-DDE	72-55-9	✓	✓	(d)
			4,4-DDT	50-29-3	✓	✓	(d)
			Aldrin	309-00-2	✓	✓	(d)
			alpha-BHC	319-84-6	✓	✓	(d)
			alpha-Chlordane	5103-71-9	✓	✓	(d)
			beta-BHC	319-85-7	✓	✓	(d)
			Chlordane	57-74-9	✓	✓	(d)
			delta-BHC	319-86-8	✓	✓	(d)
			Dieldrin	60-57-1	✓	✓	(d)
			Endosulfan I	959-98-8	✓	✓	(d)
			Endosulfan II	33213-65-9	✓	✓	(d)
			Endosulfan sulfate	1031-07-8	✓	✓	(d)
			Endrin	72-20-8	✓	✓	(d)
			Endrin aldehyde	7421-93-4	✓	✓	(d)
			Endrin ketone	53494-70-5	✓	✓	(d)
			gamma-BHC (Lindane)	58-89-9	✓	✓	(d)
			gamma-Chlordane	5103-74-2	✓	✓	(d)
			Heptachlor	76-44-8	✓	✓	(d)
			Heptachlor epoxide	1024-57-3	✓	✓	(d)
			Methoxychlor	72-43-5	✓	✓	(d)
			Toxaphene	8001-35-2	✓	✓	(d)

TABLE 3-2
SITE-RELATED CHEMICALS AND INITIAL SAMPLE ANALYSES AND DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Preparation Method	Analytical Method	Compound List	CAS Number	Sample Depth (from Table 3-1)		
					Depth 1	Depth 2/3	Deep
Polychlorinated Biphenyls	**EPA 3510C**	**EPA 8082**	Aroclor 1016	12674-11-2	✓	(b)	(b)
			Aroclor 1221	11104-28-2	✓	(b)	(b)
			Aroclor 1232	11141-16-5	✓	(b)	(b)
			Aroclor 1242	53469-21-9	✓	(b)	(b)
			Aroclor 1248	12672-29-6	✓	(b)	(b)
			Aroclor 1254	11097-69-1	✓	(b)	(b)
			Aroclor 1260	11096-82-5	✓	(b)	(b)
		EPA 1668	PCB-77	32598-13-3	✓	(b)	(b)
			PCB-81	70362-50-4	✓	(b)	(b)
			PCB-105	32598-14-4	✓	(b)	(b)
			PCB-114	74472-37-0	✓	(b)	(b)
			PCB-118	31508-00-6	✓	(b)	(b)
			PCB-123	65510-44-3	✓	(b)	(b)
			PCB-126	57465-28-8	✓	(b)	(b)
			PCB-156	38380-08-4	✓	(b)	(b)
			PCB-157	69782-90-7	✓	(b)	(b)
			PCB-167	52663-72-6	✓	(b)	(b)
			PCB-169	32774-16-6	✓	(b)	(b)
			PCB-189	39635-31-9	✓	(b)	(b)
			PCB-209	2051-24-3	✓	(b)	(b)
Polynuclear Aromatic Hydrocarbons	**EPA 3550**	**EPA 8310 or EPA 8270SIM**	Acenaphthene	83-32-9	✓	✓	(d)
			Acenaphthylene	208-96-8	✓	✓	(d)
			Anthracene	120-12-7	✓	✓	(d)
			Benzo(a)anthracene	56-55-3	✓	✓	(d)
			Benzo(a)pyrene	50-32-8	✓	✓	(d)
			Benzo(b)fluoranthene	205-99-2	✓	✓	(d)
			Benzo(g,h,i)perylene	191-24-2	✓	✓	(d)
			Benzo(k)fluoranthene	207-08-9	✓	✓	(d)
			Chrysene	218-01-9	✓	✓	(d)
			Dibenzo(a,h)anthracene	53-70-3	✓	✓	(d)
			Indeno(1,2,3-cd)pyrene	193-39-5	✓	✓	(d)
			Phenanthrene	85-01-8	✓	✓	(d)
			Pyrene	129-00-0	✓	✓	(d)
Radionuclides	**HASL 3003**	**EPA 903.0 / 903.1**	Radium-226	13982-63-3	✓	✓	(d)
		EPA 904.0	Radium-228	15262-20-1	✓	✓	(d)

TABLE 3-2
SITE-RELATED CHEMICALS AND INITIAL SAMPLE ANALYSES AND DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Preparation Method	Analytical Method	Compound List	CAS Number	Sample Depth (from Table 3-1)		
					Depth 1	Depth 2/3	Deep
Radionuclides (continued)	HASL 300 (Total Dissolution)	HASL A-01-R	Thorium-228	7440-29-1	✓	✓	(d)
			Thorium-230	14274-82-9	✓	✓	(d)
			Thorium-232	14269-63-7	✓	✓	(d)
	HASL 300 (Total Dissolution)		Uranium-233/234	13966-29-5	✓	✓	(d)
			Uranium-235/236	15117-96-1	✓	✓	(d)
			Uranium-238	7440-61-1	✓	✓	(d)
Aldehydes	EPA 8315A	EPA 8315A	Acetaldehyde	75-07-0	✓	✓	(d)
			Chloroacetaldehyde	107-20-0	(e)	(e)	(d)
			Dichloroacetaldehyde	79-02-7	(e)	(e)	(d)
			Formaldehyde	50-00-0	✓	✓	(d)
			Trichloroacetaldehyde	75-87-6	(e)	(e)	(d)
Semivolatile Organic Compounds	EPA 3550B	EPA 8270C	1,2,4,5-Tetrachlorobenzene	95-94-3	✓	✓	(d)
			1,2-Diphenylhydrazine	122-66-7	✓	✓	(d)
			1,4-Dioxane	123-91-1	✓	✓	(d)
			2,2'/4,4'-Dichlorobenzil	3457-46-3	✓	✓	(d)
			2,4,5-Trichlorophenol	95-95-4	✓	✓	(d)
			2,4,6-Trichlorophenol	88-06-2	✓	✓	(d)
			2,4-Dichlorophenol	120-83-2	✓	✓	(d)
			2,4-Dimethylphenol	105-67-9	✓	✓	(d)
			2,4-Dinitrophenol	51-28-5	✓	✓	(d)
			2,4-Dinitrotoluene	121-14-2	✓	✓	(d)
			2,6-Dinitrotoluene	606-20-2	✓	✓	(d)
			2-Chloronaphthalene	91-58-7	✓	✓	(d)
			2-Chlorophenol	95-57-8	✓	✓	(d)
			2-Methylnaphthalene	91-57-6	✓	✓	(d)
			2-Nitroaniline	88-74-4	✓	✓	(d)
			2-Nitrophenol	88-75-5	✓	✓	(d)
			3,3-Dichlorobenzidine	91-94-1	✓	✓	(d)
			3-Nitroaniline	99-09-2	✓	✓	(d)
			4,4'-Dichlorobenzil	3457-46-3	✓	✓	(d)
			4-Bromophenyl phenyl ether	101-55-3	✓	✓	(d)
			4-Chloro-3-methylphenol	59-50-7	✓	✓	(d)
			4-Chlorophenyl phenyl ether	7005-72-3	✓	✓	(d)
			4-Chlorothioanisole	123-09-1	✓	✓	(d)

TABLE 3-2
SITE-RELATED CHEMICALS AND INITIAL SAMPLE ANALYSES AND DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Preparation Method	Analytical Method	Compound List	CAS Number	Sample Depth (from Table 3-1)		
					Depth 1	Depth 2/3	Deep
Semivolatile Organic Compounds (continued)	**EPA 3550B**	**EPA 8270C**	4-Nitroaniline	100-01-6	✓	✓	(d)
			4-Nitrophenol	100-02-7	✓	✓	(d)
			Acetophenone	98-86-2	✓	✓	(d)
			Aniline	62-53-3	✓	✓	(d)
			Benzenethiol	108-98-5	✓	✓	(d)
			Benzoic acid	65-85-0	✓	✓	(d)
			Benzyl alcohol	100-51-6	✓	✓	(d)
			bis(2-Chloroethoxy)methane	111-91-1	✓	✓	(d)
			bis(2-Chloroethyl) ether	111-44-4	✓	✓	(d)
			bis(2-Chloroisopropyl) ether	108-60-1	✓	✓	(d)
			bis(2-Ethylhexyl) phthalate	117-81-7	✓	✓	(d)
			bis(p-Chlorophenyl) sulfone	80-07-9	✓	✓	(d)
			bis(p-Chlorophenyl)disulfide	1142-19-4	✓	✓	(d)
			Butylbenzyl phthalate	85-68-7	✓	✓	(d)
			Carbazole	86-74-8	✓	✓	(d)
			Dibenzofuran	132-64-9	✓	✓	(d)
			Dichloromethyl ether	542-88-1	✓	✓	(d)
			Diethyl phthalate	84-66-2	✓	✓	(d)
			Dimethyl phthalate	131-11-3	✓	✓	(d)
			Di-n-butyl phthalate	84-74-2	✓	✓	(d)
			Di-n-octyl phthalate	117-84-0	✓	✓	(d)
			Diphenyl disulfide	882-33-7	✓	✓	(d)
			Diphenyl sulfide	139-66-2	✓	✓	(d)
			Diphenyl sulfone	127-63-9	✓	✓	(d)
			Diphenylamine	122-39-4	✓	✓	(d)
			Fluoranthene	206-44-0	✓	✓	(d)
			Fluorene	86-73-7	✓	✓	(d)
			Hexachlorobenzene	118-74-1	✓	✓	(d)
			Hexachlorobutadiene	87-68-3	✓	✓	(d)
			Hexachlorocyclopentadiene	77-47-4	✓	✓	(d)
			Hexachloroethane	67-72-1	✓	✓	(d)
			Hydroxymethyl phthalimide	118-29-6	✓	✓	(d)
			Isophorone	78-59-1	✓	✓	(d)
			m,p-Cresols	106-44-5	✓	✓	(d)

TABLE 3-2
SITE-RELATED CHEMICALS AND INITIAL SAMPLE ANALYSES AND DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Preparation Method	Analytical Method	Compound List	CAS Number	Sample Depth (from Table 3-1)		
					Depth 1	Depth 2/3	Deep
Semivolatile Organic Compounds (continued)	**EPA 3550B**	**EPA 8270C**	Naphthalene	91-20-3	✓	✓	(d)
			Nitrobenzene	98-95-3	✓	✓	(d)
			N-nitrosodi-n-propylamine	621-64-7	✓	✓	(d)
			o-Cresol	95-48-7	✓	✓	(d)
			Octachlorostyrene	29082-74-4	✓	✓	(d)
			p-Chloroaniline (4-Chloroaniline)	106-47-8	✓	✓	(d)
			p-Chlorobenzenethiol	106-54-7	✓	✓	(d)
			Pentachlorobenzene	608-93-5	✓	✓	(d)
			Pentachlorophenol	87-86-5	✓	✓	(d)
			Phenol	108-95-2	✓	✓	(d)
			Phthalic acid	88-99-3	✓	✓	(d)
			Pyridine	110-86-1	✓	✓	(d)
			Tentatively Identified Compounds (TICs)		✓	✓	(d)
Volatile Organic Compounds	**EPA 5030B/ EPA 5035**	**EPA 8260B**	1,1,1,2-Tetrachloroethane	630-20-6	✓	✓	(d)
			1,1,1-Trichloroethane	71-55-6	✓	✓	(d)
			1,1,2,2-Tetrachloroethane	79-34-5	✓	✓	(d)
			1,1,2-Trichloroethane	79-00-5	✓	✓	(d)
			1,1-Dichloroethane	75-34-3	✓	✓	(d)
			1,1-Dichloroethene	75-35-4	✓	✓	(d)
			1,1-Dichloropropene	563-58-6	✓	✓	(d)
			1,2,3-Trichlorobenzene	87-61-6	✓	✓	(d)
			1,2,3-Trichloropropane	96-18-4	✓	✓	(d)
			1,2,4-Trichlorobenzene	120-82-1	✓	✓	(d)
			1,2,4-Trimethylbenzene	95-63-6	✓	✓	(d)
			1,2-Dichlorobenzene	95-50-1	✓	✓	(d)
			1,2-Dichloroethane	107-06-2	✓	✓	(d)
			1,2-Dichloroethene	540-59-0	✓	✓	(d)
			1,2-Dichloropropane	78-87-5	✓	✓	(d)
			1,3,5-Trichlorobenzene	108-70-3	✓	✓	(d)
			1,3,5-Trimethylbenzene	108-67-8	✓	✓	(d)
			1,3-Dichlorobenzene	541-73-1	✓	✓	(d)
			1,3-Dichloropropane	142-28-9	✓	✓	(d)
			1,4-Dichlorobenzene	106-46-7	✓	✓	(d)
			2,2,3-Trimethylbutane	464-06-2	✓	✓	(d)
			2,2-Dichloropropane	594-20-7	✓	✓	(d)
			2,2-Dimethylpentane	590-35-2	✓	✓	(d)

TABLE 3-2
SITE-RELATED CHEMICALS AND INITIAL SAMPLE ANALYSES AND DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Preparation Method	Analytical Method	Compound List	CAS Number	Sample Depth (from Table 3-1)		
					Depth 1	Depth 2/3	Deep
Volatile Organic Compounds (continued)	EPA 5030B/ EPA 5035	EPA 8260B	2,3-Dimethylpentane	565-59-3	✓	✓	(d)
			2,4-Dimethylpentane	108-08-7	✓	✓	(d)
			2-Chlorotoluene	95-49-8	✓	✓	(d)
			2-Hexanone	591-78-6	✓	✓	(d)
			2-Methylhexane	591-76-4	✓	✓	(d)
			2-Nitropropane	79-46-9	✓	✓	(d)
			3,3-Dimethylpentane	562-49-2	✓	✓	(d)
			3-Ethylpentane	617-78-7	✓	✓	(d)
			3-Methylhexane	589-34-4	✓	✓	(d)
			4-Chlorotoluene	106-43-4	✓	✓	(d)
			4-Methyl-2-pentanone (MIBK)	108-10-1	✓	✓	(d)
			Acetone	67-64-1	✓	✓	(d)
			Acetonitrile	75-05-8	✓	✓	(d)
			Benzene	71-43-2	✓	✓	(d)
			Bromobenzene	108-86-1	✓	✓	(d)
			Bromodichloromethane	75-27-4	✓	✓	(d)
			Bromoform	75-25-2	✓	✓	(d)
			Bromomethane	74-83-9	✓	✓	(d)
			Carbon disulfide	75-15-0	✓	✓	(d)
			Carbon tetrachloride	56-23-5	✓	✓	(d)
			Chlorobenzene	108-90-7	✓	✓	(d)
			Chlorobromomethane	74-97-5	✓	✓	(d)
			Chloroethane	75-00-3	✓	✓	(d)
			Chloroform	67-66-3	✓	✓	(d)
			Chloromethane	74-87-3	✓	✓	(d)
			cis-1,2-Dichloroethene	156-59-2	✓	✓	(d)
			cis-1,3-Dichloropropene	10061-01-5	✓	✓	(d)
			Cymene (Isopropyltoluene)	99-87-6	✓	✓	(d)
			Dibromochloromethane	124-48-1	✓	✓	(d)
			Dibromochloropropane	96-12-8	✓	✓	(d)
			Dibromomethane	74-95-3	✓	✓	(d)
			Dichloromethane (Methylene chloride)	75-09-2	✓	✓	(d)
			Dimethyldisulfide	624-92-0	✓	✓	(d)
			Ethanol	64-17-5	✓	✓	(d)

TABLE 3-2
SITE-RELATED CHEMICALS AND INITIAL SAMPLE ANALYSES AND DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Preparation Method	Analytical Method	Compound List	CAS Number	Sample Depth (from Table 3-1)		
					Depth 1	Depth 2/3	Deep
Volatile Organic Compounds (continued)	**EPA 5030B/ EPA 5035**	**EPA 8260B**	Ethylbenzene	100-41-4	✓	✓	(d)
			Freon-11	75-69-4	✓	✓	(d)
			Freon-113	76-13-1	✓	✓	(d)
			Freon-12	75-71-8	✓	✓	(d)
			Heptane	142-82-5	✓	✓	(d)
			Isopropylbenzene	98-82-8	✓	✓	(d)
			m,p-Xylene	mp-XYL	✓	✓	(d)
			Methyl ethyl ketone (2-Butanone)	78-93-3	✓	✓	(d)
			Methyl iodide	74-88-4	✓	✓	(d)
			MTBE (Methyl tert-butyl ether)	1634-04-4	✓	✓	(d)
			n-Butylbenzene	104-51-8	✓	✓	(d)
			Nonanal	124-19-6	✓	✓	(d)
			n-Propylbenzene	103-65-1	✓	✓	(d)
			o-Xylene	95-47-6	✓	✓	(d)
			sec-Butylbenzene	135-98-8	✓	✓	(d)
			Styrene	100-42-5	✓	✓	(d)
			tert-Butylbenzene	98-06-6	✓	✓	(d)
			Tetrachloroethene	127-18-4	✓	✓	(d)
			Toluene	108-88-3	✓	✓	(d)
			trans-1,2-Dichloroethene	156-60-5	✓	✓	(d)
			trans-1,3-Dichloropropene	10061-02-6	✓	✓	(d)
			Trichloroethene	79-01-6	✓	✓	(d)
			Vinyl acetate	108-05-4	✓	✓	(d)
			Vinyl chloride	75-01-4	✓	✓	(d)
			Xylenes (total)	1330-20-7	✓	✓	(d)
			Tentatively Identified Compounds (TICs)		✓	✓	(d)
Flashpoint	**NA**	**EPA 1010**	Flammables	NA	(a)	(a)	(a)
Total Petroleum Hydrocarbons	**EPA 3550**	**EPA 8015**	Diesel	64742-46-7	(a)	(a)	(a)
	EPA 3550		Gasoline	8006-61-9	(a)	(a)	(a)
	EPA 1664A		Grease	68153-81-1	(a)	(a)	(a)
			Mineral Spirits	NA	(a)	(a)	(a)
White Phosphorus	**EPA 7580M**	**EPA 7580M**	White phosphorus	12185-10-3	(a)	(a)	(a)
Methyl Mercury	**EPA 1630**	**EPA 1630**	Methyl mercury	22967-92-6	(a)	(a)	(a)

TABLE 3-2
SITE-RELATED CHEMICALS AND INITIAL SAMPLE ANALYSES AND DEPTHS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Preparation Method	Analytical Method	Compound List	CAS Number	Sample Depth (from Table 3-1)		
					Depth 1	Depth 2/3	Deep
Soil Physical Parameters	**NA**	**ASTM D2937/ MOSA1Ch .13**	Dry bulk density	NA	(d)	✓	✓
		ASTM D2435/ MOSA1Ch .18	Total porosity	NA	(d)	✓	✓
		ASTM D5084	Soil permeability/saturated hydraulic cond.	NA	(d)	✓	✓
		ASTM D854	Specific gravity of soils	NA	(d)	✓	✓
		SW846 Method 9081	Cation exchange capacity	NA	(d)	✓	✓
		ASTM D2216/D4643/D2974	Volumetric water content	NA	(d)	✓	✓
		ASTM D422	Grain size analysis by sieve and hydrometer	NA	(d)	✓	✓
		EPA 415.1/ASTM 2947	Fractional organic carbon content	NA	(d)	✓	✓

Notes:

Laboratory limits are subject to matrix interferences and may not always be achieved in all samples.

The laboratory was instructed to report the top 25 Tentatively Identified Compounds (TICs) under method 8260B and 8270C.

NA = Not applicable.

a - Removed based on rationale provided in the text.

b - Dioxins/furans and PCBs analyzed for in fill and surface soil samples only.

c - Asbestos analyzed for in current grade surface soil samples only.

d - Soil physical parameters collected from at-depth samples only (see Table 3-1).

e - Removed based on Revisions to the Analyte List Technical Memorandum approved by NDEP on 10/16/2008. Note this was done subsequent to the initial confirmation sampling conducted in June 2008.

TABLE 3-3
FINAL CONFIRMATION SOIL SAMPLE LOCATIONS AND ANALYSES
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 1 of 2)

Sample Location	Sample Depth	Sample Type	Scraped?	Asbestos	Alde-hydes	Dioxins	Gen Chem	Metals	OCPs	PAHs	PCBs	Rads	SVOCs	VOCs
GNC1-BB16	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC1-BC16	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC1-BC18	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC1-BC21	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC1-BC22	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	11	Initial			X		X	X	X	X		X	X	X
GNC1-BC23	0	Initial	YES	X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC2-BC23C	0	Confirm				X		X			X			
GNC1-BC27	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC1-BC28	0	Initial	YES	X	X	X	X	X	X	X	X	X	X	X
	11	Initial			X		X	X	X	X		X	X	X
GNC2-BC28C	0	Confirm				X					X			
GNC1-BC29	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC1-JA02	0	Suppl				X								
GNC1-JA03	0	Suppl				X		X						
GNC1-JA09	0	Suppl				X								
GNC1-JA10	0	Suppl				X		X				X		
GNC1-JB02	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	5	Initial			X		X	X	X	X		X	X	X
	15	Initial			X		X	X	X	X		X	X	X
GNC1-JB03	0	Initial	YES	X	X	X	X	X	X	X	X	X	X	X
	7	Initial			X		X	X	X	X		X	X	X
	17	Initial			X		X	X	X	X		X	X	X
GNC2-JB03C	0	Confirm				X		X			X			
GNC1-JB06	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	6	Initial			X		X	X	X	X		X	X	X
	16	Initial			X		X	X	X	X		X	X	X
GNC1-JB07	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	8	Initial			X		X	X	X	X		X	X	X
	18	Initial			X		X	X	X	X		X	X	X
GNC1-JD01	0	Initial	YES	X	X	X	X	X	X	X	X	X	X	X
	3	Initial			X		X	X	X	X		X	X	X
	13	Initial			X		X	X	X	X		X	X	X
GNC2-JD01C	0	Confirm	YES					X						
GNC3-JD01C	0	Confirm						X						

TABLE 3-3
FINAL CONFIRMATION SOIL SAMPLE LOCATIONS AND ANALYSES
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample Location	Sample Depth	Sample Type	Scraped?	Asbestos	Alde-hydes	Dioxins	Gen Chem	Metals	OCPs	PAHs	PCBs	Rads	SVOCs	VOCs
GNC1-JD02	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC1-JD03	0	Initial		X										
GNC1-JD06	0	Initial	YES	X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC2-JD06	0	Confirm						X						
GNC1-JP02	0	Initial	YES	X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC2-JP02C	0	Confirm				X		X			X			
GNC1-JP04	0	Initial	YES	X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC2-JP04C	0	Confirm				X		X			X			
GNC1-JP05	0	Initial	YES	X	X	X	X	X	X	X	X	X	X	X
	11	Initial			X		X	X	X	X		X	X	X
GNC2-JP05C	0	Confirm				X					X			
GNC2-JP05NE	0	Confirm				X					X			
GNC2-JP05NW	0	Confirm				X					X			
GNC2-JP05SE	0	Confirm				X					X			
GNC2-JP05SW	0	Confirm				X					X			
GNC1-JP06	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	3	Initial			X		X	X	X	X		X	X	X
	13	Initial			X		X	X	X	X		X	X	X
GNC1-JS08	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC1-JS17	0	Initial	YES	X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
GNC2-JS17C	0	Confirm				X					X			
UPC1-BB28	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	8	Initial			X		X	X	X	X		X	X	X
	18	Initial			X		X	X	X	X		X	X	X
UPC1-BB31	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	11	Initial			X		X	X	X	X		X	X	X
UPC1-BB32	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
UPC1-BB33	0	Initial		X	X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X
UPC1-BB34N	0	Confirm				X								
UPC1-JP11	0	Initial			X	X	X	X	X	X	X	X	X	X
	10	Initial			X		X	X	X	X		X	X	X

(shaded) = Location removed. As noted in the text, post-scrape analyses associated with follow-up rounds of remediation focused on the analytes triggering that additional remediation, and did not include the full suite analyses of the original analytical program. Therefore, analytical results from the original SAP dataset were retained for all analytes except those that were re-run after additional scraping.

TABLE 3-4
FINAL HUMAN HEALTH RISK ASSESSMENT SOIL DATASET RESULTS SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	Detect Freq.	Censored (Non-Detect) Data Count	Min	Q1	Median	Mean	Q3	Max	Detected Data[1] Count	Min	Q1	Median	Mean	Q3	Max	Outdoor Worker Soil BCL	Count of Detects > BCL	LBCL (DAF 1)	Count of Detects > DAF 1	LBCL (DAF 20)	Count of Detects > DAF 20	Max. Bkgrnd[2]	Count of Detects > Bkgrnd
Asbestos[3]	Amphibole	Structures	31	3.2%	30	--	--	--	--	--	--	1	1	--	--	--	--	1	--	--	--	--	--	--	--	--
	Chrysotile	Structures	31	0%	31	--	--	--	--	--	--	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aldehydes	Acetaldehyde	mg/kg	69	10.1%	62	0.3	0.31	0.31	0.31	0.32	0.328	7	0.334	0.35	0.43	0.43	0.46	0.594	77.7	0	--	--	--	--	--	--
	Formaldehyde	mg/kg	69	59.4%	28	0.202	0.21	0.21	0.27	0.28	0.861	41	0.209	0.24	0.28	0.32	0.39	0.566	41.6	0	--	--	--	--	--	--
Dioxins/Furans	1,2,3,4,6,7,8-Heptachlorodibenzofuran[4]	pg/g	43	79.1%	9	0.26	0.69	1.7	2.4	5	5.1	34	2.8	10	39	57	84	250	--	--	--	--	--	--	--	--
	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin[4]	pg/g	43	53.5%	20	0.12	0.25	0.32	2	5	5.1	23	3.2	7	8.6	25	28	78	--	--	--	--	--	--	--	--
	1,2,3,4,7,8,9-Heptachlorodibenzofuran[4]	pg/g	43	67.4%	14	0.13	0.49	0.97	1.7	2.5	5.1	29	2.6	6.1	21	27	41	100	--	--	--	--	--	--	--	--
	1,2,3,4,7,8-Hexachlorodibenzofuran[4]	pg/g	43	69.8%	13	0.15	0.56	1.2	1.9	3.3	5.1	30	2.6	6.2	24	31	47	100	--	--	--	--	--	--	--	--
	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin[4]	pg/g	43	2.3%	42	0.046	0.15	0.81	1.9	4.9	6.2	1	3	--	3	3	--	3	--	--	--	--	--	--	--	--
	1,2,3,6,7,8-Hexachlorodibenzofuran[4]	pg/g	43	60.5%	17	0.057	0.42	1.1	2.1	5	5.1	26	3.1	7.6	19	24	38	63	--	--	--	--	--	--	--	--
	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin[4]	pg/g	43	16.3%	36	0.049	0.15	1	2.1	4.9	6.2	7	3	3.1	3.7	4.2	5.5	5.8	--	--	--	--	--	--	--	--
	1,2,3,7,8,9-Hexachlorodibenzofuran[4]	pg/g	43	30.2%	30	0.055	0.21	0.53	1.8	4.9	6.2	13	3.3	4	5.6	5.8	7.6	8.9	--	--	--	--	--	--	--	--
	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin[4]	pg/g	43	18.6%	35	0.06	0.13	0.67	2	4.9	6.2	8	2.6	2.8	3.2	3.6	4.6	5.2	--	--	--	--	--	--	--	--
	1,2,3,7,8-Pentachlorodibenzofuran[4]	pg/g	43	58.1%	18	0.054	0.27	0.68	1.9	5	5.1	25	2.7	7.1	19	21	33	58	--	--	--	--	--	--	--	--
	1,2,3,7,8-Pentachlorodibenzo-p-dioxin[4]	pg/g	43	11.6%	38	0.049	0.16	0.65	1.9	4.9	6.2	5	2.6	2.7	3.7	3.3	3.8	3.8	--	--	--	--	--	--	--	--
	2,3,4,6,7,8-Hexachlorodibenzofuran[4]	pg/g	43	41.9%	25	0.046	0.12	1.1	1.8	3.6	6.2	18	2.6	4.7	7.9	8.3	12	15	--	--	--	--	--	--	--	--
	2,3,4,7,8-Pentachlorodibenzofuran[4]	pg/g	43	46.5%	23	0.056	0.21	0.89	1.7	2.3	5.1	20	3.3	5.9	12	13	20	28	--	--	--	--	--	--	--	--
	2,3,7,8-Tetrachlorodibenzofuran[4]	pg/g	43	81.4%	8	0.11	0.25	0.45	0.56	1	1	35	0.57	1.6	5.2	11	14	66	--	--	--	--	--	--	--	--
	2,3,7,8-Tetrachlorodibenzo-p-dioxin[4]	pg/g	43	25.6%	32	0.036	0.093	0.25	0.44	0.99	1.2	11	0.52	0.57	0.68	0.87	1.3	1.5	--	--	--	--	--	--	--	--
	Octachlorodibenzodioxin[4]	pg/g	43	46.5%	23	0.15	0.69	2.1	6.7	10	35	20	6.6	10	17	51	54	420	--	--	--	--	--	--	--	--
	Octachlorodibenzofuran[4]	pg/g	43	81.4%	8	0.71	0.87	4.5	5.2	10	10	35	6	25	130	220	230	1600	--	--	--	--	--	--	--	--
	TCDD TEQ	pg/g	43	--[4]	0	--	--	--	--	--	--	43	0.23	0.87	5.9	11	17	42.6	1000	0	--	--	--	--	--	--
General Chemistry/ Ions	Ammonia (as N)	mg/kg	69	15.9%	58	0.51	0.8	0.81	1.5	0.83	5.3	11	0.13	0.25	0.41	0.54	0.67	1.8	100000	0	--	--	--	--	--	--
	Bromide	mg/kg	69	24.6%	52	0.26	0.27	0.27	0.41	0.28	2.7	17	0.42	0.64	0.97	1.4	2.3	3	--	--	--	--	--	--	--	--
	Chlorate	mg/kg	69	17.4%	57	0.48	0.48	0.49	0.49	0.49	0.52	12	1.4	2	3	3.6	4.8	10.2	--	--	--	--	--	--	--	--
	Chloride	mg/kg	69	100%	0	--	--	--	--	--	--	69	0.38	1.7	34	150	190	958	--	--	--	--	--	--	--	--
	Cyanide, Total	mg/kg	69	24.6%	52	0.08	0.092	0.32	0.31	0.52	0.55	17	0.099	0.11	0.15	0.42	0.78	1.8	13700	0	2	0	40	0	--	--
	Fluoride	mg/kg	69	75.4%	17	0.1	0.1	0.1	0.39	1.1	1.1	52	0.15	0.51	0.87	1.1	1.5	3.8	41000	0	--	--	--	--	--	--
	Nitrate	mg/kg	69	100%	0	--	--	--	--	--	--	69	0.15	2	5.9	18	21	202	100000	0	7	30	140	2	--	--
	Nitrite	mg/kg	69	15.9%	58	0.033	0.034	0.034	0.049	0.035	0.72	11	0.073	0.085	0.12	0.29	0.48	0.95	100000	0	--	--	--	--	--	--
	Orthophosphate as P	mg/kg	69	31.9%	47	0.51	0.52	0.53	2.5	5.2	5.4	22	0.79	1.1	1.7	2.2	2.5	9.2	--	--	--	--	--	--	--	--
	Perchlorate	mg/kg	69	87.0%	9	0.0102	0.01	0.011	0.011	0.011	0.0109	60	0.0158	0.046	0.12	1.3	1.4	26.1	795	0	0.0263	55	0.526	21	--	--
	Sulfate	mg/kg	69	97.1%	2	5.2	--	5.3	5.3	--	5.3	67	2.8	12	59	450	370	7440	--	--	--	--	--	--	--	--
	Sulfide	mg/kg	69	4.3%	66	0.84	1.8	1.8	1.7	1.9	1.9	3	16.3	16	17	20	28	28.3	--	--	--	--	--	--	--	--
	Total Kjeldahl Nitrogen (TKN)	mg/kg	69	97.1%	2	51	--	52	52	--	52.1	67	25.9	70	110	160	190	1060	--	--	--	--	--	--	--	--
Metals	Aluminum	mg/kg	69	100%	0	--	--	--	--	--	--	69	5280	9300	10000	11000	12000	18700	100000	0	75	69	1500	69	15300	1
	Antimony	mg/kg	69	0%	69	0.225	0.23	0.32	0.67	0.32	2.6	0	--	--	--	--	--	--	454	--	0.3	--	6	--	0.5	--
	Arsenic	mg/kg	69	94.2%	4	5.2	5.2	5.3	5.3	5.3	5.3	65	3.4	5.2	6.1	6.4	7	14.2	1.77	65	1	65	20	0	7.2	15
	Barium	mg/kg	69	100%	0	--	--	--	--	--	--	69	119	350	450	470	530	1300	100000	0	82	69	1640	0	836	3
	Beryllium	mg/kg	69	88.4%	8	0.51	0.51	0.51	0.51	0.52	0.53	61	0.38	0.55	0.59	0.62	0.67	1.2	2230	0	3	0	60	0	0.89	1
	Boron	mg/kg	69	0%	69	2.99	17	17	19	17	52	0	--	--	--	--	--	--	100000	--	23.4	--	467	--	11.6	--
	Cadmium	mg/kg	69	46.4%	37	0.04	0.1	0.26	0.21	0.26	0.27	32	0.089	0.11	0.15	0.16	0.2	0.37	560	0	0.4	0	8	0	0.1291	20
	Calcium	mg/kg	69	100%	0	--	--	--	--	--	--	69	12700	19000	26000	28000	33000	86700	--	--	--	--	--	--	82800	1
	Chromium	mg/kg	69	100%	0	--	--	--	--	--	--	69	6.5	13	16	16	19	27.9	100000	0	--	--	--	--	16.7	30
	Chromium (VI)	mg/kg	69	39.1%	42	0.1	0.1	0.1	0.15	0.11	0.42	27	0.1	0.12	0.2	0.3	0.25	2.1	1360	0	2	1	40	0	0.32	4
	Cobalt	mg/kg	69	100%	0	--	--	--	--	--	--	69	3.6	7.9	8.8	8.9	9.7	13.2	337	0	0.495	69	9.9	15	16.3	0
	Copper	mg/kg	69	100%	0	--	--	--	--	--	--	69	12	17	20	20	22	63.7	42200	0	45.8	1	915	0	30.5	1
	Iron	mg/kg	69	100%	0	--	--	--	--	--	--	69	6360	15000	17000	17000	19000	24100	100000	0	7.56	69	151	69	19700	11
	Lead	mg/kg	69	100%	0	--	--	--	--	--	--	69	9.2	13	15	22	23	121	800	0	--	--	--	--	35.1	9
	Lithium	mg/kg	69	100%	0	--	--	--	--	--	--	69	7.3	15	17	17	19	35.4	2270	0	21.9	6	438	0	26.5	4
	Magnesium	mg/kg	69	100%	0	--	--	--	--	--	--	69	4770	9000	10000	10000	11000	19700	100000	0	973	69	19500	1	17500	1
	Manganese	mg/kg	69	100%	0	--	--	--	--	--	--	69	301	440	510	530	610	867	24900	0	1.3	69	26.1	69	1090	0

TABLE 3-4
FINAL HUMAN HEALTH RISK ASSESSMENT SOIL DATASET RESULTS SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	Detect Freq.	Censored (Non-Detect) Data							Detected Data[1]							Outdoor Worker Soil BCL	Count of Detects > BCL	LBCL (DAF 1)	Count of Detects > DAF 1	LBCL (DAF 20)	Count of Detects > DAF 20	Max. Bkgrnd[2]	Count of Detects > Bkgrnd
					Count	Min	Q1	Median	Mean	Q3	Max	Count	Min	Q1	Median	Mean	Q3	Max								
Metals	Mercury	mg/kg	69	14.5%	59	0.005	0.034	0.034	0.029	0.035	0.0364	10	0.0056	0.0072	0.014	0.021	0.038	0.0529	341	0	0.104	0	2.09	0	0.11	0
	Molybdenum	mg/kg	69	56.5%	30	0.47	0.47	2.5	2	2.6	2.6	39	0.52	0.62	0.74	0.88	0.92	2.1	5680	0	3.69	0	73.7	0	2	1
	Nickel	mg/kg	69	100%	0	--	--	--	--	--	--	69	6.6	15	17	17	19	28.9	21800	0	7	68	140	0	30	0
	Potassium	mg/kg	69	100%	0	--	--	--	--	--	--	69	1040	1800	2200	2200	2500	3710	--	--	--	--	--	--	3890	0
	Selenium	mg/kg	69	1.4%	68	0.225	0.4	0.4	0.86	0.4	2.6	1	0.33	--	0.33	0.33	--	0.33	5680	0	0.3	1	6	0	0.6	0
	Silver	mg/kg	69	43.5%	39	0.04	0.11	0.11	0.22	0.11	1	30	0.055	0.07	0.11	0.12	0.15	0.21	5680	0	0.85	0	17	0	0.2609	0
	Sodium	mg/kg	69	100%	0	--	--	--	--	--	--	69	125	220	440	540	760	1660	--	--	--	--	--	--	1320	3
	Strontium	mg/kg	69	100%	0	--	--	--	--	--	--	69	105	190	280	310	370	838	100000	0	--	--	--	--	808	1
	Thallium	mg/kg	69	1.4%	68	0.105	0.75	0.75	0.62	0.75	1	1	1.1	--	1.1	1.1	--	1.1	79.5	0	0.4	1	8	0	1.8	0
	Tin	mg/kg	69	18.8%	56	0.75	0.75	0.75	0.76	0.75	1	13	0.86	0.92	1.1	1.6	1.7	3.9	100000	0	--	--	--	--	0.8	13
	Titanium	mg/kg	69	100%	0	--	--	--	--	--	--	69	306	520	650	650	770	1030	100000	0	146000	0	2920000	0	1010	1
	Tungsten	mg/kg	69	18.8%	56	0.185	1.3	1.3	1.1	1.3	2.6	13	1.3	1.7	2.1	2.9	3.5	8.5	8510	0	41.1	0	822	0	0.0175	13
	Uranium	mg/kg	69	100%	0	--	--	--	--	--	--	69	0.64	0.86	0.98	1.1	1.3	3.9	3400	0	13.5	0	270	0	2.7	1
	Vanadium	mg/kg	69	100%	0	--	--	--	--	--	--	69	20.7	45	51	52	59	75.3	5680	0	300	0	6000	0	59.1	16
	Zinc	mg/kg	69	100%	0	--	--	--	--	--	--	69	32.6	42	45	49	56	93.1	100000	0	620	0	12400	0	121	0
Organochlorine Pesticides	2,4-DDD	mg/kg	69	5.8%	65	0.00014	0.00031	0.00032	0.00028	0.00032	0.00033	4	0.0017	0.0023	0.0045	0.004	0.0051	0.0052	--	--	--	--	--	--	--	--
	2,4-DDE	mg/kg	69	31.9%	47	0.00013	0.0002	0.00021	0.00019	0.00021	0.00022	22	0.0026	0.0037	0.0062	0.0086	0.011	0.025	--	--	--	--	--	--	--	--
	4,4-DDD	mg/kg	69	1.4%	68	0.00009	0.000092	0.000093	0.000096	0.000097	0.00012	1	0.015	--	0.015	0.015	--	0.015	11.1	0	0.8	0	16	0	--	--
	4,4-DDE	mg/kg	69	39.1%	42	0.00019	0.0002	0.0002	0.00025	0.00021	0.00044	27	0.002	0.0044	0.01	0.018	0.019	0.092	7.81	0	3	0	60	0	--	--
	4,4-DDT	mg/kg	69	33.3%	46	0.0002	0.00021	0.00021	0.00022	0.00023	0.00025	23	0.0018	0.0026	0.0045	0.0096	0.0093	0.045	7.81	0	2	0	40	0	--	--
	Aldrin	mg/kg	69	0%	69	0.000092	0.000097	0.000098	0.000098	0.0001	0.0001	0	--	--	--	--	--	--	0.113	--	0.02	--	0.4	--	--	--
	alpha-BHC	mg/kg	69	2.9%	67	0.000095	0.00029	0.00029	0.00026	0.0003	0.00031	2	0.0026	--	0.0028	0.0028	--	0.0029	270	0	0.0291	0	0.583	0	--	--
	alpha-Chlordane	mg/kg	69	0%	69	0.0001	0.00021	0.00022	0.0002	0.00022	0.00023	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	beta-BHC	mg/kg	69	29.0%	49	0.00013	0.00019	0.00019	0.00018	0.0002	0.0002	20	0.002	0.003	0.0039	0.0055	0.0067	0.017	53.9	0	0.00596	6	0.119	0	--	--
	Chlordane	mg/kg	69	0%	69	0.0015	0.0024	0.0024	0.0023	0.0024	0.0025	0	--	--	--	--	--	--	7.19	--	0.5	--	10	--	--	--
	delta-BHC	mg/kg	69	0%	69	0.00011	0.00017	0.00017	0.00016	0.00018	0.00018	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Dieldrin	mg/kg	69	1.4%	68	0.000092	0.000094	0.000095	0.000095	0.000097	0.0001	1	0.0025	--	0.0025	0.0025	--	0.0025	0.12	0	0.0002	1	0.004	0	--	--
	Endosulfan I	mg/kg	69	0%	69	0.000096	0.00011	0.00011	0.00011	0.00011	0.00011	0	--	--	--	--	--	--	4100	--	0.9	--	18	--	--	--
	Endosulfan II	mg/kg	69	0%	69	0.000094	0.000096	0.000097	0.0001	0.0001	0.00012	0	--	--	--	--	--	--	4100	--	0.9	--	18	--	--	--
	Endosulfan sulfate	mg/kg	69	0%	69	0.00013	0.00027	0.00027	0.00025	0.00028	0.00029	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Endrin	mg/kg	69	0%	69	0.000084	0.000086	0.000087	0.000091	0.00009	0.00011	0	--	--	--	--	--	--	205	--	0.05	--	1	--	--	--
	Endrin aldehyde	mg/kg	69	1.4%	68	0.00015	0.00018	0.00019	0.00018	0.00019	0.0002	1	0.0022	--	0.0022	0.0022	--	0.0022	--	--	--	--	--	--	--	--
	Endrin ketone	mg/kg	69	0%	69	0.00013	0.00017	0.00017	0.00016	0.00017	0.00018	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	gamma-BHC (Lindane)	mg/kg	69	0%	69	0.0001	0.00013	0.00013	0.00013	0.00013	0.00013	0	--	--	--	--	--	--	8.98	--	0.0005	--	0.01	--	--	--
	gamma-Chlordane	mg/kg	69	1.4%	68	0.000084	0.000086	0.000087	0.000087	0.000088	0.000091	1	0.002	--	0.002	0.002	--	0.002	--	--	--	--	--	--	--	--
	Heptachlor	mg/kg	69	0%	69	0.000096	0.00017	0.00018	0.00016	0.00018	0.00019	0	--	--	--	--	--	--	0.426	--	1	--	20	--	--	--
	Heptachlor epoxide	mg/kg	69	0%	69	0.00012	0.00013	0.00014	0.00013	0.00014	0.00014	0	--	--	--	--	--	--	0.21	--	0.03	--	0.6	--	--	--
	Methoxychlor	mg/kg	69	4.3%	66	0.00032	0.00033	0.00033	0.00033	0.00034	0.00035	3	0.0038	0.0038	0.0038	0.004	0.0044	0.0044	3420	0	8	0	160	0	--	--
	Toxaphene	mg/kg	69	0%	69	0.0057	0.0059	0.006	0.006	0.0061	0.0063	0	--	--	--	--	--	--	1.74	--	2	--	40	--	--	--
Polynuclear Aromatic Hydrocarbons	Acenaphthene	mg/kg	69	0%	69	0.00168	0.0017	0.0017	0.0017	0.0018	0.00182	0	--	--	--	--	--	--	2560	--	29	--	580	--	--	--
	Acenaphthylene	mg/kg	69	0%	69	0.00168	0.0017	0.0017	0.0017	0.0018	0.00182	0	--	--	--	--	--	--	147	--	--	--	--	--	--	--
	Anthracene	mg/kg	69	5.8%	65	0.00168	0.0017	0.0017	0.0017	0.0018	0.00182	4	0.00177	0.0018	0.0021	0.0026	0.0039	0.00451	9920	0	590	0	11800	0	--	--
	Benzo(a)anthracene	mg/kg	69	11.6%	61	0.00168	0.0017	0.0017	0.0017	0.0018	0.00182	8	0.00186	0.002	0.003	0.0033	0.0044	0.00664	2.34	0	0.08	0	1.6	0	--	--
	Benzo(a)pyrene	mg/kg	69	23.2%	53	0.00168	0.0017	0.0017	0.0017	0.0018	0.0018	16	0.00181	0.002	0.0022	0.0032	0.0043	0.00822	0.234	0	0.4	0	8	0	--	--
	Benzo(b)fluoranthene	mg/kg	69	39.1%	42	0.00168	0.0017	0.0017	0.0017	0.0018	0.00178	27	0.0018	0.0021	0.0054	0.0086	0.018	0.0216	2.34	0	0.2	0	4	0	--	--
	Benzo(g,h,i)perylene	mg/kg	69	24.6%	52	0.00168	0.0017	0.0017	0.0017	0.0018	0.0018	17	0.00181	0.0019	0.0024	0.0032	0.0038	0.00973	34100	0	--	--	--	--	--	--
	Benzo(k)fluoranthene	mg/kg	69	10.1%	62	0.00168	0.0017	0.0017	0.0017	0.0018	0.00182	7	0.00194	0.002	0.0024	0.0033	0.0049	0.00548	23.4	0	2	0	40	0	--	--
	Chrysene	mg/kg	69	14.5%	59	0.00168	0.0017	0.0017	0.0017	0.0018	0.00182	10	0.00182	0.0019	0.0028	0.0035	0.0054	0.00691	234	0	8	0	160	0	--	--
	Dibenzo(a,h)anthracene	mg/kg	69	18.8%	56	0.00168	0.0017	0.0017	0.0017	0.0018	0.00182	13	0.00184	0.0022	0.0031	0.0076	0.017	0.0174	0.234	0	0.08	0	1.6	0	--	--
	Indeno(1,2,3-cd)pyrene	mg/kg	69	15.9%	58	0.00168	0.0017	0.0017	0.0017	0.0018	0.00179	11	0.00179	0.0018	0.0021	0.0028	0.0043	0.0054	2.34	0	0.7	0	14	0	--	--
	Phenanthrene	mg/kg	69	8.7%	63	0.00168	0.0017	0.0017	0.0017	0.0018	0.00182	6	0.00191	0.0021	0.0026	0.0034	0.0055	0.00554	24.5	0	--	--	--	--	--	--
	Pyrene	mg/kg	69	29.0%	49	0.00168	0.0017	0.0017	0.0017	0.0018	0.00182	20	0.00181	0.0022	0.0031	0.0037	0.005	0.0095	19300	0	210	0	4200	0	--	--

TABLE 3-4
FINAL HUMAN HEALTH RISK ASSESSMENT SOIL DATASET RESULTS SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	Detect Freq.	Censored (Non-Detect) Data Count	Censored Min	Censored Q1	Censored Median	Censored Mean	Censored Q3	Censored Max	Detected Data[1] Count	Detected Min	Detected Q1	Detected Median	Detected Mean	Detected Q3	Detected Max	Outdoor Worker Soil BCL	Count of Detects > BCL	LBCL (DAF 1)	Count of Detects > DAF 1	LBCL (DAF 20)	Count of Detects > DAF 20	Max. Bkgrnd[2]	Count of Detects > Bkgrnd
Polychlorinated Biphenyls	PCB 105[4]	pg/g	37	56.8%	16	2	2	2	9	2.2	63	21	5.2	12	29	150	74	980	--	--	--	--	--	--	--	--
	PCB 114[4]	pg/g	37	54.1%	17	2	2	2	2	2	2.2	20	2.2	6.8	19	19	31	55	--	--	--	--	--	--	--	--
	PCB 118[4]	pg/g	37	62.2%	14	2	2	2	20	5.2	140	23	2.4	21	65	240	120	1900	--	--	--	--	--	--	--	--
	PCB 123[4]	pg/g	37	2.7%	36	2	2	2	2.1	2.1	2.2	1	2.4	--	2.4	2.4	--	2.4	--	--	--	--	--	--	--	--
	PCB 126[4]	pg/g	37	35.1%	24	2	2	2	2	2.1	2.2	13	2.1	3.1	4.8	10	16	43	--	--	--	--	--	--	--	--
	PCB 156[4]	pg/g	37	59.5%	15	2	2	2	4	2.1	19	22	2.1	3.1	11	48	31	510	--	--	--	--	--	--	--	--
	PCB 157[4]	pg/g	37	37.8%	23	2	2	2	2	2	2.2	14	2.6	3.3	4.8	16	25	98	--	--	--	--	--	--	--	--
	PCB 167[4]	pg/g	37	37.8%	23	2	2	2	2.5	2.1	8	14	3.5	6.4	9.5	29	39	190	--	--	--	--	--	--	--	--
	PCB 169[4]	pg/g	37	5.4%	35	2	2	2	2	2.1	2.2	2	2.3	--	2.7	2.7	--	3	--	--	--	--	--	--	--	--
	PCB 189[4]	pg/g	37	35.1%	24	2	2	2	2.4	2.1	7.7	13	2.2	5.1	8.4	15	16	85	--	--	--	--	--	--	--	--
	PCB 209[4]	pg/g	37	86.5%	5	2	2	2	2	2	2	32	22	88	430	1300	1700	8100	--	--	--	--	--	--	--	--
	PCB 77[4]	pg/g	37	0%	37	2	2	2	2	2.1	2.2	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	PCB 81[4]	pg/g	37	0%	37	2	2	2	2	2.1	2.2	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Radionuclides	Radium-226	pCi/g	70	85.7%	10	--	--	--	--	--	--	60	0.168	0.6	1	1	1.3	2.42	0.023	60	0.016	60	0.32	60	2.36	2
	Radium-228	pCi/g	70	92.9%	5	--	--	--	--	--	--	65	0.525	1.2	1.6	1.6	1.9	3.37	0.041	65	0.016	65	0.32	65	2.94	1
	Thorium-228	pCi/g	70	100%	0	--	--	--	--	--	--	70	0.742	1.3	1.5	1.6	1.8	3.15	0.025	70	0.0023	70	0.045	70	2.28	6
	Thorium-230	pCi/g	70	98.6%	1	--	--	--	--	--	--	69	0.416	0.9	1.2	1.2	1.4	2.23	8.3	0	0.00084	69	0.017	69	3.01	0
	Thorium-232	pCi/g	70	100%	0	--	--	--	--	--	--	70	0.657	1.2	1.4	1.4	1.7	2.93	7.4	0	0.0029	70	0.058	70	2.23	3
	Uranium-233/234	pCi/g	70	95.7%	3	--	--	--	--	--	--	67	0.312	0.69	0.9	1	1.2	2.34	11	0	--	--	--	--	2.84	0
	Uranium-235/236	pCi/g	70	4.3%	67	--	--	--	--	--	--	3	-0.0434	0.034	0.059	0.075	0.11	0.449	0.35	0	--	--	--	--	0.21	0
	Uranium-238	pCi/g	70	97.1%	2	--	--	--	--	--	--	68	0.405	0.7	0.9	0.92	1.1	1.58	1.4	4	--	--	--	--	2.37	0
Semivolatile Organic Compounds	1,2,4,5-Tetrachlorobenzene	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	205	--	--	--	--	--	--	--
	1,2-Diphenylhydrazine	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	2.39	--	--	--	--	--	--	--
	1,4-Dioxane	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	19.2	--	--	--	--	--	--	--
	2,2'-Dichlorobenzil	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	341	--	0.0003	--	0.006	--	--	--
	2,4,5-Trichlorophenol	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	68400	--	14	--	280	--	--	--
	2,4,6-Trichlorophenol	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	174	--	0.008	--	0.16	--	--	--
	2,4-Dichlorophenol	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	2050	--	0.05	--	1	--	--	--
	2,4-Dimethylphenol	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	13700	--	0.4	--	8	--	--	--
	2,4-Dinitrophenol	mg/kg	69	0%	69	0.127	0.13	0.13	0.13	0.13	0.138	0	--	--	--	--	--	--	1370	--	0.01	--	0.2	--	--	--
	2,4-Dinitrotoluene	mg/kg	69	0%	69	0.0335	0.034	0.035	0.035	0.035	0.0364	0	--	--	--	--	--	--	6.18	--	0.00004	--	0.0008	--	--	--
	2,6-Dinitrotoluene	mg/kg	69	0%	69	0.0335	0.034	0.035	0.035	0.035	0.0364	0	--	--	--	--	--	--	684	--	0.00003	--	0.0006	--	--	--
	2-Chloronaphthalene	mg/kg	69	0%	69	0.0117	0.012	0.012	0.012	0.012	0.0127	0	--	--	--	--	--	--	389	--	--	--	--	--	--	--
	2-Chlorophenol	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	1670	--	0.2	--	4	--	--	--
	2-Methylnaphthalene	mg/kg	69	0%	69	0.0067	0.0069	0.0069	0.007	0.007	0.00727	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2-Nitroaniline	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	2050	--	--	--	--	--	--	--
	2-Nitrophenol	mg/kg	69	0%	69	0.0335	0.034	0.035	0.035	0.035	0.0364	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3,3-Dichlorobenzidine	mg/kg	69	0%	69	0.101	0.1	0.1	0.1	0.11	0.109	0	--	--	--	--	--	--	4.26	--	0.0003	--	0.006	--	--	--
	3-Nitroaniline	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	4-Bromophenyl phenyl ether	mg/kg	69	0%	69	0.0335	0.034	0.035	0.035	0.035	0.0364	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	4-Chloro-3-methylphenol	mg/kg	69	0%	69	0.0335	0.034	0.035	0.035	0.035	0.0364	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	4-Chlorophenyl phenyl ether	mg/kg	69	0%	69	0.0335	0.034	0.035	0.035	0.035	0.0364	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	4-Chlorothioanisole	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	4-Nitroaniline	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	4-Nitrophenol	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	5470	--	--	--	--	--	--	--
	Acetophenone	mg/kg	69	0%	69	0.0335	0.034	0.035	0.035	0.035	0.0364	0	--	--	--	--	--	--	1740	--	--	--	--	--	--	--
	Aniline	mg/kg	69	0%	69	0.117	0.12	0.12	0.12	0.12	0.127	0	--	--	--	--	--	--	336	--	--	--	--	--	--	--
	Benzenethiol	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Benzoic acid	mg/kg	69	0%	69	0.168	0.17	0.17	0.17	0.18	0.182	0	--	--	--	--	--	--	100000	--	20	--	400	--	--	--
	Benzyl alcohol	mg/kg	68	0%	68	0.101	0.1	0.1	0.1	0.11	0.109	0	--	--	--	--	--	--	100000	--	--	--	--	--	--	--
	bis(2-Chloroethoxy)methane	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	bis(2-Chloroethyl) ether	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	1.3	--	0.00002	--	0.0004	--	--	--

TABLE 3-4
FINAL HUMAN HEALTH RISK ASSESSMENT SOIL DATASET RESULTS SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	Detect Freq.	Censored (Non-Detect) Data Count	Min	Q1	Median	Mean	Q3	Max	Detected Data[1] Count	Min	Q1	Median	Mean	Q3	Max	Outdoor Worker Soil BCL	Count of Detects > BCL	LBCL (DAF 1)	Count of Detects > DAF 1	LBCL (DAF 20)	Count of Detects > DAF 20	Max. Bkgrnd[2]	Count of Detects > Bkgrnd
Semivolatile Organic Compounds	bis(2-Chloroisopropyl) ether	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	18	--	--	--	--	--	--	--
	bis(2-Ethylhexyl) phthalate	mg/kg	69	1.4%	68	0.067	0.069	0.069	0.07	0.07	0.107	1	0.0747	--	0.075	0.075	--	0.0747	137	0	180	0	3600	0	--	--
	bis(p-Chlorophenyl) sulfone	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	bis(p-Chlorophenyl)disulfide	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Butylbenzyl phthalate	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	240	--	810	--	16200	--	--	--
	Carbazole	mg/kg	69	0%	69	0.0101	0.01	0.01	0.01	0.011	0.0109	0	--	--	--	--	--	--	95.8	--	0.03	--	0.6	--	--	--
	Dibenzofuran	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	2270	--	--	--	--	--	--	--
	Dichloromethyl ether	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	0.00134	--	--	--	--	--	--	--
	Diethyl phthalate	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	100000	--	--	--	--	--	--	--
	Dimethyl phthalate	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	100000	--	--	--	--	--	--	--
	Di-n-butyl phthalate	mg/kg	69	0%	69	0.0335	0.034	0.035	0.035	0.035	0.0364	0	--	--	--	--	--	--	68400	--	270	--	5400	--	--	--
	Di-n-octyl phthalate	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Diphenyl disulfide	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Diphenyl sulfide	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Diphenyl sulfone	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	2050	--	--	--	--	--	--	--
	Diphenylamine	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	17100	--	--	--	--	--	--	--
	Fluoranthene	mg/kg	69	0%	69	0.0101	0.01	0.01	0.01	0.011	0.0109	0	--	--	--	--	--	--	24400	--	210	--	4200	--	--	--
	Fluorene	mg/kg	69	0%	69	0.0101	0.01	0.01	0.01	0.011	0.0109	0	--	--	--	--	--	--	3670	--	28	--	560	--	--	--
	Hexachlorobenzene	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	1.2	--	0.1	--	2	--	--	--
	Hexachlorobutadiene	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	24.6	--	0.1	--	2	--	--	--
	Hexachlorocyclopentadiene	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	4090	--	20	--	400	--	--	--
	Hexachloroethane	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	137	--	0.02	--	0.4	--	--	--
	Hydroxymethyl phthalimide	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Isophorone	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	2020	--	0.03	--	0.6	--	--	--
	m,p-Cresols	mg/kg	69	0%	69	0.134	0.14	0.14	0.14	0.14	0.145	0	--	--	--	--	--	--	3420	--	--	--	--	--	--	--
	Naphthalene	mg/kg	69	0%	69	0.0101	0.01	0.01	0.01	0.011	0.0109	0	--	--	--	--	--	--	17.4	--	4	--	80	--	--	--
	Nitrobenzene	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	15.1	--	0.007	--	0.14	--	--	--
	N-nitrosodi-n-propylamine	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	0.274	--	0.000002	--	0.00004	--	--	--
	o-Cresol	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	34200	--	0.8	--	16	--	--	--
	Octachlorostyrene	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	p-Chloroaniline	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	9.58	--	0.03	--	0.6	--	--	--
	p-Chlorobenzenethiol	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Pentachlorobenzene	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	547	--	--	--	--	--	--	--
	Pentachlorophenol	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	3	--	0.001	--	0.02	--	--	--
	Phenol	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	100000	--	5	--	100	--	--	--
	Phthalic acid	mg/kg	69	0%	69	0.111	0.11	0.11	0.11	0.12	0.12	0	--	--	--	--	--	--	100000	--	--	--	--	--	--	--
	Pyridine	mg/kg	69	0%	69	0.067	0.069	0.069	0.07	0.07	0.0727	0	--	--	--	--	--	--	667	--	--	--	--	--	--	--
Volatile Organic Compounds	1,1,1,2-Tetrachloroethane	mg/kg	69	0%	69	0.00018	0.00018	0.00019	0.00022	0.00019	0.00039	0	--	--	--	--	--	--	20.3	--	--	--	--	--	--	--
	1,1,1-Trichloroethane	mg/kg	69	0%	69	0.00011	0.00011	0.00011	0.00013	0.00011	0.00024	0	--	--	--	--	--	--	1390	--	0.1	--	2	--	--	--
	1,1,2,2-Tetrachloroethane	mg/kg	69	0%	69	0.000079	0.000081	0.000082	0.00015	0.000084	0.00046	0	--	--	--	--	--	--	2.59	--	0.0002	--	0.004	--	--	--
	1,1,2-Trichloroethane	mg/kg	69	0%	69	0.000068	0.000069	0.00007	0.00013	0.000073	0.00037	0	--	--	--	--	--	--	5.8	--	0.0009	--	0.018	--	--	--
	1,1-Dichloroethane	mg/kg	69	0%	69	0.000071	0.000072	0.000073	0.00013	0.000076	0.00038	0	--	--	--	--	--	--	23.3	--	1	--	20	--	--	--
	1,1-Dichloroethene	mg/kg	69	0%	69	0.00012	0.00012	0.00013	0.00015	0.00013	0.00024	0	--	--	--	--	--	--	1400	--	0.003	--	0.06	--	--	--
	1,1-Dichloropropene	mg/kg	69	0%	69	0.000088	0.00009	0.000091	0.00012	0.000094	0.00023	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	1,2,3-Trichlorobenzene	mg/kg	69	0%	69	0.00039	0.0004	0.00041	0.00041	0.00042	0.00047	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	1,2,3-Trichloropropane	mg/kg	69	0%	69	0.00025	0.00026	0.00026	0.0003	0.00027	0.0005	0	--	--	--	--	--	--	0.106	--	--	--	--	--	--	--
	1,2,4-Trichlorobenzene	mg/kg	69	0%	69	0.00031	0.00034	0.00034	0.00034	0.00035	0.00036	0	--	--	--	--	--	--	110	--	0.3	--	6	--	--	--
	1,2,4-Trimethylbenzene	mg/kg	69	7.2%	64	0.00013	0.00034	0.00041	0.00041	0.00048	0.00074	5	0.00051	0.0007	0.00098	0.00095	0.0012	0.0012	671	0	--	--	--	--	--	--
	1,2-Dichlorobenzene	mg/kg	69	11.6%	61	0.00012	0.00013	0.00013	0.00018	0.00015	0.00037	8	0.00014	0.00016	0.00019	0.00018	0.00021	0.00021	373	0	0.9	0	18	0	--	--
	1,2-Dichloroethane	mg/kg	69	0%	69	0.000067	0.000068	0.000069	0.00012	0.000072	0.00033	0	--	--	--	--	--	--	2.41	--	0.001	--	0.02	--	--	--
	1,2-Dichloroethene	mg/kg	69	0%	69	0.00011	0.00011	0.00011	0.00021	0.00012	0.00065	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	1,2-Dichloropropane	mg/kg	69	0%	69	0.00011	0.00011	0.00011	0.00016	0.00012	0.00038	0	--	--	--	--	--	--	4.54	--	0.001	--	0.02	--	--	--

TABLE 3-4
FINAL HUMAN HEALTH RISK ASSESSMENT SOIL DATASET RESULTS SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	Detect Freq.	Censored (Non-Detect) Data							Detected Data[1]							Outdoor Worker Soil BCL	Count of Detects > BCL	LBCL (DAF 1)	Count of Detects > DAF 1	LBCL (DAF 20)	Count of Detects > DAF 20	Max. Bkgrnd[2]	Count of Detects > Bkgrnd
					Count	Min	Q1	Median	Mean	Q3	Max	Count	Min	Q1	Median	Mean	Q3	Max								
Volatile Organic Compounds	1,3,5-Trichlorobenzene	mg/kg	69	0%	69	0.00037	0.00038	0.00039	0.00041	0.0004	0.00053	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	1,3,5-Trimethylbenzene	mg/kg	69	10.1%	62	0.000098	0.0001	0.0001	0.00013	0.00013	0.00026	7	0.00012	0.00012	0.00013	0.00019	0.00027	0.00042	254	0	--	--	--	--	--	--
	1,3-Dichlorobenzene	mg/kg	69	10.1%	62	0.00013	0.00014	0.00014	0.0002	0.00015	0.00045	7	0.00015	0.00017	0.00018	0.00018	0.00019	0.00022	373	0	--	--	--	--	--	--
	1,3-Dichloropropane	mg/kg	69	0%	69	0.000052	0.000053	0.000053	0.00012	0.000055	0.00043	0	--	--	--	--	--	--	71.6	--	0.001	--	0.02	--	--	--
	1,4-Dichlorobenzene	mg/kg	69	10.1%	62	0.00014	0.00014	0.00014	0.00018	0.00016	0.00032	7	0.00016	0.00019	0.00023	0.00023	0.00028	0.00031	14.3	0	0.1	0	2	0	--	--
	2,2,3-Trimethylbutane	mg/kg	69	0%	69	0.00021	0.00022	0.00022	0.00028	0.00023	0.00055	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2,2-Dichloropropane	mg/kg	69	0%	69	0.00023	0.00024	0.00024	0.00026	0.00025	0.00032	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2,2-Dimethylpentane	mg/kg	69	0%	69	0.00028	0.00028	0.00029	0.00033	0.0003	0.00055	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2,3-Dimethylpentane	mg/kg	69	0%	69	0.00023	0.00023	0.00023	0.00027	0.00024	0.00045	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2,4-Dimethylpentane	mg/kg	69	0%	69	0.0002	0.0002	0.0002	0.00026	0.00021	0.0005	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2-Chlorotoluene	mg/kg	69	0%	69	0.00025	0.00026	0.00026	0.00027	0.00027	0.00035	0	--	--	--	--	--	--	511	--	--	--	--	--	--	--
	2-Hexanone	mg/kg	69	0%	69	0.00024	0.00024	0.00025	0.00025	0.00026	0.00029	0	--	--	--	--	--	--	2150	--	--	--	--	--	--	--
	2-Methylhexane	mg/kg	69	0%	69	0.00021	0.00021	0.00021	0.00027	0.00022	0.00052	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2-Nitropropane	mg/kg	69	0%	69	0.00032	0.00061	0.00062	0.00057	0.00063	0.00066	0	--	--	--	--	--	--	0.0598	--	--	--	--	--	--	--
	3,3-Dimethylpentane	mg/kg	69	0%	69	0.00021	0.00021	0.00021	0.00026	0.00022	0.00049	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3-Ethylpentane	mg/kg	69	0%	69	0.00021	0.00022	0.00022	0.00026	0.00023	0.00046	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3-Methylhexane	mg/kg	69	0%	69	0.00014	0.00014	0.00015	0.00021	0.00015	0.00048	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	4-Chlorotoluene	mg/kg	69	0%	69	0.00017	0.00018	0.00018	0.00019	0.00019	0.00026	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	4-Methyl-2-pentanone (MIBK)	mg/kg	69	0%	69	0.00029	0.0003	0.0003	0.0003	0.00031	0.00032	0	--	--	--	--	--	--	17200	--	--	--	--	--	--	--
	Acetone	mg/kg	69	14.5%	59	0.0017	0.0018	0.0067	0.0082	0.013	0.021	10	0.0037	0.0084	0.012	0.017	0.024	0.048	100000	0	0.8	0	16	0	--	--
	Acetonitrile	mg/kg	69	0%	69	0.0035	0.0055	0.0056	0.0053	0.0057	0.0059	0	--	--	--	--	--	--	6840	--	--	--	--	--	--	--
	Benzene	mg/kg	69	5.8%	65	0.000088	0.00009	0.000091	0.00014	0.000095	0.00034	4	0.00019	0.00019	0.0002	0.0002	0.00021	0.00021	4.5	0	0.002	0	0.04	0	--	--
	Bromobenzene	mg/kg	69	1.4%	68	0.00012	0.00012	0.00013	0.00018	0.00013	0.00039	1	0.00023	--	0.00023	0.00023	--	0.00023	695	0	--	--	--	--	--	--
	Bromodichloromethane	mg/kg	69	0%	69	0.00022	0.00022	0.00022	0.00024	0.00023	0.00033	0	--	--	--	--	--	--	3.6	--	0.03	--	0.6	--	--	--
	Bromoform	mg/kg	69	0%	69	0.00006	0.000061	0.000062	0.00013	0.000064	0.00043	0	--	--	--	--	--	--	242	--	0.04	--	0.8	--	--	--
	Bromomethane	mg/kg	69	0%	69	0.00013	0.00013	0.00014	0.00019	0.00014	0.00041	0	--	--	--	--	--	--	42.9	--	0.01	--	0.2	--	--	--
	Carbon disulfide	mg/kg	69	0%	69	0.00012	0.00013	0.00013	0.00016	0.00013	0.00028	0	--	--	--	--	--	--	721	--	2	--	40	--	--	--
	Carbon tetrachloride	mg/kg	69	0%	69	0.00021	0.00021	0.00021	0.00023	0.00022	0.00031	0	--	--	--	--	--	--	4.07	--	0.003	--	0.06	--	--	--
	Chlorobenzene	mg/kg	69	2.9%	67	0.00011	0.00011	0.00011	0.00014	0.00012	0.00031	2	0.0007	--	0.0009	0.0009	--	0.0011	695	0	0.07	0	1.4	0	--	--
	Chlorobromomethane	mg/kg	69	0%	69	0.00023	0.00023	0.00024	0.00027	0.00024	0.00045	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Chloroethane	mg/kg	69	0%	69	0.00031	0.00047	0.00048	0.00045	0.00048	0.0005	0	--	--	--	--	--	--	1100	--	--	--	--	--	--	--
	Chloroform	mg/kg	69	0%	69	0.0001	0.0001	0.0001	0.00015	0.00011	0.00037	0	--	--	--	--	--	--	1.71	--	0.03	--	0.6	--	--	--
	Chloromethane	mg/kg	69	4.3%	66	0.00027	0.00028	0.00028	0.00028	0.00028	0.00029	3	0.00028	0.00028	0.00029	0.00029	0.00031	0.00031	8.95	0	--	--	--	--	--	--
	cis-1,2-Dichloroethene	mg/kg	69	0%	69	0.000055	0.000056	0.000056	0.00011	0.000059	0.00034	0	--	--	--	--	--	--	791	--	0.02	--	0.4	--	--	--
	cis-1,3-Dichloropropene	mg/kg	69	0%	69	0.0001	0.0001	0.0001	0.00013	0.00011	0.00024	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Cymene (Isopropyltoluene)	mg/kg	69	0%	69	0.00013	0.00013	0.00013	0.00016	0.00013	0.00027	0	--	--	--	--	--	--	647	--	--	--	--	--	--	--
	Dibromochloromethane	mg/kg	69	0%	69	0.00012	0.00012	0.00012	0.00015	0.00013	0.0003	0	--	--	--	--	--	--	6.15	--	0.02	--	0.4	--	--	--
	Dibromochloropropane	mg/kg	69	0%	69	0.00021	0.00022	0.00022	0.00029	0.00023	0.00062	0	--	--	--	--	--	--	0.0583	--	--	--	--	--	--	--
	Dibromomethane	mg/kg	69	0%	69	0.00017	0.00017	0.00017	0.00021	0.00018	0.00036	0	--	--	--	--	--	--	210	--	--	--	--	--	--	--
	Dichloromethane (Methylene chloride)	mg/kg	69	39.1%	42	0.0007	0.00073	0.0024	0.0039	0.0055	0.013	27	0.0014	0.01	0.012	0.011	0.013	0.016	60.4	0	0.001	27	0.02	0	--	--
	Dimethyldisulfide	mg/kg	69	0%	69	0.00018	0.00018	0.00018	0.00024	0.00019	0.00049	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Ethanol	mg/kg	69	1.4%	68	0.048	0.049	0.049	0.052	0.051	0.064	1	1.9	--	1.9	1.9	--	1.9	100000	0	--	--	--	--	--	--
	Ethylbenzene	mg/kg	69	14.5%	59	0.000059	0.00006	0.000061	0.00012	0.00018	0.0003	10	0.00016	0.00018	0.00018	0.00018	0.00019	0.0002	21	0	0.7	0	14	0	--	--
	Freon-11 (Trichlorofluoromethane)	mg/kg	69	2.9%	67	0.00022	0.00023	0.00023	0.00024	0.00023	0.00031	2	0.00031	--	0.00032	0.00032	--	0.00033	1980	0	--	--	--	--	--	--
	Freon-113 (1,1,2-Trifluoro-1,2,2-trichloroethar	mg/kg	69	0%	69	0.00015	0.00015	0.00015	0.00017	0.00016	0.00026	0	--	--	--	--	--	--	5550	--	--	--	--	--	--	--
	Freon-12 (Dichlorodifluoromethane)	mg/kg	69	0%	69	0.00025	0.00029	0.0003	0.00029	0.0003	0.00032	0	--	--	--	--	--	--	340	--	--	--	--	--	--	--
	Heptane	mg/kg	69	0%	69	0.00017	0.00017	0.00017	0.00021	0.00018	0.00039	0	--	--	--	--	--	--	220	--	0.03	--	0.6	--	--	--
	Isopropylbenzene	mg/kg	69	4.3%	66	0.0001	0.00011	0.00011	0.00014	0.00011	0.00029	3	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	647	0	--	--	--	--	--	--
	m,p-Xylene	mg/kg	69	15.9%	58	0.00017	0.00017	0.00017	0.00023	0.00018	0.00047	11	0.00024	0.00024	0.00026	0.00039	0.00032	0.0011	214	0	10	0	200	0	--	--
	Methyl ethyl ketone (2-Butanone)	mg/kg	69	4.3%	66	0.00058	0.00089	0.0009	0.00086	0.00091	0.00095	3	0.0045	0.0045	0.0095	0.008	0.0099	0.0099	34100	0	--	--	--	--	--	--
	Methyl iodide	mg/kg	69	0%	69	0.00013	0.00013	0.00013	0.00018	0.00013	0.0004	0	--	--	--	--	--	--	1680	--	--	--	--	--	--	--
	MTBE (Methyl tert-butyl ether)	mg/kg	69	0%	69	0.00009	0.000092	0.000093	0.00016	0.000096	0.00048	0	--	--	--	--	--	--	216	--	--	--	--	--	--	--

TABLE 3-4
FINAL HUMAN HEALTH RISK ASSESSMENT SOIL DATASET RESULTS SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	Detect Freq.	Censored (Non-Detect) Data							Detected Data[1]							Outdoor Worker Soil BCL	Count of Detects > BCL	LBCL (DAF 1)	Count of Detects > DAF 1	LBCL (DAF 20)	Count of Detects > DAF 20	Max. Bkgrnd[2]	Count of Detects > Bkgrnd
					Count	Min	Q1	Median	Mean	Q3	Max	Count	Min	Q1	Median	Mean	Q3	Max								
Volatile Organic Compounds	n-Butylbenzene	mg/kg	69	0%	69	0.00018	0.00019	0.00019	0.00021	0.0002	0.0003	0	--	--	--	--	--	--	237	--	--	--	--	--	--	--
	Nonanal	mg/kg	69	4.3%	66	0.00036	0.00047	0.00048	0.00046	0.00049	0.00051	3	0.00049	0.00049	0.0018	0.0028	0.0061	0.0061	--	--	--	--	--	--	--	--
	n-Propylbenzene	mg/kg	69	14.5%	59	0.00011	0.00011	0.00011	0.00015	0.00012	0.00028	10	0.00014	0.00015	0.00016	0.00016	0.00017	0.00017	237	0	--	--	--	--	--	--
	o-Xylene	mg/kg	69	10.1%	62	0.000077	0.000078	0.00008	0.00011	0.000083	0.00024	7	0.000087	0.00011	0.00012	0.00017	0.00024	0.00038	282	0	9	0	180	0	--	--
	sec-Butylbenzene	mg/kg	69	5.8%	65	0.00011	0.00011	0.00011	0.00015	0.00012	0.00033	4	0.00012	0.00012	0.00013	0.00013	0.00015	0.00015	223	0	--	--	--	--	--	--
	Styrene	mg/kg	69	1.4%	68	0.00018	0.00018	0.00018	0.0002	0.00021	0.00027	1	0.00053	--	0.00053	0.00053	--	0.00053	1730	0	0.2	0	4	0	--	--
	tert-Butylbenzene	mg/kg	69	5.8%	65	0.0001	0.0001	0.0001	0.00013	0.00011	0.00023	4	0.00012	0.00012	0.00012	0.00012	0.00013	0.00013	393	0	--	--	--	--	--	--
	Tetrachloroethene	mg/kg	69	0%	69	0.000088	0.00009	0.000091	0.00016	0.000094	0.00048	0	--	--	--	--	--	--	3.28	--	0.003	--	0.06	--	--	--
	Toluene	mg/kg	69	1.4%	68	0.00024	0.00033	0.00033	0.00032	0.00034	0.00044	1	0.00056	--	0.00056	0.00056	--	0.00056	521	0	0.6	0	12	0	--	--
	trans-1,2-Dichloroethene	mg/kg	69	0%	69	0.000091	0.000093	0.000094	0.00014	0.000097	0.00035	0	--	--	--	--	--	--	600	--	0.03	--	0.6	--	--	--
	trans-1,3-Dichloropropene	mg/kg	69	1.4%	68	0.0001	0.0001	0.0001	0.00012	0.00011	0.00018	1	0.00015	--	0.00015	0.00015	--	0.00015	--	--	--	--	--	--	--	--
	Trichloroethene	mg/kg	69	0%	69	0.00011	0.00011	0.00011	0.00014	0.00011	0.00027	0	--	--	--	--	--	--	5.49	--	0.003	--	0.06	--	--	--
	Vinyl acetate	mg/kg	69	0%	69	0.00024	0.00025	0.00025	0.00028	0.00026	0.00039	0	--	--	--	--	--	--	2710	--	8	--	160	--	--	--
	Vinyl chloride	mg/kg	69	0%	69	0.00011	0.00012	0.00012	0.00016	0.00012	0.00033	0	--	--	--	--	--	--	1.86	--	0.0007	--	0.014	--	--	--
	Xylenes (total)	mg/kg	69	13.0%	60	0.00023	0.00024	0.00024	0.00032	0.00025	0.00066	9	0.00026	0.00033	0.00038	0.00056	0.00075	0.0015	214	0	10	0	200	0	--	--

Notes:

This table includes only data included in the risk assessment. Because of this, the total number of analyses does not always coincide with the total number of analyses reported in the tables in Appendix B, which include all data, regardless of status.

The values used are simply a comparison to NDEP BCL values for information purposes only.

Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics (and exceedances of comparison levels) are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

Values for Q1, median, mean, and Q3 are rounded to 2 significant figures. BCLs are rounded to 3 significant figures.

BCL = Basic Comparison Levels (BCLs) from NDEP 2012.

LBCL = Leaching-based BCLs from NDEP 2012.

Max = Maximum

Min = Minimum

Q1 = 1st quartile (25th percentile)

Q3 = 3rd quartile (75th percentile)

(1) Range of detections include estimated values of detect results between the detection limit and reporting limit. As such some minimum detected concentrations may be below the minimum reporting limit. In these cases the respective sample results are flagged in the dataset.

(2) Comparisons are for information purposes only. See Chapter 5 for statistical background comparisons, and the background dataset used.

(3) Asbestos results shown are for long protocol structures (>10um). The minimum and maximum values represent the number of protocol structures in an individual sample. The detect count represents the number of samples with at least one detected protocol structure, not the total number of structures.

(4) TCDD TEQ values are calculated from congener-specific (dioxins, furans, and PCBs) concentrations. An individual TCDD TEQ value may include detect and non-detect congeners. Therefore, the number of detects and non-detects, and a frequency of detection for TCDD TEQ are not presented.

-- = Not applicable or no value has been established.

TABLE 3-13
SOIL VAPOR FLUX SAMPLE ANALYSES
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 1 of 3)

Compound	CAS Number	MDL ppbv	RL ppbv	MDL µg/m^3	RL µg/m^3
List of Compounds for USEPA Method TO-15 Full Scan Mode Operation and MDLs					
1,1,1,2-Tetrachloroethane	630-20-6	0.1	0.51	0.72	3.62
1,1,1-Trichloroethane	71-55-6	0.1	0.52	0.58	2.89
1,1,2,2-Tetrachloroethane	79-34-5	0.1	0.52	0.73	3.65
1,1,2-Trichloroethane	79-00-5	0.1	0.51	0.57	2.86
1,1-Dichloroethane	75-34-3	0.1	0.52	0.43	2.15
1,1-Dichloroethene	75-35-4	0.1	0.52	0.42	2.13
1,1-Dichloropropene	563-58-6	0.1	0.49	0.46	2.3
1,2,3-Trichloropropane	96-18-4	0.11	0.55	0.68	3.39
1,2,4-Trichlorobenzene	120-82-1	0.1	0.52	0.79	3.94
1,2,4-Trimethylbenzene	95-63-6	0.1	0.52	0.52	2.61
1,2-Dibromoethane	106-93-4	0.1	0.52	0.82	4.09
1,2-Dichlorobenzene	95-50-1	0.1	0.52	0.64	3.2
1,2-Dichloroethane	107-06-2	0.1	0.52	0.43	2.15
1,2-Dichloropropane	78-87-5	0.1	0.52	0.49	2.46
1,3,5-Trimethylbenzene	108-67-8	0.1	0.52	0.53	2.64
1,3-Dichlorobenzene	541-73-1	0.1	0.52	0.64	3.2
1,3-Dichloropropane	142-28-9	0.11	0.54	0.52	2.58
1,4-Dichlorobenzene	106-46-7	0.1	0.52	0.64	3.2
1,4-Dioxane	123-91-1	0.09	0.44	0.33	1.64
2,2-Dichloropropane	594-20-7	0.11	0.53	0.5	2.53
2-Hexanone	591-78-6	0.09	0.44	0.37	1.86
2-Methyl-1-propanol	78-83-1	0.23	1.13	0.84	4.21
4-Methyl-2-pentanone (MIBK)	108-10-1	0.09	0.46	0.38	1.95
Acetone	67-64-1	0.09	0.45	0.22	1.1
Acetonitrile	75-05-8	0.22	1.12	0.48	2.39
Benzene	71-43-2	0.1	0.52	0.34	1.7
Benzyl chloride	100-44-7	0.09	0.45	0.48	2.41
Bromodichloromethane	75-27-4	0.08	0.4	0.55	2.77
Bromoform	75-25-2	0.09	0.47	0.99	4.96
Bromomethane	74-83-9	0.1	0.51	0.41	2.04
Carbon disulfide	75-15-0	0.09	0.45	0.29	1.45
Carbon tetrachloride	56-23-5	0.1	0.52	0.67	3.38
Chlorobenzene	108-90-7	0.1	0.52	0.5	2.48

TABLE 3-13
SOIL VAPOR FLUX SAMPLE ANALYSES
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 2 of 3)

Compound	CAS Number	MDL ppbv	RL ppbv	MDL µg/m^3	RL µg/m^3
Chlorobromomethane	74-97-5	0.1	0.51	0.55	2.76
Chloroethane	75-00-3	0.1	0.51	0.28	1.39
Chloroform	67-66-3	0.1	0.52	0.52	2.59
Chloromethane	74-87-3	0.1	0.51	0.22	1.09
cis-1,2-Dichloroethene	156-59-2	0.1	0.52	0.42	2.11
cis-1,3-Dichloropropene	10061-01-5	0.1	0.52	0.48	2.41
Cymene (Isopropyltoluene)	99-87-6	0.11	0.55	0.62	3.12
Dibromochloromethane	124-48-1	0.09	0.44	0.77	3.87
Dibromochloropropane	96-12-8	0.22	1.1	2.2	10.98
Dibromomethane	74-95-3	0.11	0.55	0.97	4.84
Dichloromethane (Methylene chloride)	75-09-2	0.1	0.52	0.37	1.86
Ethanol	64-17-5	0.22	1.12	0.44	2.18
Ethylbenzene	100-41-4	0.1	0.52	0.46	2.33
Freon-11 (Trichlorofluoromethane)	75-69-4	0.1	0.51	0.59	2.95
Freon-113 (1,1,2-Trifluoro-1,2,2-trichloroethane)	76-13-1	0.1	0.52	0.81	4.07
Freon-12 (Dichlorodifluoromethane)	75-71-8	0.1	0.51	0.52	2.61
Heptane	142-82-5	0.08	0.42	0.35	1.78
Hexachlorobutadiene	87-68-3	0.1	0.52	1.14	5.68
Isopropylbenzene	98-82-8	0.11	0.57	0.58	2.89
m & p-Xylenes	108-38-3	0.21	1.03	0.92	4.61
Methyl ethyl ketone (2-Butanone)	78-93-3	0.09	0.43	0.26	1.31
Methyl iodide	4227-95-6	0.19	0.94	1.13	5.67
MTBE (Methyl tert-butyl ether)	1634-04-4	0.08	0.39	0.29	1.45
Naphthalene	91-20-3	0.22	1.09	1.19	5.9
n-Butylbenzene	104-51-8	0.1	0.52	0.59	2.95
n-Propylbenzene	103-65-1	0.11	0.54	0.55	2.74
o-Xylene	95-47-6	0.1	0.52	0.46	2.31
sec-Butylbenzene	135-98-8	0.11	0.52	0.59	2.95
Styrene	100-42-5	0.1	0.52	0.45	2.26
tert-Butylbenzene	98-06-6	0.11	0.52	0.59	2.85
Tetrachloroethene	127-18-4	0.1	0.52	0.72	3.61
Toluene	108-88-3	0.1	0.52	0.4	2
trans-1,2-Dichloroethene	156-60-5	0.09	0.44	0.36	1.8
trans-1,3-Dichloropropene	10061-02-6	0.1	0.52	0.48	2.41

TABLE 3-13
SOIL VAPOR FLUX SAMPLE ANALYSES
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 3 of 3)

Compound	CAS Number	MDL ppbv	RL ppbv	MDL µg/m^3	RL µg/m^3
Trichloroethene	79-01-6	0.1	0.52	0.57	2.85
Vinyl acetate	108-05-4	0.09	0.43	0.31	1.56
Vinyl chloride	75-01-4	0.1	0.51	0.27	1.35
List of Compounds for USEPA Method TO-15 Selective Ion Mode (SIM) Operation and MDLs					
1,1,2,2-Tetrachloroethane	79-34-5	0.005	0.026	0.035	0.18
1,1,2-Trichloroethane	79-00-5	0.005	0.026	0.028	0.14
1,2,3-Trichloropropane	96-18-4	0.005	0.026	0.031	0.16
1,2-Dibromoethane	106-93-4	0.005	0.026	0.039	0.2
1,2-Dichlorobenzene	95-50-1	0.005	0.026	0.031	0.16
1,2-Dichloroethane	107-06-2	0.005	0.026	0.021	0.11
1,2-Dichloropropane	78-87-5	0.005	0.026	0.024	0.12
1,3-Dichlorobenzene	541-73-1	0.005	0.026	0.031	0.16
1,4-Dichlorobenzene	106-46-7	0.005	0.026	0.031	0.16
Benzene	71-43-2	0.005	0.026	0.016	0.085
Benzyl chloride	100-44-7	0.005	0.026	0.026	0.14
Bromodichloromethane	75-27-4	0.005	0.026	0.034	0.18
Carbon tetrachloride	56-23-5	0.005	0.026	0.032	0.17
Chloroform	67-66-3	0.005	0.026	0.025	0.13
Dibromochloromethane	124-48-1	0.005	0.026	0.043	0.23
Dibromochloropropane	96-12-8	0.01	0.026	0.098	0.26
Dichloromethane (Methylene chloride)	75-09-2	0.005	0.026	0.018	0.009
Hexachlorobutadiene	87-68-3	0.01	0.026	0.108	0.28
Naphthalene	91-20-3	0.01	0.026	0.534	0.14
Tetrachloroethene	127-18-4	0.005	0.026	0.035	0.18
Trichloroethene	79-01-6	0.005	0.026	0.027	0.14
Vinyl chloride	75-01-4	0.005	0.026	0.013	0.068

Note:

The actual reported MDL may vary based on Canister dilution or matrix interferences.

CAS - Chemical abstract system

MDL - Method detection limit

RL - Reporting limit

ppbv - Parts per billion by volume

µg/m^3 - microgram per cubic meter

TABLE 3-14
SOIL VAPOR FLUX SAMPLE RESULTS SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	Detect Freq.	Censored (Non-Detect) Data							Detected Data[(1)]						
					Count	Min	Q1	Median	Mean	Q3	Max	Count	Min	Q1	Median	Mean	Q3	Max
Volatile Organic Compounds (Full Scan)	1,1,1,2-Tetrachloroethane	μg/m^2,min^{-1}	12	0%	12	0.01	0.01308	0.0158	0.01515	0.0158	0.0223	0	--	--	--	--	--	--
	1,1,1-Trichloroethane	μg/m^2,min^{-1}	12	0%	12	0.0142	0.0142	0.0146	0.01711	0.0213	0.0258	0	--	--	--	--	--	--
	1,1,2,2-Tetrachloroethane	μg/m^2,min^{-1}	9	0%	9	0.0177	0.0181	0.0181	0.01896	0.0183	0.0258	0	--	--	--	--	--	--
	1,1,2-Trichloroethane	μg/m^2,min^{-1}	12	0%	12	0.0142	0.0142	0.0146	0.01711	0.0213	0.0258	0	--	--	--	--	--	--
	1,1-Dichloroethane	μg/m^2,min^{-1}	12	0%	12	0.0104	0.0104	0.0108	0.01256	0.0156	0.0189	0	--	--	--	--	--	--
	1,1-Dichloroethene	μg/m^2,min^{-1}	12	0%	12	0.01	0.0104	0.0104	0.01233	0.0152	0.0185	0	--	--	--	--	--	--
	1,1-Dichloropropene	μg/m^2,min^{-1}	12	0%	12	0.00963	0.00963	0.01	0.01059	0.0111	0.0139	0	--	--	--	--	--	--
	1,2,3-Trichloropropane	μg/m^2,min^{-1}	12	0%	12	0.0108	0.0128	0.0135	0.01343	0.0135	0.0189	0	--	--	--	--	--	--
	1,2,4-Trichlorobenzene	μg/m^2,min^{-1}	12	17%	10	0.0393	0.0393	0.03985	0.06791	0.1205	0.142	2	0.0597	--	0.96	0.96	--	1.86
	1,2,4-Trimethylbenzene	μg/m^2,min^{-1}	12	17%	10	0.0258	0.0258	0.0262	0.0446	0.07915	0.0936	2	0.0835	--	0.327	0.327	--	0.571
	1,2-Dibromoethane	μg/m^2,min^{-1}	9	0%	9	0.0204	0.0204	0.0208	0.02157	0.0208	0.0293	0	--	--	--	--	--	--
	1,2-Dichlorobenzene	μg/m^2,min^{-1}	12	8%	11	0.0304	0.0308	0.0312	0.05132	0.0936	0.112	1	0.0416	--	0.0416	0.0416	--	0.0416
	1,2-Dichloroethane	μg/m^2,min^{-1}	9	0%	9	0.0108	0.0108	0.0108	0.01131	0.0108	0.0154	0	--	--	--	--	--	--
	1,2-Dichloropropane	μg/m^2,min^{-1}	12	0%	12	0.0119	0.0123	0.0123	0.01464	0.0182	0.0223	0	--	--	--	--	--	--
	1,3,5-Trimethylbenzene	μg/m^2,min^{-1}	12	8%	11	0.0204	0.0243	0.0266	0.02652	0.027	0.0381	1	0.415	--	0.415	0.415	--	0.415
	1,3-Dichlorobenzene	μg/m^2,min^{-1}	12	8%	11	0.0312	0.0316	0.032	0.0524	0.0955	0.114	1	0.037	--	0.037	0.037	--	0.037
	1,3-Dichloropropane	μg/m^2,min^{-1}	12	0%	12	0.00963	0.01	0.01	0.01075	0.0114	0.0139	0	--	--	--	--	--	--
	1,4-Dichlorobenzene	μg/m^2,min^{-1}	9	11%	8	0.0312	0.0316	0.0316	0.03336	0.03223	0.045	1	0.0628	--	0.0628	0.0628	--	0.0628
	1,4-Dioxane	μg/m^2,min^{-1}	12	0%	12	0.00809	0.00809	0.00809	0.01352	0.02255	0.0316	0	--	--	--	--	--	--
	2,2-Dichloropropane	μg/m^2,min^{-1}	12	0%	12	0.0108	0.0108	0.0108	0.01249	0.0152	0.0177	0	--	--	--	--	--	--
	2-Hexanone	μg/m^2,min^{-1}	12	33%	8	0.00924	0.00924	0.00982	0.01045	0.01193	0.0131	4	0.01	0.0104	0.0124	0.0242	0.0498	0.062
	2-Methyl-1-propanol	μg/m^2,min^{-1}	9	0%	9	0.0189	0.0193	0.0193	0.02018	0.01945	0.0273	0	--	--	--	--	--	--
	4-Methyl-2-pentanone (MIBK)	μg/m^2,min^{-1}	12	0%	12	0.00963	0.00963	0.00963	0.0106	0.0115	0.0139	0	--	--	--	--	--	--
	Acetone	μg/m^2,min^{-1}	12	50%	6	0.00539	0.00539	0.00559	0.07074	0.12738	0.349	6	0.159	0.163	0.218	0.299	0.429	0.695
	Acetonitrile	μg/m^2,min^{-1}	12	17%	10	0.0104	0.0107	0.0108	0.01226	0.01428	0.0158	2	0.11	--	0.203	0.203	--	0.296
	Benzene	μg/m^2,min^{-1}	12	25%	9	0.0196	0.02175	0.032	0.03662	0.04025	0.0939	3	0.0181	0.0181	0.032	0.0344	0.0531	0.0531
	Benzyl chloride	μg/m^2,min^{-1}	9	11%	8	0.0239	0.0239	0.0241	0.02539	0.02453	0.0343	1	0.0866	--	0.0866	0.0866	--	0.0866
	Bromodichloromethane	μg/m^2,min^{-1}	12	0%	12	0.00963	0.01208	0.0139	0.01349	0.0139	0.0196	0	--	--	--	--	--	--
	Bromoform	μg/m^2,min^{-1}	12	0%	12	0.01	0.01508	0.0246	0.02218	0.025	0.035	0	--	--	--	--	--	--
	Bromomethane	μg/m^2,min^{-1}	12	0%	12	0.0104	0.0104	0.0104	0.01246	0.0155	0.0189	0	--	--	--	--	--	--
	Carbon disulfide	μg/m^2,min^{-1}	12	33%	8	0.00693	0.00703	0.00732	0.01184	0.01183	0.0362	4	0.0162	0.0407	0.131	0.131	0.223	0.248
	Carbon tetrachloride	μg/m^2,min^{-1}	9	11%	8	0.0162	0.0166	0.0166	0.01745	0.01683	0.0235	1	0.166	--	0.166	0.166	--	0.166
	Chlorobenzene	μg/m^2,min^{-1}	12	17%	10	0.0119	0.0119	0.0123	0.01488	0.0184	0.0219	2	0.0139	--	0.0168	0.0168	--	0.0196
	Chlorobromomethane	μg/m^2,min^{-1}	12	0%	12	0.01	0.0116	0.01175	0.01194	0.0119	0.0166	0	--	--	--	--	--	--
	Chloroethane	μg/m^2,min^{-1}	12	17%	10	0.00693	0.00693	0.00732	0.00844	0.0109	0.0127	2	0.0481	--	0.062	0.062	--	0.0758
	Chloroform	μg/m^2,min^{-1}	9	44%	5	0.0127	0.0127	0.0127	0.01386	0.0156	0.0181	4	0.0208	0.0213	0.0372	0.069	0.149	0.181
	Chloromethane	μg/m^2,min^{-1}	12	8%	11	0.00539	0.00539	0.00539	0.0084	0.0077	0.0304	1	0.0296	--	0.0296	0.0296	--	0.0296

TABLE 3-14
SOIL VAPOR FLUX SAMPLE RESULTS SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	Detect Freq.	Censored (Non-Detect) Data							Detected Data[1]						
					Count	Min	Q1	Median	Mean	Q3	Max	Count	Min	Q1	Median	Mean	Q3	Max
Volatile Organic Compounds (Full Scan)	cis-1,2-Dichloroethene	$\mu g/m^2,min^{-1}$	12	0%	12	0.0104	0.0104	0.0108	0.01256	0.0156	0.0189	0	--	--	--	--	--	--
	cis-1,3-Dichloropropene	$\mu g/m^2,min^{-1}$	12	0%	12	0.0123	0.0123	0.0127	0.01484	0.0186	0.0223	0	--	--	--	--	--	--
	Cymene (Isopropyltoluene)	$\mu g/m^2,min^{-1}$	12	8%	11	0.0135	0.0162	0.0258	0.02377	0.0262	0.0366	1	0.268	--	0.268	0.268	--	0.268
	Dibromochloromethane	$\mu g/m^2,min^{-1}$	9	0%	9	0.0193	0.0193	0.0196	0.02041	0.0198	0.0277	0	--	--	--	--	--	--
	Dibromochloropropane	$\mu g/m^2,min^{-1}$	9	0%	9	0.118	0.119	0.12	0.12544	0.1215	0.17	0	--	--	--	--	--	--
	Dibromomethane	$\mu g/m^2,min^{-1}$	12	0%	12	0.00963	0.01265	0.0162	0.01533	0.0162	0.0231	0	--	--	--	--	--	--
	Dichloromethane (Methylene chloride)	$\mu g/m^2,min^{-1}$	12	8%	11	0.00924	0.00924	0.00924	0.01123	0.0139	0.0169	1	0.0227	--	0.0227	0.0227	--	0.0227
	Ethanol	$\mu g/m^2,min^{-1}$	12	33%	8	0.0119	0.0119	0.0119	0.04844	0.10475	0.121	4	0.111	0.112	0.279	0.309	0.536	0.567
	Ethylbenzene	$\mu g/m^2,min^{-1}$	12	25%	9	0.0116	0.0116	0.0119	0.01418	0.0181	0.0212	3	0.0212	0.0212	0.0212	0.0236	0.0285	0.0285
	Freon-11	$\mu g/m^2,min^{-1}$	12	17%	10	0.015	0.015	0.0154	0.01744	0.02188	0.0239	2	0.0173	--	0.0231	0.0231	--	0.0289
	Freon-113	$\mu g/m^2,min^{-1}$	12	0%	12	0.02	0.02	0.0204	0.02406	0.02993	0.0366	0	--	--	--	--	--	--
	Freon-12	$\mu g/m^2,min^{-1}$	12	33%	8	0.0131	0.0135	0.0135	0.01494	0.01755	0.02	4	0.0196	0.0255	0.047	0.0444	0.0606	0.0639
	Heptane	$\mu g/m^2,min^{-1}$	12	17%	10	0.00886	0.00886	0.00886	0.00975	0.00963	0.0154	2	0.015	--	0.0341	0.0341	--	0.0531
	Hexachlorobutadiene	$\mu g/m^2,min^{-1}$	9	11%	8	0.0558	0.0562	0.0564	0.05959	0.0577	0.0805	1	1.37	--	1.37	1.37	--	1.37
	Isopropylbenzene	$\mu g/m^2,min^{-1}$	12	25%	9	0.0119	0.0119	0.0123	0.0129	0.01385	0.0162	3	0.0285	0.0285	0.0708	0.175	0.425	0.425
	m & p-Xylenes	$\mu g/m^2,min^{-1}$	9	44%	5	0.0231	0.0231	0.0231	0.02326	0.0235	0.0235	4	0.0235	0.0326	0.0632	0.0588	0.0808	0.0855
	Methyl ethyl ketone (2-Butanone)	$\mu g/m^2,min^{-1}$	12	50%	6	0.00655	0.00655	0.00655	0.01283	0.0229	0.0304	6	0.0447	0.0461	0.0805	0.238	0.346	1.07
	Methyl iodide	$\mu g/m^2,min^{-1}$	12	0%	12	0.00693	0.01367	0.0304	0.02599	0.0312	0.0435	0	--	--	--	--	--	--
	MTBE (Methyl tert-butyl ether)	$\mu g/m^2,min^{-1}$	12	0%	12	0.00732	0.00732	0.00732	0.00835	0.00991	0.0116	0	--	--	--	--	--	--
	Naphthalene	$\mu g/m^2,min^{-1}$	3	0%	3	0.0181	0.0181	0.0189	0.01953	0.0216	0.0216	0	--	--	--	--	--	--
	n-Butylbenzene	$\mu g/m^2,min^{-1}$	12	8%	11	0.0127	0.0154	0.0258	0.02371	0.0262	0.037	1	0.295	--	0.295	0.295	--	0.295
	n-Propylbenzene	$\mu g/m^2,min^{-1}$	12	17%	10	0.0108	0.0108	0.0108	0.01226	0.01418	0.0158	2	0.0196	--	0.0503	0.0503	--	0.0809
	o-Xylene	$\mu g/m^2,min^{-1}$	12	25%	9	0.0116	0.0116	0.0116	0.01398	0.0177	0.0208	3	0.0293	0.0293	0.0296	0.0303	0.032	0.032
	sec-Butylbenzene	$\mu g/m^2,min^{-1}$	12	17%	10	0.0139	0.0161	0.0258	0.02373	0.0262	0.0366	2	0.0327	--	0.0909	0.0909	--	0.149
	Styrene	$\mu g/m^2,min^{-1}$	12	0%	12	0.0112	0.0112	0.0116	0.01353	0.01673	0.0204	0	--	--	--	--	--	--
	tert-Butylbenzene	$\mu g/m^2,min^{-1}$	12	8%	11	0.0131	0.0154	0.0254	0.02335	0.0258	0.0362	1	0.157	--	0.157	0.157	--	0.157
	Tetrachloroethene	$\mu g/m^2,min^{-1}$	12	8%	11	0.0177	0.0177	0.0181	0.02093	0.027	0.0323	1	0.212	--	0.212	0.212	--	0.212
	Toluene	$\mu g/m^2,min^{-1}$	12	42%	7	0.01	0.01	0.01	0.01661	0.0181	0.0424	5	0.0227	0.0239	0.12	0.154	0.302	0.356
	trans-1,2-Dichloroethene	$\mu g/m^2,min^{-1}$	12	0%	12	0.00886	0.00886	0.00886	0.00976	0.0107	0.0127	0	--	--	--	--	--	--
	trans-1,3-Dichloropropene	$\mu g/m^2,min^{-1}$	12	0%	12	0.0119	0.0119	0.0123	0.01448	0.0182	0.0219	0	--	--	--	--	--	--
	Trichloroethene	$\mu g/m^2,min^{-1}$	12	0%	12	0.0142	0.0142	0.0142	0.01704	0.0213	0.0258	0	--	--	--	--	--	--
	Vinyl acetate	$\mu g/m^2,min^{-1}$	12	0%	12	0.0077	0.0077	0.0077	0.0181	0.03603	0.0531	0	--	--	--	--	--	--
	Vinyl chloride	$\mu g/m^2,min^{-1}$	12	0%	12	0.00693	0.00693	0.00693	0.00821	0.01021	0.0123	0	--	--	--	--	--	--
Volatile Organic Compounds (SIM)	1,1,2,2-Tetrachloroethane	$\mu g/m^2,min^{-1}$	12	0%	12	0.00177	0.00181	0.00181	0.0022	0.00251	0.00458	0	--	--	--	--	--	--
	1,1,2-Trichloroethane	$\mu g/m^2,min^{-1}$	9	0%	9	0.00142	0.00142	0.00142	0.00143	0.00146	0.00146	0	--	--	--	--	--	--
	1,2,3-Trichloropropane	$\mu g/m^2,min^{-1}$	9	0%	9	0.00123	0.00123	0.00123	0.00124	0.00127	0.00127	0	--	--	--	--	--	--
	1,2-Dibromoethane	$\mu g/m^2,min^{-1}$	9	0%	9	0.00204	0.00204	0.00208	0.00227	0.00231	0.00347	0	--	--	--	--	--	--

TABLE 3-14
SOIL VAPOR FLUX SAMPLE RESULTS SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	Detect Freq.	Censored (Non-Detect) Data							Detected Data[1]						
					Count	Min	Q1	Median	Mean	Q3	Max	Count	Min	Q1	Median	Mean	Q3	Max
Volatile Organic Compounds (SIM)	1,2-Dichlorobenzene	$\mu g/m^2,min^{-1}$	9	11%	8	0.00154	0.00154	0.00154	0.00156	0.00158	0.00158	1	0.0115	--	0.0115	0.0115	--	0.0115
	1,2-Dichloroethane	$\mu g/m^2,min^{-1}$	12	8%	11	0.00108	0.00108	0.00108	0.00134	0.00162	0.00273	1	0.00196	--	0.00196	0.00196	--	0.00196
	1,2-Dichloropropane	$\mu g/m^2,min^{-1}$	9	0%	9	0.00123	0.00123	0.00123	0.00124	0.00127	0.00127	0	--	--	--	--	--	--
	1,3-Dichlorobenzene	$\mu g/m^2,min^{-1}$	9	11%	8	0.00158	0.00158	0.00158	0.00162	0.00161	0.00185	1	0.0104	--	0.0104	0.0104	--	0.0104
	1,4-Dichlorobenzene	$\mu g/m^2,min^{-1}$	12	8%	11	0.00158	0.00158	0.00158	0.00206	0.0025	0.004	1	0.018	--	0.018	0.018	--	0.018
	Benzene	$\mu g/m^2,min^{-1}$	9	56%	4	0.00501	0.00522	0.00761	0.00861	0.01299	0.0142	5	0.00343	0.00357	0.0128	0.0124	0.0211	0.0257
	Benzyl chloride	$\mu g/m^2,min^{-1}$	9	0%	9	0.001	0.001	0.001	0.00101	0.00104	0.00104	0	--	--	--	--	--	--
	Bromodichloromethane	$\mu g/m^2,min^{-1}$	9	0%	9	0.00116	0.00116	0.00116	0.00117	0.00119	0.00119	0	--	--	--	--	--	--
	Carbon tetrachloride	$\mu g/m^2,min^{-1}$	12	100%	0	--	--	--	--	--	--	12	0.00296	0.00415	0.00678	0.043	0.012	0.433
	Chloroform	$\mu g/m^2,min^{-1}$	12	100%	0	--	--	--	--	--	--	12	0.00458	0.0125	0.0194	0.0534	0.0639	0.317
	Dibromochloromethane	$\mu g/m^2,min^{-1}$	12	8%	11	0.00123	0.00162	0.00162	0.0016	0.00166	0.00204	1	0.0215	--	0.0215	0.0215	--	0.0215
	Dibromochloropropane	$\mu g/m^2,min^{-1}$	12	0%	12	0.00527	0.00531	0.00537	0.00878	0.01141	0.0278	0	--	--	--	--	--	--
	Dichloromethane (Methylene chloride)	$\mu g/m^2,min^{-1}$	9	56%	4	0.00092	0.00092	0.00092	0.00093	0.00095	0.00096	5	0.0025	0.00331	0.0121	0.0142	0.0263	0.0376
	Hexachlorobutadiene	$\mu g/m^2,min^{-1}$	12	8%	11	0.00281	0.00285	0.00285	0.00353	0.00427	0.00716	1	0.234	--	0.234	0.234	--	0.234
	Naphthalene	$\mu g/m^2,min^{-1}$	9	11%	8	0.00285	0.00289	0.00289	0.0029	0.00292	0.00293	1	0.0298	--	0.0298	0.0298	--	0.0298
	Tetrachloroethene	$\mu g/m^2,min^{-1}$	9	22%	7	0.00177	0.00177	0.00243	0.00265	0.00354	0.004	2	0.00766	--	0.0923	0.0923	--	0.177
	Trichloroethene	$\mu g/m^2,min^{-1}$	9	11%	8	0.00142	0.00146	0.00258	0.00283	0.00376	0.00589	1	0.00212	--	0.00212	0.00212	--	0.00212
	Vinyl chloride	$\mu g/m^2,min^{-1}$	9	0%	9	0.00069	0.00069	0.00069	0.00069	0.00069	0.00069	0	--	--	--	--	--	--

Notes:

Values for Q1, median, mean, and Q3 are rounded to 3 significant figures.

Max = Maximum

Min = Minimum

Q1 = 1st quartile (25th percentile)

Q3 = 3rd quartile (75th percentile)

(1) Range of detections include estimated values of detect results ("J" flagged values).

-- = Not applicable or no value has been established.

TABLE 5-1
BACKGROUND COMPARISON SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

	Galleria Dr. Right-of-Way Sub-Area															
			Censored (Non-Detect) Data							Detected Data[1]						
Chemical	Total Count	Detect Freq.	Count	Min	Q1	Median	Mean	Q3	Max	Count	Min	Q1	Median	Mean	Q3	Max
Aluminum	69	100%	0	--	--	--	--	--	--	69	5280	9300	10000	11000	12000	18700
Antimony	69	0%	69	0.225	0.23	0.32	0.67	0.32	2.6	0	--	--	--	--	--	--
Arsenic	69	94%	4	5.2	5.2	5.3	5.3	5.3	5.3	65	3.4	5.2	6.1	6.4	7	14.2
Barium	69	100%	0	--	--	--	--	--	--	69	119	350	450	470	530	1300
Beryllium	69	88%	8	0.51	0.51	0.51	0.51	0.52	0.53	61	0.38	0.55	0.59	0.62	0.67	1.2
Boron	69	0%	69	2.99	17	17	19	17	52	0	--	--	--	--	--	--
Cadmium	69	46%	37	0.04	0.1	0.26	0.21	0.26	0.27	32	0.089	0.11	0.15	0.16	0.2	0.37
Calcium	69	100%	0	--	--	--	--	--	--	69	12700	19000	26000	28000	33000	86700
Chromium	69	100%	0	--	--	--	--	--	--	69	6.5	13	16	16	19	27.9
Chromium (VI)	69	39%	42	0.1	0.1	0.1	0.15	0.11	0.42	27	0.1	0.12	0.2	0.3	0.25	2.1
Cobalt	69	100%	0	--	--	--	--	--	--	69	3.6	7.9	8.8	8.9	9.7	13.2
Copper	69	100%	0	--	--	--	--	--	--	69	12	17	20	20	22	63.7
Iron	69	100%	0	--	--	--	--	--	--	69	6360	15000	17000	17000	19000	24100
Lead	69	100%	0	--	--	--	--	--	--	69	9.2	13	15	22	23	121
Lithium	69	100%	0	--	--	--	--	--	--	69	7.3	15	17	17	19	35.4
Magnesium	69	100%	0	--	--	--	--	--	--	69	4770	9000	10000	10000	11000	19700
Manganese	69	100%	0	--	--	--	--	--	--	69	301	440	510	530	610	867
Mercury	69	14%	59	0.005	0.034	0.034	0.029	0.035	0.0364	10	0.0056	0.0072	0.014	0.021	0.038	0.0529
Molybdenum	69	57%	30	0.47	0.47	2.5	2	2.6	2.6	39	0.52	0.62	0.74	0.88	0.92	2.1
Nickel	69	100%	0	--	--	--	--	--	--	69	6.6	15	17	17	19	28.9
Potassium	69	100%	0	--	--	--	--	--	--	69	1040	1800	2200	2200	2500	3710
Selenium	69	1%	68	0.225	0.4	0.4	0.86	0.4	2.6	1	0.33	--	0.33	0.33	--	0.33
Silver	69	43%	39	0.04	0.11	0.11	0.22	0.11	1	30	0.055	0.07	0.11	0.12	0.15	0.21

TABLE 5-1
BACKGROUND COMPARISON SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

	Galleria Dr. Right-of-Way Sub-Area															
			Censored (Non-Detect) Data							Detected Data[1]						
Chemical	**Total Count**	**Detect Freq.**	**Count**	**Min**	**Q1**	**Median**	**Mean**	**Q3**	**Max**	**Count**	**Min**	**Q1**	**Median**	**Mean**	**Q3**	**Max**
Sodium	69	100%	0	--	--	--	--	--	--	69	125	220	440	540	760	1660
Strontium	69	100%	0	--	--	--	--	--	--	69	105	190	280	310	370	838
Thallium	69	1%	68	0.105	0.75	0.75	0.62	0.75	1	1	1.1	--	1.1	1.1	--	1.1
Tin	69	19%	56	0.75	0.75	0.75	0.76	0.75	1	13	0.86	0.92	1.1	1.6	1.7	3.9
Titanium	69	100%	0	--	--	--	--	--	--	69	306	520	650	650	770	1030
Tungsten	69	19%	56	0.185	1.3	1.3	1.1	1.3	2.6	13	1.3	1.7	2.1	2.9	3.5	8.5
Uranium	69	100%	0	--	--	--	--	--	--	69	0.64	0.86	0.98	1.1	1.3	3.9
Vanadium	69	100%	0	--	--	--	--	--	--	69	20.7	45	51	52	59	75.3
Zinc	69	100%	0	--	--	--	--	--	--	69	32.6	42	45	49	56	93.1
Radium-226	70	86%	10	--	--	--	--	--	--	60	0.168	0.6	1	1	1.3	2.42
Radium-228	70	93%	5	--	--	--	--	--	--	65	0.525	1.2	1.6	1.6	1.9	3.37
Thorium-228	70	100%	0	--	--	--	--	--	--	70	0.742	1.3	1.5	1.6	1.8	3.15
Thorium-230	70	99%	1	--	--	--	--	--	--	69	0.416	0.9	1.2	1.2	1.4	2.23
Thorium-232	70	100%	0	--	--	--	--	--	--	70	0.657	1.2	1.4	1.4	1.7	2.93
Uranium-233/234	70	96%	3	--	--	--	--	--	--	67	0.312	0.69	0.9	1	1.2	2.34
Uranium-235/236	70	4%	67	--	--	--	--	--	--	3	-0.0434	0.034	0.059	0.075	0.11	0.449
Uranium-238	70	97%	2	--	--	--	--	--	--	68	0.405	0.7	0.9	0.92	1.1	1.58

Note: Background comparison t-tests were performed using one-half the detection limit for metals and using GiSdT® (Neptune and Company 2009). The non-parametric Gehan, quantile and slippage tests make no adjustment for detection limits, since their algorithms account for non-detects through Gehan ranking.
Max = Maximum
Min = Minimum
Q1 = 1st quartile (25th percentile)
Q3 = 3rd quartile (75th percentile)
(1) Range of detections include estimated values of detect results between the detection limit and reporting limit. As such some minimum detected concentrations may be below the minimum reporting limit. In these cases the respective sample results are flagged in the dataset.
BOLD with Highlight indicates Site concentrations are greater than background.
WRS = Wilcoxon Rank Sum Test with the Gehan Modification
N/A = Not applicable.

TABLE 5-1
BACKGROUND COMPARISON SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

	Shallow McCullough Qal Background															
			Censored (Non-Detect) Data							Detected Data[1]						
Chemical	Total Count	Detect Freq.	Count	Min	Q1	Median	Mean	Q3	Max	Count	Min	Q1	Median	Mean	Q3	Max
Aluminum	95	100%	0	--	--	--	--	--	--	95	3740	6700	8400	9000	11000	15300
Antimony	95	45%	52	0.3298	0.33	0.33	0.33	0.33	0.3298	43	0.12	0.15	0.22	0.24	0.29	0.5
Arsenic	95	100%	0	--	--	--	--	--	--	95	2.5	3.4	4	4.2	5	7.2
Barium	95	100%	0	--	--	--	--	--	--	95	73	140	170	180	220	445
Beryllium	95	100%	0	--	--	--	--	--	--	95	0.16	0.46	0.57	0.59	0.73	0.89
Boron	95	36%	61	3.2	3.2	3.2	3.2	3.2	3.2	34	5.2	5.8	6.8	7.1	8.3	11.6
Cadmium	95	0%	95	0.1291	0.13	0.13	0.13	0.13	0.1291	0	--	--	--	--	--	--
Calcium	95	100%	0	--	--	--	--	--	--	95	9440	18000	25000	29000	37000	82800
Chromium	95	100%	0	--	--	--	--	--	--	95	2.6	6.8	9	9.1	11	16.7
Chromium (VI)	95	0%	95	0.25	0.25	0.26	0.26	0.26	0.32	0	--	--	--	--	--	--
Cobalt	95	100%	0	--	--	--	--	--	--	95	3.7	7.3	9	8.8	10	16.3
Copper	95	100%	0	--	--	--	--	--	--	95	10.2	15	18	18	20	25.9
Iron	95	100%	0	--	--	--	--	--	--	95	5410	11000	13000	13000	16000	19700
Lead	95	100%	0	--	--	--	--	--	--	95	3	6	7.2	8.2	9.3	35.1
Lithium	95	100%	0	--	--	--	--	--	--	95	7.5	11	13	14	17	26.5
Magnesium	95	100%	0	--	--	--	--	--	--	95	4690	8500	10000	10000	13000	17500
Manganese	95	100%	0	--	--	--	--	--	--	95	151	320	410	410	500	863
Mercury	95	77%	22	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	73	0.0084	0.012	0.018	0.023	0.028	0.11
Molybdenum	95	100%	0	--	--	--	--	--	--	95	0.3	0.41	0.49	0.55	0.61	2
Nickel	95	100%	0	--	--	--	--	--	--	95	7.9	14	16	16	19	30
Potassium	95	100%	0	--	--	--	--	--	--	95	625	1200	1600	1800	2200	3890
Selenium	95	35%	62	0.1579	0.16	0.16	0.16	0.16	0.1579	33	0.23	0.28	0.31	0.33	0.36	0.6
Silver	95	0%	95	0.2609	0.26	0.26	0.26	0.26	0.2609	0	--	--	--	--	--	--

TABLE 5-1
BACKGROUND COMPARISON SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

	Shallow McCullough Qal Background															
			Censored (Non-Detect) Data							Detected Data[1]						
Chemical	**Total Count**	**Detect Freq.**	**Count**	**Min**	**Q1**	**Median**	**Mean**	**Q3**	**Max**	**Count**	**Min**	**Q1**	**Median**	**Mean**	**Q3**	**Max**
Sodium	95	100%	0	--	--	--	--	--	--	95	128	210	490	500	690	1320
Strontium	95	100%	0	--	--	--	--	--	--	95	75.5	140	190	230	270	808
Thallium	95	22%	74	0.5428	0.54	0.54	0.54	0.54	0.5428	21	1.1	1.2	1.4	1.4	1.7	1.8
Tin	95	100%	0	--	--	--	--	--	--	95	0.24	0.41	0.51	0.5	0.57	0.8
Titanium	95	100%	0	--	--	--	--	--	--	95	262	460	540	560	660	1010
Tungsten	95	0%	95	0.0175	0.018	0.018	0.018	0.018	0.0175	0	--	--	--	--	--	--
Uranium	94	100%	0	--	--	--	--	--	--	94	0.62	0.84	0.97	1	1.1	2.7
Vanadium	95	100%	0	--	--	--	--	--	--	95	20.2	34	38	39	45	59.1
Zinc	95	100%	0	--	--	--	--	--	--	95	15.4	30	38	38	43	121
Radium-226	95	96%	4	--	--	--	--	--	--	91	0.494	0.95	1.1	1.1	1.3	2.36
Radium-228	81	80%	16	--	--	--	--	--	--	65	0.946	1.6	1.9	1.9	2.2	2.92
Thorium-228	95	100%	0	--	--	--	--	--	--	95	1.15	1.5	1.8	1.7	1.9	2.28
Thorium-230	95	100%	0	--	--	--	--	--	--	95	0.73	1	1.2	1.3	1.5	3.01
Thorium-232	95	100%	0	--	--	--	--	--	--	95	1.22	1.4	1.7	1.7	1.9	2.23
Uranium-233/234	95	47%	50	--	--	--	--	--	--	45	0.63	0.9	1.1	1.2	1.2	2.84
Uranium-235/236	95	44%	53	--	--	--	--	--	--	42	0.0009	0.045	0.06	0.07	0.092	0.21
Uranium-238	95	100%	0	--	--	--	--	--	--	95	0.65	0.94	1.1	1.2	1.4	2.37

Note: Background comparison t-tests were performed using one-half the detection limit for metals and using GiSdT (Neptune and Company 2009). The non-parametric Gehan, quantile and slippage tests make no adjustment for detection limits, since their algorithms account for non-detects through Gehan ranking.
Max = Maximum
Min = Minimum
Q1 = 1st quartile (25th percentile)
Q3 = 3rd quartile (75th percentile)
(1) Range of detections include estimated values of detect results between the detection limit and reporting limit. As such some minimum detected concentrations may be below the minimum reporting limit. In these cases the respective sample results are flagged in the dataset.
BOLD with Highlight indicates Site concentrations are greater than background.
WRS = Wilcoxon Rank Sum Test with the Gehan Modification
N/A = Not applicable.

TABLE 5-1
BACKGROUND COMPARISON SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	T Test *p*	Quantile Test *p*	Slippage Test *p*	WRS Test *p*	Greater than Background?	Units	Basis
Aluminum	1.5 E-5	2.1 E-1	4.2 E-1	6.9 E-5	YES	mg/kg	Multiple tests
Antimony	5.7 E-3	8.8 E-1	1.0 E+0	9.2 E-1	NO	mg/kg	Multiple tests; ND in Site data
Arsenic	2.8 E-11	2.4 E-9	8.6 E-7	2.2 E-16	YES	mg/kg	Multiple tests
Barium	2.9 E-19	2.8 E-18	8.8 E-17	0.0 E+0	YES	mg/kg	Multiple tests
Beryllium	6.6 E-1	9.8 E-1	4.2 E-1	1.6 E-1	NO	mg/kg	Multiple tests
Boron	1.4 E-9	1.0 E+0	1.0 E+0	6.6 E-14	NO	mg/kg	Multiple tests; ND in Site data
Cadmium	1.4 E-14	5.9 E-11	NA	5.1 E-6	YES	mg/kg	Multiple tests
Calcium	6.3 E-1	7.4 E-1	4.2 E-1	3.7 E-1	NO	mg/kg	Multiple tests
Chromium	9.0 E-19	7.0 E-15	5.1 E-14	0.0 E+0	YES	mg/kg	Multiple tests
Chromium (VI)	1.6 E-1	8.4 E-15	NA	1.0 E+0	YES	mg/kg	Quantile Test
Cobalt	3.3 E-1	8.0 E-1	1.0 E+0	3.9 E-1	NO	mg/kg	Multiple tests
Copper	1.3 E-3	7.3 E-4	1.2 E-2	5.6 E-4	YES	mg/kg	Multiple tests
Iron	6.0 E-12	1.4 E-6	4.4 E-5	1.0 E-10	YES	mg/kg	Multiple tests
Lead	2.3 E-8	1.9 E-13	3.0 E-4	0.0 E+0	YES	mg/kg	Multiple tests
Lithium	4.5 E-6	6.1 E-2	3.0 E-2	3.0 E-7	YES	mg/kg	Multiple tests
Magnesium	3.8 E-1	9.8 E-1	4.2 E-1	6.0 E-1	NO	mg/kg	Multiple tests
Manganese	2.0 E-8	3.7 E-4	4.2 E-1	4.3 E-8	YES	mg/kg	Multiple tests
Mercury	9.2 E-1	1.0 E+0	1.0 E+0	4.6 E-6	YES	mg/kg	WRS Test
Molybdenum	6.6 E-10	1.9 E-2	3.3 E-1	6.2 E-15	YES	mg/kg	Multiple tests
Nickel	1.6 E-1	8.0 E-1	1.0 E+0	1.8 E-1	NO	mg/kg	Multiple tests
Potassium	6.5 E-6	4.2 E-3	1.0 E+0	7.3 E-7	YES	mg/kg	Multiple tests
Selenium	5.7 E-6	1.0 E+0	1.0 E+0	0.0 E+0	YES	mg/kg	Multiple tests
Silver	9.0 E-1	4.8 E-9	NA	1.0 E+0	YES	mg/kg	Quantile Test

TABLE 5-1
BACKGROUND COMPARISON SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	T Test *p*	Quantile Test *p*	Slippage Test *p*	WRS Test *p*	Greater than Background?	Units	Basis
Sodium	2.4 E-1	1.6 E-1	7.3 E-2	4.5 E-1	NO	mg/kg	Multiple tests
Strontium	5.4 E-4	2.8 E-2	4.2 E-1	2.5 E-5	YES	mg/kg	Multiple tests
Thallium	1.0 E+0	1.0 E+0	1.0 E+0	1.1 E-2	YES	mg/kg	WRS Test
Tin	8.4 E-2	9.3 E-1	4.3 E-6	0.0 E+0	YES	mg/kg	Multiple tests
Titanium	1.6 E-4	3.7 E-4	4.2 E-1	2.1 E-4	YES	mg/kg	Multiple tests
Tungsten	6.3 E-9	1.4 E-8	NA	0.0 E+0	YES	mg/kg	Multiple tests
Uranium	5.3 E-2	1.3 E-1	4.2 E-1	2.0 E-1	NO	mg/kg	Multiple tests
Vanadium	6.9 E-15	8.3 E-10	3.1 E-7	2.6 E-14	YES	mg/kg	Multiple tests
Zinc	1.2 E-8	3.7 E-4	1.0 E+0	1.3 E-10	YES	mg/kg	Multiple tests
Radium-226	9.8 E-1	4.2 E-1	1.8 E-1	9.8 E-1	NO	pCi/g	Multiple tests
Radium-228	1.0 E+0	9.7 E-1	4.6 E-1	1.0 E+0	NO	pCi/g	Multiple tests
Thorium-228	9.9 E-1	8.7 E-1	5.1 E-3	1.0 E+0	NO	pCi/g	Multiple tests
Thorium-230	9.9 E-1	9.9 E-1	1.0 E+0	9.8 E-1	NO	pCi/g	Multiple tests
Thorium-232	1.0 E+0	9.9 E-1	7.4 E-2	1.0 E+0	NO	pCi/g	Multiple tests
Uranium-233/234	1.0 E+0	7.5 E-1	1.0 E+0	1.0 E+0	NO	pCi/g	Multiple tests
Uranium-235/236	3.2 E-1	1.3 E-1	1.8 E-1	5.5 E-1	NO	pCi/g	All other radionuclides not greater than background; all results near noise level of instrument
Uranium-238	1.0 E+0	9.8 E-1	1.0 E+0	1.0 E+0	NO	pCi/g	Multiple tests

Note: Background comparison t-tests were performed using one-half the detection limit for metals and using GiSdT (Neptune and Company 2009). The non-parametric Gehan, quantile and slippage tests make no adjustment for detection limits, since their algorithms account for non-detects through Gehan ranking.
Max = Maximum
Min = Minimum
Q1 = 1st quartile (25th percentile)
Q3 = 3rd quartile (75th percentile)
(1) Range of detections include estimated values of detect results between the detection limit and reporting limit. As such some minimum detected concentrations may be below the minimum reporting limit. In these cases the respective sample results are flagged in the dataset.
BOLD with Highlight indicates Site concentrations are greater than background.
WRS = Wilcoxon Rank Sum Test with the Gehan Modification
N/A = Not applicable.

TABLE 5-5
COMPARISONS TO RESIDENTIAL SOIL BCLs
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Max. Detect	Greater than Background?	Residential Soil BCL	1/10th Residential Soil BCL	Max. Detect Greater than 1/10th Residential BCL
Aldehydes									
Acetaldehyde	mg/kg	7	69	10.1%	0.594	--	13.9	1.39	NO
Formaldehyde	mg/kg	41	69	59.4%	0.566	--	10.6	1.06	NO
Asbestos									
Asbestos	Structures	--	--	--	--	--	--	--	--
Dioxins / Furans									
1,2,3,4,6,7,8-Heptachlorodibenzofuran	pg/g	34	43	79.1%	250	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	pg/g	23	43	53.5%	78	--	--	--	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran	pg/g	29	43	67.4%	100	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzofuran	pg/g	30	43	69.8%	100	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	pg/g	1	43	2.3%	3	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzofuran	pg/g	26	43	60.5%	63	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	pg/g	7	43	16.3%	5.8	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzofuran	pg/g	13	43	30.2%	8.9	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	pg/g	8	43	18.6%	5.2	--	--	--	--
1,2,3,7,8-Pentachlorodibenzofuran	pg/g	25	43	58.1%	58	--	--	--	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	pg/g	5	43	11.6%	3.8	--	--	--	--
2,3,4,6,7,8-Hexachlorodibenzofuran	pg/g	18	43	41.9%	15	--	--	--	--
2,3,4,7,8-Pentachlorodibenzofuran	pg/g	20	43	46.5%	28	--	--	--	--
2,3,7,8-Tetrachlorodibenzofuran	pg/g	35	43	81.4%	66	--	--	--	--
2,3,7,8-Tetrachlorodibenzo-p-dioxin	pg/g	11	43	25.6%	1.5	--	--	--	--
Octachlorodibenzodioxin	pg/g	20	43	46.5%	420	--	--	--	--
Octachlorodibenzofuran	pg/g	35	43	81.4%	1600	--	--	--	--
TCDD TEQ	pg/g	43	43	--	42.6	--	50	--	--
General Chemistry/Ions									
Ammonia (as N)	mg/kg	11	69	15.9%	1.8	--	--	--	--
Bromide	mg/kg	17	69	24.6%	3	--	--	--	--
Chlorate	mg/kg	12	69	17.4%	10.2	--	--	--	--
Chloride	mg/kg	69	69	100%	958	--	--	--	--
Cyanide, Total	mg/kg	17	69	24.6%	1.8	--	1220	122	NO
Fluoride	mg/kg	52	69	75.4%	3.8	--	3670	367	NO
Nitrate	mg/kg	69	69	100%	202	--	100000	10000	NO
Nitrite	mg/kg	11	69	15.9%	0.95	--	7820	782	NO
Orthophosphate as P	mg/kg	22	69	31.9%	9.2	--	--	--	--
Perchlorate	mg/kg	60	69	87.0%	26.1	--	54.8	5.48	YES
Sulfate	mg/kg	67	69	97.1%	7440	--	--	--	--
Sulfide	mg/kg	3	69	4.3%	28.3	--	--	--	--
Total Kjeldahl Nitrogen (TKN)	mg/kg	67	69	97.1%	1060	--	--	--	--

TABLE 5-5
COMPARISONS TO RESIDENTIAL SOIL BCLs
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Max. Detect	Greater than Background?	Residential Soil BCL	1/10th Residential Soil BCL	Max. Detect Greater than 1/10th Residential BCL
Metals									
Aluminum	mg/kg	69	69	100%	18700	YES	77200	7720	YES
Antimony	mg/kg	0	69	0%	--	NO	31.3	3.13	--
Arsenic	mg/kg	65	69	94.2%	14.2	YES	0.39	0.039	YES
Barium	mg/kg	69	69	100%	1300	YES	15300	1530	NO
Beryllium	mg/kg	61	69	88.4%	1.2	NO	155	15.5	--
Boron	mg/kg	0	69	0%	--	NO	15600	1560	--
Cadmium	mg/kg	32	69	46.4%	0.37	YES	38.9	3.89	NO
Calcium	mg/kg	69	69	100%	86700	NO	--	--	--
Chromium	mg/kg	69	69	100%	27.9	YES	100000	10000	NO
Chromium (VI)	mg/kg	27	69	39.1%	2.1	YES	234	23.4	NO
Cobalt	mg/kg	69	69	100%	13.2	NO	23.4	2.34	--
Copper	mg/kg	69	69	100%	63.7	YES	2910	291	NO
Iron	mg/kg	69	69	100%	24100	YES	54800	5480	YES
Lead	mg/kg	69	69	100%	121	YES	400	--	--
Lithium	mg/kg	69	69	100%	35.4	YES	156	15.6	YES
Magnesium	mg/kg	69	69	100%	19700	NO	100000	10000	--
Manganese	mg/kg	69	69	100%	867	YES	1820	182	YES
Mercury	mg/kg	10	69	14.5%	0.0529	YES	23.5	2.35	NO
Molybdenum	mg/kg	39	69	56.5%	2.1	YES	391	39.1	NO
Nickel	mg/kg	69	69	100%	28.9	NO	1540	154	--
Potassium	mg/kg	69	69	100%	3710	YES	--	--	--
Selenium	mg/kg	1	69	1.4%	0.33	YES	391	39.1	NO
Silver	mg/kg	30	69	43.5%	0.21	YES	391	39.1	NO
Sodium	mg/kg	69	69	100%	1660	NO	--	--	--
Strontium	mg/kg	69	69	100%	838	YES	46900	4690	NO
Thallium	mg/kg	1	69	1.4%	1.1	YES	5.48	0.548	YES
Tin	mg/kg	13	69	18.8%	3.9	YES	46900	4690	NO
Titanium	mg/kg	69	69	100%	1030	YES	100000	10000	NO
Tungsten	mg/kg	13	69	18.8%	8.5	YES	587	58.7	NO
Uranium	mg/kg	69	69	100%	3.9	NO	234	23.4	--
Vanadium	mg/kg	69	69	100%	75.3	YES	391	39.1	YES
Zinc	mg/kg	69	69	100%	93.1	YES	23500	2350	NO
Organochlorine Pesticides									
2,4-DDD	mg/kg	4	69	5.8%	0.0052	--	--	--	--
2,4-DDE	mg/kg	22	69	31.9%	0.025	--	--	--	--
4,4-DDD	mg/kg	1	69	1.4%	0.015	--	2.44	0.244	NO
4,4-DDE	mg/kg	27	69	39.1%	0.092	--	1.72	0.172	NO

TABLE 5-5
COMPARISONS TO RESIDENTIAL SOIL BCLs
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Max. Detect	Greater than Background?	Residential Soil BCL	1/10th Residential Soil BCL	Max. Detect Greater than 1/10th Residential BCL
4,4-DDT	mg/kg	23	69	33.3%	0.045	--	1.72	0.172	NO
Aldrin	mg/kg	0	69	0%	--	--	0.0286	0.00286	--
alpha-BHC	mg/kg	2	69	2.9%	0.0029	--	21.1	2.11	NO
alpha-Chlordane	mg/kg	0	69	0%	--	--	--	--	--
beta-BHC	mg/kg	20	69	29.0%	0.017	--	4.22	0.422	NO
Chlordane	mg/kg	0	69	0%	--	--	1.62	0.162	--
delta-BHC	mg/kg	0	69	0%	--	--	--	--	--
Dieldrin	mg/kg	1	69	1.4%	0.0025	--	0.0304	0.00304	NO
Endosulfan I	mg/kg	0	69	0%	--	--	367	36.7	--
Endosulfan II	mg/kg	0	69	0%	--	--	367	36.7	--
Endosulfan sulfate	mg/kg	0	69	0%	--	--	--	--	--
Endrin	mg/kg	0	69	0%	--	--	18.3	1.83	--
Endrin aldehyde	mg/kg	1	69	1.4%	0.0022	--	--	--	--
Endrin ketone	mg/kg	0	69	0%	--	--	--	--	--
gamma-BHC (Lindane)	mg/kg	0	69	0%	--	--	0.703	0.0703	--
gamma-Chlordane	mg/kg	1	69	1.4%	0.002	--	--	--	--
Heptachlor	mg/kg	0	69	0%	--	--	0.108	0.0108	--
Heptachlor epoxide	mg/kg	0	69	0%	--	--	0.0534	0.00534	--
Methoxychlor	mg/kg	3	69	4.3%	0.0044	--	306	30.6	NO
Toxaphene	mg/kg	0	69	0%	--	--	0.442	0.0442	--
Polynuclear Aromatic Hydrocarbons									
Acenaphthene	mg/kg	0	69	0%	--	--	509	50.9	--
Acenaphthylene	mg/kg	0	69	0%	--	--	147	14.7	--
Anthracene	mg/kg	4	69	5.8%	0.00451	--	2000	200	NO
Benzo(a)anthracene	mg/kg	8	69	11.6%	0.00664	--	0.621	0.0621	NO
Benzo(a)pyrene	mg/kg	16	69	23.2%	0.00822	--	0.0621	0.00621	YES
Benzo(b)fluoranthene	mg/kg	27	69	39.1%	0.0216	--	0.621	0.0621	NO
Benzo(g,h,i)perylene	mg/kg	17	69	24.6%	0.00973	--	2350	235	NO
Benzo(k)fluoranthene	mg/kg	7	69	10.1%	0.00548	--	6.21	0.621	NO
Chrysene	mg/kg	10	69	14.5%	0.00691	--	62.1	6.21	NO
Dibenzo(a,h)anthracene	mg/kg	13	69	18.8%	0.0174	--	0.0621	0.00621	YES
Indeno(1,2,3-cd)pyrene	mg/kg	11	69	15.9%	0.0054	--	0.621	0.0621	NO
Phenanthrene	mg/kg	6	69	8.7%	0.00554	--	24.5	2.45	NO
Pyrene	mg/kg	20	69	29.0%	0.0095	--	1890	189	NO
Polychlorinated Biphenyls									
PCB 105	pg/g	21	37	56.8%	980	--	--	--	--
PCB 114	pg/g	20	37	54.1%	55	--	--	--	--
PCB 118	pg/g	23	37	62.2%	1900	--	--	--	--

TABLE 5-5
COMPARISONS TO RESIDENTIAL SOIL BCLs
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Max. Detect	Greater than Background?	Residential Soil BCL	1/10th Residential Soil BCL	Max. Detect Greater than 1/10th Residential BCL
PCB 123	pg/g	1	37	2.7%	2.4	--	--	--	--
PCB 126	pg/g	13	37	35.1%	43	--	--	--	--
PCB 156	pg/g	22	37	59.5%	510	--	--	--	--
PCB 157	pg/g	14	37	37.8%	98	--	--	--	--
PCB 167	pg/g	14	37	37.8%	190	--	--	--	--
PCB 169	pg/g	2	37	5.4%	3	--	--	--	--
PCB 189	pg/g	13	37	35.1%	85	--	--	--	--
PCB 209	pg/g	32	37	86.5%	8100	--	--	--	--
PCB 77	pg/g	0	37	0%	--	--	--	--	--
PCB 81	pg/g	0	37	0%	--	--	--	--	--
Radionuclides									
Radium-226	pCi/g	60	70	85.7%	2.42	NO	0.0071	0.00071	--
Radium-228	pCi/g	65	70	92.9%	3.37	NO	0.013	0.0013	--
Thorium-228	pCi/g	70	70	100%	3.15	NO	0.0078	0.00078	--
Thorium-230	pCi/g	69	70	98.6%	2.23	NO	3.2	0.32	--
Thorium-232	pCi/g	70	70	100%	2.93	NO	2.8	0.28	--
Uranium-233/234	pCi/g	67	70	95.7%	2.34	NO	4.2	0.42	--
Uranium-235/236	pCi/g	3	70	4.3%	0.449	NO	0.11	0.011	--
Uranium-238	pCi/g	68	70	97.1%	1.58	NO	0.46	0.046	--
Semi-Volatile Organic Compounds									
1,2,4,5-Tetrachlorobenzene	mg/kg	0	69	0%	--	--	18.3	1.83	--
1,2-Diphenylhydrazine	mg/kg	0	69	0%	--	--	0.608	0.0608	--
1,4-Dioxane	mg/kg	0	69	0%	--	--	4.86	0.486	--
2,2'-Dichlorobenzil	mg/kg	0	69	0%	--	--	23.5	2.35	--
2,4,5-Trichlorophenol	mg/kg	0	69	0%	--	--	6110	611	--
2,4,6-Trichlorophenol	mg/kg	0	69	0%	--	--	44.2	4.42	--
2,4-Dichlorophenol	mg/kg	0	69	0%	--	--	183	18.3	--
2,4-Dimethylphenol	mg/kg	0	69	0%	--	--	1220	122	--
2,4-Dinitrophenol	mg/kg	0	69	0%	--	--	122	12.2	--
2,4-Dinitrotoluene	mg/kg	0	69	0%	--	--	1.57	0.157	--
2,6-Dinitrotoluene	mg/kg	0	69	0%	--	--	61.1	6.11	--
2-Chloronaphthalene	mg/kg	0	69	0%	--	--	82.6	8.26	--
2-Chlorophenol	mg/kg	0	69	0%	--	--	220	22	--
2-Methylnaphthalene	mg/kg	0	69	0%	--	--	--	--	--
2-Nitroaniline	mg/kg	0	69	0%	--	--	183	18.3	--
2-Nitrophenol	mg/kg	0	69	0%	--	--	--	--	--
3,3-Dichlorobenzidine	mg/kg	0	69	0%	--	--	1.08	0.108	--
3-Nitroaniline	mg/kg	0	69	0%	--	--	--	--	--

TABLE 5-5
COMPARISONS TO RESIDENTIAL SOIL BCLs
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Max. Detect	Greater than Background?	Residential Soil BCL	1/10th Residential Soil BCL	Max. Detect Greater than 1/10th Residential BCL
4-Bromophenyl phenyl ether	mg/kg	0	69	0%	--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	0	69	0%	--	--	--	--	--
4-Chlorophenyl phenyl ether	mg/kg	0	69	0%	--	--	--	--	--
4-Chlorothioanisole	mg/kg	0	69	0%	--	--	--	--	--
4-Nitroaniline	mg/kg	0	69	0%	--	--	--	--	--
4-Nitrophenol	mg/kg	0	69	0%	--	--	489	48.9	--
Acetophenone	mg/kg	0	69	0%	--	--	1740	174	--
Aniline	mg/kg	0	69	0%	--	--	85.3	8.53	--
Benzenethiol	mg/kg	0	69	0%	--	--	--	--	--
Benzoic acid	mg/kg	0	69	0%	--	--	100000	10000	--
Benzyl alcohol	mg/kg	0	68	0%	--	--	30600	3060	--
bis(2-Chloroethoxy)methane	mg/kg	0	69	0%	--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	0	69	0%	--	--	0.244	0.0244	--
bis(2-Chloroisopropyl) ether	mg/kg	0	69	0%	--	--	3.37	0.337	--
bis(2-Ethylhexyl) phthalate	mg/kg	1	69	1.4%	0.0747	--	34.7	3.47	NO
bis(p-Chlorophenyl) sulfone	mg/kg	0	69	0%	--	--	--	--	--
bis(p-Chlorophenyl)disulfide	mg/kg	0	69	0%	--	--	--	--	--
Butylbenzyl phthalate	mg/kg	0	69	0%	--	--	240	24	--
Carbazole	mg/kg	0	69	0%	--	--	24.3	2.43	--
Dibenzofuran	mg/kg	0	69	0%	--	--	156	15.6	--
Dichloromethyl ether	mg/kg	0	69	0%	--	--	0.000242	0.0000242	--
Diethyl phthalate	mg/kg	0	69	0%	--	--	48900	4890	--
Dimethyl phthalate	mg/kg	0	69	0%	--	--	100000	10000	--
Di-n-butyl phthalate	mg/kg	0	69	0%	--	--	6110	611	--
Di-n-octyl phthalate	mg/kg	0	69	0%	--	--	--	--	--
Diphenyl disulfide	mg/kg	0	69	0%	--	--	--	--	--
Diphenyl sulfide	mg/kg	0	69	0%	--	--	--	--	--
Diphenyl sulfone	mg/kg	0	69	0%	--	--	183	18.3	--
Diphenylamine	mg/kg	0	69	0%	--	--	1530	153	--
Fluoranthene	mg/kg	0	69	0%	--	--	2290	229	--
Fluorene	mg/kg	0	69	0%	--	--	671	67.1	--
Hexachlorobenzene	mg/kg	0	69	0%	--	--	0.304	0.0304	--
Hexachlorobutadiene	mg/kg	0	69	0%	--	--	6.24	0.624	--
Hexachlorocyclopentadiene	mg/kg	0	69	0%	--	--	366	36.6	--
Hexachloroethane	mg/kg	0	69	0%	--	--	34.7	3.47	--
Hydroxymethyl phthalimide	mg/kg	0	69	0%	--	--	--	--	--
Isophorone	mg/kg	0	69	0%	--	--	512	51.2	--
m,p-Cresols	mg/kg	0	69	0%	--	--	306	30.6	--

TABLE 5-5
COMPARISONS TO RESIDENTIAL SOIL BCLs
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Max. Detect	Greater than Background?	Residential Soil BCL	1/10th Residential Soil BCL	Max. Detect Greater than 1/10th Residential BCL
Naphthalene	mg/kg	0	69	0%	--	--	3.1	0.31	--
Nitrobenzene	mg/kg	0	69	0%	--	--	2.69	0.269	--
N-nitrosodi-n-propylamine	mg/kg	0	69	0%	--	--	0.0695	0.00695	--
o-Cresol	mg/kg	0	69	0%	--	--	3060	306	--
Octachlorostyrene	mg/kg	0	69	0%	--	--	--	--	--
p-Chloroaniline	mg/kg	0	69	0%	--	--	2.43	0.243	--
p-Chlorobenzenethiol	mg/kg	0	69	0%	--	--	--	--	--
Pentachlorobenzene	mg/kg	0	69	0%	--	--	48.9	4.89	--
Pentachlorophenol	mg/kg	0	69	0%	--	--	0.894	0.0894	--
Phenol	mg/kg	0	69	0%	--	--	18300	1830	--
Phthalic acid	mg/kg	0	69	0%	--	--	100000	10000	--
Pyridine	mg/kg	0	69	0%	--	--	60.5	6.05	--
Volatile Organic Compounds									
1,1,1,2-Tetrachloroethane	mg/kg	0	69	0%	--	--	3.69	0.369	--
1,1,1-Trichloroethane	mg/kg	0	69	0%	--	--	1390	139	--
1,1,2,2-Tetrachloroethane	mg/kg	0	69	0%	--	--	0.472	0.0472	--
1,1,2-Trichloroethane	mg/kg	0	69	0%	--	--	1.05	0.105	--
1,1-Dichloroethane	mg/kg	0	69	0%	--	--	4.19	0.419	--
1,1-Dichloroethene	mg/kg	0	69	0%	--	--	285	28.5	--
1,1-Dichloropropene	mg/kg	0	69	0%	--	--	--	--	--
1,2,3-Trichlorobenzene	mg/kg	0	69	0%	--	--	--	--	--
1,2,3-Trichloropropane	mg/kg	0	69	0%	--	--	0.0213	0.00213	--
1,2,4-Trichlorobenzene	mg/kg	0	69	0%	--	--	22.1	2.21	--
1,2,4-Trimethylbenzene	mg/kg	5	69	7.2%	0.0012	--	144	14.4	NO
1,2-Dichlorobenzene	mg/kg	8	69	11.6%	0.00021	--	373	37.3	NO
1,2-Dichloroethane	mg/kg	0	69	0%	--	--	0.433	0.0433	--
1,2-Dichloroethene	mg/kg	0	69	0%	--	--	--	--	--
1,2-Dichloropropane	mg/kg	0	69	0%	--	--	0.82	0.082	--
1,3,5-Trichlorobenzene	mg/kg	0	69	0%	--	--	--	--	--
1,3,5-Trimethylbenzene	mg/kg	7	69	10.1%	0.00042	--	57.9	5.79	NO
1,3-Dichlorobenzene	mg/kg	7	69	10.1%	0.00022	--	214	21.4	NO
1,3-Dichloropropane	mg/kg	0	69	0%	--	--	15.2	1.52	--
1,4-Dichlorobenzene	mg/kg	7	69	10.1%	0.00031	--	2.59	0.259	NO
2,2,3-Trimethylbutane	mg/kg	0	69	0%	--	--	--	--	--
2,2-Dichloropropane	mg/kg	0	69	0%	--	--	--	--	--
2,2-Dimethylpentane	mg/kg	0	69	0%	--	--	--	--	--
2,3-Dimethylpentane	mg/kg	0	69	0%	--	--	--	--	--
2,4-Dimethylpentane	mg/kg	0	69	0%	--	--	--	--	--

TABLE 5-5
COMPARISONS TO RESIDENTIAL SOIL BCLs
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Max. Detect	Greater than Background?	Residential Soil BCL	1/10th Residential Soil BCL	Max. Detect Greater than 1/10th Residential BCL
2-Chlorotoluene	mg/kg	0	69	0%	--	--	248	24.8	--
2-Hexanone	mg/kg	0	69	0%	--	--	460	46	--
2-Methylhexane	mg/kg	0	69	0%	--	--	--	--	--
2-Nitropropane	mg/kg	0	69	0%	--	--	0.0109	0.00109	--
3,3-Dimethylpentane	mg/kg	0	69	0%	--	--	--	--	--
3-Ethylpentane	mg/kg	0	69	0%	--	--	--	--	--
3-Methylhexane	mg/kg	0	69	0%	--	--	--	--	--
4-Chlorotoluene	mg/kg	0	69	0%	--	--	--	--	--
4-Methyl-2-pentanone (MIBK)	mg/kg	0	69	0%	--	--	5800	580	--
Acetone	mg/kg	10	69	14.5%	0.048	--	60000	6000	NO
Acetonitrile	mg/kg	0	69	0%	--	--	1470	147	--
Benzene	mg/kg	4	69	5.8%	0.00021	--	0.81	0.081	NO
Bromobenzene	mg/kg	1	69	1.4%	0.00023	--	243	24.3	NO
Bromodichloromethane	mg/kg	0	69	0%	--	--	0.648	0.0648	--
Bromoform	mg/kg	0	69	0%	--	--	61.6	6.16	--
Bromomethane	mg/kg	0	69	0%	--	--	8.7	0.87	--
Carbon disulfide	mg/kg	0	69	0%	--	--	721	72.1	--
Carbon tetrachloride	mg/kg	0	69	0%	--	--	0.735	0.0735	--
Chlorobenzene	mg/kg	2	69	2.9%	0.0011	--	273	27.3	NO
Chlorobromomethane	mg/kg	0	69	0%	--	--	--	--	--
Chloroethane	mg/kg	0	69	0%	--	--	221	22.1	--
Chloroform	mg/kg	0	69	0%	--	--	0.306	0.0306	--
Chloromethane	mg/kg	3	69	4.3%	0.00031	--	1.6	0.16	NO
cis-1,2-Dichloroethene	mg/kg	0	69	0%	--	--	148	14.8	--
cis-1,3-Dichloropropene	mg/kg	0	69	0%	--	--	--	--	--
Cymene (Isopropyltoluene)	mg/kg	0	69	0%	--	--	389	38.9	--
Dibromochloromethane	mg/kg	0	69	0%	--	--	1.12	0.112	--
Dibromochloropropane	mg/kg	0	69	0%	--	--	0.0104	0.00104	--
Dibromomethane	mg/kg	0	69	0%	--	--	43.4	4.34	--
Dichloromethane (Methylene chloride)	mg/kg	27	69	39.1%	0.016	--	11	1.1	NO
Dimethyldisulfide	mg/kg	0	69	0%	--	--	--	--	--
Ethanol	mg/kg	1	69	1.4%	1.9	--	100000	10000	NO
Ethylbenzene	mg/kg	10	69	14.5%	0.0002	--	3.79	0.379	NO
Freon-11 (Trichlorofluoromethane)	mg/kg	2	69	2.9%	0.00033	--	883	88.3	NO
Freon-113 (1,1,2-Trifluoro-1,2,2-trichloroethane)	mg/kg	0	69	0%	--	--	5550	555	--
Freon-12 (Dichlorodifluoromethane)	mg/kg	0	69	0%	--	--	218	21.8	--
Heptane	mg/kg	0	69	0%	--	--	220	22	--
Isopropylbenzene	mg/kg	3	69	4.3%	0.00012	--	371	37.1	NO

TABLE 5-5
COMPARISONS TO RESIDENTIAL SOIL BCLs
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Max. Detect	Greater than Background?	Residential Soil BCL	1/10th Residential Soil BCL	Max. Detect Greater than 1/10th Residential BCL
m,p-Xylene	mg/kg	11	69	15.9%	0.0011	--	214	21.4	NO
Methyl ethyl ketone (2-Butanone)	mg/kg	3	69	4.3%	0.0099	--	32100	3210	NO
Methyl iodide	mg/kg	0	69	0%	--	--	360	36	--
MTBE (Methyl tert-butyl ether)	mg/kg	0	69	0%	--	--	39.2	3.92	--
n-Butylbenzene	mg/kg	0	69	0%	--	--	237	23.7	--
Nonanal	mg/kg	3	69	4.3%	0.0061	--	--	--	--
n-Propylbenzene	mg/kg	10	69	14.5%	0.00017	--	237	23.7	NO
o-Xylene	mg/kg	7	69	10.1%	0.00038	--	282	28.2	NO
sec-Butylbenzene	mg/kg	4	69	5.8%	0.00015	--	223	22.3	NO
Styrene	mg/kg	1	69	1.4%	0.00053	--	1730	173	NO
tert-Butylbenzene	mg/kg	4	69	5.8%	0.00013	--	393	39.3	NO
Tetrachloroethene	mg/kg	0	69	0%	--	--	0.624	0.0624	--
Toluene	mg/kg	1	69	1.4%	0.00056	--	521	52.1	NO
trans-1,2-Dichloroethene	mg/kg	0	69	0%	--	--	122	12.2	--
trans-1,3-Dichloropropene	mg/kg	1	69	1.4%	0.00015	--	--	--	--
Trichloroethene	mg/kg	0	69	0%	--	--	1.06	0.106	--
Vinyl acetate	mg/kg	0	69	0%	--	--	988	98.8	--
Vinyl chloride	mg/kg	0	69	0%	--	--	0.349	0.0349	--
Xylenes (total)	mg/kg	9	69	13.0%	0.0015	--	214	21.4	NO

mg/kg - milligrams per kilogram

pCi/g - picoCuries per gram

pg/g - picograms per gram

-- - Not available or not applicable

Chemical with at least one detection was compared to it's respective BCL.

Dioxin/furans and PCB congeners are evaluated as TCDD TEQs. These constituents, as well as lead, are evaluated using a separate process (see text).

Highlight indicates metals exceeding background and other inorganic/organic chemicals exceeding 1/10th residential BCLs.

TABLE 5-7
SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC)
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Min ND	Max ND	Min Detect	Max Detect	Mean	Greater than Background?	PBT(1) or Class A Carcinogen?	COPC?	Rationale
Aldehydes													
Acetaldehyde	mg/kg	7	69	10.1%	0.3	0.328	0.334	0.594	0.43	--	No	No	(5)(13)
Formaldehyde	mg/kg	41	69	59.4%	0.202	0.861	0.209	0.566	0.32	--	No	No	(5)(13)
Asbestos													
Asbestos	Structures	1	25	3.8%	N/A	N/A	1	1	N/A	--	Yes	Yes	(1)
Dioxins / Furans													
1,2,3,4,6,7,8-Heptachlorodibenzofuran	pg/g	34	43	79.1%	0.26	5.1	2.8	250	57	--	Yes	No	(1)(3)
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	pg/g	23	43	53.5%	0.12	5.1	3.2	78	25	--	Yes	No	(1)(3)
1,2,3,4,7,8,9-Heptachlorodibenzofuran	pg/g	29	43	67.4%	0.13	5.1	2.6	100	27	--	Yes	No	(1)(3)
1,2,3,4,7,8-Hexachlorodibenzofuran	pg/g	30	43	69.8%	0.15	5.1	2.6	100	31	--	Yes	No	(1)(3)
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	pg/g	1	43	2.3%	0.046	6.2	3	3	3	--	Yes	No	(1)(3)
1,2,3,6,7,8-Hexachlorodibenzofuran	pg/g	26	43	60.5%	0.057	5.1	3.1	63	24	--	Yes	No	(1)(3)
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	pg/g	7	43	16.3%	0.049	6.2	3	5.8	4.2	--	Yes	No	(1)(3)
1,2,3,7,8,9-Hexachlorodibenzofuran	pg/g	13	43	30.2%	0.055	6.2	3.3	8.9	5.8	--	Yes	No	(1)(3)
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	pg/g	8	43	18.6%	0.06	6.2	2.6	5.2	3.6	--	Yes	No	(1)(3)
1,2,3,7,8-Pentachlorodibenzofuran	pg/g	25	43	58.1%	0.054	5.1	2.7	58	21	--	Yes	No	(1)(3)
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	pg/g	5	43	11.6%	0.049	6.2	2.6	3.8	3.3	--	Yes	No	(1)(3)
2,3,4,6,7,8-Hexachlorodibenzofuran	pg/g	18	43	41.9%	0.046	6.2	2.6	15	8.3	--	Yes	No	(1)(3)
2,3,4,7,8-Pentachlorodibenzofuran	pg/g	20	43	46.5%	0.056	5.1	3.3	28	13	--	Yes	No	(1)(3)
2,3,7,8-Tetrachlorodibenzofuran	pg/g	35	43	81.4%	0.11	1	0.57	66	11	--	Yes	No	(1)(3)
2,3,7,8-Tetrachlorodibenzo-p-dioxin	pg/g	11	43	25.6%	0.036	1.2	0.52	1.5	0.87	--	Yes	No	(1)(3)
Octachlorodibenzodioxin	pg/g	20	43	46.5%	0.15	35	6.6	420	51	--	Yes	No	(1)(3)
Octachlorodibenzofuran	pg/g	35	43	81.4%	0.71	10	6	1600	220	--	Yes	No	(1)(3)
TCDD TEQ	pg/g	43	43	--	--	--	0.23	42.6	11	--	Yes	No	(1)(3)
General Chemistry/Ions													
Ammonia (as N)	mg/kg	11	69	15.9%	0.51	5.3	0.13	1.8	0.54	--	No	No	(5)(13)
Bromide	mg/kg	17	69	24.6%	0.26	2.7	0.42	3	1.4	--	No	No	(9)
Chlorate	mg/kg	12	69	17.4%	0.48	0.52	1.4	10.2	3.6	--	No	No	(9)
Chloride	mg/kg	69	69	100%	--	--	0.38	958	150	--	No	No	(9)
Cyanide, Total	mg/kg	17	69	24.6%	0.08	0.55	0.099	1.8	0.42	--	No	No	(5)(13)
Fluoride	mg/kg	52	69	75.4%	0.1	1.1	0.15	3.8	1.1	--	No	No	(5)(13)

TABLE 5-7
SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC)
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Min ND	Max ND	Min Detect	Max Detect	Mean	Greater than Background?	PBT(1) or Class A Carcinogen?	COPC?	Rationale
Nitrate	mg/kg	69	69	100%	--	--	0.15	202	18	--	No	No	(5)(13)
Nitrite	mg/kg	11	69	15.9%	0.033	0.72	0.073	0.95	0.29	--	No	No	(5)(13)
Orthophosphate as P	mg/kg	22	69	31.9%	0.51	5.4	0.79	9.2	2.2	--	No	No	(9)
Perchlorate	mg/kg	60	69	87.0%	0.0102	0.0109	0.0158	26.1	1.3	--	No	Yes	(5)(14)
Sulfate	mg/kg	67	69	97.1%	5.2	5.3	2.8	7440	450	--	No	No	(9)
Sulfide	mg/kg	3	69	4.3%	0.84	1.9	16.3	28.3	20	--	No	No	(4)(15)
Total Kjeldahl Nitrogen (TKN)	mg/kg	67	69	97.1%	51	52.1	25.9	1060	160	--	No	No	(9)
Metals													
Aluminum	mg/kg	69	69	100%	--	--	5280	18700	11000	YES	No	Yes	(8)(14)
Antimony	mg/kg	0	69	0%	0.225	2.6	--	--	--	NO	No	No	(2)(6)
Arsenic	mg/kg	65	69	94.2%	5.2	5.3	3.4	14.2	6.4	YES	Yes	Yes	(1)(8)(14)
Barium	mg/kg	69	69	100%	--	--	119	1300	470	YES	No	No	(8)(13)
Beryllium	mg/kg	61	69	88.4%	0.51	0.53	0.38	1.2	0.62	NO	No	No	(6)(13)
Boron	mg/kg	0	69	0%	2.99	52	--	--	--	NO	No	No	(2)(6)
Cadmium	mg/kg	32	69	46.4%	0.04	0.27	0.089	0.37	0.16	YES	No	No	(8)(13)
Calcium	mg/kg	69	69	100%	--	--	12700	86700	28000	NO	No	No	(12)(15)
Chromium	mg/kg	69	69	100%	--	--	6.5	27.9	16	YES	No	No	(8)(13)
Chromium (VI)	mg/kg	27	69	39.1%	0.1	0.42	0.1	2.1	0.3	YES	Yes	No	(8)(13)
Cobalt	mg/kg	69	69	100%	--	--	3.6	13.2	8.9	NO	No	No	(6)(13)
Copper	mg/kg	69	69	100%	--	--	12	63.7	20	YES	No	No	(8)(13)
Iron	mg/kg	69	69	100%	--	--	6360	24100	17000	YES	No	No	(8)(12)
Lead	mg/kg	69	69	100%	--	--	9.2	121	22	YES	Yes	No	(11)
Lithium	mg/kg	69	69	100%	--	--	7.3	35.4	17	YES	No	Yes	(8)(14)
Magnesium	mg/kg	69	69	100%	--	--	4770	19700	10000	NO	No	No	(12)(15)
Manganese	mg/kg	69	69	100%	--	--	301	867	530	YES	No	Yes	(8)(14)
Mercury	mg/kg	10	69	14.5%	0.005	0.0364	0.0056	0.0529	0.021	YES	No	No	(8)(13)
Molybdenum	mg/kg	39	69	56.5%	0.47	2.6	0.52	2.1	0.88	YES	No	No	(8)(13)
Nickel	mg/kg	69	69	100%	--	--	6.6	28.9	17	NO	No	No	(6)(13)
Potassium	mg/kg	69	69	100%	--	--	1040	3710	2200	YES	No	No	(12)(15)
Selenium	mg/kg	1	69	1.4%	0.225	2.6	0.33	0.33	0.33	YES	No	No	(4)(8)(13)
Silver	mg/kg	30	69	43.5%	0.04	1	0.055	0.21	0.12	YES	No	No	(8)(13)

TABLE 5-7
SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC)
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Min ND	Max ND	Min Detect	Max Detect	Mean	Greater than Background?	PBT(1) or Class A Carcinogen?	COPC?	Rationale
Sodium	mg/kg	69	69	100%	--	--	125	1660	540	NO	No	No	(6)(12)
Strontium	mg/kg	69	69	100%	--	--	105	838	310	YES	No	No	(8)(13)
Thallium	mg/kg	1	69	1.4%	0.105	1	1.1	1.1	1.1	YES	No	Yes	(8)(14)
Tin	mg/kg	13	69	18.8%	0.75	1	0.86	3.9	1.6	YES	No	No	(8)(13)
Titanium	mg/kg	69	69	100%	--	--	306	1030	650	YES	No	No	(8)(13)
Tungsten	mg/kg	13	69	18.8%	0.185	2.6	1.3	8.5	2.9	YES	No	No	(8)(13)
Uranium	mg/kg	69	69	100%	--	--	0.64	3.9	1.1	NO	No	No	(6)(13)
Vanadium	mg/kg	69	69	100%	--	--	20.7	75.3	52	YES	No	Yes	(8)(14)
Zinc	mg/kg	69	69	100%	--	--	32.6	93.1	49	YES	No	No	(8)(13)
Organochlorine Pesticides													
2,4-DDD	mg/kg	4	69	5.8%	0.00014	0.00033	0.0017	0.0052	0.004	--	Yes	No	(1)(5)(13)
2,4-DDE	mg/kg	22	69	31.9%	0.00013	0.00022	0.0026	0.025	0.0086	--	Yes	No	(1)(5)(13)
4,4-DDD	mg/kg	1	69	1.4%	0.00009	0.00012	0.015	0.015	0.015	--	Yes	No	(7)(13)
4,4-DDE	mg/kg	27	69	39.1%	0.00019	0.00044	0.002	0.092	0.018	--	Yes	No	(1)(5)(13)
4,4-DDT	mg/kg	23	69	33.3%	0.0002	0.00025	0.0018	0.045	0.0096	--	Yes	No	(1)(5)(13)
Aldrin	mg/kg	0	69	0%	0.000092	0.0001	--	--	--	--	Yes	No	(2)
alpha-BHC	mg/kg	2	69	2.9%	0.000095	0.00031	0.0026	0.0029	0.0028	--	No	No	(4)(13)
alpha-Chlordane	mg/kg	0	69	0%	0.0001	0.00023	--	--	--	--	Yes	No	(2)
beta-BHC	mg/kg	20	69	29.0%	0.00013	0.0002	0.002	0.017	0.0055	--	No	No	(5)(13)
Chlordane	mg/kg	0	69	0%	0.0015	0.0025	--	--	--	--	Yes	No	(2)
delta-BHC	mg/kg	0	69	0%	0.00011	0.00018	--	--	--	--	No	No	(2)
Dieldrin	mg/kg	1	69	1.4%	0.000092	0.0001	0.0025	0.0025	0.0025	--	Yes	No	(7)(13)
Endosulfan I	mg/kg	0	69	0%	0.000096	0.00011	--	--	--	--	No	No	(2)
Endosulfan II	mg/kg	0	69	0%	0.000094	0.00012	--	--	--	--	No	No	(2)
Endosulfan sulfate	mg/kg	0	69	0%	0.00013	0.00029	--	--	--	--	No	No	(2)
Endrin	mg/kg	0	69	0%	0.000084	0.00011	--	--	--	--	No	No	(2)
Endrin aldehyde	mg/kg	1	69	1.4%	0.00015	0.0002	0.0022	0.0022	0.0022	--	No	No	(4)(13)
Endrin ketone	mg/kg	0	69	0%	0.00013	0.00018	--	--	--	--	No	No	(2)
gamma-BHC (Lindane)	mg/kg	0	69	0%	0.0001	0.00013	--	--	--	--	No	No	(2)
gamma-Chlordane	mg/kg	1	69	1.4%	0.000084	0.000091	0.002	0.002	0.002	--	Yes	No	(7)(13)
Heptachlor	mg/kg	0	69	0%	0.000096	0.00019	--	--	--	--	No	No	(2)

TABLE 5-7
SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC)
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Min ND	Max ND	Min Detect	Max Detect	Mean	Greater than Background?	PBT(1) or Class A Carcinogen?	COPC?	Rationale
Heptachlor epoxide	mg/kg	0	69	0%	0.00012	0.00014	--	--	--	--	No	No	(2)
Methoxychlor	mg/kg	3	69	4.3%	0.00032	0.00035	0.0038	0.0044	0.004	--	No	No	(4)(13)
Toxaphene	mg/kg	0	69	0%	0.0057	0.0063	--	--	--	--	Yes	No	(2)
Polynuclear Aromatic Hydrocarbons													
Acenaphthene	mg/kg	0	69	0%	0.00168	0.00182	--	--	--	--	No	No	(2)
Acenaphthylene	mg/kg	0	69	0%	0.00168	0.00182	--	--	--	--	No	No	(2)
Anthracene	mg/kg	4	69	5.8%	0.00168	0.00182	0.00177	0.00451	0.0026	--	No	No	(5)(13)
Benzo(a)anthracene	mg/kg	8	69	11.6%	0.00168	0.00182	0.00186	0.00664	0.0033	--	No	Yes	(5)(13)(10)
Benzo(a)pyrene	mg/kg	16	69	23.2%	0.00168	0.0018	0.00181	0.00822	0.0032	--	Yes	Yes	(1)(5)(14)
Benzo(b)fluoranthene	mg/kg	27	69	39.1%	0.00168	0.00178	0.0018	0.0216	0.0086	--	No	Yes	(5)(13)(10)
Benzo(g,h,i)perylene	mg/kg	17	69	24.6%	0.00168	0.0018	0.00181	0.00973	0.0032	--	No	No	(5)(13)
Benzo(k)fluoranthene	mg/kg	7	69	10.1%	0.00168	0.00182	0.00194	0.00548	0.0033	--	No	Yes	(5)(13)(10)
Chrysene	mg/kg	10	69	14.5%	0.00168	0.00182	0.00182	0.00691	0.0035	--	No	Yes	(5)(13)(10)
Dibenzo(a,h)anthracene	mg/kg	13	69	18.8%	0.00168	0.00182	0.00184	0.0174	0.0076	--	No	Yes	(5)(14)
Indeno(1,2,3-cd)pyrene	mg/kg	11	69	15.9%	0.00168	0.00179	0.00179	0.0054	0.0028	--	No	Yes	(5)(13)(10)
Phenanthrene	mg/kg	6	69	8.7%	0.00168	0.00182	0.00191	0.00554	0.0034	--	No	No	(5)(13)
Pyrene	mg/kg	20	69	29.0%	0.00168	0.00182	0.00181	0.0095	0.0037	--	No	No	(5)(13)
Polychlorinated Biphenyls													
PCB 105	pg/g	21	37	56.8%	2	63	5.2	980	150	--	Yes	No	(1)(3)
PCB 114	pg/g	20	37	54.1%	2	2.2	2.2	55	19	--	Yes	No	(1)(3)
PCB 118	pg/g	23	37	62.2%	2	140	2.4	1900	240	--	Yes	No	(1)(3)
PCB 123	pg/g	1	37	2.7%	2	2.2	2.4	2.4	2.4	--	Yes	No	(1)(3)
PCB 126	pg/g	13	37	35.1%	2	2.2	2.1	43	10	--	Yes	No	(1)(3)
PCB 156	pg/g	22	37	59.5%	2	19	2.1	510	48	--	Yes	No	(1)(3)
PCB 157	pg/g	14	37	37.8%	2	2.2	2.6	98	16	--	Yes	No	(1)(3)
PCB 167	pg/g	14	37	37.8%	2	8	3.5	190	29	--	Yes	No	(1)(3)
PCB 169	pg/g	2	37	5.4%	2	2.2	2.3	3	2.7	--	Yes	No	(1)(3)
PCB 189	pg/g	13	37	35.1%	2	7.7	2.2	85	15	--	Yes	No	(1)(3)
PCB 209	pg/g	32	37	86.5%	2	2	22	8100	1300	--	Yes	No	(1)(3)
PCB 77	pg/g	0	37	0%	2	2.2	--	--	--	--	Yes	No	(1)(3)
PCB 81	pg/g	0	37	0%	2	2.2	--	--	--	--	Yes	No	(1)(3)

TABLE 5-7
SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC)
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Min ND	Max ND	Min Detect	Max Detect	Mean	Greater than Background?	PBT(1) or Class A Carcinogen?	COPC?	Rationale
Radionuclides													
Radium-226	pCi/g	60	70	85.7%	--	--	0.168	2.42	1	NO	Yes	No	(1)(6)
Radium-228	pCi/g	65	70	92.9%	--	--	0.525	3.37	1.6	NO	Yes	No	(1)(6)
Thorium-228	pCi/g	70	70	100%	--	--	0.742	3.15	1.6	NO	Yes	No	(1)(6)
Thorium-230	pCi/g	69	70	98.6%	--	--	0.416	2.23	1.2	NO	Yes	No	(1)(6)
Thorium-232	pCi/g	70	70	100%	--	--	0.657	2.93	1.4	NO	Yes	No	(1)(6)
Uranium-233/234	pCi/g	67	70	95.7%	--	--	0.312	2.34	1	NO	Yes	No	(1)(6)
Uranium-235/236	pCi/g	3	70	4.3%	--	--	-0.0434	0.449	0.075	NO	Yes	No	(1)(6)
Uranium-238	pCi/g	68	70	97.1%	--	--	0.405	1.58	0.92	NO	Yes	No	(1)(6)
Semi-Volatile Organic Compounds													
1,2,4,5-Tetrachlorobenzene	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
1,2-Diphenylhydrazine	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
1,4-Dioxane	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
2,2'-Dichlorobenzil	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
2,4,5-Trichlorophenol	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
2,4,6-Trichlorophenol	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
2,4-Dichlorophenol	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
2,4-Dimethylphenol	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
2,4-Dinitrophenol	mg/kg	0	69	0%	0.127	0.138	--	--	--	--	No	No	(2)
2,4-Dinitrotoluene	mg/kg	0	69	0%	0.0335	0.0364	--	--	--	--	No	No	(2)
2,6-Dinitrotoluene	mg/kg	0	69	0%	0.0335	0.0364	--	--	--	--	No	No	(2)
2-Chloronaphthalene	mg/kg	0	69	0%	0.0117	0.0127	--	--	--	--	No	No	(2)
2-Chlorophenol	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
2-Methylnaphthalene	mg/kg	0	69	0%	0.0067	0.00727	--	--	--	--	No	No	(2)
2-Nitroaniline	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
2-Nitrophenol	mg/kg	0	69	0%	0.0335	0.0364	--	--	--	--	No	No	(2)
3,3-Dichlorobenzidine	mg/kg	0	69	0%	0.101	0.109	--	--	--	--	No	No	(2)
3-Nitroaniline	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
4-Bromophenyl phenyl ether	mg/kg	0	69	0%	0.0335	0.0364	--	--	--	--	No	No	(2)
4-Chloro-3-methylphenol	mg/kg	0	69	0%	0.0335	0.0364	--	--	--	--	No	No	(2)
4-Chlorophenyl phenyl ether	mg/kg	0	69	0%	0.0335	0.0364	--	--	--	--	No	No	(2)

TABLE 5-7
SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC)
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Min ND	Max ND	Min Detect	Max Detect	Mean	Greater than Background?	PBT(1) or Class A Carcinogen?	COPC?	Rationale
4-Chlorothioanisole	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
4-Nitroaniline	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
4-Nitrophenol	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Acetophenone	mg/kg	0	69	0%	0.0335	0.0364	--	--	--	--	No	No	(2)
Aniline	mg/kg	0	69	0%	0.117	0.127	--	--	--	--	No	No	(2)
Benzenethiol	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
Benzoic acid	mg/kg	0	69	0%	0.168	0.182	--	--	--	--	No	No	(2)
Benzyl alcohol	mg/kg	0	68	0%	0.101	0.109	--	--	--	--	No	No	(2)
bis(2-Chloroethoxy)methane	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	Yes	No	(2)
bis(2-Chloroethyl) ether	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
bis(2-Chloroisopropyl) ether	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
bis(2-Ethylhexyl) phthalate	mg/kg	1	69	1.4%	0.067	0.107	0.0747	0.0747	0.075	--	No	No	(4)(13)
bis(p-Chlorophenyl) sulfone	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
bis(p-Chlorophenyl)disulfide	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
Butylbenzyl phthalate	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Carbazole	mg/kg	0	69	0%	0.0101	0.0109	--	--	--	--	No	No	(2)
Dibenzofuran	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Dichloromethyl ether	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
Diethyl phthalate	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Dimethyl phthalate	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Di-n-butyl phthalate	mg/kg	0	69	0%	0.0335	0.0364	--	--	--	--	No	No	(2)
Di-n-octyl phthalate	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Diphenyl disulfide	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
Diphenyl sulfide	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
Diphenyl sulfone	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
Diphenylamine	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Fluoranthene	mg/kg	0	69	0%	0.0101	0.0109	--	--	--	--	No	No	(2)
Fluorene	mg/kg	0	69	0%	0.0101	0.0109	--	--	--	--	No	No	(2)
Hexachlorobenzene	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	Yes	No	(2)
Hexachlorobutadiene	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Hexachlorocyclopentadiene	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)

TABLE 5-7
SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC)
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 7 of 10)

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Min ND	Max ND	Min Detect	Max Detect	Mean	Greater than Background?	PBT(1) or Class A Carcinogen?	COPC?	Rationale
Hexachloroethane	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Hydroxymethyl phthalimide	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
Isophorone	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
m,p-Cresols	mg/kg	0	69	0%	0.134	0.145	--	--	--	--	No	No	(2)
Naphthalene	mg/kg	0	69	0%	0.0101	0.0109	--	--	--	--	No	No	(2)
Nitrobenzene	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
N-nitrosodi-n-propylamine	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	Yes	No	(2)
o-Cresol	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Octachlorostyrene	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
p-Chloroaniline	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
p-Chlorobenzenethiol	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
Pentachlorobenzene	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Pentachlorophenol	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Phenol	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Phthalic acid	mg/kg	0	69	0%	0.111	0.12	--	--	--	--	No	No	(2)
Pyridine	mg/kg	0	69	0%	0.067	0.0727	--	--	--	--	No	No	(2)
Volatile Organic Compounds													
1,1,1,2-Tetrachloroethane	mg/kg	0	69	0%	0.00018	0.00039	--	--	--	--	No	No	(2)
1,1,1-Trichloroethane	mg/kg	0	69	0%	0.00011	0.00024	--	--	--	--	No	No	(2)
1,1,2,2-Tetrachloroethane	mg/kg	0	69	0%	0.000079	0.00046	--	--	--	--	No	No	(2)
1,1,2-Trichloroethane	mg/kg	0	69	0%	0.000068	0.00037	--	--	--	--	No	No	(2)
1,1-Dichloroethane	mg/kg	0	69	0%	0.000071	0.00038	--	--	--	--	No	No	(2)
1,1-Dichloroethene	mg/kg	0	69	0%	0.00012	0.00024	--	--	--	--	No	No	(2)
1,1-Dichloropropene	mg/kg	0	69	0%	0.000088	0.00023	--	--	--	--	No	No	(2)
1,2,3-Trichlorobenzene	mg/kg	0	69	0%	0.00039	0.00047	--	--	--	--	No	No	(2)
1,2,3-Trichloropropane	mg/kg	0	69	0%	0.00025	0.0005	--	--	--	--	No	No	(2)
1,2,4-Trichlorobenzene	mg/kg	0	69	0%	0.00031	0.00036	--	--	--	--	No	No	(2)
1,2,4-Trimethylbenzene	mg/kg	5	69	7.2%	0.00013	0.00074	0.00051	0.0012	0.00095	--	No	No	(5)(13)
1,2-Dichlorobenzene	mg/kg	8	69	11.6%	0.00012	0.00037	0.00014	0.00021	0.00018	--	No	No	(5)(13)
1,2-Dichloroethane	mg/kg	0	69	0%	0.000067	0.00033	--	--	--	--	No	No	(2)
1,2-Dichloroethene	mg/kg	0	69	0%	0.00011	0.00065	--	--	--	--	No	No	(2)

TABLE 5-7
SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC)
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Min ND	Max ND	Min Detect	Max Detect	Mean	Greater than Background?	PBT(1) or Class A Carcinogen?	COPC?	Rationale
1,2-Dichloropropane	mg/kg	0	69	0%	0.00011	0.00038	--	--	--	--	No	No	(2)
1,3,5-Trichlorobenzene	mg/kg	0	69	0%	0.00037	0.00053	--	--	--	--	No	No	(2)
1,3,5-Trimethylbenzene	mg/kg	7	69	10.1%	0.000098	0.00026	0.00012	0.00042	0.00019	--	No	No	(5)(13)
1,3-Dichlorobenzene	mg/kg	7	69	10.1%	0.00013	0.00045	0.00015	0.00022	0.00018	--	No	No	(5)(13)
1,3-Dichloropropane	mg/kg	0	69	0%	0.000052	0.00043	--	--	--	--	No	No	(2)
1,4-Dichlorobenzene	mg/kg	7	69	10.1%	0.00014	0.00032	0.00016	0.00031	0.00023	--	No	No	(5)(13)
2,2,3-Trimethylbutane	mg/kg	0	69	0%	0.00021	0.00055	--	--	--	--	No	No	(2)
2,2-Dichloropropane	mg/kg	0	69	0%	0.00023	0.00032	--	--	--	--	No	No	(2)
2,2-Dimethylpentane	mg/kg	0	69	0%	0.00028	0.00055	--	--	--	--	No	No	(2)
2,3-Dimethylpentane	mg/kg	0	69	0%	0.00023	0.00045	--	--	--	--	No	No	(2)
2,4-Dimethylpentane	mg/kg	0	69	0%	0.0002	0.0005	--	--	--	--	No	No	(2)
2-Chlorotoluene	mg/kg	0	69	0%	0.00025	0.00035	--	--	--	--	No	No	(2)
2-Hexanone	mg/kg	0	69	0%	0.00024	0.00029	--	--	--	--	No	No	(2)
2-Methylhexane	mg/kg	0	69	0%	0.00021	0.00052	--	--	--	--	No	No	(2)
2-Nitropropane	mg/kg	0	69	0%	0.00032	0.00066	--	--	--	--	No	No	(2)
3,3-Dimethylpentane	mg/kg	0	69	0%	0.00021	0.00049	--	--	--	--	No	No	(2)
3-Ethylpentane	mg/kg	0	69	0%	0.00021	0.00046	--	--	--	--	No	No	(2)
3-Methylhexane	mg/kg	0	69	0%	0.00014	0.00048	--	--	--	--	No	No	(2)
4-Chlorotoluene	mg/kg	0	69	0%	0.00017	0.00026	--	--	--	--	No	No	(2)
4-Methyl-2-pentanone (MIBK)	mg/kg	0	69	0%	0.00029	0.00032	--	--	--	--	No	No	(2)
Acetone	mg/kg	10	69	14.5%	0.0017	0.021	0.0037	0.048	0.017	--	No	No	(5)(13)
Acetonitrile	mg/kg	0	69	0%	0.0035	0.0059	--	--	--	--	No	No	(2)
Benzene	mg/kg	4	69	5.8%	0.000088	0.00034	0.00019	0.00021	0.0002	--	Yes	No	(1)(5)(13)
Bromobenzene	mg/kg	1	69	1.4%	0.00012	0.00039	0.00023	0.00023	0.00023	--	No	No	(2)
Bromodichloromethane	mg/kg	0	69	0%	0.00022	0.00033	--	--	--	--	No	No	(2)
Bromoform	mg/kg	0	69	0%	0.00006	0.00043	--	--	--	--	No	No	(2)
Bromomethane	mg/kg	0	69	0%	0.00013	0.00041	--	--	--	--	No	No	(2)
Carbon disulfide	mg/kg	0	69	0%	0.00012	0.00028	--	--	--	--	No	No	(2)
Carbon tetrachloride	mg/kg	0	69	0%	0.00021	0.00031	--	--	--	--	No	No	(2)
Chlorobenzene	mg/kg	2	69	2.9%	0.00011	0.00031	0.0007	0.0011	0.0009	--	No	No	(2)
Chlorobromomethane	mg/kg	0	69	0%	0.00023	0.00045	--	--	--	--	No	No	(2)

TABLE 5-7
SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC)
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Min ND	Max ND	Min Detect	Max Detect	Mean	Greater than Background?	PBT(1) or Class A Carcinogen?	COPC?	Rationale
Chloroethane	mg/kg	0	69	0%	0.00031	0.0005	--	--	--	--	No	No	(2)
Chloroform	mg/kg	0	69	0%	0.0001	0.00037	--	--	--	--	No	No	(2)
Chloromethane	mg/kg	3	69	4.3%	0.00027	0.00029	0.00028	0.00031	0.00029	--	No	No	(2)
cis-1,2-Dichloroethene	mg/kg	0	69	0%	0.000055	0.00034	--	--	--	--	No	No	(2)
cis-1,3-Dichloropropene	mg/kg	0	69	0%	0.0001	0.00024	--	--	--	--	No	No	(2)
Cymene (Isopropyltoluene)	mg/kg	0	69	0%	0.00013	0.00027	--	--	--	--	No	No	(2)
Dibromochloromethane	mg/kg	0	69	0%	0.00012	0.0003	--	--	--	--	No	No	(2)
Dibromochloropropane	mg/kg	0	69	0%	0.00021	0.00062	--	--	--	--	No	No	(2)
Dibromomethane	mg/kg	0	69	0%	0.00017	0.00036	--	--	--	--	No	No	(2)
Dichloromethane (Methylene chloride)	mg/kg	27	69	39.1%	0.0007	0.013	0.0014	0.016	0.011	--	No	No	(5)(13)
Dimethyldisulfide	mg/kg	0	69	0%	0.00018	0.00049	--	--	--	--	No	No	(2)
Ethanol	mg/kg	1	69	1.4%	0.048	0.064	1.9	1.9	1.9	--	No	No	(2)
Ethylbenzene	mg/kg	10	69	14.5%	0.000059	0.0003	0.00016	0.0002	0.00018	--	No	No	(5)(13)
Freon-11 (Trichlorofluoromethane)	mg/kg	2	69	2.9%	0.00022	0.00031	0.00031	0.00033	0.00032	--	No	No	(2)
Freon-113 (1,1,2-Trifluoro-1,2,2-trichloroethane)	mg/kg	0	69	0%	0.00015	0.00026	--	--	--	--	No	No	(2)
Freon-12 (Dichlorodifluoromethane)	mg/kg	0	69	0%	0.00025	0.00032	--	--	--	--	No	No	(2)
Heptane	mg/kg	0	69	0%	0.00017	0.00039	--	--	--	--	No	No	(2)
Isopropylbenzene	mg/kg	3	69	4.3%	0.0001	0.00029	0.00012	0.00012	0.00012	--	No	No	(2)
m,p-Xylene	mg/kg	11	69	15.9%	0.00017	0.00047	0.00024	0.0011	0.00039	--	No	No	(5)(13)
Methyl ethyl ketone (2-Butanone)	mg/kg	3	69	4.3%	0.00058	0.00095	0.0045	0.0099	0.008	--	No	No	(2)
Methyl iodide	mg/kg	0	69	0%	0.00013	0.0004	--	--	--	--	No	No	(2)
MTBE (Methyl tert-butyl ether)	mg/kg	0	69	0%	0.00009	0.00048	--	--	--	--	No	No	(2)
n-Butylbenzene	mg/kg	0	69	0%	0.00018	0.0003	--	--	--	--	No	No	(2)
Nonanal	mg/kg	3	69	4.3%	0.00036	0.00051	0.00049	0.0061	0.0028	--	No	No	(4)(15)
n-Propylbenzene	mg/kg	10	69	14.5%	0.00011	0.00028	0.00014	0.00017	0.00016	--	No	No	(5)(13)
o-Xylene	mg/kg	7	69	10.1%	0.000077	0.00024	0.000087	0.00038	0.00017	--	No	No	(5)(13)
sec-Butylbenzene	mg/kg	4	69	5.8%	0.00011	0.00033	0.00012	0.00015	0.00013	--	No	No	(5)(13)
Styrene	mg/kg	1	69	1.4%	0.00018	0.00027	0.00053	0.00053	0.00053	--	No	No	(4)(13)
tert-Butylbenzene	mg/kg	4	69	5.8%	0.0001	0.00023	0.00012	0.00013	0.00012	--	No	No	(5)(13)
Tetrachloroethene	mg/kg	0	69	0%	0.000088	0.00048	--	--	--	--	No	No	(2)
Toluene	mg/kg	1	69	1.4%	0.00024	0.00044	0.00056	0.00056	0.00056	--	No	No	(4)(13)

TABLE 5-7
SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC)
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Min ND	Max ND	Min Detect	Max Detect	Mean	Greater than Background?	PBT(1) or Class A Carcinogen?	COPC?	Rationale
trans-1,2-Dichloroethene	mg/kg	0	69	0%	0.000091	0.00035	--	--	--	--	No	No	(2)
trans-1,3-Dichloropropene	mg/kg	1	69	1.4%	0.0001	0.00018	0.00015	0.00015	0.00015	--	No	No	(4)(13)
Trichloroethene	mg/kg	0	69	0%	0.00011	0.00027	--	--	--	--	No	No	(2)
Vinyl acetate	mg/kg	0	69	0%	0.00024	0.00039	--	--	--	--	No	No	(2)
Vinyl chloride	mg/kg	0	69	0%	0.00011	0.00033	--	--	--	--	No	No	(2)
Xylenes (total)	mg/kg	9	69	13.0%	0.00023	0.00066	0.00026	0.0015	0.00056	--	No	No	(5)(13)

mg/kg - milligrams per kilogram

pCi/g - picoCuries per gram

ppt - parts per trillion

-- - Not available or not applicable.

ND - Not detected.

Highlight indicates selected as COPC.

(1) Persistent, Bioaccumulative, and Toxic (PBT) Program.

(2) Not detected.

(3) Dioxin and PCB congeners are not evaluated separately. Dioxin and PCB congeners are evaluated as TCDD TEQs. The maximum TCDD TEQ was less than the 50 ppt residential BCL.

(4) Chemical detected in less than 5 percent of the samples and is not a PBT or Class A carcinogen.

(5) Chemical detected in greater than 5 percent of samples.

(6) Chemical concentrations are equivalent to background.

(7) Chemical detected in less than 5 percent of the samples, but is a PBT or Class A carcinogen.

(8) Based on statistical tests, Site concentrations are elevated compared to background.

(9) No toxicity criteria or applicable surrogate criteria are available.

(10) At least one carcinogenic polynuclear aromatic hydrocarbon (PAH) is a COPC, therefore all carcinogenic PAHs are COPCs.

(11) Lead was not selected as a COPC because the maximum concentration is below 400 mg/kg.

(12) USEPA (1989) states that "Chemicals that are (1) essential human nutrients, (2) present at low concentrations (i.e., only slightly elevated above naturally occurring levels), and (3) toxic only at very high doses (i.e., much higher than those that could be associated with contact at the site) need not be considered further in the quantitative risk assessment. Examples of such chemicals are iron, magnesium, calcium, potassium, and sodium."

(13) Maximum detected site concentration below one-tenth residential BCL.

(14) Maximum detected site concentration greater than one-tenth residential BCL.

(15) Chemical has no BCL.

TABLE 6-1
EXPOSURE POINT CONCENTRATIONS IN SOIL
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Chemical	Units	Number of Detects	Total Count	Detect Freq.	Min ND	Max ND	Min Detect	Max Detect	Mean	Standard Deviation
Inorganics										
Perchlorate	mg/kg	60	69	87%	0.0102	0.0109	0.016	26.1	1.1	3.3
Metals										
Aluminum	mg/kg	69	69	100%	--	--	5280	18700	10570	2019
Arsenic	mg/kg	65	69	94%	5.2	5.3	3.4	14.2	6.2	2.1
Lithium	mg/kg	69	69	100%	--	--	7.3	35.4	17.4	4.7
Manganese	mg/kg	69	69	100%	--	--	301	867	527	118
Thallium	mg/kg	1	69	1%	0.105	1	1.1	1.1	0.32	0.17
Vanadium	mg/kg	69	69	100%	--	--	20.7	75.3	51.8	9.8
Polynuclear Aromatic Hydrocarbons										
Benzo(a)anthracene	mg/kg	8	69	12%	0.00168	0.00182	0.00186	0.00664	0.0012	0.00095
Benzo(a)pyrene	mg/kg	16	69	23%	0.00168	0.0018	0.00181	0.00822	0.0014	0.0013
Benzo(b)fluoranthene	mg/kg	27	69	39%	0.00168	0.00178	0.0018	0.0216	0.0039	0.0060
Benzo(k)fluoranthene	mg/kg	7	69	10%	0.00168	0.00182	0.00194	0.00548	0.0011	0.00086
Chrysene	mg/kg	10	69	14%	0.00168	0.00182	0.00182	0.00691	0.0013	0.0012
Dibenzo(a,h)anthracene	mg/kg	13	69	19%	0.00168	0.00182	0.00184	0.0174	0.0021	0.0039
Indeno(1,2,3-cd)pyrene	mg/kg	11	69	16%	0.00168	0.00179	0.00179	0.0054	0.0012	0.00088

(1) The EPC is either the maximum of the All and Surface 95 UCLs unless it exceeds the maximum detection concentration, then it is the maximum detected concentration.

EPC - Exposure point concentration.

UCL - Upper Confidence Limit

NA - Not applicable.

Chemical	Units	All		Surface		EPC[1]
		95% UCL	UCL Calc Method	95% UCL	UCL Calc Method	
		Inorganics				
Perchlorate	mg/kg	2.3	Bootstrap BCa UCL	1.1	Bootstrap BCa UCL	2.3
		Metals				
Aluminum	mg/kg	11000	Bootstrap Percentile UCL	11300	Student's-t UCL	11300
Arsenic	mg/kg	6.7	Bootstrap BCa UCL	6.7	Bootstrap BCa UCL	6.7
Lithium	mg/kg	18.3	Bootstrap BCa UCL	17.9	Bootstrap Percentile UCL	18.3
Manganese	mg/kg	551	Student's-t UCL	596	Bootstrap BCa UCL	596
Thallium	mg/kg	0.35	Student's-t UCL	0.38	Bootstrap Percentile UCL	0.38
Vanadium	mg/kg	53.8	Bootstrap BCa UCL	55.4	Student's-t UCL	55.4
		Polynuclear Aromatic Hydrocarbons				
Benzo(a)anthracene	mg/kg	0.0014	Bootstrap BCa UCL	0.0015	Bootstrap BCa UCL	0.0015
Benzo(a)pyrene	mg/kg	0.0018	Bootstrap BCa UCL	0.0022	Bootstrap BCa UCL	0.0022
Benzo(b)fluoranthene	mg/kg	0.0052	Bootstrap BCa UCL	0.0078	Bootstrap BCa UCL	0.0078
Benzo(k)fluoranthene	mg/kg	0.0014	Bootstrap BCa UCL	0.0015	Bootstrap BCa UCL	0.0015
Chrysene	mg/kg	0.0015	Bootstrap BCa UCL	0.0018	Bootstrap BCa UCL	0.0018
Dibenzo(a,h)anthracene	mg/kg	0.0031	Bootstrap BCa UCL	0.0050	Bootstrap BCa UCL	0.0050
Indeno(1,2,3-cd)pyrene	mg/kg	0.0014	Bootstrap BCa UCL	0.0017	Bootstrap BCa UCL	0.0017

(1) The EPC is either the maximum of the All and Surface 95 UCLs unless it exceeds the maximum detection concentration, then it is the maximum detected concentration.

EPC - Exposure point concentration.

UCL - Upper Confidence Limit

NA - Not applicable.

TABLE 6-2
ASBESTOS RESULTS AND ANALYTICAL SENSITIVITIES
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 1 of 1)

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Analytical Sensitivity (10^6 s/gPM$_{10}$)	Concentration Protocol Structures(1) Chrysotile (10^6 s/gPM$_{10}$)	Concentration Protocol Structures(1) Amphibole (10^6 s/gPM$_{10}$)	Number of Protocol Structures(2) Chrysotile Total	Number of Protocol Structures(2) Chrysotile Long	Number of Protocol Structures(2) Amphibole Total	Number of Protocol Structures(2) Amphibole Long
GNC1-BB16	0	NORM	1/26/09	2.998	< 8.963 E+6	< 8.963 E+6	0	0	0	0
GNC1-BC16	0	NORM	1/26/09	2.983	< 8.919 E+6	< 8.919 E+6	1	0	0	0
GNC1-BC18	0	NORM	1/26/09	2.983	< 8.919 E+6	< 8.919 E+6	0	0	0	0
GNC1-BC18	0	FD	1/26/09	2.960	< 8.851 E+6	< 8.851 E+6	0	0	0	0
GNC1-BC21	0	NORM	1/26/09	2.963	< 8.859 E+6	< 8.859 E+6	0	0	0	0
GNC1-BC22	0	NORM	1/28/09	2.966	< 8.869 E+6	< 8.869 E+6	0	0	0	0
GNC1-BC23	0	NORM	1/28/09	2.979	< 8.908 E+6	< 8.908 E+6	0	0	0	0
GNC1-BC27	0	NORM	1/28/09	2.967	< 1.095 E+7	< 1.095 E+7	1	0	0	0
GNC1-BC28	0	NORM	1/28/09	2.967	< 8.870 E+6	< 8.870 E+6	0	0	0	0
GNC1-BC29	0	NORM	1/28/09	2.963	< 8.859 E+6	< 8.859 E+6	0	0	0	0
GNC1-JB02	0	NORM	1/28/09	2.981	< 8.912 E+6	< 8.912 E+6	0	0	0	0
GNC1-JB03	0	NORM	1/28/09	2.965	< 8.864 E+6	1.405 E+7	0	0	1	1
GNC1-JB06	0	NORM	1/28/09	2.987	< 8.930 E+6	< 8.930 E+6	0	0	0	0
GNC1-JB07	0	NORM	1/28/09	2.983	< 8.919 E+6	< 8.919 E+6	0	0	0	0
GNC1-JB07	0	FD	1/28/09	2.991	< 8.944 E+6	< 8.944 E+6	0	0	0	0
GNC1-JD02	0	NORM	1/26/09	2.967	< 8.870 E+6	< 8.870 E+6	0	0	0	0
GNC1-JD03	0	NORM	1/26/09	2.979	< 8.908 E+6	< 8.908 E+6	0	0	0	0
GNC1-JD06	0	NORM	1/26/09	2.983	< 8.919 E+6	< 8.919 E+6	0	0	0	0
GNC1-JP02	0	NORM	1/28/09	2.960	< 8.851 E+6	< 8.851 E+6	0	0	0	0
GNC1-JP02	0	FD	1/28/09	2.979	< 8.908 E+6	< 8.908 E+6	0	0	0	0
GNC1-JP04	0	NORM	1/28/09	2.959	< 8.846 E+6	< 8.846 E+6	0	0	0	0
GNC1-JP05	0	NORM	1/28/09	2.960	< 8.851 E+6	< 8.851 E+6	0	0	0	0
GNC1-JP06	0	NORM	1/28/09	2.958	< 8.845 E+6	< 8.845 E+6	0	0	0	0
GNC1-JS08	0	NORM	1/26/09	2.965	< 8.864 E+6	< 8.864 E+6	0	0	0	0
GNC1-JS17	0	NORM	1/28/09	2.981	< 8.912 E+6	< 8.912 E+6	0	0	0	0
GNC2-JD01	0	NORM	1/18/10	2.967	< 8.960 E+6	< 8.960 E+6	0	0	0	0
GNC2-JD01	0	FD	1/18/10	2.967	< 8.910 E+6	< 8.910 E+6	0	0	0	0
UPC1-BB28	0	NORM	1/12/09	2.981	< 8.912 E+6	< 8.912 E+6	0	0	0	0
UPC1-BB31	0	NORM	1/12/09	2.981	< 8.912 E+6	< 8.912 E+6	0	0	0	0
UPC1-BB32	0	NORM	1/12/09	2.965	< 8.864 E+6	< 8.864 E+6	0	0	0	0
UPC1-BB33	0	NORM	1/12/09	2.998	< 8.963 E+6	< 8.963 E+6	1	0	0	0

(1)Fiber dimensions are presented in the respective analytical reports for each sample.

(2)Only long structures (>10μm) present a potential risk and are used for estimating asbestos risks. Total fiber concentrations are presented for informational purposes only. Protocol structures are structures longer than 10 μm and thinner than 0.4 μm.

TABLE 6-3
EXPOSURE POINT CONCENTRATIONS FROM SURFACE FLUX
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

	GNC1-BE20		GNC1-BE21		GNC1-BE22		GNC1-BF19		GNC1-BF20		GNC1-BF21	
Chemical	Method	Outdoor Air	Method	Outdoor Air	Method	Outdoor Air	Method	Outdoor Air	Method	Outdoor Air	Method	Outdoor Air
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	--	F	1.2 E-5	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	--	--	F	1.7 E-5	--	--	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	S	3.9 E-7	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--	--	--	--
2-Hexanone	--	--	--	--	--	--	--	--	F	2.6 E-6	F	2.3 E-6
2-Methyl-1-propanol	--	--	--	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (MIBK)	--	--	--	--	--	--	--	--	--	--	--	--
Acetone	F	3.2 E-5	--	--	F	3.3 E-5	--	--	--	--	--	--
Acetonitrile	--	--	--	--	F	2.2 E-5	--	--	--	--	--	--
Benzene	--	--	S	6.9 E-7	--	--	--	--	S	7.4 E-7	S	2.6 E-6
Benzyl chloride	--	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	--	--	--	--	--	--	--	--	--	--	--
Bromoform	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	--	--	--	--	--	--	--	--	--	--	--	--
Carbon disulfide	--	--	--	--	F	2.3 E-5	F	5.0 E-5	--	--	--	--
Carbon tetrachloride	S	1.0 E-6	S	6.2 E-7	S	1.8 E-6	S	7.6 E-7	S	1.1 E-6	S	3.9 E-6
Chlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--	--	--	--
Chloroethane	--	--	--	--	F	1.5 E-5	--	--	--	--	--	--
Chloroform	S	2.6 E-6	S	1.7 E-6	S	5.1 E-6	S	6.7 E-6	S	8.3 E-6	S	1.4 E-5
Chloromethane	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--	--	--	--
Cymene (Isopropyltoluene)	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloropropane	--	--	--	--	--	--	--	--	--	--	--	--
Dibromomethane	--	--	--	--	--	--	--	--	--	--	--	--
Dichloromethane (Methylene chloride)	S	5.0 E-7	--	--	F	4.6 E-6	--	--	--	--	--	--
Ethanol	F	2.2 E-5	F	1.1 E-4	F	2.3 E-5	--	--	--	--	--	--
Ethylbenzene	--	--	F	4.3 E-6	--	--	--	--	--	--	--	--

TABLE 6-3
EXPOSURE POINT CONCENTRATIONS FROM SURFACE FLUX
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

	GNC1-BE20		GNC1-BE21		GNC1-BE22		GNC1-BF19		GNC1-BF20		GNC1-BF21	
Chemical	**Method**	**Outdoor Air**	**Method**	**Outdoor Air**	**Method**	**Outdoor Air**	**Method**	**Outdoor Air**	**Method**	**Outdoor Air**	**Method**	**Outdoor Air**
Freon-11 (Trichlorofluoromethane)	--	--	--	--	F	3.5 E-6	--	--	--	--	--	--
Freon-113 (1,1,2-Trifluoro-1,2,2-trichloroethane)	--	--	--	--	--	--	--	--	--	--	--	--
Freon-12 (Dichlorodifluoromethane)	F	3.9 E-6	--	--	F	1.0 E-5	--	--	--	--	--	--
Heptane	--	--	--	--	F	3.0 E-6	--	--	--	--	--	--
Hexachlorobutadiene	--	--	--	--	--	--	--	--	--	--	--	--
Isopropylbenzene	--	--	F	1.4 E-5	--	--	--	--	--	--	--	--
m & p-Xylenes	--	--	F	1.2 E-5	F	4.7 E-6	--	--	--	--	--	--
Methyl ethyl ketone (2-Butanone)	F	9.0 E-6	--	--	F	2.1 E-5	--	--	--	--	--	--
Methyl iodide	--	--	--	--	--	--	--	--	--	--	--	--
MTBE (Methyl tert-butyl ether)	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--
n-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--
n-Propylbenzene	--	--	F	3.9 E-6	--	--	--	--	--	--	--	--
o-Xylene	--	--	F	6.4 E-6	--	--	--	--	--	--	--	--
sec-Butylbenzene	--	--	F	6.6 E-6	--	--	--	--	--	--	--	--
Styrene	--	--	--	--	--	--	--	--	--	--	--	--
tert-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethene	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	--	--	--	--	F	2.4 E-5	--	--	--	--	--	--
trans-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	--	--	S	4.3 E-7	--	--	--	--	--	--	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--	--	--	--
Vinyl chloride	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

All units in mg/m^3.

Method represents the surface flux measurement used in the risk calculations for that particular chemical/location: S = SIM; F = Full Scan.

See Appendix H for all outdoor air concentration calculations from surface flux measurement data. See Table 6-6 for outdoor air exposure point concentrations for non-volatile COPCs in soil.

Exposure point concentrations for surface flux data are based on a sample by sample basis. Averaging of the data was not conducted. Therefore only those chemicals detected in a particular sample were included in the risk estimates. A "--" is presented for those chemical not detected and not included in the risk estimates for each sample location. The exposure point concentration is the maximum of the full scan or SIM analysis results (when both had detected values, otherwise the detected value from one or the other is used). Thus, summary statistics are not presented in this table (see Table 3-14 for the surface flux data summary).

TABLE 6-3
EXPOSURE POINT CONCENTRATIONS FROM SURFACE FLUX
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

	GNC1-BF22		GNC1-BG19		GNC1-BG20		GNC1-BG21		GNC1-BG22		GNC1-JD09	
Chemical	Method	Outdoor Air	Method	Outdoor Air	Method	Outdoor Air	Method	Outdoor Air	Method	Outdoor Air	Method	Outdoor Air
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	F	3.7 E-4	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	F	1.1 E-4	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	F	8.3 E-6	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	F	8.3 E-5	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	F	7.4 E-6	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	F	1.3 E-5	--	--	--	--	--	--	--	--	--	--
1,4-Dioxane	--	--	--	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--	--	--	--
2-Hexanone	F	1.2 E-5	F	2.0 E-6	--	--	--	--	--	--	--	--
2-Methyl-1-propanol	--	--	--	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (MIBK)	--	--	--	--	--	--	--	--	--	--	--	--
Acetone	--	--	F	3.3 E-5	F	1.4 E-4	F	5.4 E-5	F	6.8 E-5	--	--
Acetonitrile	--	--	--	--	F	5.9 E-5	--	--	--	--	--	--
Benzene	--	--	S	3.3 E-6	F	1.1 E-5	F	3.6 E-6	F	6.4 E-6	--	--
Benzyl chloride	F	1.7 E-5	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	--	--	--	--	--	--	--	--	--	--	--	--
Bromoform	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	--	--	--	--	--	--	--	--	--	--	--	--
Carbon disulfide	--	--	--	--	F	2.9 E-5	F	3.2 E-6	--	--	--	--
Carbon tetrachloride	S	1.5 E-6	S	8.7 E-5	S	1.3 E-6	S	1.5 E-6	S	5.9 E-7	S	2.6 E-6
Chlorobenzene	F	3.9 E-6	F	2.8 E-6	--	--	--	--	--	--	--	--
Chlorobromomethane	--	--	--	--	--	--	--	--	--	--	--	--
Chloroethane	--	--	--	--	F	9.6 E-6	--	--	--	--	--	--
Chloroform	S	1.7 E-5	S	6.4 E-5	S	2.6 E-6	S	2.7 E-6	S	9.2 E-7	S	2.5 E-6
Chloromethane	--	--	--	--	--	--	F	5.9 E-6	--	--	--	--
cis-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--	--	--	--
Cymene (Isopropyltoluene)	F	5.4 E-5	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	--	--	S	4.3 E-6	--	--	--	--	--	--	--	--
Dibromochloropropane	--	--	--	--	--	--	--	--	--	--	--	--
Dibromomethane	--	--	--	--	--	--	--	--	--	--	--	--
Dichloromethane (Methylene chloride)	S	3.0 E-6	S	7.5 E-6	S	2.4 E-6	--	--	--	--	--	--
Ethanol	--	--	--	--	F	8.9 E-5	--	--	--	--	--	--
Ethylbenzene	F	4.3 E-6	--	--	F	5.7 E-6	--	--	--	--	--	--

TABLE 6-3
EXPOSURE POINT CONCENTRATIONS FROM SURFACE FLUX
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 4 of 4)

	GNC1-BF22		GNC1-BG19		GNC1-BG20		GNC1-BG21		GNC1-BG22		GNC1-JD09	
Chemical	Method	Outdoor Air	Method	Outdoor Air	Method	Outdoor Air	Method	Outdoor Air	Method	Outdoor Air	Method	Outdoor Air
Freon-11 (Trichlorofluoromethane)	--	--	--	--	--	--	--	--	--	--	F	5.8 E-6
Freon-113 (1,1,2-Trifluoro-1,2,2-trichloroethane)	--	--	--	--	--	--	--	--	--	--	--	--
Freon-12 (Dichlorodifluoromethane)	--	--	--	--	--	--	F	8.6 E-6	--	--	F	1.3 E-5
Heptane	--	--	--	--	F	1.1 E-5	--	--	--	--	--	--
Hexachlorobutadiene	F	2.7 E-4	--	--	--	--	--	--	--	--	--	--
Isopropylbenzene	F	8.5 E-5	--	--	F	5.7 E-6	--	--	--	--	--	--
m & p-Xylenes	F	1.3 E-5	--	--	F	1.7 E-5	--	--	--	--	--	--
Methyl ethyl ketone (2-Butanone)	F	2.1 E-4	--	--	F	2.1 E-5	F	9.3 E-6	F	1.1 E-5	--	--
Methyl iodide	--	--	--	--	--	--	--	--	--	--	--	--
MTBE (Methyl tert-butyl ether)	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	S	6.0 E-6	--	--	--	--	--	--	--	--	--	--
n-Butylbenzene	F	5.9 E-5	--	--	--	--	--	--	--	--	--	--
n-Propylbenzene	F	1.6 E-5	--	--	--	--	--	--	--	--	--	--
o-Xylene	F	5.9 E-6	--	--	F	5.9 E-6	--	--	--	--	--	--
sec-Butylbenzene	F	3.0 E-5	--	--	--	--	--	--	--	--	--	--
Styrene	--	--	--	--	--	--	--	--	--	--	--	--
tert-Butylbenzene	F	3.1 E-5	--	--	--	--	--	--	--	--	--	--
Tetrachloroethene	--	--	S	1.5 E-6	F	4.3 E-5	--	--	--	--	--	--
Toluene	F	5.0 E-5	F	5.0 E-6	F	7.1 E-5	--	--	F	4.6 E-6	--	--
trans-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	--	--	--	--	--	--	--	--	--	--	--	--
Vinyl acetate	--	--	--	--	--	--	--	--	--	--	--	--
Vinyl chloride	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

All units in mg/m^3.
Method represents the surface flux measurement used in the risk calculations for that particular chemical/location: S = SIM; F = Full Scan.
See Appendix H for all outdoor air concentration calculations from surface flux measurement data. See Table 6-6 for outdoor air exposure point concentrations for non-volatile COPCs in soil.
Exposure point concentrations for surface flux data are based on a sample by sample basis. Averaging of the data was not conducted. Therefore only those chemicals detected in a particular sample were included in the risk estimates. A "--" is presented for those chemical not detected and not included in the risk estimates for each sample location. The exposure point concentration is the maximum of the full scan or SIM analysis results (when both had detected values, otherwise the detected value from one or the other is used). Thus, summary statistics are not presented in this table (see Table 3-14 for the surface flux data summary).

TABLE 6-4
PARTICULATE EMISSION FACTOR (PEF) FOR NON-CONSTRUCTION SCENARIO
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter	Abbrev.	Units	Value
Wind Erosion and Construction Activities			
Fraction of vegetative cover(1)	V	--	0.5
Mean annual wind speed(2)	U_m	m/s	4.10
Equivalent threshold value of wind speed(1)	U_t	m/s	11.32
Function dependent on U/U_t(1)	F(x)	--	0.19
Air Dispersion Factor for Area Source(4)	**Q/C_{wind}**	**g/m^2-sec per kg/m^3**	**40.80**
Constant A(1)	A	--	13.31
Constant B(1)	B	--	19.84
Constant C(1)	C	--	230.17
Areal Extent of site surface contamination(3)	A_{surf}	acres	43.90
Onsite Residential PEF(5)	**$PEF_{Onsite\ Resident}$**	**m^3/kg**	**8.85E+08**
Total outdoor ambient air dust concentration(6)	**$D_{Onsite\ Resident}$**	**kg/m^3**	**1.13E-09**

(1) Assumed value for the site based upon USEPA (2002b). Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites.
Office of Solid Waste and Emergency Response, Washington, DC. OSWER 9355.4-24. December.

(2) Derived by averaging data from the Las Vegas Airport and Nellis AFB stations.

(3) Site area.

(4) From USEPA 2002b - $Q/C_{sa} = A \times \exp[(\ln(A_{surf}) - B)^2/C]$.

$$\{[2.6 \times (s/12)^{0.8} \times (W/3)^{0.4}/(M/0.2)^{0.3}] \times [(365-p)/365] \times 281.9 \times \sum VKT_{road}\}.$$

(5) From USEPA 2002b - $PEF_{Onsite\ Resident} = Q/C_{wind} * (3600/(0.036*(1-V)*((U_m/U_t)^3)*F(x)))$

(6) $D_{Onsite\ Resident} = 1/PEF_{Onsite\ Resident}$

TABLE 6-5
PARTICULATE EMISSION FACTOR (PEF) FOR CONSTRUCTION SCENARIO
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter	Abbrev.	Units	Value
Wind Erosion and Construction Activities			
Fugitive dust from wind erosion(1)	M_{wind}	g	**5.2E+05**
Fraction of vegetative cover(2)	V	--	0.00
Mean annual wind speed(3)	U_m	m/s	4.10
Equivalent threshold value of wind speed(2)	U_t	m/s	11.32
Function dependent on U/U_t(2)	F(x)	--	0.194
Areal Extent of site surface contamination(4)	A_{surf}	m^2	177663.30
Exposure duration(5)	ED	year	1
Fugitive dust from excavation soil dumping(6)	M_{excav}	g	**4.6E+04**
In situ wet soil bulk density(7)	ρ_{soil}	Mg/m^3	1.83
Gravimetric Soil Moisture Content %(8)	M	%	4.98
Areal extent of site excavation(9)	A_{excav}	m^2	35532.66
Average depth of site excavation(2)	d_{excav}	m	1.00
Number of times soil is dumped(2)	N_A	--	2.00
Fugitive dust from dozing(10)	M_{doz}	g	**1.2E+04**
Soil silt content %(7)	s	%	6.90
Gravimetric Soil Moisture Content %(8)	M	%	4.98
Average dozing speed(2)	S_{doz}	km/hr	11.40
Number of times area is dozed	N_{doze}	--	3.00
Length of dozer blade	B_d	m	2.44
Sum dozing kilometers traveled(11)	VKT_{doz}	km	218.44
Fugitive dust from grading(12)	M_{grade}	g	**9.5E+04**
Average grading speed(2)	S_{grade}	km/hr	11.40
Number of times area is graded	N_{grade}	--	3.00
Length of grading blade	B_g	m	2.44
Sum grading kilometers traveled(12)	VKT_{grade}	km	218.44

TABLE 6-5
PARTICULATE EMISSION FACTOR (PEF) FOR CONSTRUCTION SCENARIO
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter	Abbrev.	Units	Value
Fugitive dust from tilling[13]	M_{till}	g	**2.5E+04**
Soil silt content %[7]	s	%	6.90
Areal extent of site tilling[9]	A_{till}	acre	8.78
Number of times soil is tilled[2]	N_A	--	2.00
Total Time Averaged PM_{10} Emission[14]	J'_T	g/m2-sec	**1.24E-07**
Duration of construction[2]	T	sec	3.15E+07
Subchronic Dispersion Factor for Area Source[15]	Q/C_{sa}	g/m^2-sec per kg/m^3	**6.70**
Constant A[2]	A	--	2.45
Constant B[2]	B	--	17.57
Constant C[2]	C	--	189.04
Areal Extent of site surface contamination[4]	A_{surf}	acres	43.90
Dispersion correction factor[16]	F_D	--	**0.186**
Duration of construction (time period during which construction activities occur)	t_c	hr	8760
Subchronic PEF for Construction Activities[17]	PEF_{sc}	m^3/kg	**2.91E+08**
Unpaved Road Traffic			
Length of road segment[18]	L_R	m	421.50
Width of road segment[2]	W_R	m	6.10
Surface area of contaminated road segment[19]	A_R	m^2	2569.47
Road surface silt content %[20]	s	%	8.50
Mean vehicle weight[2]	W	tons	8.00
Percent moisture in dry road surface[20]	M	%	4.31
Number of days/year with at least 0.01 inches of precipitation[3]	p	days	27.00
Number of vehicles for duration of construction	N_V	vehicles	30.00
Length of road traveled per day	L_D	m/day	421.50
Sum of fleet vehicle kilometers traveled during the exposure duration[21]	VKT_{road}	km	1643.85

TABLE 6-5
PARTICULATE EMISSION FACTOR (PEF) FOR CONSTRUCTION SCENARIO
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 3 of 3)

Parameter	Abbrev.	Units	Value
Subchronic Dispersion Factor for road segment(22)	Q/C_{sr}	g/m^2-sec per kg/m^3	13.64
Constant A(2)	A		12.94
Constant B(2)	B		5.74
Constant C(2)	C		71.77
Subchronic PEF for Unpaved Road Traffic(23)	$\mathbf{PEF_{sc\_road}}$	$\mathbf{m^3/kg}$	**1.19E+07**
Total construction related PEF(24)	$\mathbf{PEF_{sc\_total}}$	$\mathbf{m^3/kg}$	**1.15E+07**
Total outdoor ambient air dust concentration(25)	$\mathbf{D_{construct}}$	$\mathbf{kg/m^3}$	**8.73E-08**

(1) From USEPA. (2002b). Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. Office of Solid Waste and Emergency Response, Washington, DC. OSWER 9355.4-24. December. - Mwind = $0.036 \times (1\text{-}V) \times (Um/Ut)^3 \times F(x) \times Asurf \times ED \times 8760hr/yr$.
(2) Assumed value for the site based upon USEPA (2002b).
(3) Derived by averaging data from the Las Vegas Airport and Nellis AFB stations.
(4) Site area.
(5) Construction worker ED
(6) From USEPA 2002b - $M_{excav} = 0.35 \times 0.0016 \times [(U_m/2.2)^{1.3}/(M/2)^{1.4}] \times \rho_{soil} \times A_{excav} \times d_{excav} \times N_A \times 10^3 g/kg$.
(7) This value can change based on site specific characteristics
(8) Based on the average of percent moisture across the site.
(9) Assumed value of one fifth of the site based upon USEPA (2002b).
(10) From USEPA 2002b - $M_{doz} = 0.75 \times [(0.45 \times s^{1.5})/(M)^{1.4}] \times \sum VKT_{doz}/S_{doz} \times 10^3 g/kg$.
(11) From USEPA 2002b - $VKT_{doz} = [(A_{surf}^{0.5}/2.44m) \times A_{surf}^{0.5} \times 3]/1{,}000$ m/km.
(12) From USEPA 2002b - $M_{grade} = 0.60 \times (0.0056 \times S^{2.0}) \times \sum VKT_{grade} \times 10^3 g/kg$.
(13) From USEPA 2002b - $M_{till} = 1.1 \times s^{0.6} \times A_{till} \times 4{,}047 m^2/acre \times 10^{-4} ha/m^2 \times 10^3 g/kg \times N_A$.
(14) From USEPA 2002b - $J'_T = (M_{wind} + M_{excav} + M_{doz} + M_{grade} + M_{till})/(A_{surf} \times T)$.
(15) From USEPA 2002b - $Q/C_{sa} = A \times \exp[(\ln(A_{surf}) - B)^2/C]$.
(16) From USEPA 2002b - $F_D = 0.1852 + (5.3537/t_c)+(-9.6318/t_c^2)$, $t_c = T/(3{,}600 sec/hour)$.
(17) From USEPA 2002b - $PEF_{sc} = Q/C_{sa} \times (1/F_D) \times (1/J'_T)$.
(18) Assumed value of the square root of the site area, based upon USEPA (2002b).
(19) From USEPA 2002b - $A_R = L_R \times W_R$ * 0.092903 m2/ft2
(20) Average of surface soil percent moisture results.
(21) From USEPA 2002b - VKT_{road} = 30 vehicles $\times L_R \times$ [(52 wks/yr)/2] $\times$ (5 days/week) / (1000 m/km).
(22) From USEPA 2002b - $Q/C_{sr} = A \times \exp[(\ln(A_{surf}) - B)^2/C]$.
(23) From USEPA 2002b - $PEF_{sc\_road} = Q/C_{sr} \times (1/F_D) \times T \times A_R / \{[2.6 \times (s/12)^{0.8} \times (W/3)^{0.4}/(M/0.2)^{0.3}] \times [(365\text{-}p)/365] \times 281.9 \times \sum VKTroad\}$.
(24) $PEF_{sc\_total} = \{1/[(1/PEF_{sc})+(1/PEF_{sc\_road})]\}$.
(25) $D_{construct} = 1/PEF_{sc\_total}$.

TABLE 6-6
OUTDOOR AIR EXPOSURE POINT CONCENTRATIONS FROM SOIL
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 1 of 1)

Chemical	Soil Conc. (mg/kg)	Construction Worker Outdoor Air PEF/VF(1) (kg/m^3)	Construction Worker Outdoor Air Air Conc.(2) (mg/m^3)	Maintenance Worker Outdoor Air PEF/VF(3) (kg/m^3)	Maintenance Worker Outdoor Air Air Conc.(2) (mg/m^3)
Inorganics					
Perchlorate	2.3 E+0	8.7 E-8	2.0 E-7	1.1 E-9	2.6 E-9
Metals					
Aluminum	1.1 E+4	8.7 E-8	9.9 E-4	1.1 E-9	1.3 E-5
Arsenic	6.7 E+0	8.7 E-8	5.9 E-7	1.1 E-9	7.6 E-9
Lithium	1.8 E+1	8.7 E-8	1.6 E-6	1.1 E-9	2.1 E-8
Manganese	6.0 E+2	8.7 E-8	5.2 E-5	1.1 E-9	6.7 E-7
Thallium	3.8 E-1	8.7 E-8	3.3 E-8	1.1 E-9	4.3 E-10
Vanadium	5.5 E+1	8.7 E-8	4.8 E-6	1.1 E-9	6.3 E-8
Polynuclear Aromatic Hydrocarbons					
Benzo(a)anthracene	1.5 E-3	8.7 E-8	1.3 E-10	1.1 E-9	1.7 E-12
Benzo(a)pyrene	2.2 E-3	8.7 E-8	1.9 E-10	1.1 E-9	2.5 E-12
Benzo(b)fluoranthene	7.8 E-3	8.7 E-8	6.8 E-10	1.1 E-9	8.9 E-12
Benzo(k)fluoranthene	1.5 E-3	8.7 E-8	1.3 E-10	1.1 E-9	1.7 E-12
Chrysene	1.8 E-3	8.7 E-8	1.6 E-10	1.1 E-9	2.1 E-12
Dibenzo(a,h)anthracene	5.0 E-3	8.7 E-8	4.4 E-10	1.1 E-9	5.6 E-12
Indeno(1,2,3-cd)pyrene	1.7 E-3	8.7 E-8	1.4 E-10	1.1 E-9	1.9 E-12

Notes:
(1) Construction worker PEF from Table 6-5.
(2) Soil concentration × PEF
(3) Non-construction worker PEF from Table 6-4.

TABLE 6-7
WORKERS EXPOSURE FACTORS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 1 of 1)

Parameter	Abbrev.	Value	Units	Reference
Dermal absorption fraction	ABS	---chemical-specific--		see text
Maintenance worker dermal adherence factor	AF_{mw}	0.2	mg/cm^2	Closure Plan
Construction worker dermal adherence factor	AF_{cw}	0.3	mg/cm^2	Closure Plan
Averaging time, carcinogenic	AT_c	70	years	Closure Plan
Averaging time, carcinogenic (inhalation)	AT_c	613200	hours	Closure Plan
Averaging time, non-carcinogenic, maintenance worker	AT_{nc}	25	years	Closure Plan
Averaging time, non-carcinogenic, maintenance worker (inhalation)	AT_{nc}	219000	hours	Closure Plan
Averaging time, non-carcinogenic, construction worker	$AT_{nc,c}$	1	years	Closure Plan
Averaging time, non-carcinogenic, construction worker (inhalation)	$AT_{nc,c}$	8760	hours	Closure Plan
Adult body weight	BW_a	70	kg	Closure Plan
Maintenance worker exposure frequency	EF_{mw}	225	days/year	Closure Plan
Construction worker exposure frequency	EF_{cmw}	250	days/year	Closure Plan
Exposure duration, maintenance worker	ED	25	years	Closure Plan
Exposure duration, maintenance worker (inhalation)	ED	219000	hours	Closure Plan
Exposure duration, construction worker	ED	1	years	Closure Plan
Exposure duration, construction worker (inhalation)	ED	8760	hours	Closure Plan
Maintenance worker exposed surface area	SA_{mw}	3,300	cm^2/day	Closure Plan
Construction worker exposed surface area	SA_{mw}	3,300	cm^2/day	Closure Plan
Maintenance worker soil ingestion rate	$IR_{s,mw}$	100	mg/day	Closure Plan
Construction worker soil ingestion rate	$IR_{s,cmw}$	330	mg/day	Closure Plan
Maintenance worker exposure time, indoors	$ET_{mw,i}$	0	outdoor worker	Closure Plan
Maintenance worker exposure time, outdoors	$ET_{mw,o}$	8	based on 8 hr/d	Closure Plan
Soil ingestion, non-cancer, maintenance worker	--	8.81 E-7	day^{-1}	Calculated
Soil ingestion, cancer, maintenance worker	--	3.15 E-7	day^{-1}	Calculated
Soil dermal contact, non-cancer, maintenance worker	--	5.81 E-6	day^{-1}	Calculated
Soil dermal contact, cancer, maintenance worker	--	2.08 E-6	day^{-1}	Calculated
Inhalation, fugitive-dust, outdoor, non-cancer, maintenance worker	--	2.05 E-1	unitless	Calculated
Inhalation, fugitive-dust, outdoor, cancer, maintenance worker	--	7.34 E-2	unitless	Calculated
Soil ingestion, noncancer, construction worker	--	3.23 E-6	day^{-1}	Calculated
Soil ingestion, cancer, construction worker	--	4.61 E-8	day^{-1}	Calculated
Soil dermal contact, noncancer, construction worker	--	9.69 E-6	day^{-1}	Calculated
Soil dermal contact, cancer, construction worker	--	1.38 E-7	day^{-1}	Calculated
Inhalation, soil-dust, outdoor, noncancer, construction worker	--	2.28 E-1	unitless	Calculated
Inhalation, soil-dust, outdoor, cancer, construction worker	--	3.26 E-3	unitless	Calculated

Note: Exposure parameters for maintenance workers and commerical workers are based on outdoor and indoor commercial/industrial worker exposure factors, respectively, from USEPA, 2002b.

TABLE 6-8
TOXICITY CRITERIA FOR SURFACE FLUX
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Compound	Cancer IUR 1/(µg/m^3)		Non-Cancer RfC (mg/m^3)	
1,1,1,2-Tetrachloroethane	7.4 E-6	I	--	
1,1,1-Trichloroethane	--		5.0 E+0	I
1,1,2,2-Tetrachloroethane	5.8 E-5	I	--	
1,1,2-Trichloroethane	1.6 E-5	I	--	
1,1-Dichloroethane	1.6 E-6	CA	--	
1,1-Dichloroethene	--		2.0 E-1	I
1,1-Dichloropropene	--		2.0 E-2	S
1,2,3-Trichloropropane	--		3.0 E-4	I
1,2,4-Trichlorobenzene	--		4.0 E-3	P
1,2,4-Trimethylbenzene	--		7.0 E-3	P
1,2-Dibromoethane	6.0 E-4	I	9.0 E-3	I
1,2-Dichlorobenzene	--		2.0 E-1	H
1,2-Dichloroethane	2.6 E-5	I	2.4 E+0	A
1,2-Dichloropropane	1.0 E-5	CA	4.0 E-3	I
1,3,5-Trimethylbenzene	--		7.0 E-3	P
1,3-Dichlorobenzene	--		2.0 E-1	S
1,3-Dichloropropane	--		4.0 E-3	S
1,4-Dichlorobenzene	1.1 E-5	CA	8.0 E-1	I
1,4-Dioxane	7.7 E-6	CA	3.6 E+0	A
2,2-Dichloropropane	--		4.0 E-3	S
2-Hexanone	--		3.0 E-2	I
2-Methyl-1-propanol	--		3.0 E+1	S
4-Methyl-2-pentanone (MIBK)	--		3.0 E+0	I
Acetone	--		3.1 E+1	A
Acetonitrile	--		6.0 E-2	I
Benzene	7.8 E-6	I	3.0 E-2	I
Benzyl chloride	--		1.0 E-3	P
Bromodichloromethane	--		1.0 E+0	S
Bromoform	1.1 E-6	I	--	
Bromomethane	--		5.0 E-3	I
Carbon disulfide	--		7.0 E-1	I
Carbon tetrachloride	6.0 E-6	I	1.0 E-1	I
Chlorobenzene	--		5.0 E-2	P
Chlorobromomethane	--		4.0 E-2	S
Chloroethane	--		1.0 E+1	I
Chloroform	2.3 E-5	I	9.8 E-2	A
Chloromethane	1.8 E-6	H	9.0 E-2	I
cis-1,2-Dichloroethene	--		6.0 E-2	S

TABLE 6-8
TOXICITY CRITERIA FOR SURFACE FLUX
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 2 of 2)

Compound	Cancer IUR 1/(µg/m^3)		Non-Cancer RfC (mg/m^3)	
cis-1,3-Dichloropropene	4.0 E-6	I	2.0 E-2	I
Cymene (Isopropyltoluene)	--		4.0 E-1	S
Dibromochloromethane	2.7 E-5	CA	--	
Dibromochloropropane	6.0 E-3	P	2.0 E-4	I
Dibromomethane	--		4.0 E-3	S
Dichloromethane (Methylene chloride)	4.7 E-7	I	1.1 E+0	A
Ethanol	--		1.0 E+2	S
Ethylbenzene	2.5 E-6	CA	1.0 E+0	I
Freon-11 (Trichlorofluoromethane)	--		7.0 E-1	H
Freon-113 (1,1,2-Trifluoro-1,2,2-trichloroethane)	--		3.0 E+1	H
Freon-12 (Dichlorodifluoromethane)	--		2.0 E-1	H
Heptane	--		7.0 E+0	S
Hexachlorobutadiene	2.2 E-5	I	--	
Isopropylbenzene	--		4.0 E-1	I
m & p-Xylenes	--		1.0 E-1	I
Methyl ethyl ketone (2-Butanone)	--		5.0 E+0	I
Methyl iodide	--		1.7 E-1	S
MTBE (Methyl tert-butyl ether)	2.6 E-7	CA	3.0 E+0	I
Naphthalene	3.4 E-5	CA	3.0 E-3	I
n-Butylbenzene	--		4.0 E-1	S
n-Propylbenzene	--		4.0 E-1	S
o-Xylene	--		1.0 E-1	I
sec-Butylbenzene	--		4.0 E-1	S
Styrene	--		1.0 E+0	I
tert-Butylbenzene	--		4.0 E-1	S
Tetrachloroethene	2.6 E-7	I	4.0 E-2	I
Toluene	--		5.0 E+0	I
trans-1,2-Dichloroethene	--		6.0 E-2	P
trans-1,3-Dichloropropene	4.0 E-6	I	2.0 E-2	I
Trichloroethene	4.1 E-6	I	2.0 E-3	I
Vinyl acetate	--		2.0 E-1	I
Vinyl chloride	4.4 E-6	I	1.0 E-1	I

Key:
A = ATSDR
H = HEAST (USEPA 1997)
I = IRIS (USEPA 2012)
CA = Cal/EPA (from NDEP 2012)
P = USEPA EPA PPRTV (from NDEP 2012)
S = NDEP Surrogate (from NDEP 2012)

TABLE 6-9
NON-CANCER TOXICITY CRITERIA FOR SOIL
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 1 of 1)

Chemical	Inhalation - Chronic		Inhalation - Subchronic		Oral[1] - Chronic		Oral[1] - Subchronic		Oral BIO	Dermal ABS[2]
	Value (mg/m^3)	Reference	Value (mg/m^3)	Reference	Value (mg/kg/day)	Reference	Value (mg/kg/day)	Reference		
Inorganics										
Perchlorate	NA		NA		7.0 E-4	USEPA 2012	7.0 E-4	Chronic	1.0	NA
Metals										
Aluminum	5.0 E-3	PPRTV	5.0 E-3	Chronic	1.0 E+0	PPRTV	1.0 E+0	Chronic	1.0	NA
Arsenic	1.5 E-5	USEPA 2012	1.5 E-5	Chronic	3.0 E-4	USEPA 2012	3.0 E-4	Chronic	0.3	NA
Lithium	NA		NA		2.0 E-3	PPRTV	2.0 E-3	Chronic	1.0	NA
Manganese (non-food)	5.0 E-5	USEPA 2012	5.0 E-5	Chronic	2.4 E-2	USEPA 2012	2.4 E-2	Chronic	1.0	NA
Thallium	NA		NA		7.0 E-5	USEPA 2012	7.0 E-5	Chronic	1.0	NA
Vanadium	NA		NA		5.0 E-3	USEPA 2012	5.0 E-3	Chronic	1.0	2.6%
Organic Compounds										
Benzo(a)anthracene	NA		NA		3.0 E-2	pyrene as surrogate	3.0 E-2	Chronic	1.0	0.13
Benzo(a)pyrene	NA		NA		3.0 E-2	pyrene as surrogate	3.0 E-2	Chronic	1.0	0.13
Benzo(b)fluoranthene	NA		NA		3.0 E-2	pyrene as surrogate	3.0 E-2	Chronic	1.0	0.13
Benzo(k)fluoranthene	NA		NA		3.0 E-2	pyrene as surrogate	3.0 E-2	Chronic	1.0	0.13
Chrysene	NA		NA		3.0 E-2	pyrene as surrogate	3.0 E-2	Chronic	1.0	0.13
Dibenzo(a,h)anthracene	NA		NA		3.0 E-2	pyrene as surrogate	3.0 E-2	Chronic	1.0	0.13
Indeno(1,2,3-cd)pyrene	NA		NA		3.0 E-2	pyrene as surrogate	3.0 E-2	Chronic	1.0	0.13

Notes

Values obtained from NDEP (2012).

NA = Not applicable. Data is either not applicable for this chemical or not available.

BIO = bioavailability

ABS = dermal absorption efficiency

(1) Vanadium required the adjustment of the oral toxicity criteria for the dermal soil exposure pathway (USEPA 2004e).

(2) Dermal absorption factors obtained from USEPA 2004e.

TABLE 6-10
CANCER TOXICITY CRITERIA FOR SOIL
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 1 of 1)

Chemical	Inhalation Value $(\mu g/m^3)^{-1}$	Inhalation Reference	Oral[1] Value $(mg/kg\text{-}day)^{-1}$	Oral[1] Reference	Oral BIO	Dermal ABS[2]
Inorganics						
Perchlorate	NA		NA		1.0	NA
Metals						
Aluminum	NA		NA		1.0	NA
Arsenic	4.3 E-3	USEPA 2012	1.5 E+0	USEPA 2012	0.3	NA
Lithium	NA		NA		1.0	NA
Manganese	NA		NA		1.0	NA
Thallium	NA		NA		1.0	NA
Vanadium	NA		NA		1.0	2.6%
Organic Compounds						
Benzo(a)anthracene	1.1 E-4	Cal/EPA	7.3 E-1	USEPA 1993	1.0	0.13
Benzo(a)pyrene	1.1 E-3	Cal/EPA	7.3 E+0	USEPA 2012	1.0	0.13
Benzo(b)fluoranthene	1.1 E-4	Cal/EPA	7.3 E-1	USEPA 1993	1.0	0.13
Benzo(k)fluoranthene	1.1 E-4	Cal/EPA	7.3 E-2	USEPA 1993	1.0	0.13
Chrysene	1.1 E-5	Cal/EPA	7.3 E-3	USEPA 1993	1.0	0.13
Dibenzo(a,h)anthracene	1.2 E-3	Cal/EPA	7.3 E+0	USEPA 1993	1.0	0.13
Indeno(1,2,3-cd)pyrene	1.1 E-4	Cal/EPA	7.3 E-1	USEPA 1993	1.0	0.13

Notes

Values obtained from NDEP (2012).

NA = Not applicable. Data is either not applicable for this chemical (*i.e.* , not carcinogenic) or not available.

BIO = bioavailability - NOTE: The basis for the arsenic oral bioavailability is presented in Closure Plan.

ABS = dermal absorption efficiency

(1) Vanadium required the adjustment of the oral toxicity criteria for the dermal soil exposure pathway (USEPA 2004e).

(2) Dermal absorption factors obtained from USEPA 2004e.

TABLE 6-11
CHEMICAL RISK SUMMARY FOR CONSTRUCTION WORKER RECEPTORS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Receptor	HI	ILCR
Future On-Site Construction Worker		
Soil, Dermal, and Dust	0.52	2 E-7
Volatile Inhalation (from Flux)(1)	0.033	2 E-8
Combined	0.56	2 E-7

Chemical	Soil Conc. (mg/kg)	Oral HQ	Dermal HQ	Outdoor Inhal HQ	Total HI	Oral ILCR	Dermal ILCR	Outdoor Inhal ILCR	Total ILCR
Inorganics									
Perchlorate	2.3	1.0 E-2	NA	NA	1.0 E-2	NA	NA	NA	NA
Metals									
Aluminum	11300	3.6 E-2	NA	4.5 E-2	8.2 E-2	NA	NA	NA	NA
Arsenic	6.7	2.2 E-2	NA	8.9 E-3	3.1 E-2	1 E-7	NA	8 E-9	1 E-7
Lithium	18.3	3.0 E-2	NA	NA	3.0 E-2	NA	NA	NA	NA
Manganese	596.2	8.0 E-2	NA	2.4 E-1	3.2 E-1	NA	NA	NA	NA
Thallium	0	1.8 E-2	NA	NA	1.8 E-2	NA	NA	NA	NA
Vanadium	55.4	3.6 E-2	NA	NA	3.6 E-2	NA	NA	NA	NA
Polynuclear Aromatic Hydrocarbons									
Benzo(a)anthracene	0.002	1.6 E-7	6.4 E-8	NA	2.3 E-7	5 E-11	2 E-11	5 E-14	7 E-11
Benzo(a)pyrene	0.002	2.4 E-7	9.3 E-8	NA	3.3 E-7	7 E-10	3 E-10	7 E-13	1 E-9
Benzo(b)fluoranthene	0.008	8.4 E-7	3.3 E-7	NA	1.2 E-6	3 E-10	1 E-10	2 E-13	4 E-10
Benzo(k)fluoranthene	0.0015	1.6 E-7	6.2 E-8	NA	2.2 E-7	5 E-12	2 E-12	5 E-14	7 E-12
Chrysene	0.002	2.0 E-7	7.6 E-8	NA	2.7 E-7	6 E-13	2 E-13	6 E-15	9 E-13
Dibenzo(a,h)anthracene	0.005	5.4 E-7	2.1 E-7	NA	7.5 E-7	2 E-9	7 E-10	2 E-12	2 E-9
Indeno(1,2,3-cd)pyrene	0.0017	1.8 E-7	6.9 E-8	NA	2.5 E-7	6 E-11	2 E-11	5 E-14	8 E-11
Total		0.23	0.00000090	0.29	**0.52**	1 E-7	1 E-9	8 E-9	**2 E-7**

HQ = hazard quotient
HI - hazard index
ILCR = incremental lifetime cancer risk
(1) Note that risk estimates for surface flux data were done on a sample-by-sample basis, therefore, risks are presented as the maximum individual sample location. See Appendix H for sample-specific risk estimates.

TABLE 6-12
CHEMICAL RISK SUMMARY FOR MAINTENANCE (OUTDOOR) WORKER RECEPTORS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 1 of 1)

Receptor	HI	ILCR
Future On-Site Maintenance Worker		
Soil, Dermal, and Dust	0.067	1 E-6
Volatile Inhalation (from Flux)(1)	0.029	5 E-7
Combined	0.096	1 E-6

Chemical	Soil Conc. (mg/kg)	Oral HQ	Dermal HQ	Outdoor Inhal HQ	Total HI	Oral ILCR	Dermal ILCR	Outdoor Inhal ILCR	Total ILCR
Inorganics									
Perchlorate	2.3	2.8 E-3	NA	NA	2.8 E-3	NA	NA	NA	NA
Metals									
Aluminum	11300	1.0 E-2	NA	5.2 E-4	1.0 E-2	NA	NA	NA	NA
Arsenic	6.7	5.9 E-3	NA	1.0 E-4	6.0 E-3	9 E-7	NA	2 E-9	1 E-6
Lithium	18.3	8.1 E-3	NA	NA	8.1 E-3	NA	NA	NA	NA
Manganese	596.2	2.2 E-2	NA	2.8 E-3	2.5 E-2	NA	NA	NA	NA
Thallium	0	4.8 E-3	NA	NA	4.8 E-3	NA	NA	NA	NA
Vanadium	55.4	9.8 E-3	NA	NA	9.8 E-3	NA	NA	NA	NA
Polynuclear Aromatic Hydrocarbons									
Benzo(a)anthracene	0.002	4.5 E-8	3.8 E-8	NA	8.3 E-8	3 E-10	3 E-10	1 E-14	6 E-10
Benzo(a)pyrene	0.002	6.5 E-8	5.6 E-8	NA	1.2 E-7	5 E-9	4 E-9	2 E-13	9 E-9
Benzo(b)fluoranthene	0.008	2.3 E-7	2.0 E-7	NA	4.3 E-7	2 E-9	2 E-9	7 E-14	3 E-9
Benzo(k)fluoranthene	0.0015	4.3 E-8	3.7 E-8	NA	8.1 E-8	3 E-11	3 E-11	1 E-14	6 E-11
Chrysene	0.002	5.3 E-8	4.6 E-8	NA	9.9 E-8	4 E-12	4 E-12	2 E-15	8 E-12
Dibenzo(a,h)anthracene	0.005	1.5 E-7	1.3 E-7	NA	2.7 E-7	1 E-8	1 E-8	5 E-13	2 E-8
Indeno(1,2,3-cd)pyrene	0.0017	4.8 E-8	4.2 E-8	NA	9.0 E-8	4 E-10	3 E-10	2 E-14	7 E-10
Total		0.063	0.00000054	0.0034	**0.067**	1 E-6	2 E-8	2 E-9	**1 E-6**

HQ = hazard quotient
HI - hazard index
ILCR = incremental lifetime cancer risk
(1) Note that risk estimates for surface flux data were done on a sample-by-sample basis, therefore, risks are presented as the maximum individual sample location. See Appendix H for sample-specific risk estimates.

TABLE 6-13
ASBESTOS RISK SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Asbestos Risk Calculations ***Risk = $(C_{soil}*URF*(ET_{out}+(ET_{in}*ATT_{in}))*EF*ED) / (PEF*AT)$***

		CHRYSOTILE				AMPHIBOLE			
ESTIMATED RISK	**Units**	**Construction**	**Outdoor Worker**	**Indoor Worker**	**Onsite Resident**	**Construction**	**Outdoor Worker**	**Indoor Worker**	**Onsite Resident**
Estimated Risk (Total Structures)	Unitless	0 E+0	0 E+0	--	--	2 E-7	5 E-8	--	--
95% UCL (Total Structures)	Unitless	5 E-9	1 E-9	--	--	8 E-7	2 E-7	--	--
ESTIMATED AIR CONCENTRATIONS									
Estimated Airborne Concentration, C_{air} (best estimate)[A]	f/m^3	0.00E+00	0.00E+00	--	--	8.37E+00	1.08E-01	--	--
Estimated Airborne Concentration (upper bound)[B]	f/m^3	2.51E+01	3.25E-01	--	--	3.97E+01	5.14E-01	--	--

[A] *Estimated Airborne Concentration = Estimated C_{soil} * 1/PEF*

[B] *Estimated Airborne Concentration = 95% UCL (upper bound) * 1/PEF*

TABLE 7-1
UNCERTAINTY ANALYSIS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Source of Uncertainty	May Underestimate Risk	May Overestimate Risk	May Under or Overestimate Risk
Environmental Sampling and Analysis			
Sampling and laboratory analyses may have been inadequate to fully characterize the concentrations at the site.			Moderate
Systematic or random errors in the chemical analyses may yield erroneous data.			Low
The risk estimates are based on the COPCs only. Other chemicals were not quantified.	Moderate		
There was one result that was rejected through data validation (a benzyl alcohol result for UPC1-BB33-0). The rejection was due to a very low matrix spike/matrix spike duplicate (MS/MSD) recovery.	Low		
Although radon flux sampling was performed, the results were not evaluated in the human health risk assessment based on results of recent radon testing performed in groundwater and indoor air samples.	Low		
Exposure Assumptions			
Fate and transport modeling did not take into account biodegradation or other degradation processes.		Moderate	
Modeling did not take into account interactions that may occur among the different chemicals which may influence their migration.		Moderate	
Only primary receptors of concern were evaluated. Other populations (*e.g.* , nearby residents) were not assessed.	Low		
Only primary exposure pathways were evaluated. Other pathways were not assessed.	Low		
Some of the exposure point concentrations used in the exposure assessment were based on modeled, rather than measured, levels in various media (*e.g.* , air).			Moderate

TABLE 7-1
UNCERTAINTY ANALYSIS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Source of Uncertainty	May Underestimate Risk	May Overestimate Risk	May Under or Overestimate Risk
Reasonable maximum exposure values were combined to arrive at the ADD and LADD estimates. There is a low probability that all of the various upper bound assumptions used in the exposure assessment would occur in conjunction with the 95 percent UCL chemical concentration.		Moderate	
Exposure point concentrations and the amount of media intake were assumed to be constant over time.		Low	
Toxicological Data			
Sub-chronic RfDs are appropriate to characterize non-cancer effects for short-term expo-sures (*i.e.* , construction workers). However, sub-chronic RfDs were not available and therefore, chronic RfDs were used.		Moderate	
RfDs are derived and extrapolated from laboratory animal studies that expose animals to relatively high intakes. Errors are inherent in the extrapolation of data from animals to humans, from high to low doses, and from one exposure route to another.			Moderate
RfDs used to estimate non-carcinogenic risk are derived from NOAELs which are based on the sensitive endpoints in the sensitive species. As a result, extrapolation of toxicity data from animals to humans is uncertain. There may be differences in metabolism, uptake, or distribution of chemicals in the body between animals and humans. To account for this, NOAELs are divided by uncertainty factors spanning several orders of magnitude to establish the RfD. The combination of these two conservative assumptions may establish RfDs which greatly overprotect human health.		Moderate	

TABLE 7-1
UNCERTAINTY ANALYSIS
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Source of Uncertainty	May Underestimate Risk	May Overestimate Risk	May Under or Overestimate Risk
CSFs used for the animal carcinogens are the 95% UCL derived from the linearized multistage model using animal chronic bioassay data, which tends to greatly overestimate carcinogenic risk in humans. The linearized multistage model ignores many known factors that have been documented to protect humans against the carcinogenic actions of chemicals, such as DNA repair and immunosurveillence.		High	
RfDs, CSFs and defensible carcinogenicity data were not available for some COPCs, which were therefore not quantitatively evaluated.	Low		
Aggregation of Exposure Units			
Aggregating the exposure areas or extrapolating from Site analytical results to estimated concentrations for individual 1/8-acre exposure areas.	Low		

TABLE 9-1
DATA QUALITY ASSESSMENT
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Table 9-1a: Sample Size Results for Arsenic with Background = 7.2 mg/kg

Number of samples = 69		s = 2.06		
Threshold = 7.2 mg/kg		α = 5%	α = 10%	α = 15%
MDD = 10% (0.72 mg/kg)	β = 15%	70	52	42
	β = 20%	61	44	34
	β = 25%	53	37	28
MDD = 20% (1.4 mg/kg)	β = 15%	19	14	11
	β = 20%	16	12	9
	β = 25%	14	10	8
MDD = 30% (2.2 mg/kg)	β = 15%	9	7	5
	β = 20%	8	6	4
	β = 25%	7	5	4

Table 9-1b: Sample Size Results for Benzo(a)pyrene with Resid. BCL = 0.0622 mg/kg

Number of samples = 69		s = 0.0013		
Threshold = 0.0622 mg/kg		α = 5%	α = 10%	α = 15%
MDD = 10% (0.00622 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 20% (0.0124 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 30% (0.0187 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1

Table 9-1c: Sample Size Results for beta-BHC with Resid. BCL = 4.22 mg/kg

Number of samples = 69		s = 0.0033		
Threshold = 4.22 mg/kg		α = 5%	α = 10%	α = 15%
MDD = 10% (0.422 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 20% (0.844 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 30% (1.27 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1

Table 9-1d: Sample Size Results for Chromium with Resid. BCL = 100,000 mg/kg

Number of samples = 69		s = 4.8		
Threshold = 100,000 mg/kg		α = 5%	α = 10%	α = 15%
MDD = 10% (10,000 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 20% (20,000 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 30% (30,000 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1

Table 9-1e: Sample Size Results for Chromium (VI) with Resid. BCL = 234 mg/kg

Number of samples = 69		s = 0.27		
Threshold = 234 mg/kg		α = 5%	α = 10%	α = 15%
MDD = 10% (23.4 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 20% (46.8 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 30% (70.2 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1

Table 9-1f: Sample Size Results for Thorium-228 with Background = 2.28 pCi/g

Number of samples = 70		s = 0.47		
Threshold = 2.28 pCi/g		α = 5%	α = 10%	α = 15%
MDD = 10% (0.228 pCi/g)	β = 15%	36	27	21
	β = 20%	31	23	18
	β = 25%	28	19	15
MDD = 20% (0.456 pCi/g)	β = 15%	10	7	6
	β = 20%	9	6	5
	β = 25%	8	6	4
MDD = 30% (0.684 pCi/g)	β = 15%	5	4	3
	β = 20%	5	3	3
	β = 25%	4	3	2

TABLE 9-1
DATA QUALITY ASSESSMENT
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Table 9-1g: Sample Size Results for Formaldehyde with Resid. BCL = 10.6 mg/kg

Number of samples = 69		s = 0.13		
Threshold = 10.6 mg/kg		α = 5%	α = 10%	α = 15%
MDD = 10% (1.06 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 20% (2.12 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 30% (3.18 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1

Table 9-1h: Sample Size Results for Lead with BCL = Resid. 400 mg/kg

Number of samples = 69		s = 18.1		
Threshold = 400 mg/kg		α = 5%	α = 10%	α = 15%
MDD = 10% (40 mg/kg)	β = 15%	3	2	2
	β = 20%	3	2	1
	β = 25%	3	2	1
MDD = 20% (80 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 30% (120 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1

Table 9-1i: Sample Size Results for Perchlorate with Resid. BCL = 54.8 mg/kg

Number of samples = 69		s = 3.31		
Threshold = 54.8 mg/kg		α = 5%	α = 10%	α = 15%
MDD = 10% (5.48 mg/kg)	β = 15%	5	3	2
	β = 20%	4	3	2
	β = 25%	4	3	2
MDD = 20% (10.96 mg/kg)	β = 15%	2	2	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 30% (16.4 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1

TABLE 9-1
DATA QUALITY ASSESSMENT
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Table 9-1j: Sample Size Results for 2,3,7,8-TCDD with Resid. BCL = 0.0000039 mg/kg

Number of samples = 43		s = 0.00000038		
Threshold = 0.0000039 mg/kg		α = 5%	α = 10%	α = 15%
MDD = 10% (0.00000039 mg/kg)	β = 15%	10	7	5
	β = 20%	8	6	5
	β = 25%	8	5	4
MDD = 20% (0.00000078 mg/kg)	β = 15%	4	2	2
	β = 20%	3	2	2
	β = 25%	3	2	1
MDD = 30% (0.0000012 mg/kg)	β = 15%	2	2	1
	β = 20%	2	2	1
	β = 25%	2	1	1

Table 9-1k: Sample Size Results for Vanadium with Resid. BCL = 391 mg/kg

Number of samples = 69		s = 9.8		
Threshold = 391 mg/kg		α = 5%	α = 10%	α = 15%
MDD = 10% (39.1 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 20% (78.2 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1
MDD = 30% (117.3 mg/kg)	β = 15%	2	1	1
	β = 20%	2	1	1
	β = 25%	2	1	1

α = alpha
β = beta
s = standard deviation of sample data

APPENDIX A

NDEP COMMENTS AND BRC'S RESPONSE TO COMMENTS

APPENDIX A

Response to Draft NDEP Comments Dated January 11, 2013 on the Human Health Risk Assessment and Closure Report for the Galleria Dr. Right-of-Way, BMI Common Areas (Eastside), Clark County, Nevada, Dated December 2012

Significant corrections needed

1. Appendix H, Calculation Spreadsheets

For the construction worker scenario, the RfCs in App H CW_Calc are incorrect. The RfCs in the spreadsheet are linked to App H C Tox Criteria instead of App H NC Tox Criteria so that the values are the IURs and not the RfCs. This is a significant error because when the link is corrected, the overall inhalation HI goes from 3.7E-5 in the original calculation to 0.29 and the overall pathway HI goes from 0.23 in the original to 0.52 when corrected.

Response: *BRC agrees that this error exists in the construction worker risk estimate spreadsheet as identified in this comment. The error has been corrected, and as noted in the comment the total HI for the construction worker scenario is 0.52 (0.56 with surface flux risks included), which remains below the target HI of 1.0.*

2. No Appendix J provided as noted in cover letter.

Response: *The legal description will be provided in the coming days and therefore will be added as Appendix J.*

3. Page 2-9 and Figure 6

Text states in regard to Figure 6 that "[t]his is an example and actual features may change in the future." NDEP suggests that additional text be added to this section to clarify that no residential development will take place in the Galleria ROW boundaries unless a subsequent HHRA for residential scenario for additional areas is prepared and approved by NDEP. Alternatively, NDEP could add such language to any proposed NFA determination for Galleria ROW.

Response: *The Executive Summary and Section 2.5state that "Future closure plans will evaluate exposures associated with other receptors for areas developed outside the final roadway alignment and right-of-way for other uses, as necessary." Based on recent discussion with the NDEP, BRC agrees that suitable language can be added to the NFA determination for the Site similar to language added to the Warm Springs Road NFA already issued by the NDEP. Therefore, no changes have been made to the report.*

Minor corrections needed

4. Page 3-15, Thallium and Table 5-5

The BCL for thallium oxide is used rather than thallium. In the absence of a discussion as to why thallium oxide is more appropriate, the BCL for thallium should be used in the HHRA.

Response: *The BCL (from NDEP's May 2012 table) for thallium was used (which happens to be the same as that for thallic oxide), therefore, no changes were made to the report.*

5. Section 4.5 and Table 4-3.

Section 4.5 indicates benzyl alcohol data for sample UPC1-BB33-0 which was rejected; however Table 4-3 only has a UJ qualifier for this sample result. The text and table need to be in agreement.

Response: *The sample listed in Table 4-3 was collected at 10 feet bgs (UPC1-BB33-10) not the surface (UPC1-BB33-0). Additionally, UPC1-BB33-0 was rejected due to matrix spike recoveries and Table 4-3 discusses LCS recoveries.UPC1-BB33-0 is not discussed in Section 4.5.3.1 (MS/MSD qualifications) because its focus is estimated data. No changes are required.*

6. Tables 4-8, 4-9, 4-10, 4-11, and 4-12.

The control limits for calibration need to be listed in these tables so one can easily identify analytes that did not meet these criteria.

Response: *Control limits have been added to the tables listed.*

7. Table 5-1.

The background comparison results for thorium-228 do not pass the slippage test (p=0.00513). This should be noted in the text as well as updated on the table presented on page 5-4. It is recognized that the other radionuclides are the same as or statistically less than background and are all in secular equilibrium. However, for clarity and completeness, it is recommended that a note be included in the text that acknowledges the failure of the slippage test for thorium-228 and this issue should be addressed in the Uncertainty Analysis.

The first note under Table 5-1 is not correct – "Note: Background comparison statistics were performed using one-half the detection limit for metals and using GiSdT® (Neptune and Company 2009)." The non-parametric Gehan, quantile and slippage tests make no adjustment for detection limits, since their algorithms account for non-detects through Gehan ranking. It is only the *t*-test that uses ½ the detection limit.

Response*: Per NDEP's comment above, a footnote has been added to Table 5-2 stating "Although background comparison results for thorium-228 do not pass the slippage test; all other background comparison test pass, as do all background tests for other radionuclides (except for uranium-235/236 as noted in the table). In addition, radionuclides are in secular equilibrium, therefore, thorium-228 is not considered to be greater than background at the Site."*

The footnote for Table 5-1 has been changed to "Background comparison t-tests were performed using one-half the detection limit for metals and using GiSdT® (Neptune and Company 2009). The non-parametric Gehan, quantile and slippage tests make no adjustment for detection limits, since their algorithms account for non-detects through Gehan ranking."

8. Table 5-5

The title of this table should be changed to reference "Residential Soil BCLs" rather than "Outdoor Worker BCLs".

Response: *The table title has been revised as suggested.*

9. Table 6-2

Please verify or acknowledge that the asbestos lab report had a sample that was not reported in Table 6-2. The sample was GNC1-JD01-A (pg 133 of lab reports); 2 short and 2 long chrysotile were found. Is this sample pertinent to this report? If so, please include. If not, then please acknowledge in a response to comments. We note that this can happen (and has before) where the sample package included more samples than are relevant to a specific HHRA report.

Response: *Table 6-2 includes only those samples that remain after remediation and are therefore evaluated in the risk assessment. As indicated in Appendix B, Table B-1 (and the electronic database) sample GNC1-JD01 was excavated and the data replaced with post-excavation data (that is, sample GNC2-JD01 (and field duplicate). Which is why, consistent with past reports, this sample was not included in Table 6-2.*

10. Section 9.0 and Table 9-1.

The residential BCL for beta-BHC used in the DQA analysis should be 4.22 mg/kg rather than 0.316 mg/kg. This was verified against Table 5-5, which indicated that the residential BCL is 4.22 mg/kg.

Response: *The table has been changed as suggested.*

11. According to NDEP Asbestos Data Validation Guidance, the blank analyses, which includes filter lot, laboratory, field, method and equipment blanks, should be included with the asbestos laboratory reports.

Response: *Asbestos samples for the Site were collected in January 2009 and January 2010, predating NDEP's 2012 Asbestos Data Validation Guidance. Also, as noted previously, asbestos quality control (QC) analyses are based on laboratory sample totals which are based upon total elutriators received and then cross over between clients. These are not specific to a client or SDG group. In addition, any QC samples associated with the Site are included in the DVSRs as part of Appendix F of the report.*

Editorial

12. Table ES-1 notes.

There are 3 notes labeled 1, 3 and 4 – please change to 1, 2 and 3.

Response: *The footnotes have been changed as suggested.*

13. Section 4.5.3.1 and Table 4-2.

In Table 4-2, one laboratory data package has inconsistent naming compared to others. Specifically, data package ‘F0A080516 has an apostrophe while others do not. Please verify that this name is correct.

Response: *The apostrophe was included in error and has been removed from the table.*

REDLINE/STRIKOUT TEXT

EXECUTIVE SUMMARY

Basic Remediation Company LLC (BRC) has prepared this Human Health Risk Assessment (HHRA) and Closure Report for the Galleria Dr. Right-of-Way (Site) of the Basic Management, Inc. (BMI) Common Areas (Eastside) in Clark County, Nevada. The Site lies on and is a portion of the Galleria North and other (Phase I Development, Sunset North, and Eastside Main) sub-areas that have been defined within Eastside property. The purpose of this report is to support a request for a No Further Action Determination (NFAD) by the Nevada Division of Environmental Protection (NDEP) for the Site.

The HHRA evaluates the potential for adverse human health impacts that may occur as a result of potential exposures to residual concentrations of chemicals in soil, groundwater, and air following remediation of the Site. If the residual risks do not pose an unacceptable risk to human health and the environment, then an NFAD will be requested from the NDEP. Upon issuance of an NFAD by the NDEP, redevelopment of the Site is expected to proceed in a manner consistent with the Environmental Covenant (Instrument 201102030002818 Clark County Recorders Office) that is attached to the property. This report also describes the various remediation actions that were performed and presents the subsequent confirmation data collected in 2009 and 2010 at the Site.

BACKGROUND

An initial confirmation sampling investigation was conducted at the Site in 2009 in accordance with BRC's Sampling and Analysis Plans for the Galleria North and Upper Ponds sub-areas (SAPs, approved by the NDEP on December 12, 2008, and May 18, 2009, respectively), with follow-up sampling in 2010. The SAPs addressed sampling procedures such that remaining contaminants and their potential impacts to future Site uses (as discussed in Section 1.1 of the *BRC Closure Plan* for the BMI Common Areas [BRC, Environmental Resources Management (ERM), and Daniel B. Stephens & Associates, Inc. (DBS&A) 2007[1]]) can be determined. The Site investigation involved collection of soil matrix and surface flux samples from throughout the Site. The sampling plan performed for this purpose, as described in Section 4 of each SAP (BRC 2008, 2009a), was consistent with the approach presented in Section 2 of the *Statistical Methodology Report* (NewFields 2006). The *Statistical Methodology Report* describes the

[1] The *BRC Closure Plan* was finalized and approved by NDEP in 2007. Subsequent to this date, revisions were made to Section 9 of the *BRC Closure Plan* (Risk Assessment Methodology–Human Health). The latest revision to Section 9 is March 2010. No other sections of the *BRC Closure Plan* have been revised since 2007.

statistical methods that are used to confirm the final soils closure at each of the Eastside sub-areas of the BMI Common Areas. Several subsequent rounds of soil remediation and confirmation sampling were performed. The final number of samples collected was determined to be adequate for the completion of a statistically robust dataset upon which to perform an HHRA.

CONCEPTUAL SITE MODEL

The conceptual site model for the Site considers current and potential future land-use conditions. Currently, the Site is undeveloped. Current receptors that may be exposed to Site chemicals of potential concern (COPCs) include on-site trespassers, occasional on-site workers, and off-site residents. Future receptors identified as "on-site receptors" are defined as receptors located within the current Site boundaries (Figure 1), while future "off-site receptors" are those located outside the current Site boundaries. Under the prospective redevelopment plan, the Site is proposed for use primarily as the Galleria Drive roadway, including right-of-way and landscaping. Portions of the Site may subsequently be developed for other uses (e.g., low- and medium-density residential and retail/commercial). For the evaluation in this Closure Report, the focus is for the Galleria Drive roadway and right-of-way and the HHRA assumes future receptors will include outdoor maintenance workers and construction workers. Future closure plans will evaluate exposures associated with other receptors for areas developed outside the final roadway alignment and right-of-way for other uses, as necessary.

Due to the requirement for use of default reasonable maximum exposure parameters for future receptors, exposures to future receptors are greater than current exposures. Accordingly, only future receptors were assessed in the HHRA. Potential exposures to off-site residents were qualitatively evaluated. The HHRA conforms to the methodology included in Section 9 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010).

The entire Site will be enhanced by restoration and redevelopment once remediation is complete. Therefore, there is no exposure to ecological receptors, because the Site will be prepared for human use as a roadway.

DATA REVIEW AND USABILITY EVALUATION

A data review and usability evaluation was performed to identify appropriate data for use in the HHRA. The results of the data usability evaluation indicate that the data collected in 2009 and 2010 are adequate in terms of quality and quantity for use in a risk assessment.

HUMAN HEALTH RISK ASSESSMENT

An HHRA was conducted to determine if chemical concentrations in Site soils are either: (1) representative of background conditions; or (2) do not pose an unacceptable risk to human health and the environment under current and potential future use conditions. The HHRA followed the procedures outlined in U.S. Environmental Protection Agency (USEPA) and the NDEP guidance documents. As noted above, the HHRA also conforms to the methodology presented in Section 9 of the NDEP-approved *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010) and includes all COPCs for the Site. Radionuclides were not included as COPCs because they were consistent with background conditions. Results of the HHRA are summarized below.

TABLE ES-1: SUMMARY OF HUMAN HEALTH RISK ASSESSMENT CALCULATIONS

	Construction Worker	Maintenance (Outdoor) Worker
Site (Total) Non-Cancer HI[1]	0.~~26~~56	0.096
Site (Total) Cancer Risk[2]	2×10^{-7}	1×10^{-6}
Asbestos Risk[3]	0 to 8×10^{-7}	0 to 2×10^{-7}

1 – HI = hazard index; the value presented is the total cumulative non-cancer HI.
~~3~~2 – Cancer risk is the maximum theoretical upper-bound incremental lifetime cancer risk (ILCR).
~~4~~3 – Asbestos risks represent the cumulative asbestos risks for chrysotile and amphibole fibers.

Outdoor air exposures to volatile organic compounds (VOCs) are evaluated on a sample-by-sample basis, per NDEP requirements, using the surface flux data measurements. Because of this, the minimum and maximum surface flux risks and HI estimates are summed with the soil risk and HI estimates to provide a range of cumulative risks and HIs. The risk estimates shown above incorporate the maximum surface flux risks. Primary risk contributors are discussed in the main body of the report.

EVALUATION OF UNCERTAINTIES

Risk estimates are values that have uncertainties associated with them. These uncertainties, which arise at every step of a risk assessment, are evaluated in the report to provide an indication of the uncertainty associated with a risk estimate. Uncertainties from different sources are compounded in the HHRA. Because the uncertainties are compounded and because the exposure assumptions and toxicity criteria used are considered conservative, the risk estimates calculated in this HHRA are likely to overestimate rather than underestimate potential risks. A detailed discussion of these uncertainties is provided in the Uncertainty Analysis (Section 7) of the report.

POTENTIAL IMPACTS TO GROUNDWATER

As noted in a letter dated September 17, 2012, from Greg Lovato, NDEP, to Mark Paris, BRC, HHRA reports for the project no longer evaluate the potential leaching impacts to groundwater for any sub-area. This issue will be addressed in the Eastside groundwater remedial alternatives study (GW RAS). As provided for in Section XVII of the Phase III Administrative Order on Consent, No Further Action Determinations issued for sub-areas are subject to continuing Work to address Water Pollution Conditions, Operation and Maintenance, maintenance of existing Institutional Controls, and/or Efficacy Review.

SUMMARY

Based on the results of the 2009/2010 sampling, the HHRA, and the conclusions presented there from in this report, exposures to residual levels of chemicals in soil at the Galleria Dr. Right-of-Way should not result in adverse health effects to any of the future receptors evaluated. As a result, an NFAD for the Galleria Dr. Right-of-Way is warranted, given the following provisos:

1. The NFAD does not pertain to groundwater. BRC retains the responsibility to address any environmental impacts to groundwater beneath the Site, pursuant to the *Settlement Agreement and Administrative Order on Consent, Phase 3* (NDEP 2006). As such, additional investigation may be necessary on the Site as it relates to BRC's responsibilities for groundwater. BRC must be granted access to the Site for activities such as well or soil boring installations or other investigative or remedial efforts.

2. The soils beneath 10 feet bgs of the Recorded Environmental Covenant (Instrument 201102030002818 Clark County Recorders Office) redevelopment grading plan for the Site have not been evaluated to date. Accordingly, the NFAD does not pertain to soil below the top 10 feet of the redevelopment grading plan for the Site. The property owner should note that these soils should not be disturbed without additional investigation or evaluation. BRC understands that this provision will be reflected in an Environmental Covenant for the Site.

3. The property owner should ensure that activities at the Site do not exacerbate existing, sub-surface, environmental conditions. The redevelopment grading plan (Figure 2) that has been prepared for redevelopment of the Site has been incorporated as an Environmental Covenant for the Site to control subsurface excavation.

4. Site use is otherwise suitable for purposes as a road right-of-way.

1.0 INTRODUCTION

Basic Remediation Company LLC (BRC) has prepared this Human Health Risk Assessment (HHRA) and Closure Report for the Galleria Dr. Right-of-Way (Site; Figure 1) of the Basic Management, Inc. (BMI) Common Areas (Eastside) in Clark County, Nevada. The purpose of this report is to support a request for a No Further Action Determination (NFAD) by the Nevada Division of Environmental Protection (NDEP) for the Site. As presented in Section XVII.1.a. of the *Settlement Agreement and Administrative Order on Consent: BMI Common Areas, Phase 3* (AOC3; NDEP 2006), the NDEP acknowledges that discrete Eastside areas may be issued an NFAD as remedial actions are completed for selected environmental media. Any such NFAD request shall identify the remedial actions and other work completed at the property in question, the results of such remedial actions and other work, the proposed land use(s), and the reasons supporting the eligibility of the property for an NFAD. This report provides this information for the Site.

BRC recognizes that the following conditions will be included in a Recorded Environmental Covenant (Instrument 201102030002818 Clark County Recorders Office) as a condition to receiving an NFAD from the NDEP:

1. The NFAD does not pertain to groundwater. BRC retains the responsibility to address any environmental impacts to groundwater beneath the Site, pursuant to the AOC3. As such, additional investigation may be necessary on the Site as it relates to BRC's responsibilities for groundwater. BRC must be granted access to the Site for activities such as well or soil boring installations or other investigative or remedial efforts.

2. The soils beneath 10 feet below ground surface (bgs) of the redevelopment grading plan for the Site have not been evaluated to date. Accordingly, the NFAD does not pertain to soil below the top 10 feet of the redevelopment grading plan for the Site. The property owner should note that these soils should not be disturbed without additional investigation or evaluation.

3. The property owner should ensure that activities at the Site do not exacerbate existing, sub-surface, environmental conditions. The grading plan (Figure 2), which has been prepared for redevelopment of the Site, has been incorporated as an Environmental Covenant for the Site to control subsurface excavation.

4. Site use is otherwise suitable for purposes as a road right-of-way.

As stated in Section VI of the NDEP's *Record of Decision, Remediation of Soils and Sediments in the Upper and Lower Ponds at the BMI Complex* (ROD; NDEP 2001), cleanup of the Site proceeded under Alternative 4B (soils transferred from the Site to a dedicated Corrective Action Management Unit [CAMU] within the BMI Complex),[2] as identified and described in Section 9 of the Remedial Alternatives Study (RAS) for the Eastside. The *Remedial Alternatives Study for Soils and Sediments in the Upper and Lower Ponds at the BMI Complex* (Environmental Resources Management [ERM] 2000) was submitted to the NDEP in March 2000. The RAS is documented via issuance of the ROD, dated November 2, 2001, by the NDEP.

This report is consistent in format with prior closure reports for other study areas, and incorporates comments received from the NDEP on those reports. Draft NDEP comments dated January 11, 2013 and BRC's response to these comments are included in Appendix A, as well as redline/strikeout text showing the revisions from the original version of the report. ~~Consistent with those reports, Appendix A has been reserved for potential future NDEP comments on this report and BRC's response to these comments.~~ An electronic version of the entire report, as well as original format files (MS Word and MS Excel) of all text, tables, modeling, and risk calculations are included on the report compact disc (CD) in Appendix B.

1.1 PURPOSE OF THE RISK ASSESSMENT

The purpose of the HHRA is to evaluate the potential for adverse human health impacts that may occur as a result of potential exposures to residual concentrations of chemicals in soil, groundwater, and air following remediation, and to assess whether any additional remedial actions are necessary in order to request an NFAD from the NDEP to allow redevelopment of the Site to proceed. The results of the risk assessment provide risk managers an understanding of the potential human health risks associated with background conditions and additional risks associated with past Site activities.[3] Pending issuance of an NFAD by the NDEP, redevelopment

[2] Under this alternative, the Site could be developed in accordance with the current development plan and the recorded Environmental Covenant for the Site that assures appropriate management of soils beneath 10 feet bgs (post-graded), should they need to be disturbed in the future.

[3] The HHRA presents total Site-related risk. Background risk is the risk to which a population is normally exposed, and does not include risks from Site contamination. Total Site-related risk includes both incremental (Site only) and background risks. Because naturally occurring constituents are typically included in a risk assessment (i.e., metals and radionuclides) the total Site-related risk will have some element of total risk included. However, because risks are only calculated for a subset of metal and radionuclides, a 'total' risk is not calculated. In instances where the total Site-related risk is calculated to exceed a cancer risk of 10^{-5} (typically when radionuclides are included in the risk assessment calculations) or a non-cancer hazard index greater than 1.0, then a background risk, only including those naturally occurring constituents included in the risk assessment, will also be calculated to provide context to the risk assessment results.

of the Site is expected to proceed in a manner consistent with the Recorded Environmental Covenant attached to the property.

As presented in Section 2.5 of the Sampling and Analysis Plans for the Galleria North and Upper Ponds Sub-Areas, BMI Common Areas (Eastside) Clark County, Nevada (BRC 2008, 2009a; hereinafter "SAPs"; approved by the NDEP on December 12, 2008, and May 18, 2008, respectively), the only remediation conducted at the Site prior to sampling in accordance with the SAPs involved tamarisk and debris removal. When the sampling conducted in accordance with the SAPs was performed, areas within the Site that warranted remediation were identified, as discussed in Section 3.3. These areas have been addressed. The overall goal of the risk assessment presented in this report, therefore, is to confirm that residual chemical concentrations are: (1) either representative of background conditions; or (2) do not pose an unacceptable risk to human health and the environment under current and potential future land use conditions. Findings of the HHRA are intended to support the Site closure process.

While, in general, human health protection, BRC's overall goal is to remediate Site soils such that they are suitable for residential uses, that is not appropriate nor necessary for this Site since its intended use is a roadway.

Project-specific risk level and remediation goals consistent with USEPA precedents and guidelines have been established, as summarized below. It should be noted that: (1) all comparisons to risk or chemical-specific goals are made on an exposure area basis consistent with likely exposure assumptions; and (2) these comparisons are demonstrated through the use of spatial statistical analysis to apply to each one-eighth-acre exposure area.

Human health risks are represented by estimated theoretical upper-bound cancer risks and non-cancer hazards derived in accordance with standard USEPA and NDEP methods. If the carcinogenic risks or non-cancer hazards exceed USEPA acceptable levels or NDEP risk goals, then remedial action alternatives must be considered. The acceptable risk levels defined by USEPA for the protection of human health, as identified in Section 9.1.1 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010), are:

- Post-NFAD chemical and radionuclide concentrations in Site soils are targeted to have an associated residual, cumulative theoretical upper-bound incremental lifetime cancer risk (ILCR) level point of departure of 10^{-6}. This is the target risk goal for the project. For cases where the NDEP identifies this goal to be unfeasible, it is BRC's understanding that the NDEP will re-evaluate the goal in accordance with USEPA (1991a) guidance. In no case will the residual, cumulative theoretical upper-bound carcinogenic risk levels exceed those allowed per USEPA guidance.

- Post-NFAD chemical concentrations in Site soils are targeted to have an associated cumulative, non-carcinogenic hazard index (HI) of 1.0 or less. If the screening HI is determined to be greater than 1.0, target organ-specific HIs will be calculated for primary and secondary organs. The final risk goal will be to achieve target organ-specific non-carcinogenic HIs of less than 1.0.

- Where background levels exceed risk level goals or chemical-specific remediation goals, metal concentrations and radionuclide activities in Site soils are targeted to have risks no greater than those associated with background conditions.

In addition to the risk goals discussed above, chemical-specific remediation goals have been established for lead and dioxins/furans. The target goal for lead is 400 milligrams per kilogram (mg/kg) for residential land use, which is a residential soil concentration identified by USEPA (based on the Integrated Exposure Uptake Biokinetic Model [IEUBK] model) as protective of any exposure scenario (USEPA 2004a).

For dioxins/furans and polychlorinated biphenyl (PCB) congeners, the USEPA toxicity equivalency (TEQ) procedure, developed to describe the cumulative toxicity of these compounds, is used. This procedure involves assigning individual toxicity equivalency factors (TEFs) to the 2,3,7,8 substituted dioxin/furan and PCB congeners. TEFs are estimates of the toxicity of dioxin-like compounds relative to the toxicity of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD), which is assigned a TEF of 1.0. Calculating the TEQ of a mixture involves multiplying the concentration of individual congeners by their respective TEF. One-half the detection limit is used for calculating the TEQ for individual congeners that are non-detect in a particular sample. The sum of the TEQ concentrations for the individual congeners is the TCDD TEQ concentration for the mixture. TEFs from USEPA (2010) are used.[4] Consistent with the Agency for Toxic Substances and Disease Registry (ATSDR) *Update to the ATSDR Policy Guideline for Dioxins and Dioxin-Like Compounds in Residential Soil* (2008a), the target goal for residential land use is the ATSDR screening value and the NDEP residential Basic Comparison Level (BCL; NDEP 2012) of 50 parts per trillion (ppt) TCDD TEQ.

[4] Consistent with the letter dated November 9, 2010, from Greg Lovato, NDEP, to Mark Paris, BRC. BRC will revise the *BRC Closure Plan* accordingly.

1.2 METHODOLOGY AND REGULATORY GUIDANCE

This risk assessment follows procedures outlined in USEPA *Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual* (RAGS; USEPA 1989), and conforms to Section 9 (Risk Assessment Methodology–Human Health) of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010) which was approved by the NDEP on July 16, 2007. Various NDEP guidance documents are also relied on for the risk assessment (as referenced throughout this report). In addition, the NDEP's BCLs (NDEP 2012) are used for comparison of Site characterization data to provide for an initial screening evaluation, assist in the evaluation of data usability, and aid in determination of extent of contamination. A full list of guidance documents consulted is provided in Section 6 and the References section at the end of this document.

This report also relies upon methodology and information provided in the NDEP-approved *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010). The main text of the *BRC Closure Plan* provides discussions of the following elements relative to the BMI Common Areas project as a whole:

- The project history, including cleanup goals and project objective (Closure Plan Sections 1 and 2);
- The list of Site-related chemicals (SRCs; Closure Plan Section 3);
- The conceptual site model (CSM) addressing potential contaminant sources, the nature and extent of chemical of potential concern (COPC) occurrence, and potential exposure pathways (Closure Plan Section 4; a CSM discussion specific to the Site is provided in Section 5 of this report);
- Data verification and validation procedures (Closure Plan Section 5);
- The procedures used to evaluate the usability and adequacy of data for use in the risk assessment (Closure Plan Sections 6 and 9 [2010 revision]);

- The data quality objectives (DQOs; Closure Plan Section 7[5]);
- The RAS process for the Site (Closure Plan Section 8);
- Risk assessment procedures that will be used for Site closure (Closure Plan Section 9 for human health [2010 revision] and Section 10 for ecological); and
- Data quality assessment (Closure Plan Section 5).

As discussed in this report, the risk assessment for the Site is conducted primarily using the data collected during implementation of the Site-specific SAPs and subsequent confirmation sampling events, which have been designed to produce data representative of the conditions to which current (non-remediation workers) and future users would be exposed.

1.3 REPORT ORGANIZATION

The closure report is composed of 11 sections, as outlined below:

- This section (Section 1) presents the purpose of the risk assessment and the methods used in this assessment.
- Section 2 presents Site background, the environmental setting for the Site, and a summary of previous investigations. Section 2 also presents the CSM for the risk assessment. This includes identification of potentially exposed populations, and the potential pathways of human exposure.
- Section 3 presents the confirmation data collected in 2009 and 2010, as well as discussions on the various remedial actions conducted at the Site.
- Section 4 presents data evaluation procedures, including statistical analysis of background concentrations, and data usability and quality.
- Section 5 presents the selection of COPCs recommended for further assessment, including comparisons of Site metals and radionuclides to background conditions.

[5] As noted in the *BRC Closure Plan*, per discussions with the NDEP, the DQO process is addressed, on an Eastside sub-area by sub-area basis (for soils), in the respective sub-area SAPs developed for each sub-area relating to the soils cleanup. Therefore, the DQO process for the Site is presented in the SAP and is not repeated here. This DQO process was incorporated in the data usability/data adequacy evaluation for the Site data used in the risk assessment.

- Section 6 presents the HHRA. This includes relevant statistical analyses, determination of representative exposure point concentrations, applicable fate and transport modeling, exposure assessment, toxicity assessment, and risk characterization.
- In Section 7, the uncertainties associated with the risk assessment are discussed.
- A summary of the risk assessment results is provided in Section 8.
- The data quality assessment for the risk assessment is presented in Section 9.
- A summary of the HHRA and Closure Report is provided in Section 10; and
- A list of references is provided in Section 11.

Smaller tables with supporting information are inserted in the text at the place of reference. The text is followed by the larger tables, and figures and appendices.

2.0 SITE DESCRIPTION

This section presents a description of the Site, including Site background and history, the environmental setting, and a summary of previous investigations. The area known as the "BMI Common Areas," of which the Galleria Dr. Right-of-Way is a part, is delineated in Appendix A of the AOC3. The subject Site is near the BMI Industrial Complex, in Clark County, Nevada, approximately 13 miles southeast of Las Vegas, within the City of Henderson (CoH) corporate limits, northeast of the City Hall (Figure 1). The total extent of the Site is approximately 44 acres. The Site is a portion of the sub-areas within Eastside that was previously defined as the Galleria North and Upper Ponds sub-areas in Section 1 and Figure 1-2 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010). The Site is a curvilinear area south of the CoH northern Rapid Infiltration Basins (RIBs) and CoH Water Reclamation Facility (WRF), which roughly trends along the former Galleria North/Upper Ponds boundary. The Tuscany residential development is immediately north of the eastern third of the Site, and the Weston Hills residential development is approximately 800 feet north of the Site.

The Site is essentially undeveloped desert with the exception of a former effluent conveyance ditch, a portion of which traverses the western portion of the Site along the boundary shared with the City WRF. From 1942 through 1976, various plant wastewaters were discharged into this conveyance ditch (named the Beta Ditch). A segment of the Southern Nevada Water Authority (SNWA) Pittman Lateral pipeline passes south and adjacent to the Site. This east-west trending subsurface feature is a major water supply conduit for the Las Vegas Valley. In addition, other utilities such as City of Henderson sewer mains, reuse water mains, and portions of the Nevada Environmental Response Trust (NERT) groundwater treatment water main are also present in portions of the site. Since 1976, when wastewater discharge to the Beta Ditch ceased, the Site has been vacant and unused. A utility corridor transects the Site near the Beta Ditch. This utility corridor was granted an NFAD by the NDEP on September 4, 2009, and is excluded from the Site.

2.1 SITE HISTORY

Approximately 400 of the more than 2,200 acres comprising the BMI Common Areas contained a network of ditches, canals, flumes, and unlined ponds that were used for the disposal of aqueous waste from the original magnesium plant and, later, other industrial plants and the adjacent municipality. Effluent wastes discharged to the ponds of the BMI Common Areas from the war-time Basic Magnesium operations can be characterized as salts from the production process (chloride salts of a variety of metals and radionuclides), organic solids, and inorganic solids and dissolved components of various types. Chlorinated organic chemicals were included in the effluent. Notable processes that contributed to the waste stream from the plants that succeeded Basic Magnesium included effluents from the manufacture of the following types of products: chlorine and sodium hydroxide (caustic soda); a variety of chlorate and perchlorate compounds, and halogenated boron compounds; manganese dioxide; titanium and related compounds; and a variety of pesticides. Among these wastes were salts, organic and inorganic chemicals, and metals. A more detailed description of these processes and their effluents is found in Sections 2.2 and 2.3 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010).

2.2 ENVIRONMENTAL SETTING

The BMI Common Areas and Complex are located in Clark County, Nevada, and are situated approximately 2 miles west of the River Mountains and 1 mile north of the McCullough Range. The local surface topography slopes in a westerly to northwesterly direction from the River Mountains and in a northerly to northeasterly direction from the McCullough Range. Near the BMI Common Areas and Complex, the surface topography slopes north toward the Las Vegas Wash. The River Mountains and McCullough Range consist of volcanic rocks: dacite in the River Mountains and andesite in the McCullough Range (Umhoefer et al. 2010).

The Site (Figure 3) comprises approximately 44 acres of undeveloped land with little surface relief that is gently sloping to the northeast. The Site is currently undeveloped, except for the previously noted Beta Ditch segment along the western edge of the Site, and unused ponds. As depicted on Figure 3, the Site has no other features of historical use; this Site has historically been undeveloped and unused. The native soils are compacted, poorly sorted, non-plastic, light brown to red silty sand with varying amounts of gravel.

2.2.1 Site Location, Climate and Physical Attributes

The Site is in the northeastern quarter of Section 5, Township 22 South, Range 63 East Mount Diablo Base and Meridian. The Site is in the Las Vegas Valley, a broad alluvial valley that occupies a structural basin in the Basin and Range Physiographic Province. The valley is about 1,550 square miles in size, and the structural and topographical axis is aligned approximately northwest to southeast. The eastern edge of the valley is about 5 miles west of Lake Mead, a major multipurpose artificial reservoir on the Colorado River. The Las Vegas Valley is surrounded mostly by mountains, ranging from 2,000 to 10,000 feet higher than the valley floor.

The valley floor ranges in elevation from about 3,000 feet above mean sea level (msl), in the west at the mountain front, to 1,500 feet above msl, in the east at the Wash (Clark County GIS Management Office 2003). The surrounding mountain ranges are:

- Sheep Range to the north;
- Frenchman and Sunrise Mountains to the northeast;
- River Range to the east;
- McCullough Range to the south; and
- Spring Mountains and Sierra Nevada mountain range of California to the west.

The Site is within the CoH corporate limits, northeast of the City Hall, and approximately 13 miles southeast of the city of Las Vegas (Figure 1). At its closest point, the Site is approximately 1 mile south of the Las Vegas Wash. The Site is a curvilinear area located south of the CoH northern RIBs and CoH WRF, which roughly trends along the former Galleria North/Upper Ponds boundary. The Radio Nevada and Tuscany residential development are immediately north of the eastern third of the Site, and the Weston Hills residential development is approximately 800 feet north of the Site.

The Site is situated in a natural desert area, where evaporation/evapotranspiration rates are high, due to high temperatures, high winds, and low humidity. Precipitation in this area averages approximately 0.4 inch per month or 4.8 inches per year (Western Regional Climate Center 2008). As discussed in the *Sources/Sinks and Input Parameters for Groundwater Flow Model Revised Technical Memorandum* (DBS&A 2009), in arid settings, recharge from precipitation is typically a small percentage of annual precipitation. Based on values from Scanlon et al. (2006), recharge as a percentage of annual precipitation for the Site area was estimated to be between 0.1 and 5 percent. Recharge is thus estimated to be between 0.0048 and 0.24 inch per year.

According to the Southern Nevada Water Authority's document entitled *Extent and Potential Use of the Shallow Aquifer and Wash Flow in Las Vegas Valley, Nevada* (1996), annual potential evapotranspiration exceeds 86 inches. Pan evaporation data measured from 1985 through 1988 were as high as 17 inches per month; the months with the highest evaporation (May through September) coincide with those months with the highest intensity of rainfall (Law Engineering 1993). However, evaporation and evapotranspiration are functions of vegetation type and density and other Site-specific conditions (especially anthropogenic conditions). Therefore, Site-specific evaporation/evapotranspiration may vary from these regional conditions. These climatic parameters may be appreciably influenced by future redevelopment (e.g., vegetation removal, pavement extent, and construction).

Wind flow patterns are fairly consistent from one month to another, but vary slightly between measurement stations (McCarran International Airport and a station within the BMI Complex adjacent to the employee parking lot at the Titanium Metals Corporation [TIMET] plant entrance) adjacent to the BRC haul road. For the McCarran station, the prevailing wind direction is from the southwest. The TIMET station also showed a predominant wind direction from the southwest, with southeasterly components. Wind velocity at both locations tends to be the highest in the spring and early summer months (April through July).

2.2.2 Geology/Hydrology

As is common throughout the Las Vegas Valley, Site soils are primarily sand and gravel, with occasional cobbles. This is consistent with the depositional environment of an alluvial fan. The Site is located on alluvial fan sediments, with a surface that slopes to the north-northeast at a gradient of approximately 0.02 foot per foot towards the Las Vegas Wash. Regional drainage is generally to the east.

The uppermost strata beneath the Site consist primarily of alluvial sands and gravels derived from the River Mountains and from the volcanic source rocks in the McCullough Range, located southeast and southwest of the Site, respectively. These uppermost alluvial sediments were deposited within the last 2 million years and are of Quaternary Age, and are thus mapped and referred to as the Quaternary alluvium (Qal; Carlsen et al. 1991). The Qal is typically on the order of 50 feet thick at the Site with variations due, in part, to the non-uniform contact between the Qal and the underlying Tertiary Muddy Creek Formation (TMCf).

The TMCf underlies the Qal. The Muddy Creek formation, of which the TMCf is the uppermost part, is a lacustrine deposition from the Tertiary Age, and it underlies much of the Las Vegas Valley. It is more than 2,000 feet thick in places. The lithology of the TMCf underlying the Site is typically fine-grained (sandy silt and clayey silt), although layers with increased sand content are sporadically encountered. These TMCf materials have typically low permeability, with hydraulic conductivities on the order of 10^{-6} to10^{-8} centimeters per second (Weston 1993). The TMCf in the vicinity of the Site was encountered to the maximum explored depth of 430 feet bgs. Lithologic cross sections are shown on Figures 4 and 5.

Two distinct, laterally continuous water-bearing zones are present within the upper 400 feet of the Site subsurface: (1) an upper, unconfined water-bearing zone primarily within the Qal referred to herein as the alluvial aquifer (Aa); and (2) a deep, confined water-bearing zone that occurs in a sandier depth interval within the silts of the deeper TMCf. Both of these water-bearing zones contain high concentrations of total dissolved solids. Between these two distinct water-bearing zones, a series of saturated sand stringers was sporadically and unpredictably encountered during drilling.

The Aa is an unconfined, shallower, water-bearing zone that occurs across the Site. For the most part, water in the Aa occurs in the Qal. The water surface in the Aa generally follows topography, with the water surface sloping towards the Las Vegas Wash. The depth from the surface to first groundwater at the Site is approximately 34 to 64 feet bgs (Figure 3). Wells completed in the Aa are not highly productive, with sustainable flows typically less than 5 gallons per minute.

2.2.3 Surface Water

Surface water flow occurs for brief periods of time during periodic precipitation events. The Las Vegas Wash collects storm water, shallow groundwater, urban runoff, and treated municipal wastewater. It is the receiving water body for all major Las Vegas area discharges. In dry weather, flow in the Wash comprises mainly treated effluent from the Clark County Water Reclamation District City of North Las Vegas, City of Las Vegas Water Pollution Control Facility, and the City of Henderson WRF. The CoH contributes smaller amounts. Aggregate flow is in excess of 160 million gallons per day (Las Vegas Wash Coordination Committee 2000). Discharge from these sources is sufficient to maintain surface flows in the Wash throughout the year. In winter, low-intensity rains fall over broad areas; in the spring and fall, thunderstorms provide short periods of high-intensity rainfall. The latter creates high run-off conditions. Run-off is also affected by human development, which tends to (1) create conduits for surface water flow and (2) decrease infiltration into native soils by covering them with man-made structures or materials (e.g., pavement).

Under current conditions, it is unlikely that ephemeral surface waters generated within the Site will migrate via overland transport to the Las Vegas Wash from the Site due to the intervening presence of the CoH WRF, northern RIBs, and the Weston Hills and Tuscany developments between the Site and the Wash. However, the presence of the drainage ditches suggests the current potential for rainfall to be carried from those portions of the Site to the Wash. After redevelopment, when the ditches have been removed, there will be an even lower likelihood that ephemeral surface waters generated within the Site will migrate via overland transport to the Las Vegas Wash from the Site because of the proposed design of the future storm water facilities and the regional requirement that nuisance flows not be discharged directly into the Las Vegas Wash unless they do so under existing conditions. (Flows from future development do not meet this criterion.)

Groundwater seeps currently exist at various locations north of the BMI Common Areas near the Las Vegas Wash. No seeps currently exist within the Site. Evidence that they have existed within the Site in the past 70 years is equivocal. In the series of aerial photographs taken regularly over the 70-year period between 1941 and 2011, those from the mid- to late-1960s appear to show a dark feature that could be water. It is not possible to definitively interpret these photographs, and no photographs taken before or after this time period show the same dark feature. There is no chemical or hydrological evidence that seeps have existed on the Site. The estimated locations of any hypothesized historical seeps in the Site vicinity are depicted on Figure 3.

2.3 SUMMARY OF HISTORICAL INVESTIGATIONS

Several historical field investigations were conducted at the Site to characterize the nature and extent of chemical occurrence in Site soils and groundwater. Based on these sampling events, BRC identified portions of the Site that warranted remediation for protection of human health and the environment,[6] and subsequently performed remediation in those areas. The SAPs present a detailed analysis of data collected during the historical field investigations conducted at the Galleria North and Upper Ponds sub-areas. Of those investigations, the following sampling events included sampling within the Site boundaries:

- Supplemental soil investigation conducted in October 1999 (dataset 6d) in the Upper Ponds. These data were not collected under a formal NDEP-approved work plan. Data validation results are presented in the DVSR for dataset 6d (ERM 2006), which was approved by NDEP on October 10, 2006.

- Supplemental soil investigation conducted in May/June 2001 (dataset 20c). These data were not collected under a formal NDEP-approved work plan. Data validation results are

[6] It should be noted that this determination was based on comparison of chemical detections to then-applicable human-health risk-based screening levels.

presented in the DVSRs for dataset 20c (ERM 2007a), which same dataset was approved by the NDEP on February 5, 2007.

- Deep soil characterization conducted in June/July 2004 during monitoring well installation at one on-site location (SB-05-B) as part of the overall Eastside 2004 Hydrologic Characterization Investigation (dataset 27). The sampling results for the investigation activities were presented in the 2004 version of the *BRC Closure Plan*, which was not approved by NDEP. Data validation results are presented in the DVSR for dataset 27 (MWH 2006a), which was approved by NDEP on August 31, 2006.

- Discussions between BRC and NDEP after the unusually heavy rainstorms of 2004 resulted in the decision to collect surface soil samples at three locations where the Alpha Ditch joins the City of Henderson. Data validation results are presented in the DVSR for dataset 32 (MWH 2006b), which was approved by NDEP on September 26, 2006.

- Soil sampling was conducted in June/July 2007 (dataset 46) in association with an investigation to further assess groundwater conditions within the northeast portion of the Common Areas. Data validation results are presented in the DVSR for dataset 46 (ERM 2007b), which was approved by NDEP on December 5, 2007.

The Site-related data from the above investigations were also presented in Appendix B of the SAPs. During these investigations, soil samples at various depths were collected and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), organochlorine pesticides, organophosphorus pesticides, PCBs, chlorinated herbicides, dioxins/furans, aldehydes, glycols/alcohols, organic acids, metals, perchlorate, radionuclides, and/or asbestos. The data from these investigations have been validated, as noted above. Data validations are presented in the respective DVSRs for each of the datasets, and all have been approved by the NDEP.

Several of the samples collected during these historical investigations were composite samples and were collected at least 10 years ago; few of the previous samples were analyzed for all of the major chemicals or chemical families now mandated; several analyses used different analytical methods than established in the current analytical program for the BMI Common Areas; and spatial coverage of the Site was incomplete. Therefore, because of these various factors, the data collected as part of the SAPs (as discussed in Section 3) are considered more representative of current Site conditions[7] than data collected from previous investigations, and these recent 2009/2010 data are therefore relied upon for risk assessment purposes as described in this report.

2.4 HISTORICAL REMEDIAL ACTIVITIES

Prior to 2009, remedial activities had not been conducted within the Site boundaries. However, in 2007, BRC conducted a broad-scale removal of tamarisk plants and debris across the Eastside property. The tamarisk removal efforts in the Site were minor, and were primarily associated with the immediate vicinity of the former ditches (see Figure 3); these efforts involved removal of minimal amounts of Site soil incorporated in the plant roots. In March-April 2000, an interim remedial measure (IRM) was conducted in the adjacent Sunset North Commercial and Upper Ponds sub-areas. This IRM area is also shown on Figure 3.

2.5 CONCEPTUAL SITE MODEL

The CSM is a tool used in risk assessment to describe relationships between chemicals and potentially exposed human receptor populations, thereby delineating the relationships between the suspected sources of chemicals identified at the Site, the mechanisms by which the chemicals might be released and transported in the environment, and the means by which the receptors could come in contact with the chemicals. The CSM provides a basis for defining DQOs, guiding Site characterization, and developing exposure scenarios. The Site history, land uses, climate, physical attributes, including geology and hydrogeology, and various field investigations are described in Sections 2.1 through 2.4 of this HHRA. The history and environmental conditions of the BMI Common Areas are described in Sections 2 and 4 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010), and in the Sitewide CSM (in preparation).

The HHRA evaluates current and potential future land-use conditions. The Site is currently undeveloped. The potential on- and off-site receptors are currently trespassers, occasional on-site workers, and off-site residents. Exposures to current receptors are being managed through Site access control.

Under the prospective redevelopment plan, the Site will have a roadway land use, including right-of-way and landscaping. Portions of the Site may subsequently be developed for other uses (e.g., low- and-medium density residential and retail/commercial). For the evaluation in this

[7] This determination is also based on the data usability evaluation summarized in Section 4.2.

Closure Report, the focus is for the Galleria Drive roadway and right-of-way and the HHRA assumes future receptors will include outdoor maintenance workers and construction workers. Future closure plans will evaluate exposures associated with other receptors for areas developed outside the roadway for other uses, as necessary.

The entire Site will be enhanced by restoration and redevelopment once remediation is complete. Therefore, exposures to ecological receptors will be mitigated or removed. Future receptors identified as “on-site receptors” are defined as receptors located within current Site boundaries (Figure 1), while future “off-site receptors” are those located outside current Site boundaries. Many potential human receptors are possible at the Site in the period during and after redevelopment. The potentially exposed populations and their potential routes of exposure are discussed in Section 2.5.3.

The current development plan for the Site is shown on Figure 6 (note the right-of-way on this figure was prepared subsequent to the development plan shown). This is an example and actual features may change in the future. To construct the roadway and associated features, the land will be cut and/or filled, paved with roads, and nurtured with imported top soils[8] as needed. Figure 2 shows the Redevelopment Grading Plan for the Site, indicating which areas will be filled and which areas will be cut.

The CSM includes the planned redevelopment of the Site. All potential transfer pathways are included in the CSM. The human health aspects of the CSM for the Site are presented on Figure 7.

Numerous release mechanisms influence chemical behavior in environmental media. Under both current and future land use conditions at the Site, the principal release mechanisms involved are:

- Vertical migration in the vadose zone;
- Storm/surface water runoff into surface water and sediments;
- Fugitive dust generation and transport; and
- Vapor emission and transport.

[8] Imported soil data are not included in risk assessment calculations. However, the chemical data for fill material from a given site may be useful for evaluating sub-areas to receive fill from that site.

Although these release mechanisms are identified here, no quantitative modeling is presented in this section. Instead, those primary release mechanisms identified for particular receptors are presented in this section, and are quantitatively evaluated in Section 6.

2.5.1 Impacted Environmental Media

Environmental media at the Site consist of five categories: surface soil, subsurface soil, groundwater, indoor air, and ambient outdoor air. Samples relative to Site baseline conditions have been collected at the Site for soil. Generally, impacted soil is the source of chemical exposures for other media at the Site.

Because the background water quality of groundwater beneath the Site and in the surrounding area is generally poor (viz., high salt concentrations) and because BRC has placed Environmental Covenants in the form of a deed restriction to prevent future users from utilizing groundwater beneath the Site, the use of private water wells by residents, businesses, or parks for drinking water, irrigation water, or other non-potable uses (e.g., washing cars, filling swimming pools) will not occur in the post-redevelopment phase. Furthermore, there are no anticipated groundwater uses associated with the proposed roadway land use. Therefore, exposure pathways relating to this type of use are incomplete, as defined by USEPA (1989).

Although direct exposures to groundwater will not occur; indirect exposures are possible. The primary indirect exposure pathway from groundwater is the infiltration of VOCs from soil and groundwater to indoor air. In addition, residual levels of chemicals in soil may leach and impact groundwater quality beneath the Site.

2.5.2 Inter-Media Transfers

Exposure to Site chemicals may be direct, as in the case of impacted surface soil, or indirect following inter-media transfers. Impacted soil is the initial source for inter-media transfers at the Site, which can be primary or secondary. For example, upward migration of VOCs from impacted subsurface soil into ambient air thereby reaching a point of human inhalation represents a secondary inter-media transfer.

These inter-media transfers represent the potential migration pathways that may transport one or more chemicals to an area away from the Site where a human receptor could be exposed. Discussions of each of the identified potential transfer pathways are presented below. Figure 7 presents a conceptualized diagram of the inter-media transfers and fate and transport modeling for the Site.

Five initial transfer pathways for which chemicals can migrate from impacted soil to other media have been identified. The first of these pathways is volatilization from soil and upward migration from soil into ambient air. Ambient air can be both indoor and outdoor air. The pathway of volatilization from both soil and groundwater and upward migration into ambient air was evaluated using the surface flux measurements collected. The secondary transfer pathway is downward migration of chemicals from soil to groundwater. The third transfer pathway is migration of chemicals in surface soil via surface runoff to sediments or surface water bodies. However, as discussed in Section 2.2.3 because of the intervening City RIBs, it is unlikely that surface waters (which are ephemeral) will drain to the Las Vegas Wash from the Site. Therefore, the surface water pathway was not evaluated in this risk assessment. The fourth transfer pathway is on-site fugitive dust generation. Finally, chemicals in soil can be transferred to plants grown on the Site via uptake through the roots. However, the plant uptake pathway is only evaluated for residential receptors.

2.5.3 Potential Human Exposure Scenarios

The following subsections summarize land use and the human exposure scenarios that are assessed herein.

2.5.3.1 Current and Future Land Use

Current receptors that may use the Site include trespassers, occasional on-site workers, and off-site residents. Current exposures to native soils at the Site are minimal, but exposures to future receptors will be much greater. For example, future receptors evaluated in the HHRA include on-site workers who are assumed to be exposed to soil at the Site for 250 days per year for 25 years, which is much greater than any current exposure scenario. In addition, as discussed above, exposures to current receptors are limited through Site access control. Therefore, a current land use scenario is not quantitatively evaluated in this risk assessment.

USEPA risk assessment guidance (1989) states that potential future land use should be considered in addition to current land use when evaluating the potential for human exposure at a site. As indicated above, under the prospective redevelopment plan, the Site will be used for a roadway. The entire Eastside property will be redeveloped in several phases. Throughout the redevelopment process, the sub-areas of the Site will be redeveloped sequentially. Future receptors identified as "on-site receptors" are defined as receptors located within the current Site boundaries (Figure 1), while future "off-site receptors" are those located outside the current Site boundaries. "On-site receptors" are those future receptors that will be located within the Site under evaluation. "Off-site receptors" are those future receptors that will be located outside the Site under evaluation that may have complete exposure pathways associated with sources within the Site. As noted above, remediation of the Site is to on-site outdoor/construction worker standards. Consequently, risks to off-site receptors are addressed qualitatively in this risk assessment.

2.5.3.2 Identification of Potentially Exposed Populations and Pathways

Many potential human receptors are possible at the Site in the period during and after redevelopment. The potentially exposed populations and their potential routes of exposure are presented on Figure 7 and summarized below. For a complete exposure pathway to exist, each of the following elements must be present (USEPA 1989):

- A source and mechanism for chemical release;
- An environmental transport medium (i.e., air, water, soil);
- A point of potential human contact with the medium; and
- A route of exposure (e.g., inhalation, ingestion, dermal contact).

As presented in Section 9 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010), the following are the primary exposure pathways for each of the potential receptors following remediation and redevelopment at the Site.

- Outdoor maintenance workers
  - Incidental soil ingestion*
  - External exposure from soil†
  - Dermal contact with soil
  - Outdoor inhalation of dust*‡
  - Outdoor inhalation of VOCs from soil and groundwater

- Construction workers
  - Incidental soil ingestion*
  - External exposure from soil†
  - Dermal contact with soil

- Outdoor inhalation of dust*‡
- Outdoor inhalation of VOCs from soil and groundwater

*Includes radionuclide exposures
†Only radionuclide exposures
‡Includes asbestos exposures

Although trespassers/recreational users and downwind off-site residents are another potential receptor identified in the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010), exposures for these receptors are less than those evaluated above. As noted in Sections 9.1.1 and 9.7.1 of the *Closure Plan*, potential exposures for trespassers/recreational users will only be evaluated in areas of the BMI Common Areas that are designated as recreational end use (specifically the Western Hook-Open Space sub-area shown on Figure 1). Also, as noted in Section 9.5.4 of the *Closure Plan*, off-site dust levels based on USEPA's model are much lower than those generated for on-site, construction-related activities. Therefore, risks evaluated for an on-site construction worker, as performed in this HHRA, are considered protective of off-site residents.

3.0 CONFIRMATION DATA PROCESS AND SUMMARY

Based on the historical data for the Site, no remediation was proposed prior to implementing the sampling prescribed in the SAPs. Decisions for excavation during SAP implementation were based on the initial data (discussed below) in accordance with the Risk Assessment Methodology provided in the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010). The following is the initial scope of work for investigating the Site and meeting the SAP objectives. Much of the discussion below regarding confirmation soil sampling is taken from the *Statistical Methodology Report* (NewFields 2006).

3.1 INITIAL CONFIRMATION SOIL SAMPLING

As per Section 2 of the *Statistical Methodology Report*, the initial confirmation sampling at the Site was conducted on the basis of combined random and biased (judgmental) sampling, as follows:

- **Stratified Random Locations:** For this purpose, the Site was covered by a 3-acre cell grid network. Within each 3-acre cell, a sampling location was randomly selected. Sampling locations were randomly selected within both full and partial grid cells if they were greater than 50 percent of the total grid cell area (based on the project-wide grid cell network and the Site boundaries; those partial grid cells that contain less than 50 percent of their area within the Site were included in the adjacent sub-area SAPs). The main objective of this stratified random sampling was to provide uniform coverage of each Site within Eastside property.

- **Biased Locations:** Additional sampling locations were selected within or near small-scale contamination points of interests, including but not limited to previous debris locations, ponds, and berms. For this purpose, the randomly selected location within a corresponding 3-acre cell was adjusted to cover a nearby point of interest. In the event that currently unknown impacted areas were identified during remediation, the presence of these areas were drawn to the NDEP's attention, the need for additional biased sampling points to address those areas was evaluated, and the sampling program modified as needed.

A Site reconnaissance was performed in July and August 2008 to check for environmentally significant features such as debris piles or stained soil. Nine debris piles were observed within the Site boundaries during the reconnaissance (identified as station numbers 1, 2, 3, 16, 29, 35, 36, 39, and 42 and described in the Galleria North SAP and noted on Figure 8 of this HHRA). Biased sampling locations were selected at each of the debris piles/soil staining location. In some cases, random sampling locations were shifted slightly to address the debris locations. A final reconnaissance was performed prior to sampling to check for any additional environmentally significant features since the initial reconnaissance; if found, these additional features would also have been sampled. No such features were found. Biased sampling was also conducted along the length of the Alpha and Beta Ditches, at approximately 200-foot linear spacing (four locations within the Site). Figure 8 and accompanying Table 3-1 (see Tables section) show the sampling locations within the Site. Rationale for each of the biased sampling locations is presented below:

- GNC1-JS08 and -JS17 were included to provide coverage within debris areas observed at the Site;
- GNC1-JD01 through -JD03 were included to provide additional coverage within the Alpha Ditch;
- GNC1-JD06 was included to provide additional coverage within the Beta Ditch;
- GNC1-JP02, -JP04, -JP05, -JP06, and UPC1-JP11 were included to provide additional coverage within the former ponds; and
- GNC1-JB02, -JB03, -JB06, and -JB07 were included to provide additional coverage within the berms of the former ponds.

Elevated detections of dioxins/furans/PCB congeners were reported in initial SAP samples collected from the southern half of the Galleria North sub-area. In response, additional biased samples were collected, four of which (GNC1-JA02, GNC1-JA03, GNC1-JA09, and GNC1-JA10) were within the Site, for dioxins/furans/PCB congener analyses in August 2009. These sampling locations were outside the boundaries of soil removal actions initially performed in accordance with the *Removal Action Work Plan* (RAWP, BRC 2009b) (Section 3.3.1).

The following discusses the multi-depth soil samples that were collected and analyzed for the SRC list at each selected location. Samples were collected at:

1. Existing surface (0 foot bgs) and 10 feet bgs for sample locations in relatively flat (ungraded) locations;
2. Existing surface (0 foot bgs), post-grading surface (post-redevelopment as shown on Figure 2), and post-grade 10 feet bgs for sample locations with substantial grading (that is,

cut depths greater than 2 feet[9]) and the uppermost sampled soil is expected to be used as surface fill;

3. Existing surface (0 foot bgs) and 10 feet bgs for sample locations with minimal grading (that is, cut depths less than 2 feet) and the uppermost sampled soil is expected to be used as surface fill (at any Eastside location); and

4. Existing surface (0 foot bgs) and 10 feet bgs for sampling locations in an area expected to be covered by fill material.

The analytical sample results were then divided into surface (0- to 2-foot depth), subsurface (2- to 10-foot depth), and deep (>10-foot depth) layers, according to the following rules:

- **Rule 1: IF** the sample was collected in a relatively flat (ungraded) part of the Site (i.e., an area not targeted for substantial grading), **THEN** the depth of the collected soil sample is used to designate its soil layer grouping.

- **Rule 2: IF** the sample was collected in a part of the Site targeted for substantial grading, **AND** the sampled soil is located in an area expected to be covered by fill material (e.g., exposed excavated surfaces of ponds), **THEN** the current surface soil sample is classified as a surface (0- to 2-foot depth) sample, and the soil layer grouping of the remaining deeper sampled soil is determined based on the difference between its elevation and the final (post-graded) surface elevation in that part of the Site.

- **Rule 3: IF** the sample is collected in a part of the Site targeted for substantial grading, **AND** the cut depth is expected to be greater than 2 feet, **AND** the sampled soil is expected to be used as surface fill (e.g., soil within a berm), **THEN** the current surface soil sample is classified as a fill material sample, a final (post-graded) surface sample is classified as a surface (0- to 2-foot depth) sample, and the soil layer grouping of the remaining deeper sampled soil is determined based on the difference between its elevation and the final (post-development, graded) surface elevation in that part of the Site.

- **Rule 4: IF** the sample is collected in a part of the Site targeted for substantial grading, **AND** the cut depth is expected to be less than 2 feet, **AND** the sampled soil is expected to be used

[9] Because sample collection was over a 2- to 3-foot depth interval, locations with an anticipated cut depth less than 3 feet were only sampled at the surface and one post-grade subsurface depth. The sample depth designation (e.g., 10 feet bgs) is based on the center depth of the sample collection interval.

as surface fill (e.g., soil within a berm), **THEN** the current surface soil sample is classified as both a fill material sample and as a surface (0- to 2-foot depth) sample, and the soil layer grouping of the remaining deeper sampled soil is determined based on the difference between its elevation and the final (post-graded) surface elevation in that part of the Site.

A schematic example of these rules is shown on Figure 9. The Redevelopment Grading Plan for the Site is shown on Figure 2.[10] The sample-specific collection depths are presented in Table 3-1 (Tables section).

As noted above, soil samples were generally collected over a 2- to 3-foot depth interval. This was because of volume of soil required for completion of all analyses. The 10 feet bgs (and deeper) samples were collected in 2- to 3-foot intervals centered on 10 feet (or centered on the deeper sampling depth as indicated in Table 3-1). Confirmation samples, which usually have a shortened analyte list, were collected over a smaller sampling interval. Contamination by the historical manufacturing processes upgradient is usually found predominantly in surface soils. The objective of remedial actions at the Site was to remove surface soils that were impacted by surface releases of off-site chemicals. Therefore, higher concentrations are expected—and have been generally observed—in surface samples. However, to adequately characterize the vertical extent of possible contamination, one or more deeper samples were also collected at each sampling location, as described above.

As discussed in Section 6.1.1, given the potential for change to the prospective grading plan, these samples were classified into two different exposure depths: surface and all (surface and subsurface) depths. These different soil exposure depth classifications are considered to represent all possible exposure potential for all receptors, and thus a reasonable worst-case scenario has been assessed.

Although some samples are designated as Fill samples, the grading across the Site is anticipated to be primarily shallow grading with limited 'cut' areas. The separate evaluation of fill data is done primarily to determine if fill material from a particular sub-area can be used elsewhere. Given the limited amount of cut areas across the Site, the few samples designated as 'Fill,' that more fill areas exist than cut areas, and that the limited amount of fill material will likely be used with the Site, the separate evaluation of the fill data was not conducted for the Site.

[10] Note that the grading plan is reflected in an Environmental Covenant for the Site as a condition to receiving an NFAD from NDEP.

Initial sampling for the Site was conducted in January and February 2009. All soil samples were tagged in the database with numeric designations of their corresponding assigned soil layer grouping based on the rules presented above. During these initial sampling events (Table 3-1), 70 soil samples were collected from 28 locations (including field duplicates, but not including deep samples collected for soil physical parameter data).[11] This included 13 "random"[12] and 15 "biased" sample locations. At these locations, BRC initially collected 28 surface samples[13] (one at each location, and duplicates at eight locations in accordance with the duplicate frequency specified in the *BRC Quality Assurance Project Plan* (QAPP; BRC and ERM 2009a) and 34 subsurface soil samples. Eleven of the surface soil samples also represent Fill samples. All sampling results are presented electronically on the report CD in Appendix B, and in Tables B-1 through B-12.

3.2 CHEMICALS SELECTED FOR ANALYSIS

The analyte list for soil samples collected during the initial 2009 investigation comprised the BRC project SRC list, and was consistent with the analytical program presented in Section 3 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010)[14] and Table 3-2 (Tables section), with the following exceptions for this Site:

- Asbestos and dioxins/furans were only analyzed for in surface soil samples.[15]
- USEPA Method 8141A for organophosphorus pesticides was not conducted. There have been only 47 detections of these compounds in over 10,000 soil sample records (<0.5 percent) from throughout the Eastside. The few detections are well below the NDEP BCLs.

[11] Note that in Table 3-4, which summarizes the analyses performed on Site samples, the number of samples reported in that table for a given analysis does not always equal 70. This is due to (1) inclusion in the final dataset of supplemental samples collected to assess the extent of chemical impacts in certain areas; (2) certain analytes were not included in the subsurface samples, as noted in the following section; some samples were remediated for particular analytes, and confirmation samples collected, and (3) rejected data are not included in the statistical summary in Table 3-4.

[12] As noted before, in some cases, random sampling locations were shifted slightly to address debris locations.

[13] During the original sampling and analysis event, the only modifications to the original scope of services were eliminating sample location GNC1-JD03 due to conflicts with underground utilities. However, asbestos sampling was conducted as a separate sampling event, for surface samples only; therefore, this sample location was sampled and analyzed for asbestos only.

[14] Specific analytes and analyte-specific reporting limits for each analysis are listed in Table 4 of the QAPP.

[15] Note that all samples collected at the Site were discrete samples, with the exception of asbestos samples, which were composite samples collected as per the NDEP-approved Standard Operating Procedure [SOP]-12 as provided in the *Field Sampling and Standard Operating Procedures* [FSSOP; BRC, ERM and MWH 2009]).

- USEPA Method 8151A for chlorinated herbicides was not conducted. There have been no detections of these compounds in over 1,400 soil sample records from throughout the Eastside. Detection limits are below the NDEP BCLs.

- HPLC Method for organic acids was not conducted. There have been only three detections of these compounds in 567 soil sample records (<0.5 percent) from throughout the Eastside. Moreover, the NDEP has not established BCLs for these compounds.

- USEPA Method 8015B for non-halogenated organics (e.g., methanol and glycols) was not conducted. There have been only five detections of these compounds in 420 soil sample records (1 percent) from throughout the Eastside. The few detections have been well below the NDEP BCLs.

- USEPA Method 8015 for total petroleum hydrocarbons (TPH) was not conducted. There have been only three detections of these compounds in over 299 soil sample records (1 percent) from throughout the Eastside. The few detections have been below 100 mg/kg, which is the typical low-end aesthetic threshold used for these compounds There are no indications of possible TPH source areas (e.g., abandoned vehicles, dumping of oils/ hydraulic fluids) at the Site. While TPH was not analyzed for, its components were via other methods. In addition, TPH cannot be included in a risk assessment while its components can.

- Consistent with the current project analyte list, the following radionuclides were analyzed for: radium-226, radium-228, thorium-228, thorium-230, thorium-232, uranium-233/234, uranium-235/236, and uranium-238.

The soil analyte list consisted of 286 of the 418 compounds (including water-only parameters) on the project SRC list. The analytical and preparatory methods (Table 3-2) used in accordance with the SAPs adhered to the most recent version of the BRC QAPP (BRC and ERM 2009a; see Section B4, Table 4 of that document). As noted in Section 3.6, the analyte list for surface flux samples was composed of the list specified in the NDEP-approved Standard Operating Procedure (SOP)-16,as provided in the *Field Sampling and Standard Operating Procedures* (FSSOP; BRC, ERM and MWH 2009). Surface flux samples were analyzed for VOCs by USEPA Method TO-15 full scan, plus selective ion mode (SIM) analyses for a subset of the analytes.

3.3 INTERMEDIATE SAMPLING AND CLEANUP

3.3.1 2009 Removal Action

All initial data were reviewed and a determination made, in consultation with the NDEP, as to whether localized soil removals were warranted. In September 2009, BRC submitted a RAWP (BRC 2009b) to the NDEP. This RAWP was approved by the NDEP on September 22, 2009. The overall goal of the RAWP was to present a cleanup strategy for the Site that effectively minimized, to the extent feasible, the human health risks associated with the identified soil in the impacted areas of the Site.

The following six remediation areas were initially proposed for the Site:

- Alpha Ditch location GNC1-JD01 (metals exceedances);
- Upper Pond location GNC1-BC20 (dioxin/furan exceedances);
- Upper Pond locations GNC1-JP04, -BC23, -JP02 (dioxin/furan and metals exceedances);
- Upper Pond location GNC1-JP05 (dioxin/furan exceedances);
- Upper Pond location GNC1-JP03 (dioxin/furan exceedances); and
- Upper Pond locations GNC1-BC28 and -JS17 (dioxin/furan exceedances).

Remediation was proposed by excavation and removal of impacted soils to the CAMU. The extent of the excavations is depicted on Figure 10.

The non-ditch remediation areas were developed based on a Thiessen map overlaid across the Site. Thiessen maps are constructed from a series of polygons formed around each sampling location. Thiessen polygons are created so that every location within a polygon is closer to the sampling location in that polygon than any other sampling location. These polygons do not take into account the respective concentrations at each location. These polygons were used as the basis for the areal extent of remediation for each of the non-ditch locations with elevated dioxins/furans/PCB congeners or metals levels.

For the ditch location, the remediation area was centered about the initial sampling locations that triggered remediation. The extent of excavation at this area was a 50-foot-wide segment of the ditch, extended such that the limits of excavation reached half the distance to the adjacent ditch samples to the north and south.

Following remediation, confirmation surface soil samples were collected at each of the original sample locations associated with the remediation area polygons and ditch segments described above[16]. All sampling locations are shown on Figure 11. The analyte list was composed of those chemicals that triggered the remediation at each sampling location. These included dioxins/furans/PCB congeners and metals.

3.3.2 2010 Removal Action

Following the review of data collected from the 2009 remedial action, two additional remediation areas were identified for the Site (Figure 10). These areas were part of a larger remediation plan for the northern portion of the entire Eastside property. BRC did not submit a formal work plan to the NDEP for conducting remediation at these areas, but discussed the planned excavations with the NDEP in June 2010. These additional remediation areas were as follows:

- Additional scraping was conducted at Alpha Ditch location GNC1-JD01 to address elevated metal detections; and
- Excavation was conducted at Beta Ditch location GNC1-JD06 to address elevated metal detections.

As before, the analyte list was composed of those chemicals that triggered the remediation at each sampling location (i.e., metals).

3.4 FINAL CONFIRMATION DATASET

Post-scrape analyses associated with follow-up rounds of remediation focused on the constituents triggering that additional remediation and, therefore, did not include the full suite analyses of the original analytical program. Analytical results from the original SAPs dataset were retained for all constituents except those that were re-analyzed after additional scraping. The final confirmation dataset included the following sampling results:

- SAP sampling data, retaining the results that were not superseded by subsequent sampling;

[16] The naming convention for confirmation samples uses the same sample identification as the initial (pre-remediation) sample, with an updated numerical prefix. For example, confirmation samples associated with GNC1-JD01 are named GNC2-JD01 (after one round of confirmation sampling) or GNC3-JD01 (after a second scrape and round of confirmation sampling).

- Data generated after intermediate sampling and remediation (retaining the results that were not superseded by subsequent sampling); and
- Additional samples collected for confirmation after completion of remediation activities.

The soil dataset was subjected to a series of statistical analyses to determine representative exposure concentrations for the sub-area, as described in Sections 4 and 5 of the NDEP-approved *Statistical Methodology Report* (NewFields 2006). Consistent with the project *Statistical Methodology Report*, kriging or geostatistical analysis was not performed on the data because each measurement was assumed to be equally representative for that chemical at any point in each sub-area of the Eastside property. Hence, calculation of the 95 percent upper confidence limit (UCL) by exposure area directly from the data is considered reasonable.

As discussed in Section 4, all data have been validated. Results of all confirmation sampling and analysis are presented in Appendix B, and electronically on the report CD in Appendix B, as is the dataset used in the HHRA for the Site. All confirmation sampling locations for the Site are shown on Figure 11. Table 3-3 provides a matrix of which analytical suite was analyzed for in each of the samples collected from the Site. Geotechnical and Environmental Services (GES) conducted all fieldwork at the Site. The GES field reports, including boring logs, for each investigation are provided electronically in Appendix C (included on the report CD in Appendix B).

3.5 FINAL CONFIRMATION DATA SUMMARY

Using the compound-specific information presented in Table 2 of the QAPP (BRC and ERM 2009a), the comparison levels for each chemical included in the investigation were compiled for comparison to Site data. Specific soil comparison levels used for this effort were as follows:

- NDEP BCLs for outdoor worker soil (NDEP 2012);
- NDEP BCLs for protection of groundwater (LBCL), assuming dilution attenuation factors (DAF) of 1 and 20 (NDEP 2012); and

- The maximum background concentration (for metals and radionuclides only), derived from the shallow Qal McCullough background soil dataset presented in Section 5.[17]

A DAF of 1 is used when little or no dilution or attenuation of soil leachate concentrations is expected, and a DAF of 20 may be used when significant attenuation of the leachate is expected due to Site-specific conditions. For the Site, the LBCLs based on a DAF of 1 were used for discussion purposes. Data for the Site, including the number of instances in which chemical concentrations exceed each of the comparison levels, are listed in Table 3-4,[18] and summarized below. It is important to note that these comparisons are used to provide for an initial screening evaluation, assist in the evaluation of data usability, and determine the extent of contamination. They are not used for decision-making purposes or as an indication of the risks associated with the Site.

Aluminum

Aluminum was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). All of the detections were lower than the 100,000 mg/kg BCL, but were higher than the 75 mg/kg $LBCL_{DAF1}$. One sample from 10 feet bgs at GNC1-BC18 (18,700 mg/kg) exceeded the 15,300 mg/kg maximum shallow Qal McCullough background level.

Arsenic

Arsenic was detected in 65 of the 69 soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). All of the detections were higher than the 1.77 mg/kg BCL and the 1 mg/kg $LBCL_{DAF1}$, and 15 of the detections were higher than the maximum shallow Qal McCullough background level (7.2 mg/kg), as listed in Table 3-5 below.

TABLE 3-5: ARSENIC DETECTIONS GREATER THAN BACKGROUND

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)	Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JB02	15	7.3 J+	UPC1-BB32	0	8.4 J+
GNC1-JS17	0	7.7	GNC3-JD01C	0	8.8

[17] This value, for the shallow Qal McCullough background dataset, is used for comparison only; as discussed in Section 5.1, background comparisons were performed for the Site dataset using statistical tests.
[18] Pre-scrape data for the target constituents are not included in Table 3-4. That is, these have been replaced by post-scrape data; however, pre-scrape data for the non-target constituents are included in Table 3-4. Because of this, the total number of analyses does not always coincide with the total number of analyses reported in the tables in Appendix B, which include all data, regardless of status.

TABLE 3-5: ARSENIC DETECTIONS GREATER THAN BACKGROUND

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JD06	10	7.7
GNC1-BB16	10	7.8 J+
UPC1-BB33	10	7.8 J+
GNC1-BC22	0	7.9
GNC1-JA10	0	7.9 J+
GNC1-JS17	10	8

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JD02	0	8.8 J+
GNC1-JS08	0	9.6
GNC1-BC16	10	10.8 J+
GNC1-JA03	0	13.3 J+
GNC1-BC18	10	14.2 J+

In addition, arsenic was reported as a non-detection in four samples (surface soil confirmation samples GNC1-BC16, GNC1-BB16, and GNC1-BC18 and duplicate); the associated analytical reporting limits (5.2 and 5.3 mg/kg) are higher than the comparison levels and it is not known whether arsenic is present at concentrations above the comparison levels at this location. However, these analytical reporting limits were sufficiently low to indicate that none of these four samples contained arsenic at concentrations above background.

Barium

Barium was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 100,000 mg/kg BCL; however, all of the detections exceeded the 82 mg/kg $LBCL_{DAF1}$; and three of the detections, each from 10 feet bgs, at UPC1-BB32 (921 J mg/kg), GNC1-JP04 (1270 J+ mg/kg), and GNC1-BC18 (1,300 J mg/kg) were higher than the maximum shallow Qal McCullough background level (836 mg/kg).

Chromium (VI)

Chromium (VI) was detected in 27 of the 69 soil samples in which it was analyzed for 35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 1,360 mg/kg BCL. One surface sample from UPC1-JP22 (2.1 mg/kg) was slightly higher than the 2 mg/kg $LBCL_{DAF1}$. This detection was also above the maximum shallow Qal McCullough background level (0.32 mg/kg). The analytical reporting limits for non-detections were lower than the BCL and $LBCL_{DAF1}$.

Cobalt

Cobalt was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 337 mg/kg BCL, but all detections were higher than the 0.495 mg/kg $LBCL_{DAF1}$. However, all of the detections were lower than the maximum shallow Qal McCullough background level (16.3 mg/kg).

Copper

Copper was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 42,200 mg/kg BCL; however, one detection from GNC1-BC29 (63.7 mg/kg) at the surface was higher than both the 45.8 mg/kg $LBCL_{DAF1}$ and the 30.5 mg/kg maximum shallow Qal McCullough background level.

Iron

Iron was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 100,000 mg/kg BCL, but all detections were higher than the 7.56 mg/kg $LBCL_{DAF1}$. Of these, 11 detections were higher than the 19,700 mg/kg maximum shallow Qal McCullough background level, as listed in Table 3-6.

TABLE 3-6: IRON DETECTIONS GREATER THAN BACKGROUND

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
UPC1-BB28	0	20,900
GNC3-JD01C	0	21,300
GNC1-JB02	0	21,500 J
GNC1-JP05	0	21,600 J
GNC1-BC22	11	21,800
GNC2-JD06	0	21,900

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JP05	11	21,900 J
GNC2-JP04C	0	22,000 J
GNC1-JB02	5	22,200 J
GNC1-BC22	0	24,100
GNC1-BC18	10	24,100 J

Lithium

Lithium was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 2,270 mg/kg BCL; however, six detections were higher than the 21.9 mg/kg $LBCL_{DAF1}$, as listed in Table 3-7 below. Of these, four detections were higher than the maximum shallow Qal McCullough background level (26.5 mg/kg).

TABLE 3-7: LITHIUM DETECTIONS GREATER THAN $\mathbf{LBCL_{DAF1}}$

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)	Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JD01	13	22.8 J+	GNC1-JD02	0	30.5 J+
GNC1-BC18	10	25.2 J+	GNC3-JD01C	0	32
GNC1-BC16	10	29.7 J+	GNC1-BB16	10	35.4 J+

Magnesium

Magnesium was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of the detections were higher than the 100,000 mg/kg BCL, but all detections were higher than the 973 mg/kg $LBCL_{DAF1}$. However, all but one of the magnesium detections were lower than the 17,500 mg/kg maximum shallow Qal McCullough background level. That exceedance (19,700 mg/kg) was associated with a soil sample collected from 10 feet bgs at GNC1-BC18.

Manganese

Manganese was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). Of these detections, none were higher than the 24,900 mg/kg BCL; however, all detections were higher than the 1.3 mg/kg $LBCL_{DAF1}$. All of the manganese detections were lower than the 1,090 mg/kg maximum shallow Qal McCullough background level.

Nickel

Nickel was detected in all 69 of the soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). None of these detections exceeded the 21,800 mg/kg BCL; all except one were higher than the 7 mg/kg $LBCL_{DAF1}$. However, all of the detections were lower than the maximum shallow Qal McCullough background level for nickel (30 mg/kg).

Nitrate

Nitrate was detected in all 69 soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-3). None of the detections were higher than the 100,000 mg/kg BCL; however, 30 of the detections were higher than the 7 mg/kg $LBCL_{DAF1}$, as listed in Table 3-8.

TABLE 3-8: NITRATE DETECTIONS GREATER THAN $LBCL_{DAF1}$

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
UPC1-BB28	8	7.8
UPC1-BB32	0	7.8 J
GNC1-BC29	10	8.8
GNC1-JS17	0	9.1
GNC1-JB06	0	10.4
UPC1-JP11	10	10.6
GNC1-JB02	15	10.7
GNC1-JS08	10	10.9
GNC1-JP05	11	14.2
GNC1-BC22	11	15.3
GNC1-JB03	7	15.5
GNC1-JP02	10	17
UPC1-BB31	0	20
GNC1-BC28	11	21.3
GNC1-JB06	16	22

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JB06	6	23.4
GNC1-BC16	10	24.2
GNC1-JB02	5	25.7
GNC1-JB07	18	28.4
GNC1-JS17	10	29.6
GNC1-BC27	10	39.5
GNC1-JD02	0	40.3
GNC1-JP04	10	42.1
UPC1-BB28	18	46.4
GNC1-BC16	0	58
GNC1-JD01	0	61.4
UPC1-BB32	0	74.3 J
GNC1-JB07	8	75.2
GNC1-JP06	13	149
GNC1-JP06	3	202

Perchlorate

Perchlorate was detected in 60 of the 69 soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-3). None of the detections were higher than the 795 mg/kg BCL; however, 55 of the detections were higher than the 0.0263 mg/kg $LBCL_{DAF1}$, as listed in Table 3-9.

TABLE 3-9: PERCHLORATE DETECTIONS GREATER THAN $LBCL_{DAF1}$

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JP04	0	0.0273 J
GNC1-BC27	0	0.0284 J
GNC1-BC18	0	0.0297 J
GNC1-BC29	0	0.0314 J
GNC1-JS17	0	0.0345 J
GNC1-JS17	10	0.0348 J
GNC1-JB07	0	0.0373 J
GNC1-JP02	0	0.0378 J
GNC1-BC27	0	0.0423
GNC1-BC28	0	0.043
GNC1-BC23	0	0.0537
GNC1-BC28	11	0.0592
GNC1-JP06	13	0.0622
GNC1-JP05	0	0.0628
UPC1-BB28	0	0.0637
GNC1-JP02	0	0.0657
GNC1-BB16	0	0.067
GNC1-JP06	0	0.0688 J
GNC1-BC27	10	0.0715
GNC1-JB07	8	0.075

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JP06	3	0.155
GNC1-BB16	10	0.16
GNC1-JB02	15	0.234
GNC1-BC22	0	0.241 J+
GNC1-BC16	0	0.265
UPC1-JP11	0	0.469
GNC1-JB06	0	0.588
GNC1-BC21	0	0.856
UPC1-JP11	10	0.99
GNC1-JP04	10	1.04
GNC1-JB06	6	1.28
UPC1-BB31	0	1.35
GNC1-BC23	10	1.4
GNC1-JD01	0	1.46
GNC1-JS08	10	1.75
GNC1-JP05	11	1.9
GNC1-JP02	10	2.04
GNC1-JD06	10	2.18
GNC1-BC21	10	3.15
GNC1-BC22	11	3.28 J+

TABLE 3-9: PERCHLORATE DETECTIONS GREATER THAN $LBCL_{DAF1}$

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JD01	13	0.0767
GNC1-JB03	7	0.084
UPC1-BB33	0	0.0908 J-
UPC1-BB28	0	0.0971
GNC1-JP04	0	0.124 J
GNC1-JD02	10	0.125
GNC1-BC29	10	0.14
GNC1-JB02	5	0.147

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
UPC1-BB32	0	3.52
GNC1-JD02	0	3.58
GNC1-JB06	16	3.69
GNC1-JD01	3	3.77
UPC1-BB32	0	3.82
GNC1-JS08	0	5.76
GNC1-BC16	10	26.1

Selenium

Selenium was detected in one of the 69 soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). That detection (0.33 J+ mg/kg in a soil sample collected from the surface at UPC1-BB33) was lower than the 5,680 mg/kg BCL, but it was higher than the 0.3 mg/kg $LBCL_{DAF1}$. However, this detection was lower than the 0.6 mg/kg maximum shallow Qal McCullough background level. The analytical reporting limits for the non-detections (0.4 mg/kg standard reporting limit) were lower than the BCL; however, they were higher than the $LBCL_{DAF1,}$ such that exceedances would not necessarily have been observed.

Thallium

Thallium was detected in one of the 69 soil samples in which it was analyzed for (35 surface and 34 subsurface samples; Table B-4). That detection (1.1 mg/kg in a soil sample collected from the surface at GNC3-JD01C) was lower than the 79.5 mg/kg BCL, but, it was higher than the 0.4 mg/kg $LBCL_{DAF1}$. However, this detection was lower than the 1.8 mg/kg maximum shallow Qal McCullough background level. The analytical reporting limits for the non-detections (0.75 mg/kg standard reporting limit) were lower than the BCL; however they were higher than the $LBCL_{DAF1}$, such that exceedances would not necessarily have been observed.

Other Inorganics

As seen in Table 3-4 (Tables section) and Tables B-3 and B-4 in Appendix B, several inorganic constituents in addition to those listed above were routinely detected in soil samples. None of these additional inorganic constituents were detected at concentrations in excess of either the BCL or the $LBCL_{DAF1}$. In all cases, with the exception of antimony (0.315 mg/kg standard reporting limit higher than the 0.3 mg/kg $LBCL_{DAF1}$), the analytical reporting limits for these additional inorganic constituents were generally lower than the BCL and $LBCL_{DAF1}$, so exceedances of these screening levels would have been reported if present.

Organochlorine Pesticides

Organochlorine pesticides were analyzed for in 69 soil samples (35 surface and 34 subsurface samples; Table B-5). Several constituents were detected in at least one sample. The reported detections were lower than the screening levels with the following exceptions:

- beta-BHC was reported in six samples at concentrations higher than the 0.00596 mg/kg $LBCL_{DAF1}$, as listed in Table 3-10.

TABLE 3-10: BETA-BHC DETECTIONS GREATER THAN $LBCL_{DAF1}$

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JP02	0	0.0066 J+
UPC1-BB28	0	0.0067
GNC1-JS17	0	0.0081 J+
GNC1-JP06	0	0.011
UPC1-BB28	0	0.013
GNC1-JP06	0	0.017

- One dieldrin detection, associated with a surface soil sample at GNC1-JD01 (0.0025 J mg/kg) was higher than the 0.0002 mg/kg $LBCL_{DAF1.}$

The standard analytical reporting limits for most organochlorine pesticides were lower than the comparison levels.

Volatile Organic Compounds

VOCs were analyzed for in 69 soil samples (35 surface and 34 subsurface samples; Table B-10). As seen in Table 3-4 and Table B-10, the following 26 VOCs were detected in at least one sample:

- 1,2,4-Trimethylbenzene
- 1,2-Dichlorobenzene
- 1,3,5-Trimethylbenzene
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- Acetone
- Freon-11
- Isopropylbenzene
- m,p- Xylene
- Methyl ethyl ketone
- Nonanal
- n-Propylbenzene

- Benzene
- Bromobenzene
- Chlorobenzene
- Chloromethane
- Dichloromethane
- Ethanol
- Ethylbenzene
- o-Xylene
- sec-Butylbenzene
- Styrene
- tert-Butylbenzene
- Toluene
- trans-1,3-Dichloropropene
- Xylenes (total)

Dichloromethane was detected the most frequently in 39 percent of the samples. None of the detections were above the BCL. With the exception of dichloromethane, the VOC detections were also lower than the $LBCL_{DAF1}$. Dichloromethane was detected in 27 soil samples listed in Table 3-11 at concentrations in excess of the 0.001 $LBCL_{DAF1}$.

TABLE 3-11: DICHLOROMETHANE DETECTIONS GREATER THAN $LBCL_{DAF1}$

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JB06	6	0.0014 J
GNC1-BC18	0	0.0071
GNC1-BC16	10	0.0087
GNC1-JS08	10	0.0098
GNC1-BC22	0	0.0099
GNC1-BC18	0	0.01
GNC1-JB03	17	0.01
GNC1-JB07	8	0.01
GNC1-BC22	11	0.011
GNC1-JB03	0	0.011
GNC1-JB03	7	0.011
GNC1-JB02	0	0.012
GNC1-JB03	0	0.012
GNC1-JB06	0	0.012

Sample ID	Depth (ft bgs)	Reported Value (mg/kg)
GNC1-JD02	10	0.012
GNC1-JD06	0	0.012
GNC1-JP02	0	0.012 J
GNC1-JB02	5	0.013
GNC1-JB02	15	0.013
GNC1-JB07	0	0.013
GNC1-JD01	3	0.013
GNC1-JD02	0	0.013
GNC1-JP02	10	0.013
GNC1-BB16	10	0.014
GNC1-JD01	13	0.014
GNC1-BB16	0	0.015
GNC1-BC21	10	0.016

It should be noted that the analytical reporting limits for dichloromethane were often higher than the $LBCL_{DAF1}$; therefore, concentrations in excess of this comparison level, if present, could have potentially gone unreported. For the other VOCs, the standard reporting limits were lower than the BCL and $LBCL_{DAF1}$.

Semi-Volatile Organic Compounds

SVOCs were analyzed for in 69 soil samples (35 surface and 34 subsurface samples; Table B-9). As seen in Table 3-4 and Table B-9, only one SVOC, bis(2-ethylhexyl)phthalate, was detected.

The detection was associated with one sample and was lower than the BCL and the $LBCL_{DAF1}$. For SVOC non-detects, the standard reporting limits were lower than the BCL, except for dichloromethyl ether, which routinely had analytical reporting limits higher than the BCL.

For several other SVOC non-detections, the analytical reporting limits are higher than the $LBCL_{DAF1}$, and it is unknown whether these constituents are present in those samples at concentrations in excess of the $LBCL_{DAF1}$. The constituents with reporting limits routinely higher than the $LBCL_{DAF1}$ are as follows:

- 2,2'-Dichlorobenzil
- 2,4,6-Trichlorophenol
- 2,4-Dichlorophenol
- 2,4-Dinitrophenol
- 2,4-Dinitrotoluene
- 2,6-Dinitrotoluene
- 3,3'-Dichlorobenzidine
- bis(2-chloroethyl)Ether
- Hexachloroethane
- Isophorone
- Nitrobenzene
- n-Nitrosodi-n-propylamine
- p-Chloroaniline
- Pentachlorophenol

Dioxins and Furans

For dioxins/furans, as discussed in Section 1.1, the USEPA TEQ procedure, developed to describe the cumulative toxicity of these compounds, is used. Dioxins and furans were analyzed for in 43 surface soil samples[19] (Table B-2). All of the individual dioxins and furans congeners analyzed were reported as detections in at least one sample. None of the samples analyzed had calculated TCDD TEQ concentrations in excess of the NDEP BCL of 50 ppt. $LBCL_{DAF1}$ values have not been established for dioxin/furans, thus the potential for impacts to groundwater quality due to their presence could not be assessed by comparisons to the $LBCL_{DAF1}$.

[19] This tally includes field duplicates and confirmation samples.

Polychlorinated Biphenyls

PCBs were analyzed for in 37 surface soil samples[20] (individual PCB congeners) (Table B-7). All of the PCB congeners, except PCB 77 and PCB 81, were detected in at least one sample. BCL values have not been established for individual congeners. PCB congeners are included in the calculation of the TCDD TEQ, and are evaluated in this manner, not on an individual congener basis. $LBCL_{DAF1}$ values have not been established for individual PCB congeners.

Polynuclear Aromatic Hydrocarbons

PAHs were analyzed for in 69 soil samples (35 surface and 34 subsurface samples; Table B-6); each PAH, except acenaphthene and acenaphthylene, was detected in at least one soil sample. The PAH detections did not exceed either the BCL or the $LBCL_{DAF1}$ where established. The standard PAH analytical reporting limits were lower than the BCL and the $LBCL_{DAF1}$, thus concentrations in excess of these comparison levels, if present, would have been reported.

Aldehydes

Aldehydes were analyzed for in 69 soil samples (35 surface and 34 subsurface samples; Table B-9). Acetaldehyde was detected in seven samples, and formaldehyde was detected in 41 samples. None of the detections exceeded the BCL. The analytical reporting limits were lower than the BCL, thus concentrations in excess of the BCL, if present, would have been reported. $LBCL_{DAF1}$ values have not been established for these compounds.

Radionuclides

Radionuclides were detected in all 70 of the soil samples analyzed (36 surface, 34 subsurface samples; Table B-8). Exceedances of comparison levels for radionuclides are shown in Table 3-4 for the eight radionuclides currently included in the project analyte list (radium-226, radium-228, thorium-228, thorium-230, thorium-232, uranium-233/234, uranium-235/236, and uranium-238). Of those activities greater than comparison levels, the majority are lower than the maximum shallow Qal McCullough background activity, as shown in Table 3-4. As seen in that table, radium-226, radium-228, thorium-228, and thorium-232 were reported at activities higher than comparison levels and background. Those BCL/background exceedances are listed in Table 3-12 below.

[20] This tally includes field duplicates and confirmation samples.

TABLE 3-12: RADIONUCLIDE DETECTIONS GREATER THAN BCL AND BACKGROUND

Radionuclide	Sample ID	Depth (ft bgs)	Reported Value (pCi/g)
Radium-226	GNC1-BB16	10	2.37
Radium-226	GNC1-JD01	13	2.42
Radium-228	GNC1-JD01	3	3.37
Thorium-228	GNC1-BC18	0	2.3
Thorium-228	GNC1-JP02	10	2.37

Radionuclide	Sample ID	Depth (ft bgs)	Reported Value (pCi/g)
Thorium-228	UPC1-JP11	0	2.42
Thorium-228	GNC1-JS17	0	2.52
Thorium-228	GNC1-JP05	0	2.8
Thorium-228	GNC1-JS08	0	3.15

The above detections were also higher than the $LBCL_{DAF1}$. $LBCL_{DAF1}$/background exceedances were also observed for Thorium-232, which was higher than 0.0029 pCi/g $LBCL_{DAF1}$ and 2.23 pCi/g maximum background activity in three samples; from 7 feet bgs at GNC1-JB03 (2.24 pCi/g); and from the surface at both GNC1-BC28 (2.42 pCi/g) and GNC1-JS17 (2.93 pCi/g).

As presented in NDEP guidance (NDEP 2009a), as part of the process used to evaluate radionuclide data for the BMI Common Areas, BRC assessed whether radionuclides are in secular equilibrium. As discussed in Section 5.1, secular equilibrium is an indication of background conditions.

The data indicate that radionuclides are in secular equilibrium at the Site. Specifically, the mean radioactivities for the Thorium-232 decay chain (i.e., thorium-232, radium-228, and thorium-228) are comparable (1.4, 1.6, and 1.6 pCi/g, respectively). Similarly, the mean values for the uranium-238 decay chain (uranium-238, uranium-233/234, thorium-230, and radium-226) are also comparable, ranging from 0.92 to 1.2 pCi/g. All of the mean values are lower than their respective maximum background activity levels. A quantitative evaluation of secular equilibrium is presented in Section 5.1.

Summary of Soil Exceedances

As summarized above and in the associated data tables (Table 3-4 and Appendix B), some BCL and $LBCL_{DAF1}$ exceedances are currently observed in Site soils. The following constituents were reported at concentrations higher than the BCL and the maximum shallow Qal McCullough background level (where applicable):

- Arsenic (15 samples)
- Radium-226 (2 samples)
- Radium-228 (1 sample)
- Thorium-228 (6 samples)

The following constituents were reported at concentrations higher than the $LBCL_{DAF1}$ and the maximum shallow Qal McCullough background level (where applicable):

- Aluminum (1 sample)
- Arsenic (15 samples)
- Barium (3 samples)
- Chromium (VI) (1 sample)
- Copper (1 sample)
- Iron (11 samples)
- Lithium (4 samples)
- Magnesium (1 sample)
- Beta-BHC (6 samples)
- Dieldrin (1 sample)
- Radium-226 (2 samples)
- Radium-228 (1 sample)
- Thorium-228 (6 samples)
- Thorium-232 (3 samples)
- Dichloromethane (27 samples)

BRC's evaluation of the data revealed that there are no soil samples that exhibited elevated concentrations of multiple metals or other analytes. The limited number of BCL and $LBCL_{DAF1}$ exceedances indicates that there is a low likelihood of adverse impacts to human health and the environment due to residual chemical concentrations in Site soils. Consistent with the methodology in the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010), an HHRA was conducted to further evaluate this possibility, as discussed in subsequent sections of this report.

3.6 SURFACE FLUX SAMPLING

Concurrent with the confirmation soil sampling, BRC implemented surface flux sampling across the Site. This sampling conformed to the most recent NDEP-approved version of SOP-16 (BRC, ERM, and MWH 2009). The sampling procedure for the effort included the USEPA surface emission isolation flux chamber (flux chamber) sampling to support an air pathway analysis for the Site.

It should be noted that while radon samples were collected, they are not included in this HHRA for the following reason: BRC submitted a technical memorandum to the NDEP (BRC 2010), in which the results of recent radon testing performed in groundwater and indoor air samples were presented. Based on the findings of this memorandum, the NDEP concluded that HHRAs for

Eastside property sub-areas do not need to evaluate the pathway of radon migration from groundwater to indoor air for sub-areas with a separation distance of at least 15 feet between any current or future building structure base and the high water table (letter dated November 9, 2010, from Greg Lovato, NDEP, to Mark Paris, BRC). Based on this conclusion and given the depth to groundwater at the Site is at least 25 feet bgs, the intrusion of radon into indoor air is not evaluated in the HHRA. Furthermore, as discussed in Section 5.1, other radionuclides are consistent with background levels, which indicate that radon should also be consistent with background, naturally occurring levels in soil.

The flux chamber sample collection rationale was based on the project goal of obtaining a representative dataset of air emissions per sub-area. Flux chamber samples were collected from 11 locations (Figure 11): 5 random sampling locations and 6 biased locations (and one duplicate). This density of sample collection is considered adequate for sub-area characterization given the biased nature of the sample locations, the size of the sub-area, and the number of sample locations suggested by the USEPA (1986) in the flux chamber User's Guide for assessing zones of homogeneous site properties.

The analyte list for surface flux samples is composed of the list provided in the most recent NDEP-approved version of SOP-16 (BRC, ERM, and MWH 2009). This analyte list is provided in Table 3-13, and consists of the USEPA Method TO-15 full scan, plus SIM analyses for a subset of the analytes. The analytical results are summarized in Table B-11 (Appendix B), and the principal investigator Report of Findings (which includes descriptions of sampling procedures) is provided in Appendix D (included on the report CD in Appendix B).[21] It should be noted that, in addition to VOC data for the Site, the flux chamber report also contains data for the remainder of the Galleria North and Upper Ponds sub-areas outside the Site boundaries. Data collected from outside the Site boundaries are not included in this HHRA. A data summary for the flux chamber sample results is provided in Table 3-14.

As seen in Tables 3-14 and B-11, numerous VOCs were detected in at least one surface flux sample. The most commonly detected constituents were carbon tetrachloride and chloroform which were detected in 100 percent of the samples using the SIM method; and benzene and dichloromethane which were detected in 56 percent of the samples using the SIM method. Nearly all of the detections were qualified with "J" flags, indicating the reported concentrations

[21] Note that this report was prepared prior to data validation; therefore, data qualifiers may differ from those in the remainder of this report.

were estimated. The highest concentrations were of 1,2,4-trichlorobenzene (1.86 $\mu g/m^2, min^{-1}$ at GNC1-JP04) and hexachlorobutadiene (1.37 $\mu g/m^2, min^{-1}$ at GNC1-JP04).

As discussed in Section 4, all data have been validated. The HHRA surface flux dataset for the Site is included on the report CD in Appendix B. Surface flux sample locations are shown on Figure 11.

3.7 LEACHATE DATA

No samples collected within the Site during the initial sampling event included synthetic precipitation leaching procedure (SPLP) analysis.[22] However, two samples were collected in the vicinity of the Site. These samples were collected from location GNC1-BC17 at 10 feet bgs, and GNC1-JP03 at 12 feet bgs. These soil samples were analyzed for aldehydes, general chemistry and ions, metals, organochlorine pesticides, PAHs, radionuclides, and SVOCs. As noted in the SAPs, these constituents are considered those of greatest concern for potential migration and impacts to groundwater. Data associated with these SPLP samples are summarized in Appendix B, Table B-12. For reference, Table B-12 includes constituent-specific comparison levels (viz., NDEP's residential water BCLs and USEPA Maximum Contaminant Levels). As summarized in Table B-12, there were few detections in these leachate samples. All of the detections were inorganic constituents (i.e., general chemistry and ions, metals and radionuclides); organic compounds were not detected, with the exception of phenanthrene and pyrene, which were both detected in GNC1-BC17. Of these detections, only perchlorate in GNC1-BC17 (0.134 milligrams per liter [mg/L]) was higher than its comparison level.

[22] SPLP analysis was prepped per USEPA Method 1312 - West solution pH 4.95 with 60/40 weight sulfuric/nitric acid.

4.0 DATA EVALUATION

This section describes the procedures used to evaluate the acceptability of data for use in the risk assessment. Overall quality of sample results is a function of proper sample management. Management of samples began at the time of collection and continued throughout the analytical process. SOPs were followed to ensure that samples were collected and managed properly and consistently and to optimize the likelihood that the resultant data are valid and representative.

The primary objective of the data review and usability evaluation was to identify appropriate data for use in the HHRA. The analytical data were reviewed for applicability and usability following procedures in USEPA's *Guidance for Data Usability in Risk Assessment (Part A)* (1992a) and *Risk Assessment Guidance for Superfund: Volume I* (1989), and the NDEP's *Supplemental Guidance for Assessing Data Usability for Environmental Investigations at the BMI Complex and Common Areas* (2008a). A quality assurance/quality control (QA/QC) review of the analytical results was conducted during the sampling events. According to the USEPA Data Usability Guidance, there are six principal evaluation criteria by which data are judged for usability in risk assessment. The six criteria are:

- Reports to risk assessor (availability of information associated with Site data);
- Documentation;
- Data sources;
- Analytical methods and detection limits;
- Data review; and
- Data quality indicators (DQIs), including precision, accuracy, representativeness, comparability, and completeness (PARCC).

A summary of these six criteria for determining data usability is provided below. In addition to the six principal evaluation criteria, the NDEP's Data Usability Guidance includes a step for data usability analysis, which is discussed after these six USEPA evaluation criteria. Data usability evaluation tables are provided electronically in Appendix E (included on the report CD in Appendix B).

4.1 CRITERION I – REPORTS TO RISK ASSESSOR (AVAILABILITY OF INFORMATION ASSOCIATED WITH SITE DATA)

The usability analysis of the site characterization data requires the availability of sufficient data for review. The required information is available from documentation associated with the Site data and data collection efforts. Data have been validated as described in the following DVSRs, which are provided electronically in Appendix F:

- *Data Validation Summary Report, Galleria North Sub-Area Soil Investigations, January-March 2009; July-August 2009 (Dataset 60)* (BRC and ERM 2010a), approved by the NDEP on June 14, 2010;

- *Data Validation Summary Report, Sunset North Commercial and Galleria North Sub-Areas 2nd Round Confirmation Soil Investigations – September 2009, December 2009, January 2010 and May 2010 (Dataset 60a)* (BRC and ERM 2010b), approved by the NDEP on September 10, 2010;

- *Data Validation Summary Report, Upper Ponds Sub-Area Soil Investigation –October-November 2009; January-February 2010 (Dataset 63)* (BRC and ERM 2010c), which was approved by the NDEP on July 16, 2010;

- *Data Validation Summary Report, Eastside North Surface Flux Investigations (Remaining Sub-Areas), July-August 2010 (Dataset 71)* (BRC and ERM 2011), approved by the NDEP on July 25, 2011; and

- *Data Validation Summary Report, 2010 Eastside North Confirmation Soil Investigations – April through September 2010 – Part I (Dataset 72a)* (BRC and ERM 2010d), approved by the NDEP on December 21, 2010.

The information sources and the availability of such information for the data usability process are as follows:

- A Site description provided in this report and the NDEP-approved SAPs identifies the location and features of the Site, the characteristics of the vicinity, and contaminant transport mechanisms.

- A Site map with sampling locations is provided on Figure 11.

- Sampling design and procedures were provided in the NDEP-approved SAPs.
- Analytical methods and sample quantitation limits (SQLs) are provided in the dataset file included on the report CD in Appendix B.
- A complete dataset is provided in the dataset file included on the report CD in Appendix B.
- A narrative of qualified data is provided with each analytical data package; the laboratory provided a narrative of QA/QC procedures and results. These narratives are included as part of the DVSRs (BRC and ERM 2010a,b,c,d, 2011).
- QC results are provided by the laboratory, including blanks, replicates, and spikes. The laboratory QC results are included as part of the DVSRs (BRC and ERM 2010a,b,c,d, 2011).
- Data flags used by the laboratory were defined adequately.
- Electronic files containing the raw data made available by the laboratory are included as part of the DVSRs (BRC and ERM 2010a,b,c,d, 2011).

4.2 CRITERION II – DOCUMENTATION REVIEW

The objective of the documentation review is to confirm that the analytical results provided are associated with a specific sampling location and collection procedure, using available documentation. For the purposes of this data usability analysis, the chain-of-custody forms prepared in the field were reviewed and compared to the analytical data results provided by the laboratory to ensure completeness of the dataset as discussed in the DVSRs (BRC and ERM 2010a,b,c,d, 2011). Based on the documentation review, all samples analyzed by the laboratory were correlated to the correct geographic location at the Site, as shown on Figure 11. The samples were collected in accordance with the SAPs and RAWP (BRC 2008, 2009a,b), and the SOPs developed for the BMI Common Areas as provided in the FSSOP (BRC, ERM, and MWH 2009). Field procedures included documentation of sample times, dates, and locations; other sample-specific information such as sample depth was also recorded. Information from field forms generated during sample collection activities was imported into the project database.

The analytical data were reported in a format that provides adequate information for evaluation, including appropriate QC measures and acceptance criteria. Each laboratory report describes the analytical method used, provides results on a sample-by-sample basis along with sample-specific SQLs, and provides the results of appropriate QC samples such as laboratory control spike samples, sample surrogates and internal standards, and matrix spike samples. All laboratory reports, except for asbestos, were prepared as provided by the documentation required by USEPA's Contract Laboratory Program (USEPA 2003a, 2004b,c) which includes chain-of-custody records, calibration data, QC results for blanks, duplicates, and spike samples from the field and laboratory, and all supporting raw data generated during sample analysis were also included. Reported analytical results were imported into the project database.

Measurement of asbestos was conducted consistent with the NDEP's *Technical Guidance for the Calculation of Asbestos-Related Risk in Soils* (2009b). The recommended method for providing asbestos data that are useful for risk assessment purposes was performed by EMSL Analytical, Inc., in Westmont, New Jersey. Although this laboratory is not currently certified in Nevada, it does have State of California and U.S. accreditation for asbestos analysis. Because many of the QC procedures associated with other analyses do not apply to asbestos analysis (e.g., laboratory blanks, duplicates and spikes), data validation of the asbestos laboratory reports involved a somewhat lesser level of effort than for other analyses (consistent with the NDEP's *Technical Guidance for the Calculation of Asbestos-Related Risk in Soils*).

4.3 CRITERION III – DATA SOURCES

The review of data sources is performed to determine whether the analytical techniques used in the site characterization process (i.e., SAP sampling) are appropriate for risk assessment purposes. The data collection activities specified in the SAP were developed to characterize a broad spectrum of chemicals potentially present on the Site, including asbestos, aldehydes, general chemistry and ions, VOCs, SVOCs, metals, dioxins/furans, PAHs, organochlorine pesticides, radionuclides, and PCBs (SRCs and analyses performed under SAP implementation are listed in Table 3-2, and Table 3-13 for surface flux samples).[23] Because of the soil removals that have occurred on the Site, data collected prior to SAP implementation had significant gaps and inconsistencies in analytical methodology, and as discussed in Section 2, those historical data are not evaluated further in the data usability process, or the HHRA. Only post-remediation data collected under the SAP (and subsequent RAWPs) are being used in the HHRA, and these were subjected to the formal data usability evaluation described in this section. Figure 11 demonstrates that samples collected in accordance with the SAP are situated across the entire

[23] Although radon samples were collected and analyzed for the Site, radon has been evaluated through a separate process and is not considered further in the data usability process (see Section 3.6).

Site; analyses associated with these samples are summarized in Tables 3-2 (soil) and 3-13 (surface flux).

The State of Nevada is in the process of certifying the laboratories used to generate the analytical data. As such, standards of practice in these laboratories follow the quality program developed by the Nevada Revised Statutes and are within the guidelines of the analytical methodologies established by the USEPA. Based on the review of the available information, the data sources for chemical and physical parameter measurements are adequate for use in a risk assessment.

4.4 CRITERION IV – ANALYTICAL METHODS AND DETECTION LIMITS

In addition to the appropriateness of the analytical techniques evaluated as part of Criterion III, it is necessary to evaluate if the detection limits are low enough to allow adequate characterization of risks. At a minimum, this data usability criterion can be met through the determination that routine USEPA and U.S. Department of Energy (DOE) reference analytical methods were used in analyzing samples collected from the Site. The USEPA and DOE methods that were used in conducting the laboratory analysis of soil and surface flux samples are identified in the dataset file included on the report CD in Appendix B. Each of the identified methods is considered the most appropriate method for the respective constituent class and each was approved by the NDEP as part of the SAPs and RAWP (BRC 2008, 2009a,b). As recommended by NDEP's guidance on *Detection Limits and Data Reporting* (NDEP 2008b), the laboratory reported SQL was used in evaluating detection limits.

Laboratory practical quantitation limits (PQLs) were based on those outlined in the reference method, the SAP (BRC 2008), and the project QAPP. In accordance with respective laboratory SOPs, the analytical processes included performing instrument calibration, laboratory method blanks, and other verification standards used to ensure QC during the analyses of collected samples.

The range of SQLs achieved in field samples was compared to NDEP BCLs (NDEP 2012). As seen in the summary of the Site dataset provided in Tables 3-4 (soil) and 3-14 (surface flux), of the standard analytes, only three constituents had SQLs that exceeded their respective residential soil BCLs. The SQLs exceedances of NDEP BCLs are discussed below.

- The arsenic SQL in 4 of 69 sample analyses was higher than the BCL; this constituent was detected in all of the other samples tested. These 4 results were qualified due to laboratory blank contamination and the reporting limits were raised to the PQL.

- Organics with SQLs higher than the BCL were n-nitrosodi-n-propylamine in 33 of 69 samples, and dichloromethyl ether in all 69 samples analyzed. Neither of these compounds was detected in any samples. The n-nitrosodi-n-propylamine SQL was only slightly higher than the BCL. The dichloromethyl ether SQL is greater than 200 times the BCL and a reduction in the SQL is not likely to be easily achieved by the laboratory. Therefore, the analytical SQLs are considered adequate for risk assessment purposes.

As discussed in the *2008 Supplemental Shallow Soil Background Report* (BRC and ERM 2009b), there are differences in SQLs among datasets that may affect data comparability for datasets comprised primarily of non-detect values. For these datasets, left-censored data can result in difficulties in differentiating whether datasets are actually different or merely an artifact of detection limits.

4.5 CRITERION V – DATA REVIEW

The data review portion of the data usability process focuses primarily on the quality of the analytical data received from the laboratory. Soil and surface flux sample data were subject to data validation. DVSRs were prepared as separate deliverables (BRC and ERM 2010a,b,c,d, 2011; Appendix F). The analytical data were validated according to the internal procedures using the principles of USEPA National Functional Guidelines (USEPA 1999, 2004d, 2005a, 2008) and were designed to ensure completeness and adequacy of the dataset. Additionally, the DVSRs were issued utilizing the NDEP's two *Supplemental Guidance on Data Validation* documents (NDEP 2009c,d). Any analytical errors and/or limitations in the data have been addressed and an explanation for data qualification provided in the respective data tables. The results of ERM's data review for these issues are presented in the DVSRs and are summarized below.

Only one data point was rejected (a benzyl alcohol result for UPC1-BB33-0). The rejection was due to a very low matrix spike/matrix spike duplicate (MS/MSD) recovery and does not reflect a larger concern for this compound, sample, or method. Data qualifications are discussed in the subsections that follow.

4.5.1 Holding Time Exceedances / Sample Condition Qualifications

Holding time refers to the period of time between sample collection and the preparation and/or analysis of the sample. The accuracy of analytical results may depend upon analysis within specified holding times and sample temperature. In general, a longer holding time is assumed to result in a less accurate measurement due to the potential for loss or degradation of the analyte over time. Sample temperature is of greatest concern for VOCs that may volatilize from the sample at higher temperatures. As described in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), sample results were reviewed for compliance with the method-prescribed preparation and analysis holding times.

USEPA guidance for validation allows professional judgment to be used in evaluating qualification due to holding time exceedances. Sample results that were generated after the required holding time but less than two times after the holding time were qualified as estimated (J- or UJ-flagged). If the samples were prepared after two times the holding time was exceeded, non-detect results were qualified as rejected (R). However, no data were qualified as rejected (R). Qualifications to 24 samples were made on the basis of exceeded holding times (see Table 2-2 of DVSR 60 [BRC and ERM 2010a]; Appendix F), as follows:

- Hexavalent chromium results for 13 soil samples in two laboratory data packages (TestAmerica data packages F9A290238 [GNC1-JS08-0 and GNC1-JS08-10, 3 days beyond the method-prescribed 4-day period], F9A290222 [GNC1-BB16-0, GNC1-BB16-10, GNC1-BC16-0, GNC1-BC16-10, GNC1-BC18-0, GNC1-BC18-0-FD, GNC1-BC18-10, GNC1-JD01-13, GNC1-JD01-3, GNC1-JD02-0, and GNC1-JD02-10, 1 day beyond the method-prescribed 4-day period]), were qualified due to holding time exceedances. The results were qualified as estimated with a potential low bias "J-" for detections or "UJ" for non-detections.

- Total cyanide results associated with 11 soil samples in one laboratory data package (TestAmerica data package F9B050269 [GNC1-BC27-0, GNC1-BC27-0-FD, GNC1-BC27-10, GNC1-BC28-0, GNC1-BC28-11, GNC1-BC29-0, GNC1-BC29-10, GNC1-JP05-0, GNC1-JP05-11, GNC1-JS17-0, and GNC1-JS17-10]) were associated with analyses performed 2 days outside the method-prescribed holding time. The results were qualified as estimated with a potential low bias "J-" for detections or "UJ" for non-detections.

As noted in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), all samples were received at the laboratory within the required temperatures range of 4°±2° Celsius. No sample results were qualified based on sample temperatures or other sample preservation issues.

4.5.2 Blank Contamination

Blanks are artificial samples designed to evaluate the nature and extent of contamination of environmental samples that may be introduced by field or laboratory procedures. Field and laboratory blanks, consisting of contaminant-free water, were prepared and analyzed as part of standard QA/QC procedures to monitor for potential contamination of field equipment, laboratory process reagents, and sample containers. As presented in the DVSRs (BRC and ERM 2010a,b,c,d, 2011) 457 results were qualified as undetected (U) or and 9 results were qualified as estimated (J+) due to laboratory or field blank contamination, as discussed below. Detections of constituents qualified as non-detections due to comparable detections in laboratory or field blanks are known as "censored" data, and are presented in Tables 2-5 and 2-6 of DVSR 60, Tables 2-4 and 2-5 of DVSR 60a, Tables 2-4 and 2-5 of DVSR 63, Tables 2-3 and 2-4 of DVSR 71, and Tables 2-3 and 2-4 of DVSR 72a (Appendix F). In these cases, non-detections are represented in the database as "<[*the PQL*]" in the case of inorganics detected below the PQL, or as "<[*result value*]" for all others.[24]

These censored data are summarized in Appendix E, Table E-14 (included on the report CD in Appendix B) by compound class. As seen in that table, analytes were initially reported as detections in samples, but were later qualified as non-detections based on the presence of comparable concentrations of that analyte in blank samples. As seen in Appendix E, compounds most often censored for soil results included the following:

- Mercury (47 samples)
- Cadmium (27 samples)
- Molybdenum (22 samples)
- 1,2,4-Trimethylbenzene (51 samples)
- Acetone (33 samples)
- Cyanide (26 samples)

Table 4-1 presents the metals most likely to be affected by this issue:

TABLE 4-1: METALS MOST FREQUENTLY CENSORED DURING BLANK SAMPLE EVALUATION

Metal	Number of Detect	Number of Samples	Number of Censored Results	Max Non-Detect (mg/kg)	NDEP Residential BCL (mg/kg)
Antimony	0	69	11	2.6	31
Cadmium	32	69	27	0.27	38.9
Mercury	10	69	47	0.0364	23.5
Molybdenum	39	69	22	2.6	391
Selenium	1	69	15	2.6	391

[24] Although NDEP has issued recent guidance regarding qualifying data due to blank contamination (NDEP 2011); BRC has addressed this issue in the *Technical Memorandum – BRC Comments on NDEP Blank Contamination Guidance* (BRC 2011) and, consistent with this Technical Memorandum, discussions with the NDEP, no changes were made to the Site dataset. This issue is also further discussed in the Uncertainty Analysis (Section 7).

This table demonstrates that while the number of censored results is high compared to the number of detections, the censored values are still much lower than residential soil BCLs.

4.5.3 Sample/Duplicate Differences Outside Permissible Range or Greater than Permissible Values

During the data validation process, sample/duplicate results are evaluated to determine whether differences in those results suggest potential issues with data quality. Specifically, the analyst evaluates the following:

- MS/MSD relative percent difference (RPDs), to determine if the RPDs are outside acceptance limits;
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) RPDs, to determine if the RPDs are outside acceptance limits;
- Sample/field duplicate results to determine if differences are greater than the permissible value; and
- Sample/laboratory duplicate results to determine if differences are greater than the permissible value.

4.5.3.1 Qualifications Due to MS/MSD Recoveries Outside Acceptance Criteria

As discussed in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), inorganic constituent results for 698 sample results were qualified as estimated (either UJ for non-detections or J for detections; "+" or "–" added to denote potential high or low bias, respectively) based on MS/MSD recoveries. There was one rejection for benzyl alcohol associated with MS/MSD recoveries. The qualifications applied on the basis of MS/MSD recoveries were as follows:

- One ammonia result GNC1-BC28-0 was qualified as estimated with a low bias due to a recovery below than the acceptance criterion.
- One chloride result UPC1-JP11-0 was qualified as estimated with a high bias due to a recovery greater than the acceptance criterion.
- One cyanide result UPC1-JP11-0 was qualified as estimated non-detect with a low bias due to a recovery below than the acceptance criterion.

- One nitrate result GNC1-JB03-0 was qualified as estimated with a high bias due to a recovery greater than the acceptance criterion.

- One nitrite result UPC1-JP11-0 was qualified as estimated with a high bias due to a recovery greater than the acceptance criterion.

- The perchlorate results for the following two soil samples were qualified as estimated with a high bias due to a recovery greater than the acceptance criteria: GNC1-BC22-0 and GNC1-BC22-11. In addition, perchlorate results for the following two soil samples were qualified as estimated with a low bias due to a recovery less than the acceptance criteria: UPC1-BB33-0 and UPC1-BB33-10.

- The hexavalent chromium results for the following six soil samples were qualified as estimated with a high bias due to a recovery greater than the acceptance criteria: GNC1-JP06-0, GNC1-JP06-0-FD, GNC1-JP06-3, GNC1-JP06-13, GNC1-JP02-10, and GNC1-BC22-11.

- One sulfate result UPC1-JP11-0 was qualified as estimated with a high bias due to a recovery greater than the acceptance criterion.

- One Total Kjeldahl Nitrogen result UPC1-JP11-0 was qualified as estimated due to recoveries both greater than and less than the acceptance criterion.

- Metals results for soil samples in various laboratory data packages were qualified due to recoveries outside the acceptance criteria, as summarized in Table 4-2 below.

TABLE 4-2: METALS SAMPLES QUALIFIED DUE TO MS/MSD RECOVERIES OUTSIDE ACCEPTANCE CRITERIA

Laboratory Data Package	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Lithium	Magnesium	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Strontium	Thallium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc
F9A290222		+	+		+	+	+	+	+	+	+	-		+			+				+				+	+
F9A290238	-		+												+		+						-			
F9B020113	-		+				+	+			-				+											+
F9B050269	-					+					-						+								-	+
F9B110228	-		+												+				+				-			
F9B120113	-	+			+	+		+	+				+	+			+						-		+	+
F9B130146	-				+	+		+	+		+				+		+								+	+

TABLE 4-2: METALS SAMPLES QUALIFIED DUE TO MS/MSD RECOVERIES OUTSIDE ACCEPTANCE CRITERIA

Laboratory Data Package	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Lithium	Magnesium	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Strontium	Thallium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc
F9B140120	-				+	-			-						+		+						-		-	-
F9B180129	-				+	-			-						+								-		-	-
F9C030231	-				+	-		-	-								+						-		-	
F9H140144	-	+	- & +		+			+	+			-			+				-			+	-	+	+	+
F9J290179	-											-			-				-				-			
F9J300129		+		+	+	+	+	+	+			-	+		+	+	+	+						+	+	+
F9J310162				+	+	+	+	+	+			-	+		+	+	+				+			+	+	+
F9K040437		+					+		+				+		+	+	+	-	+		+			+		
F9K210455	-		-									-											-			
~~F0A080516~~ F0A080516		+	+		+	+		+	+	+			+		+	+	+	+	+	+				+	+	+
F0H030409	-		+								+				+								-			

+ = Recovery greater than the acceptance limits
- = Recovery less than the acceptance limits
Blank entry signifies that the recovery was within the acceptance limits

Appendix E, Table E-11 (included on the report CD in Appendix B) lists the samples and associated analytes exhibiting MS/MSD percent recoveries below the laboratory control limits. In cases in which the recoveries were higher than the acceptance criteria, the results have the potential of being similarly biased high, and using these data in the HHRA could result in risks being calculated that are higher than would be associated with actual Site conditions. Of more concern for the HHRA is underestimation of risk, which could be associated with the use of data that are biased low.

As indicated in that table (Table E-11), reported detections and non-detects for soil data were flagged as estimated ("J-" or "UJ," respectively) due to low MS/MSD recoveries (i.e., from 30 to 74 percent for metals)[25]. Non-detects associated with "very low" MS/MSD recoveries (i.e., less than 30 percent for metals), are generally rejected as unusable. No MS/MSD recoveries were that low and associated with non-detect inorganic results.

[25] If additional validation criteria (aside from the MS/MSD recoveries) did not suggest a low bias for a given result, the sample result was flagged with "J" (no bias inferred).

The data flagged as estimated based on low MS/MSD recoveries were subjected to further review in terms of data usability for the Site, as discussed in Section 4.6.2.3.

4.5.3.2 Qualifications due to LCS/LCSD Recoveries Outside Acceptance Criteria

Organic and inorganic constituents for 11 soil results and one flux result were qualified as estimated (either UJ for non-detections or J for detections; "+" or "–" added to denote potential high or low bias, respectively) based on LCS/LCSD recoveries. The qualifications applied on the basis of LCS/LCSD recoveries are summarized in Table 4-3.

TABLE 4-3: RESULTS QUALIFIED DUE TO LCS/LCSD RECOVERIES OUTSIDE ACCEPTANCE CRITERIA

Sample ID	Lab ID	Analyte	Result	Unit	Recovery	Limits
GNC1-BB16-0	F9A290222013	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	78 J-	pg/g	78%	79-140
GNC1-BC16-0	F9A290222001	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	78 J-	pg/g	78%	79-140
GNC1-BC18-0	F9A290222003	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	6.2 J	pg/g	78%	79-140
GNC1-BC18-0-FD	F9A290222007	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	78 J-	pg/g	78%	79-140
GNC1-BC21-0	F9B020113007	Cobalt	8.5 J+	mg/kg	119.3%	81-119
GNC1-BC21-10	F9B020113008	Cobalt	8.8 J+	mg/kg	119.3%	81-119
GNC1-JD01-0	F9A290222010	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	78 J-	pg/g	78%	79-140
GNC1-JD02-0	F9A290222008	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	78 J	pg/g	78%	79-140
GNC1-JS08-0	F9A290238008	Cyanide, Total	<0.52 UJ	mg/kg	83%	85-115
GNC1-JS08-10	F9A290238009	Cyanide, Total	<0.52 UJ	mg/kg	83%	85-115
UPC1-BB33-10	240047010	Benzyl alcohol	<345 UJ	µg/kg	19%	31-100
GNC1-BB16	62	Trichloroethene	<0.101 UJ	µg/m^3	65%/58%	70-130

As noted above, recoveries below the lower laboratory limits are of the most concern in terms of data usability. Appendix E, Table E-11 (included on the report CD in Appendix B) lists the samples and associated analytes exhibiting LCS/LCSD percent recoveries below the lower laboratory control limit. No results were rejected as unusable based on very low LCS/LCSD recovery. The data flagged as estimated based on low LCS/LCSD recoveries were subjected to further review in terms of data usability for the Site, as discussed in Section 4.6.2.3.

4.5.3.3 Qualifications due to Sample/Field Duplicate Differences Outside Acceptance Criteria

The following eight soil field duplicates were collected during the sampling activities

- GNC1-BC18-0-FD
- GNC1-JA02-FD
- GNC1-JP02-0-FD
- GNC1-JP06-0-FD
- GNC1-BC27-0-FD
- GNC1-JB03-0-FD
- GNC1-JP04-0-FD
- GNC2-JB03C-0-DUP

- UPC1-BB28-0 DUP
- UPC1-BB32-0 DUP

In addition, the following surface flux field duplicate was also collected during the sampling activities: GNC1-JP02-R.[26]

Field duplicate differences in excess of acceptance limits were noted in eight field duplicate pairs of soil samples. The differences are presented in Appendix E, Table E-12 (included on the report CD in Appendix B). All associated data were flagged as estimated (J/UJ). No data were rejected on the basis of sample/field duplicate differences.

4.5.3.4 Qualifications due to Sample/Laboratory Duplicate Differences Outside Acceptance Criteria

Of the samples representing post-remediation conditions (i.e., excluding those data points associated with samples from soil intervals subsequently removed from the Site), 16 samples had sample/laboratory duplicate differences greater than the permissible values (i.e., 1 pCi/g for radionuclides and RPD > 20 percent criteria for cation exchange capacity). These samples are listed in Table 4-4.

TABLE 4-4: RESULTS QUALIFIED DUE TO SAMPLE/LABORATORY DUPLICATE DIFFERENCES OUTSIDE ACCEPTANCE CRITERIA

Field Sample ID	Lab Sample ID	Analyte	Result	Unit	RPD or Difference
GNC1-BC21-0	223713006	Radium-228	1.18 J	pCi/g	Difference=1.166
GNC1-BC21-10	223713007	Radium-228	1.68 J	pCi/g	Difference=1.166
GNC1-JS08-0	F9A290238008	Cation Exchange Capacity	15.6 J	meq/100g	RPD=22
GNC1-JS08-10	F9A290238009	Cation Exchange Capacity	16.9 J	meq/100g	RPD=22
UPC1-BB28-0	240310005	Thorium-230	1.24 J	pCi/g	Difference=1.089
UPC1-BB28-0	240310005	Thorium-232	1.71 J	pCi/g	Difference=1.001
UPC1-BB28-0 DUP	241673012	Uranium-238	0.501 J	pCi/g	Difference=1.029
UPC1-BB28-18	240310007	Thorium-230	1.2 J	pCi/g	Difference=1.089
UPC1-BB28-18	240310007	Thorium-232	0.934 J	pCi/g	Difference=1.001
UPC1-BB28-8	240310006	Thorium-230	0.901 J	pCi/g	Difference=1.089
UPC1-BB28-8	240310006	Thorium-232	1.3 J	pCi/g	Difference=1.001
UPC1-BB31-0	240152004	Thorium-232	1.01 J	pCi/g	Difference=1.05
UPC1-BB31-11	240152005	Thorium-232	0.889 J	pCi/g	Difference=1.05
UPC1-BB32-0	240152001	Thorium-232	1.15 J	pCi/g	Difference=1.05
UPC1-BB32-0 DUP	240152002	Thorium-232	1.29 J	pCi/g	Difference=1.05

[26] The Galleria North Right-of-Way Site includes a sub-set of the entire Galleria North sub-area and a small portion of the Upper Ponds sub-area. Field duplicates noted in this section do not reflect the total number of field duplicates collected during either sub-area sampling events.

TABLE 4-4: RESULTS QUALIFIED DUE TO SAMPLE/LABORATORY DUPLICATE DIFFERENCES OUTSIDE ACCEPTANCE CRITERIA

Field Sample ID	Lab Sample ID	Analyte	Result	Unit	RPD or Difference
UPC1-BB32-10	240152003	Thorium-232	1.47 J	pCi/g	Difference=1.05
UPC1-JP11-0	239948005	Thorium-230	2.13 J	pCi/g	Difference=1.030
UPC1-JP11-10	239948006	Thorium-230	1.27 J	pCi/g	Difference=1.030

The above data flagged as estimated (J) based on sample/laboratory duplicate differences were subjected to further review in terms of data usability for the Site, as discussed in Section 4.6.2.3.

4.5.4 Internal Standards Outside Acceptance Criteria

Internal standards are prepared for certain organic gas chromatograph/mass spectrometry (GC/MS) and inductively coupled plasma/mass spectrometry analyses by adding compounds similar to target compounds of interest to sample aliquots. Internal standards are used in the quantitation of target compounds in the sample or sample extract. The evaluation of internal standards involved comparing the instrument response and retention time from the target compounds in the sample with the response and retention time of specific internal standards added to the sample extract prior to analysis.

As presented in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), no sample results were rejected based on internal standards. The following results were qualified due to internal standard exceedances:

- PCB results for 3 soil samples (GNC1-JD06-0, GNC1-BC27-0-FD, and GNC1-JD01-0);
- VOC results for 3 surface flux samples (GNC1-BB16, GNC1-JB07, and GNC1-JS08); and
- VOC results for 12 soil samples, as listed in Table 4-5.

TABLE 4-5: VOC SOIL SAMPLE RESULTS QUALIFIED DUE TO INTERNAL STANDARDS OUTSIDE ACCEPTANCE CRITERIA

Laboratory Data Package #	Sample ID	
F9A290222	GNC1-BB16-0	GNC1-BB16-10
	GNC1-BB18-0-FD	GNC1-JD01-0
	GNC1-JD01-13	GNC1-JD01-3
	GNC1-JD02-0	GNC1-JD02-10
F9B050269	GNC1-BC28-0	
F9A300184	GNC1-BC21-0	GNC1-BC21-10
F9A290238	GNC1-JS08-0	

- Dioxins/furans results for three soil samples, as listed in Table 4-6.

TABLE 4-6: DIOXIN/FURAN SOIL SAMPLE RESULTS QUALIFIED DUE TO INTERNAL STANDARDS OUTSIDE ACCEPTANCE CRITERIA

Laboratory Data Package #	Sample ID	
F9A290222	GNC1-BC18-0	GNC1-BC18-0-FD
	GNC1-JD02-0	

4.5.5 Surrogate Percent Recoveries Outside Laboratory Control Limit

As discussed in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), surrogate spikes were added to each of the samples submitted for organic analysis to monitor potential interferences from the matrix. Results associated with unacceptable surrogate recoveries were qualified as estimated (J+ or UJ). Generally, when surrogate recoveries are less than 10 percent, associated non-detect results are qualified as rejected (R) because false negatives are a possibility. No sample results were rejected due to surrogate recoveries. The soil samples listed in Table 4-7 were qualified due to surrogate recovery exceedances.

TABLE 4-7: RESULTS QUALIFIED DUE TO SURROGATE RECOVERIES OUTSIDE LABORATORY CONTROL LIMIT

Sample ID	Lab ID	Analysis	Recovery	Acceptable Range
GNC1-BC23-0	F9B110228005	Organochlorine pesticides	168%	61-150
GNC1-BC29-0	F9B050269006	Organochlorine pesticides	225%	61-150
GNC1-JB06-0	F9B140120013	Organochlorine pesticides	158%, 203%	61-150
GNC1-JD01-0	F9A290222010	Organochlorine pesticides	205%	61-150
GNC1-JD01-0	F9A290222010	VOCs	58%,57%	65-143, 73-131

TABLE 4-7: RESULTS QUALIFIED DUE TO SURROGATE RECOVERIES OUTSIDE LABORATORY CONTROL LIMIT

Sample ID	Lab ID	Analysis	Recovery	Acceptable Range
GNC1-JP02-0	F9B130146009	Organochlorine pesticides	298%	61-150
GNC1-JP02-0-FD	F9B130146010	Organochlorine pesticides	298%	61-150
GNC1-JP04-0-FD	F9B110228020	Organochlorine pesticides	184%	61-150
GNC1-JP05-0	F9B050269015	Organochlorine pesticides	179%	61-150
GNC1-JS17-0	F9B050269008	Organochlorine pesticides	163%	61-150
UPC1-BB33-0	F9J300129011	VOCs	157%,184%	80-131, 77-138

In addition, two surface flux samples (GNC1-JP02 and GNC1-JP04) were qualified due to surrogate recovery exceedances, both higher than the acceptable range.

Appendix E (included on the report CD in Appendix B) lists the samples and associated analytes exhibiting surrogate percent recoveries below the laboratory control limits. As seen in that appendix, with the exception of the VOC results for GNC1-JD01-0, the recoveries outside the acceptance criteria were higher than the upper laboratory control limit. The GNC1-JD01-0 VOC results were subjected to further review in terms of data usability for the Site, as discussed in Section 4.6.2.3.

4.5.6 Calibrations Outside Laboratory Control Limits

Requirements for instrument calibration ensure that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of analytical run. Continuing calibrations checks document satisfactory maintenance and adjustment of the instrument on a day-to-day basis. As presented in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), certain data were qualified due to initial or continuing calibration issues. Of specific concern, are analytes with a final qualifier indicating a low bias due to calibration. In the following tables, the percentage of analyte recovered is based on the percent difference of the actual amount and recovered amount reported from the continuing calibration. As the percentage decreases, the potential for false negatives increases.

Table 4-8 summarizes the SVOC results that were qualified due to evaluation of calibration control limits.

TABLE 4-8: SUMMARY OF SVOC RESULTS QUALIFIED DUE TO CALIBRATIONS OUTSIDE LABORATORY CONTROL LIMIT

Analyte	# of Samples Qualified	Percent of Qualified Non-Detect	Percentage of Analyte Recovered as Indicated by Outlier
1,4-Dioxane	2	100%	67%
3,3'-Dichlorobenzidine	2	100%	74%
3-Nitroaniline	34	100%	55-74%
4-Nitroaniline	27	100%	59-72%
4-Nitrophenol	12	100%	74%
Acetophenone	2	100%	69%
Aniline	11	100%	72%
Benzenethiol	1	100%	74%
Benzoic Acid	8	100%	55-72%
Benzyl alcohol	16	100%	74-75%
bis(2-Chloroethyl) ether	11	100%	74%
bis(2-Chloroisopropyl) ether	11	100%	73%
bis[p-Chlorophenyl]disulfide	2	100%	72%
Carbazole	22	100%	54-74%
Hexachlorocyclopentadiene	35	100%	47-73%
Hydroxymethyl phthalimide	12	100%	64-74%
Octachlorostyrene	2	100%	69%
p-Chlorobenzenethiol	9	100%	73-74%
Phthalic Acid	49	100%	45-74%
p-Nitroaniline	13	100%	63-70%

Note: The control limits are 75-125% (%D < 25%)

Table 4-9 summarizes the organochlorine pesticide results that were qualified due to calibrations.

TABLE 4-9: SUMMARY OF ORGANOCHLORINE PESTICIDE RESULTS QUALIFIED DUE TO CALIBRATIONS OUTSIDE LABORATORY CONTROL LIMIT

Analyte	# of Samples Qualified	Percent of Qualified Non-Detect	Percentage of Analyte Recovered as Indicated by Outlier
2,4-DDD	2	0%	116%
4,4-DDD	1	0%	119%
4,4-DDE	13	0%	115-127%
4,4-DDT	25	60%	75-121%
Alpha-BHC	1	0%	118%
Beta-BHC	2	0%	115-118%
Dieldrin	1	0%	118%
Endrin aldehyde	1	0%	116%
Gamma-Chlordane	1	0%	118%
Heptachlor	5	100%	83-84%
Methoxychlor	23	87%	76-118%
Toxaphene	5	100%	51-84%

Note: The control limits are 80-120% (%D < 20%)

Table 4-10 summarizes the organochlorine pesticide results that were qualified due to calibrations.

TABLE 4-10: SUMMARY OF DIOXIN/FURAN RESULTS QUALIFIED DUE TO CALIBRATIONS OUTSIDE LABORATORY CONTROL LIMIT

Analyte	# of Samples Qualified	Percent of Qualified Non-Detect	Percentage of Analyte Recovered as Indicated by Outlier
2,3,7,8-TCDF	4	0%	137%

Note: The control limits are 70-130% (%D < 30%)

Table 4-11 summarizes the VOC results that were qualified in soil samples due to calibrations.

TABLE 4-11: SUMMARY OF VOC SOIL RESULTS QUALIFIED DUE TO CALIBRATIONS OUTSIDE LABORATORY CONTROL LIMIT

Analyte	# of Samples Qualified	Percent of Qualified Non-Detect	Percentage of Analyte Recovered as Indicated by Outlier
Acetone	5	0%[27]	136-145%
Acetonitrile	15	100%	69-75%
Bromomethane	11	100%	71%
Chloroethane	11	100%	75%
Freon 12	16	100%	71%
Methyl iodide	16	100%	71%

Note: The control limits are 75-125% (%D < 25%)

In addition, low instrument response was noted for acetonitrile, 2-butanone, and ethanol as indicated by the relative response factor.

Table 4-12 summarizes the VOC results that were qualified in surface flux samples due to calibrations.

TABLE 4-12: SUMMARY OF VOC SURFACE FLUX SAMPLE RESULTS QUALIFIED DUE TO CALIBRATIONS OUTSIDE LABORATORY CONTROL LIMIT

Analyte	# of Samples Qualified	Percent of Qualified Non-Detect	Percentage of Analyte Recovered as Indicated by Outlier
1,1-Dichloroethene	1	100%	65%
1,1,2,2-Tetrachloroethane	2	100%	53%
1,2,3-Trichloropropane	10	100%	34-64%
1,2,4-Trichlorobenzene	11	82%	41-64%
1,2,4-Trimethylbenzene	4	100%	65%
1,2-Dichlorobenzene	10	90%	58-70%
1,3-Dichlorobenzene	6	100%	61-67%
1,4-Dichlorobenzene	7	86%	60-70%
2-Methyl-1-propanol	9	100%	45-66%
2-Hexanone	2	50%	69%
Acetone	8	63%	46-64%
Acetonitrile	4	100%	46-64%
Benzene	4	0%[28]	46-67%

[27] This analyte was detected and qualified due to a high bias from calibration, however, the results were also qualified as non-detected due to blank contamination.

TABLE 4-12: SUMMARY OF VOC SURFACE FLUX SAMPLE RESULTS QUALIFIED DUE TO CALIBRATIONS OUTSIDE LABORATORY CONTROL LIMIT

Analyte	# of Samples Qualified	Percent of Qualified Non-Detect	Percentage of Analyte Recovered as Indicated by Outlier
Benzyl chloride	10	90%	38-67%
Bromoform	3	100%	64-67%
Carbon disulfide	3	67%[28]	59-68%
Cymene	4	75%	56-65%
Dibromochloromethane	1	0%	149%
Dibromochloropropane	12	100%	28-68%
Dichloromethane	1	100%	70%
Ethanol	11	73%	45-69%
Heptane	1	0%	132%
Hexachlorobutadiene	11	91%	55-70%
Isopropylbenzene	4	75%	61-65%
Naphthalene	4	100%	53-70%
n-Butylbenzene	8	88%	51-64%
n-Propylbenzene	4	75%	66-70%
sec-Butylbenzene	4	75%	60-66%
Tert-Butylbenzene	8	88%	54-66%
Trichloroethene	7	29%[28]	56-67%

Note: The control limits are 70-130% (%D < 30%)

4.5.7 Tentatively Identified Compounds

For the GC/MS methods, a list and estimated concentrations for tentatively identified compounds (TICs) was provided by the laboratory if detected. Most of the reported TICs were identified as "unknown" or "unknown aldol condensate." Others were as follows:

.beta.-Sitosterol
1,1,2,2-Tetrachloroethane
28-Nor-17.alpha.(H)-hopane
4-Thiazolemethanol, 2-(4-chlorophenyl)-
9-Octadecenamide, (z)-
Androst-2,16-diene
Androstane
Diacetone alcohol
Eicosane
Erucylamide
Heneicosane
Hentriacontane
Heptacosane, 1-chloro-
Hexadecanamide
n-Dodecane
n-Tridecane
Nonacosane
Nordihydroguaiaretic acid
Octacosane
Octadecanamide
Pentadecanamide, 15-bromo-
Tetradecanamide

Only one of the detected TICs—1,1,2,2-tetrachloroethane—has associated toxicity criteria. Others do not. Reported TICs such as siloxanes and amides are indicative of column breakdown

[28] This analyte was detected and qualified due to a high bias from calibration, however, the some or all results were also qualified as non-detected due to blank contamination.

and saturated fatty acids. Diacetone alcohol is a ketone and is also likely indicative of column breakdown. With the exception of the 1,1,2,2-tetrachloroethane, androstane, diacetone alcohol, beta-sitosterol, and nordihydroguaiaretic acid, the above named compounds are indicative of column breakdown and are not likely to be Site-related. The 1,1,2,2-tetrachloroethane are included in the VOC analysis USEPA Method 8260B. Androstane is a steroid. It has been detected as TIC in other samples; however, the source is unknown. Nordihydroguaiaretic acid is a chemical associated with the creosote bush. The range of the creosote bush includes Nevada and it is likely associated with Site-related plants. Beta-sitosterol is a plant sterol and could be present due to organic matter collected along with the soil sample.

4.5.8 Data Review Summary

For 2,796 of the 19,359 analytical results in the final HHRA dataset, quality criteria were not met and various data qualifiers were added to indicate limitations and/or bias in the data. The definitions for the data qualifiers, or data validation flags, used during validation are those defined in SOP-40 (BRC, ERM, and MWH 2008) and the project QAPP (BRC and ERM 2009a). Of the 2,796 qualified sample results, only one was rejected. Sample results are rejected based on findings of serious deficiencies in the ability to properly collect or analyze the sample and meet QC criteria. Only rejected data are considered unusable for decision-making purposes and rejected analytical results are not used in the HHRA.

As noted above, only one sample result (a benzyl alcohol result for UPC1-BB33-0) was rejected in the Site dataset and excluded from the HHRA for the reasons previously noted. Other data points were excluded from the risk assessment not due to data quality issues, but for one of the following reasons: the sample was reanalyzed by the laboratory or the sample location was removed during a removal action.

4.6 CRITERION VI – DATA QUALITY INDICATORS

DQIs are used to verify that sampling and analytical systems used in support of project activities are in control and the quality of the data generated for this project is appropriate for making decisions affecting future activities. The DQIs address the field and analytical data quality aspects as they affect uncertainties in the data collected for site characterization and risk assessment. The DQIs include PARCC. The project QAPP provides the definitions and specific criteria for assessing DQIs using field and laboratory QC samples and is the basis for determining the overall quality of the dataset. Data validation activities included the evaluation of PARCC parameters, and all data not meeting the established PARCC criteria were qualified during the validation process using the guidelines presented in the National Functional Guidelines for Laboratory Data Review for Organics, Inorganics, and Dioxin/Furans (USEPA 1999, 2004d, 2005a, 2008).

4.6.1 Evaluation of Data Precision

Precision is a measure of the degree of agreement between replicate measurements of the same source or sample. Precision is expressed by RPD between replicate measurements. Replicate measurements can be made on the same sample or on two samples from the same source. Precision is generally assessed using a subset of the measurements made. The precision of the data was evaluated using several laboratory QA/QC procedures. Based on BRC's review of the results of these procedures, the general level of precision for the Site data and the background data (BRC and ERM 2009b) does not appear to limit the usability of a particular analyte, sample, method, or dataset as a whole.

4.6.2 Evaluation of Data Accuracy

Accuracy measures the level of bias that an analytical method or measurement exhibits. To measure accuracy, a standard or reference material containing a known concentration is analyzed or measured and the result is compared to the known value. Several QC parameters are used to evaluate the accuracy of reported analytical results, including:

- Holding times and sample temperatures;
- Calibration limits;
- LCS percent recovery;
- MS/MSD percent recovery;
- Spike sample recovery (inorganics);
- Surrogate spike recovery (organics); and
- Blank sample results.

Detailed discussions of specific exceedances to precision and accuracy (with tables) are provided in the DVSRs (BRC and ERM 2010a,b,c,d, 2011) and data qualified as a result of this evaluation are presented with qualifiers in the data usability tables in Appendix E (included on the report

CD in Appendix B). As presented in Section 4.5, only one sample result (a benzyl alcohol result for UPC1-BB33-0) was rejected in the Site dataset and excluded from the HHRA. The remaining results were considered sufficiently accurate for risk assessment purposes, as discussed below.

4.6.2.1 Holding Time Exceedances/Sample Condition

There is a potential for analyte loss if the holding time for a sample is exceeded. As discussed in Section 4.5.1, holding times were exceeded in 13 soil samples for hexavalent chromium analysis (less than 19 percent of the samples analyzed for that constituent), and in 11 samples for cyanide analysis (less than 16 percent of the samples analyzed). All 24 samples were qualified as estimated. Reported results were also significantly less than their respective BCLs. Based on the limited holding time issues, there is a limited potential for a low bias to the hexavalent chromium or cyanide datasets for Site soils.

As presented in the DVSRs (BRC and ERM 2010a,b,c,d, 2011), all Site samples with temperature requirements were received at the laboratory within the required range of 4°±2° Celsius. No sample results were qualified based on sample temperatures or due to lack of proper preservation.

4.6.2.2 Calibration Violations Indicating a Low Bias

The instrument calibration checks that resulted in a low bias are summarized in the tables presented in Section 4.5.6. Two SVOC analytes (hexachlorocyclopentadiene and phthalic acid), and nine TO-15 surface flux analytes (1,2,3-trichloropropane, 1,2,4-trichlorobenzene, 2-methyl-1-propanol, acetone, acetonitrile, benzene, benzyl chloride, dibromochloropropane, and ethanol) had recoveries below 50 percent in some samples. 2-Methyl-1-propanol, benzyl chloride, and dibromochloropropane were qualified in all samples due to calibration violations. All three compounds were non-detect in all samples. They are evaluated further in the Uncertainty Analysis (Section 7) of the report. For the other non-detect analytes with SQLs, the maximum SQLs were compared to the residential soil BCL. It is unlikely, even with a potential for a false negative, that the bias could affect the result to such a degree that the analyte is present at the Site in excess of the BCL.

4.6.2.3 MS/MSD or LCS/LCSD Recoveries below Acceptance Criteria

During the data usability review, results associated with MS/MSD and/or LCS/LCSD recoveries that were only slightly lower than the lower acceptance limit (i.e., 50 to 75 percent recoveries for inorganics) were accepted as usable without further evaluation. Samples with lower percent recoveries (i.e., recoveries lower than 50 percent for inorganics and one-half the lower limit or 30 percent, whichever is greater, for organics) were reviewed more closely to assess if it was appropriate to use them in the HHRA. Inorganic results with MS/MSD recoveries less than 50 percent [29] were as follows:

- Benzyl alcohol in one soil sample in GEL data package 240047 (a non-detection) which was rejected due to extremely low recoveries;
- Perchlorate results for two soil samples in GEL data package 240047 (both detections);
- Antimony results for seven soil samples in TestAmerica data packages F9A290238 and F0H030409 (all non-detections);
- Sodium results in three soil samples in TestAmerica data package F9K040437 (all detections);
- Strontium results in two soil samples in TestAmerica data package F9H140144 (both detections);
- Tungsten results in two soil samples in TestAmerica data package F0H030409 (both non-detections); and
- Mercury results for 12 soil samples in TestAmerica data packages F9H140144, F9J290179, F9J300129, F9J310162, and F9K210455 (9 of 12 results were non-detections).

Given the small number of samples involved, these data points are not likely to have a significant effect on risk assessment. Furthermore, benzyl alcohol and antimony were not detected in any Site soil samples and it is unlikely that they were present in the samples listed above.

As noted in Section 4.5.3, a LCS/LCSD recoveries lower than the lower laboratory control limit was observed for benzyl alcohol soil sample (UPC1-BB33-10), a non-detection, a single trichloroethene flux sample (GNC1-BB16), two cyanide samples (GNC1-JS08-0 and GNC1-JS08-10), both non-detections, and for six detections of 1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin (TestAmerica data package F9A290222). Because the trichloroethene, cyanide, and dioxin recoveries (65/58, 83 and 78 percent, respectively) were only slightly lower than the

[29] Only samples associated with MS/MSD results in which both recoveries were below 50 percent are listed.

lower laboratory control limit (70, 85 and 79 percent, respectively), no concerns were identified regarding their usability. The recovery for benzyl alcohol, 19 percent, was less than ½ the lower limit, 31 percent. Since this recovery is associated with a single sample, no concerns were identified regarding this results' usability.

4.6.2.4 Surrogate Percent Recoveries below Laboratory Control Limit

As noted in Section 4.5.5, surrogate recoveries lower than the lower laboratory control limit were observed for VOCs in one laboratory batch (TestAmerica data package F9A290222). Because the recoveries in this analytical batch (58 and 57 percent) were not substantially lower than the lower laboratory control limit (65 and 73 percent, respectively), no concerns were identified regarding their usability.

4.6.2.5 Blank Contamination

As noted in Section 4.5.2, certain detections were flagged during the data review as being non-detections or estimated with a high bias due to laboratory or field blank contamination. If the associated constituent qualified as being a non-detection was, in fact, present in the samples related to the affected blank sample, revising its status to non-detect could result in risk underestimation. In the dataset for the Site, 457 results were censored due to blank contamination. Affected analytes are listed in Table 4-13.

TABLE 4-13: SUMMARY OF ANALYTES CENSORED DURING BLANK SAMPLE EVALUATION

Analyte	# of Censored Results	Analyte	# of Censored Results	Analyte	# of Censored Results
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	1	Carbon disulfide	1	PCB 118	4
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1	Carbon disulfide (Flux)	1	PCB 156	2
1,2,4-Trimethylbenzene	51	Chloroform	2	PCB 167	2
1,2-Dichlorobenzene	3	Chloromethane (Flux)	2	PCB 189	2
1,2-Dichlorobenzene (Flux)	1	Chromium [VI]	7	Radium-226	2
1,3,5-Trimethylbenzene	4	Cyanide	26	Radium-228	1
1,3-Dichlorobenzene	2	Dibromochloropropane (Flux)	3	Selenium	15
1,3-Dichlorobenzene (Flux)	1	Dichloromethane	17	Silver	5
1,4-Dichlorobenzene	2	1,2-Dibromoethane	2	Styrene	17
1,4-Dichlorobenzene (Flux)	1	Ethylbenzene	4	Sulfate	2
Acetone	30	Fluoride	5	Tetrachloroethene (Flux)	5
Acetone (Flux)	2	Formaldehyde	9	Thallium	5
Acetonitrile (Flux)	1	Heptane	1	Tin	3

TABLE 4-13: SUMMARY OF ANALYTES CENSORED DURING BLANK SAMPLE EVALUATION

Analyte	# of Censored Results		Analyte	# of Censored Results		Analyte	# of Censored Results
Ammonia [as N]	12		M,p-Xylene	2		Toluene	1
Antimony	11		Mercury	47		Toluene (Flux)	1
Arsenic	4		2-Butanone (Flux)	2		Total Kjeldahl Nitrogen [TKN]	2
Benzene (Flux)	13		Molybdenum	22		Total Organic Carbon	2
Beryllium	8		Nitrite	1		Trichloroethene (Flux)	6
bis(2-Ethylhexyl) phthalate	2		Octachlorodibenzodioxin	3		Tungsten	6
Boron	9		Orthophosphate	20		Uranium-238	2
Bromide	3		o-Xylene	1		Xylenes (Total)	1
Cadmium	27		PCB 105	4			

The constituents for which this potential concern has the most bearing in risk assessment are those in soil samples for which the detections are close to or exceed either (1) background conditions, or (2) relevant human health comparison levels (e.g., the NDEP BCLs). As determined during that evaluation, qualification of detections as non-detections based on blank contamination is not likely to have an appreciable effect on the risk estimates, as discussed below.

Censored results that are less than the maximum background concentration and the residential soil BCL have a negligible impact on risk assessment findings. If a portion of the result reflects an actual site concentration, then the uncertainty related to the censored result is low. However, data censored at values at or above background or the residential soil BCLs, may pose a potential underestimation of human health risks. Therefore, censored results at values in excess of the residential soil BCL (or the maximum background concentration, if higher) were evaluated further. With the exception of arsenic and three radionuclides, none of the soil data censored due to blank contamination were in excess of the BCLs. The four analytes with censored results greater than the BCLs are listed in Table 4-14.

TABLE 4-14: ANALYTES CENSORED DURING BLANK SAMPLE EVALUATION WITH RESULTS GREATER THAN BCLs

Analyte	Range of Censored Results	BCL	Maximum Background Concentration
Arsenic (4 censored results)	3.3 to 5.1 mg/kg	0.39 mg/kg	7.2 mg/kg
Radium-226 (2 censored result)	0.885 to 0.996 pCi/g	0.0071 pCi/g	2.36 pCi/g
Radium-228	0.897 pCi/g	0.013 pCi/g	2.92 pCi/g

TABLE 4-14: ANALYTES CENSORED DURING BLANK SAMPLE EVALUATION WITH RESULTS GREATER THAN BCLs

Analyte	Range of Censored Results	BCL	Maximum Background Concentration
(1 censored result)			
Uranium-238 (2 censored results)	0.531 to 0.88 pCi/g	0.46 pCi/g	2.37 pCi/g

All of the above-listed censored data were lower than the maximum background concentration. Therefore, these censored data do not represent a significant potential for risk underestimation.

Surface flux data are not comparable with BCLs. Benzene was associated with 13 censored data points (of 12 surface flux samples[30]); the remaining censored analytes were associated with five or fewer surface flux samples. Benzene was detected at 12 of 12 surface flux locations, but was qualified as non-detect in 9 of 12 for the full scan analysis. For the SIM analysis, benzene was detected at 9 of 9 surface flux locations, but was qualified as non-detect in 4 of 9. Widespread blank contamination was noted for the full scan surface flux analysis of benzene. Benzene has been detected in groundwater across the BMI Complex. Since benzene was also detected in the SIM analysis (and not censored as frequently), risk estimates were calculated for benzene based on the SIM analysis results. Therefore, there is likely little effect on the final risk estimates for the Site. Benzene is discussed further in the Uncertainty Analysis (Section 7) of this report.

4.6.2.6 Data Usability Summary

As discussed above, because the qualifications with the potential for low bias were small in number, the data usability evaluation determined it was unlikely that they could lead to significant risk underestimation. Furthermore, the small amount of rejected data points (one benzyl alcohol result) does not represent a significant data gap in terms of risk assessment.

4.6.3 Evaluation of Data Representativeness

Representativeness is the degree to which data accurately and precisely represent a characteristic of the population at a sampling point or an environmental condition (USEPA 2002a). There is no standard method or formula for evaluating representativeness, which is a qualitative term. Representativeness is achieved through selection of sampling locations that are appropriate

[30] Twelve locations were analyzed using TO-15 full scan and nine were also analyzed using TO-15 SIM.

relative to the objective of the specific sampling task, and by collection of an adequate number of samples from the relevant types of locations. The sampling locations at the Site were based on both systematic sampling with random point placement within each grid cell, as well as focused samples collected from specific areas to further investigate potential areas of concern.

The samples were analyzed for a broad spectrum of chemical classes across the Site. Samples were delivered to the laboratory in coolers with ice to minimize the loss of analytes. In a few instances, such as samples being analyzed slightly beyond the holding time, the representativeness of the associated data is in question; however, there were limited instances of this, as discussed in Section 4.5.1. As previously noted, no sample results were qualified based on sample temperatures or preservation.

Sample specific results are discussed in the DVSRs. A discussion of representativeness for the background dataset is provided in each of the background investigation reports.

4.6.4 Evaluation of Data Completeness

Completeness is commonly expressed as a percentage of measurements that are valid and usable relative to the total number of measurements made. Analytical completeness is a measure of the number of overall accepted analytical results, including estimated values, compared to the total number of analytical results requested on samples submitted for analysis after review of the analytical data. Some of the data were eliminated due to data usability concerns. The percent completeness for the Site is 99.99 percent and includes the surface flux chamber data. The percent completeness for the soil-only dataset is 99.99 percent. The percent completeness for the background dataset used in the HHRA is 99.4 percent.

4.6.5 Evaluation of Data Comparability

Comparability is a qualitative characteristic expressing the confidence with which one dataset can be compared with another. The desire for comparability is the basis for specifying the analytical methods; these methods are generally consistent with those used in previous investigations of the Site. The comparability goal is achieved through using standard techniques to collect and analyze representative samples and reporting analytical results in appropriate units. The ranges of detected sample results from the current investigation are generally comparable to recent results at the Eastside, as well as to the Site background datasets (Section 5).

One exception may be uranium-235/236, which has reported activities that are somewhat elevated compared to background and other reported isotopes of uranium. This difference may be because the Site dataset's radionuclide analyses were performed at a different laboratory than the background dataset. The laboratory that performed the Site radionuclide analysis has indicated that the activities for uranium-235/236 hover around the noise level of the instrument and secular equilibrium is still achieved. Therefore, activities at the noise level of the instrument may vary between the instruments used at either laboratory.

There are differences in SQLs among datasets that may affect data comparability for datasets comprised primarily of non-detect values. Examples of the differences in SQLs at the Site and in shallow background for several analytes with low detection frequency are provided in Table 4-15.

TABLE 4-15: LOW DETECTION ANALYTES EXHIBITING SQL DIFFERENCES BETWEEN BACKGROUND AND SITE SAMPLES

Analyte	Background Min SQL	Background Max SQL	Site Min SQL	Site Max SQL[31]
Antimony	0.3298	0.3298	0.225	2.6
Boron	3.2	3.2	2.99	52
Mercury	0.0072	0.0072	0.005	0.0364
Selenium	0.1579	0.1579	0.225	2.6
Thallium	0.5428	0.5428	0.105	1

All results in units of mg/kg.

Cumulative probability plots and side-by-side boxplots for the background and Site datasets are included in Appendix G. For these datasets, left-censored data can result in difficulties in differentiating whether datasets are actually different or merely an artifact of detection limits. Note that for constituents with SQLs that meet project limit requirements, comparisons between Site and background may be less important as these left-censored data are likely to indicate conditions that pose an "acceptable" risk and further evaluation is not necessary.

4.7 DATA ANALYSIS

Data validation and usability evaluations tend to look at the data on a result-by-result basis. The data analysis step is intended to take a step back and look at the dataset as a whole. The intent of this is to identify any anomalies or unusual data trends that may indicate potential laboratory

[31] The SQLs reported here may differ from the detection limits reported elsewhere (e.g., background comparisons). Detection limits may be raised due to blank contamination.

issues. This is performed by reviewing summary statistics, cumulative probability plots and side-by-side boxplots, or other visual aids. The soil dataset used for the HHRA is summarized in tabular format in Table 3-4. While it is not feasible to present all the detected analytes in a graphical format, cumulative probability plots and side-by-side boxplots are provided in Appendix G for the analytes included in the background comparisons (that is, metals and radionuclides). No anomalies in the dataset were identified.

As discussed in Section 4.5, the data validation process resulted in numerous sample results being qualified as estimated, with only the above-listed results being rejected. Sample results qualified as estimated are likely to be quantitatively biased to some degree; estimated analytical results are used in the HHRA. Data qualified as anomalous, as defined in the DVSRs, refers to data that were qualified (“U”) due to blank contamination, and are used in the HHRA. These data usability decisions follow the guidelines provided in the *Guidance for Data Usability in Risk Assessment (Part A)* (USEPA 1992a).

For the HHRA, all soil data associated with post-remediation conditions that were not rejected during data validation, replaced by reanalysis results, or removed during a soil removal action were included. Some data were qualified as estimated due to recoveries being outside the acceptance criteria. In cases where the recoveries were higher than the acceptance criteria, the results have the potential of being similarly biased high, and using these data in the risk assessment could result in risks being calculated that are higher than would be associated with actual Site conditions. Of more concern for the HHRA is underestimation of risk, which could be associated with the use of data that are biased low. Results associated with the following QA/QC issues could lead to results that are biased low, and were subjected to further scrutiny during the data usability evaluation:

- Results associated with holding time exceedances;
- Detections qualified during the data review as being non-detections due to laboratory or field blank contamination;
- Results associated with calibration violations indicating a low bias;
- Results associated with MS/MSD or LCS/LCSD recoveries below acceptance criteria; and/or
- Results associated with surrogate percent recoveries below laboratory control limits.

Such data, which are listed above in Section 4.5, were evaluated during the data usability process to determine whether it was appropriate to use them in the risk assessment. The data usability evaluation determined that the estimated results listed in Section 4.5 were appropriate for use in the risk assessment and that the rejected data did not constitute significant data gaps and/or were not otherwise likely to lead to an underestimation of risk, as discussed in Section 4.6.2.

5.0 SELECTION OF CHEMICALS OF POTENTIAL CONCERN

The broad suite of analytes sampled for was the initial list of potential COPCs at the Site. However, to ensure that a risk assessment focuses on those substances that contribute the greatest to the overall risk (USEPA 1989); the following procedures were used to eliminate analytes as COPCs for quantitative evaluation in the risk assessment:[32]

- Identification of chemicals with detected levels similar to background concentrations (where applicable) (Section 5.1);
- Chemicals that are considered essential nutrients (Section 5.2); and
- Chemicals with maximum concentrations below risk-based comparison levels (i.e., below one-tenth of the residential soil BCLs)[33] (Section 5.3).

Following USEPA guidance (1989), compounds reliably associated with Site activities based on historical information were not eliminated from the risk assessment, even if the results of the procedures given in this section indicate that such elimination is possible. The procedures for evaluating COPCs relative to background conditions and further selection of COPCs based on the other procedures are presented below.

5.1 EVALUATION OF CONCENTRATIONS/ACTIVITES RELATIVE TO BACKGROUND CONDITIONS

Some chemicals at the Site, particularly metals and radionuclides, are known to be naturally occurring constituents of soils and groundwater. A risk assessment should consider the contribution of background concentrations to overall Site risks, as differentiated from those concentrations associated with historical Site operations or regional anthropogenic conditions. Therefore, it is necessary to establish Site-specific background conditions to support the risk assessment.

[32] Note that these procedures for selection of COPCs deviate somewhat from those presented in the *BRC Closure Plan*, but are consistent with discussions between BRC and NDEP and their consultants in a December 9, 2010, meeting. BRC will use these procedures for all subsequent risk assessments. BRC intends to revise the *BRC Closure Plan* accordingly to make it consistent with these procedures.
[33] Although the Site land use will not be residential, per discussions with the NDEP, residential soil BCLs are used for the selection of COPCs.

Based on discussions and as agreed upon by both BRC and the NDEP, background data recommended for the Site is the shallow Qal McCullough background dataset.[34] The lithology for the Site and surrounding area is shown on Figure 12. Therefore, comparison of Site-related soil concentrations to background levels was conducted using the shallow Qal McCullough background dataset presented in the *Background Soil Compilation Report* (BRC and ERM 2010e). The background dataset used is included in the dataset file on the enclosed report CD in Appendix B.

Background comparisons were performed using the Quantile test, Slippage test, the *t*-test, and the Wilcoxon Rank Sum (WRS) test with Gehan modification. The Guided Interactive Statistical Decision Tools (GiSdT®) library (Neptune and Company 2009) run from within the R statistical computer software program was used to perform all background comparison statistics. A weight-of-evidence approach is utilized to interpret the results of these analyses. If the detection frequency in both Site and background datasets is greater than 40 percent, then the following rationale is used for evaluation: (1) where one or two results fail one or more of the statistical tests, the remaining testing and statistical information (boxplots, summary statistics) are reviewed to support decision-making regarding whether or not the chemical should be considered consistent with background (as described by the rationale in the table below); and (2) where three or more statistical tests fail, the constituent is considered inconsistent with background. If the detection frequency is less than 40 percent in either the background or Site datasets, then the constituent is evaluated based on boxplots and summary statistics.

For samples with primary and field duplicate results, the Site sample and field duplicate[35] are treated as independent samples and both are included in all subsequent data analyses, regardless of whether one or both are non-detect. This is considered appropriate because field duplicate samples represent a discrete and unique measurement of soil chemical conditions proximal to the primary sample (unlike split samples). The field duplicates were compared to the primary sample during the course of data validation. The variances were not out of the line with the variance in results across the Site. Therefore, as distinct soil chemical measurements, they are treated as unique samples in the analyses.

[34] As noted in a letter dated September 17, 2012, from Greg Lovato, NDEP, to Mark Paris, BRC, the 2003 soil background dataset collected by Environ for the City of Henderson is not used for background soil comparison purposes.
[35] Field duplicates are shown in Appendix B and indicated with the "FD" qualifier under the column entitled "Sample Type."

The shallow Qal McCullough background dataset was compared to the Site HHRA dataset as a whole. The results of the background comparison evaluation are presented in Table 5-1 (Tables section), and summarized in Table 5-2 below.

TABLE 5-2: SUMMARY OF STATISTICAL BACKGROUND COMPARISON EVALUATION

Chemical	Greater than Background?	Basis
Aluminum	**YES**	Multiple tests
Antimony	NO	Multiple tests; ND in Site data
Arsenic	**YES**	Multiple tests
Barium	**YES**	Multiple tests
Beryllium	NO	Multiple tests
Boron	NO	Multiple tests; ND in Site data
Cadmium	**YES**	Multiple tests
Calcium	NO	Multiple tests
Chromium	**YES**	Multiple tests
Chromium (VI)	**YES**	Quantile Test
Cobalt	NO	Multiple tests
Copper	**YES**	Multiple tests
Iron	**YES**	Multiple tests
Lead	**YES**	Multiple tests
Lithium	**YES**	Multiple tests
Magnesium	NO	Multiple tests
Manganese	**YES**	Multiple tests
Mercury	**YES**	WRS Test
Molybdenum	**YES**	Multiple tests
Nickel	NO	Multiple tests
Potassium	**YES**	Multiple tests
Selenium	**YES**	Multiple tests
Silver	**YES**	Quantile Test
Sodium	NO	Multiple tests

TABLE 5-2: SUMMARY OF STATISTICAL BACKGROUND COMPARISON EVALUATION

Chemical	Greater than Background?	Basis
Strontium	**YES**	Multiple tests
Thallium	**YES**	WRS Test
Tin	**YES**	Multiple tests
Titanium	**YES**	Multiple tests
Tungsten	**YES**	Multiple tests
Uranium	NO	Multiple tests
Vanadium	**YES**	Multiple tests
Zinc	**YES**	Multiple tests
Radium-226	NO	Multiple tests
Radium-228	NO	Multiple tests
Thorium-228	NO	Multiple ~~tests~~tests[1]
Thorium-230	NO	Multiple tests
Thorium-232	NO	Multiple tests
Uranium-233/234	NO	Multiple tests
Uranium-235/236	NO	All other radionuclides (and uranium) not greater than background; all results near noise level of instrument
Uranium-238	NO	Multiple tests

[1]Although background comparison results for thorium-228 do not pass the slippage test; all other background comparison test pass, as do all background tests for other radionuclides (except for uranium-235/236 as noted in the table). In addition, radionuclides are in secular equilibrium, therefore, thorium-228 is not considered to be greater than background at the Site.

Cumulative probability plots and side-by-side boxplots[36] were also prepared and are included in Appendix G. These plots give a visual indication of the similarities and differences between the Site and background datasets. The results of this comparison indicate that a number of metals are statistically significant (greater than) with respect to background levels. Due to the large number of sample data in both the Site and background datasets, even small differences between the two are identified as statistically significant. For example, although there were small differences in

[36] Site and background boxplots were segregated by depth (and all data). This is different than how the data were segregated in the development of exposure point concentrations as presented in Section 6.1.

median concentrations, cobalt, copper, and nickel were found to be statistically greater than background, as shown in Table 5-3.

TABLE 5-3: EXAMPLE DIFFERENCES IN SITE AND BACKGROUND MEDIAN CONCENTRATIONS FOR CHEMICALS STATISTICALLY GREATER THAN BACKGROUND

Metal	Difference[1]
Copper	2.0 mg/kg
Lithium	4.0 mg/kg
Zinc	7.0 mg/kg

1 These differences in median concentrations were small relative to both background median concentrations and residential soil BCLs.

It should be noted that statistically significant differences may not represent scientifically and technically relevant differences.

Secular Equilibrium for Radionuclides. For radionuclides, secular equilibrium exists when the quantity of a radioactive isotope remains constant because its production rate (due to the decay of a parent isotope) is equal to its decay rate. In theory, if secular equilibrium exists, the parent isotope activity should be equivalent to the activity of all daughter radionuclides. Pure secular equilibrium is not expected in environmental samples because of the effect of natural chemical and physical processes. However, approximate secular equilibrium is expected under background conditions (NDEP 2009e). Both the thorium-232 and uranium-238 chains were determined to be in approximate secular equilibrium following equivalence testing outlined in the NDEP's *Guidance for Evaluating Secular Equilibrium at the BMI Complex and Common Areas February* (NDEP 2009e). The results of the equivalence testing for secular equilibrium are provided in Table 5-4.

TABLE 5-4: SECULAR EQUIVALENCE TESTING RESULTS

Chain	Equivalence Test		Secular Equilibrium?	Mean Proportion			
	Delta	*p*-value		Ra-226	Th-230	U-233/234	U-238
U-238	0.1	0.0004	Yes	0.2373	0.2922	0.2423	0.2282
				Ra-228	Th-228	Th-232	
Th-232	0.1	<0.0001	Yes	0.3457	0.3424	0.3119	

Therefore, since no radionuclides failed any background tests and all are in secular equilibrium, all radionuclides are considered to be similar to background. Radionuclides are therefore not evaluated further in the HHRA.

5.2 ESSENTIAL NUTRIENTS

An essential nutrient is a chemical required for normal body functioning that either cannot be synthesized by the body at all, or cannot be synthesized in amounts adequate for good health, and thus must be obtained from a dietary source. USEPA (1989) states that "Chemicals that are (1) essential human nutrients, (2) present at low concentrations (i.e., only slightly elevated above naturally occurring levels), and (3) toxic only at very high doses (i.e., much higher than those that could be associated with contact at the Site) need not be considered further in the quantitative risk assessment. Examples of such chemicals are calcium, iron, magnesium, potassium, and sodium." As discussed with and approved by the NDEP[37] and consistent with guidance and standard practices, no further quantitative evaluations are required for these essential nutrients.

5.3 COMPARISON TO RESIDENTIAL SOILS BCLs

BCLs for residential soils are chemical-specific, risk-based concentrations in soils that are protective of a residential land use scenario (NDEP 2012).As discussed with and approved by the NDEP (see footnote 35), if the maximum detected concentration for a constituent is less than one-tenth of the residential soil BCL, then no further quantitative evaluation is required for that constituent. For those constituents with 100 percent non-detect values, if the maximum non-detect concentration[38] for a constituent is less than one-tenth of the residential soil BCL, no further evaluation will be conducted. If the maximum non-detect concentration is greater than one-tenth of the residential soil BCL, no further quantitative evaluation will be conducted; however, a discussion is provided in the Uncertainty Analysis (Section 7) for these constituents.

Consistent with the Closure Plan, if the TCDD TEQ concentrations do not exceed the NDEP residential BCL of 50 ppt for any sample within the Site,[39] dioxins/furans are not retained as COPCs. Therefore, because this criterion is met for the Site, dioxins/furans are not considered COPCs, and are not evaluated further in the HHRA. Lead was also not evaluated further in the HHRA since all concentrations were below its target goal of 400 mg/kg for residential land use.

The results of comparisons to one-tenth of the residential soil BCL are presented in Table 5-5 (Tables section), and summarized in Table 5-6 below.

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[37] Meeting with NDEP on December 9, 2010.
[38] The non-detect value is equal to the SQL.
[39] See Section 2.5 for a discussion on future land use for the Galleria Dr. Right-of-Way.

TABLE 5-6: RESULTS OF COMPARISON TO RESIDENTIAL SOILS BCLs

Chemical	Maximum Concentration Greater than 1/10th BCL?	Notes
Perchlorate	**YES**	
Aluminum	**YES**	
Arsenic	**YES**	
Lithium	**YES**	
Manganese	**YES**	
Thallium	**YES**	
Vanadium	**YES**	
All other metals/inorganics	NO	
Benzo(a)pyrene	**YES**	
Dibenzo(a,h)anthracene	**YES**	
All other organic compounds	NO	

Note: Only metals and radionuclides greater than background (Section 5.1) were included in the comparison to one-tenth of the residential soil BCL.

Two organic compounds and seven inorganic compounds were found to exceed their respective one-tenth of the residential soil BCL.

5.4 SUMMARY OF SELECTION OF COPCS

The procedures for COPC selection were discussed above. Results of the selection of COPCs, including the rationale for excluding chemicals as COPCs, are presented in Table 5-7.

These procedures apply to soil results. Outdoor air exposures for VOCs are evaluated on a sample-by-sample basis, per NDEP requirements, using the surface flux data measurements. Because of this, elimination of COPCs from the surface flux data is not done. Instead, every chemical detected in an individual surface flux location is included in the evaluation for that location. Therefore, the maximum surface flux risk estimates are summed with the soil risk estimates to provide an upper-bound risk for each receptor.

6.0 HUMAN HEALTH RISK ASSESSMENT

This section presents the HHRA of all COPCs identified in Section 5 for all receptors of concern via all complete pathways. The methods used in the risk assessment follow standard USEPA guidance. Specifically, the methods used in the risk assessment followed basic procedures outlined in the USEPA's *Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual* (USEPA 1989). Other guidance documents consulted include:

- *Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual. Supplemental Guidance: Standard Default Exposure Factors* (USEPA 1991b).
- *Guidelines for Exposure Assessment* (USEPA 1992b).
- *Soil Screening Guidance: Technical Background Document* (USEPA 1996).
- *Exposure Factors Handbook, Volumes I-III* (USEPA 1997).
- *Soil Screening Guidance for Radionuclides* (USEPA 2000).
- *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (USEPA 2002b).
- *Technical Support Document for a Protocol to Assess Asbestos-Related Risk. Final Draft* (USEPA 2003b).
- *Child-Specific Exposure Factors Handbook* (USEPA 2006).
- *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)* (USEPA 2004e).
- *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)* (USEPA 2009).

Various NDEP guidance documents are also relied on for the HHRA. These include:

- *Supplemental Guidance for Assessing Data Usability for Environmental Investigations at the BMI Complex and Common Areas in Henderson, Nevada* (NDEP 2008a).
- *Guidance for Evaluating Secular Equilibrium at the BMI Complex and Common Areas* (NDEP 2009a).

- *Technical Guidance for the Calculation of Asbestos-Related Risk in Soils for the Basic Management Incorporated (BMI) Complex and Common Areas* (NDEP 2009b, 2010).

- *Supplemental Guidance on Data Validation* (NDEP 2009c,d).

- *Guidance for Evaluating Radionuclide Data for the BMI Plant Sites and Common Areas Projects* (NDEP 2009e).

The risk assessment is a deterministic risk assessment, meaning that single values based on conservative assumptions are used for all modeling, exposure parameters, and toxicity criteria. These conservative estimates compound each other so that the calculated risks likely exceed the true risks at the Site.

The method used in the risk assessment consists of several steps. The first step is the calculation of exposure point concentrations representative of the particular area, for each medium of concern. This step includes fate and transport modeling to predict concentrations that may be present when direct measurements are not available. The second step is the exposure assessment for the various receptors present in the particular areas. The next step is to define the toxicity values for each COPC. The final step is risk characterization where theoretical upper-bound cancer risks and non-cancer HIs are calculated.

6.1 DETERMINATION OF EXPOSURE POINT CONCENTRATIONS

A representative exposure concentration is a COPC-specific and media-specific concentration value. In risk assessment, these exposure concentrations are values incorporated into the exposure assessment equations from which potential baseline human exposures are calculated. As described below, the methods, rationale, and assumptions employed in deriving these concentration values follow USEPA guidance and reflect Site-specific conditions.

Chemical, physical, and biological processes may affect the fate and transport of chemicals in water, soil, and air. Chemical processes include solubilization, hydrolysis, oxidation-reduction, and photolysis. Physical processes include advection and hydrodynamic dispersion, volatilization, dispersion, and sorption/desorption to soil, sediment, and other solid surfaces. Biological processes include biodegradation, bioaccumulation, and bioconcentration. All of these processes are dependent upon the physical and chemical properties of the chemicals, the physical and chemical properties of the soil and water, and other environmental factors such as temperature, humidity, and the conditions of water recharge and movement. The net effect of these environmental factors is a time-dependent reduction of chemical concentrations in water, soil, and air. The determination of exposure point concentrations for media other than soil take into account chemical-specific physical parameters and inter-media transfers as discussed below. All modeling input parameters, calculations and results are presented in Appendix H (included on the report CD in Appendix B).

6.1.1 Soil

Due to the uncertainty associated with determining the true average concentration at a site, where direct measurements of the site average are infeasible and unavailable, the USEPA recommends using the lower of the maximum detected concentration or the 95 percent UCL as the concentration of a chemical to which an individual could be exposed over time (USEPA 1992b). For the 95 percent UCL concentration approach, the 95 percent UCL was computed to represent the area-wide exposure point concentrations. The 95 percent UCL is a statistic that quantifies the uncertainty associated with the sample mean. If randomly drawn subsets of Site data are collected and the UCL is computed for each subset, the UCL equals or exceeds the true mean roughly 95 percent of the time. The purpose for using the 95 percent UCL is to derive a conservative, upper-bound estimate of the mean concentration, which takes into account the different concentrations to which a person may be exposed at the Site. That is, an individual will be exposed to a range of concentrations that exist at an exposure area, from non-detect to the maximum concentration, over an entire exposure period.

A 95 percent UCL was calculated using the summary.stats() function in the GiSdT® package (Neptune and Company 2009) in R (R Core Team 2012). Section 5.1 outlines the treatment of sample locations with field duplicates prior to the 95 percent UCL statistical calculations described in this section. For these calculations, chemical non-detect results are assigned a value of one-half the SQL. The formulas for calculating the 95 percent UCL COPC concentration (as the representative exposure concentration) are presented in USEPA (1992c, 2002c) and GiSdT® (Neptune and Company 2009). Three UCL methods are employed in the GiSdT® library. They include the Student's t UCL, the bootstrap percentile UCL, and the bootstrap BCa UCL. The maximum UCL of these three methods was used as the exposure point concentration, unless the maximum UCL of the three methods was greater than the maximum detected concentration. In these cases, the maximum detected concentration was selected as the exposure point concentration.

The representativeness of the 95 percent UCLs for the exposure area, that is, a Sitewide mean concentration is valid for all receptors at the Site, is further supported by the intensity plot figures included in Appendix I. Figures for each of the COPCs are included in Appendix I (in addition to figures developed for all metals). A figure is also presented for TCDD TEQ. Although not COPCs for the Site, TCDD TEQ is a primary chemical of interest for the project. Based on the results of the background comparison tests, a review of the probability plots, boxplots, and distribution and intensity plot figures, data across the Site are assumed to be uncorrelated, that is, there is no discernable spatial correlation.[40] Although there may be spatial correlation of data across the Site, it has not been observed. Thus, the assumption is made for statistical testing purposes that the data are not spatially correlated.[41] This results in lower p-values and hence a greater number of statistical differences than would be the case if spatial correlation were accounted for. Ignoring correlation therefore causes conservatism, and the need to further evaluate spatial correlation is not warranted. Therefore consistent with the project *Statistical Methodology Report* (NewFields 2006), each measurement is assumed to be equally representative for that chemical at any point in the Site and calculation of the 95 percent UCL is appropriate. The data were also reviewed for the presence of hot spots, and as discussed in Section 3.5, no potential hot spots were identified at the Site.

Representative exposure concentrations for soil are based on the potential exposure depth for each of the receptors. For all receptors, two different exposure depths are considered, based on the sample depth rules schematic presented in Section 3: all data (surface and subsurface) and data classified as surface soil only. These different soil exposure classifications are considered to represent all possible exposure potential for all receptors, based on the future grade and use of Site soils. Ninety-five percent UCLs are calculated for both exposure depth scenarios. To be conservative, the higher of the two values was used in the risk estimates for each COPC. The 95 percent UCL for each COPC is presented in Table 6-1 (Tables section). For indirect exposures, this concentration was used in fate and transport modeling.

[40] Although the Statistical Methodology Report states that confirmation measurements of each chemical in a given soil layer will be used to compute variograms, as noted in the text above, this was not conducted for the Site, which is a deviation from the *BRC Closure Plan* methodology.
[41] Some variability of the data is expected, if there was perfect homogeneity then only one sample would be needed to represent the Site. This natural variability is demonstrated by the background datasets for the project. As shown on the probability and boxplots in Appendix G, the data generally follow a normal distribution, and their variability are similar to the background data.

The exposure point concentrations for asbestos (USEPA 2003b, NDEP 2009b) were based on the pooled analytical sensitivity of the dataset. The asbestos data and analytical sensitivities are presented in Table 6-2. Therefore, asbestos exposure point concentrations are determined differently than those for the other COPCs. The pooled analytical sensitivity is calculated as follows:

$$\textit{Pooled Analytical Sensitivity} = 1/\left[\sum_i (\textit{1/analytical sensitivity for trial i})\right]$$

Two estimates of the asbestos concentration were evaluated, best estimate and upper bound, as defined in the draft methodology (USEPA 2003b). The best estimate concentration is similar to a central tendency estimate, while the upper bound concentration is comparable to a reasonable maximum exposure estimate. The pooled analytical sensitivity is multiplied by the number of chrysotile or amphibole structures to estimate concentration:

$$\text{Estimated Bulk Concentration } (10^6 \text{ s/gPM10}) = \text{Long fiber count} \times \text{Pooled analytical sensitivity}$$

For the best estimate, the number of fibers measured across all samples is incorporated into the calculation above. The upper bound of the asbestos concentration was also evaluated. It is calculated as the 95 percent UCL of the Poisson distribution mean, where the Poisson mean was estimated as the total number of structures detected across all samples. In Microsoft Excel, the following equation may be employed to calculate this value:

95 percent UCL of Poisson Distribution Mean = CHIINV(1-upper confidence percentile, 2 × (Long fiber count + 1))/2

This value is then multiplied by the pooled analytical sensitivity to estimate the upper bound concentration. The intent of the risk assessment methodology is to predict the risk associated with airborne asbestos. In order to quantify the airborne asbestos concentration, the estimated dust levels or particulate emission factors (PEFs) were used:

$$\begin{aligned}\text{Estimated Airborne Concentration } (\text{s/cm}^3) = {} & \text{Estimated bulk concentration } (10^6 \text{ s/gPM10}) \times \\ & \text{Estimated dust level } (\text{ug/cm}^3)\end{aligned}$$

Further explanation of the asbestos risk calculations and estimates are provided in the NDEP's Technical Guidance for the Calculation of Asbestos-Related Risk in Soils (2009b) and Workbook for the Calculation of Asbestos-Related Risk in Soils (2010).

6.1.2 Outdoor Air from Surface Flux

Concentrations of volatile constituents (VOCs and certain SVOCs) in soil and groundwater that may infiltrate through the ground to ambient air are estimated using USEPA surface emission isolation flux chamber (flux chamber) measurements collected at the Site in accordance with USEPA guidance (USEPA 1986) and the Flux Chamber SOP-16 (BRC, ERM, and MWH 2008). The flux chamber is used to measure the emission rates from surfaces emitting gas species. Use of the flux chamber reduces the need for modeling surface flux rates, which potentially reduces the uncertainty in the air representative exposure concentrations and the risk characterization. As noted in Section 5.4, indoor air exposures are evaluated on a sample by sample basis, per NDEP requirements, using the surface flux data measurements. Every chemical detected in an individual surface flux location is included in the evaluation for that location.

Outdoor surface flux data are divided by the dispersion factor for volatiles (Q/C_{vol} for Las Vegas; from USEPA 2002b) for use in the outdoor air exposure pathway. The same dispersion factor is used for all scenarios. The dispersion factor for the construction worker is not adjusted to account for soil intrusion activities. Outdoor air concentrations based on the surface flux data measurements are shown in the electronic air calculation files in Appendix H (included on the report CD in Appendix B) and are summarized in Table 6-3. In all cases the maximum of the two flux chamber measurements (TO-15 full scan and TO-15 SIM) is used.

6.1.3 Outdoor Air

Long–term exposure to COPCs bound to dust particles is evaluated using the USEPA's PEF approach (USEPA 2002b). The PEF relates concentrations of a chemical in soil to the concentration of dust particles in the air. The Q/C (Site-Specific Dispersion Factor) values in this equation are for Las Vegas, Nevada (Appendix D of USEPA 2002b). The equation used is:

$$PEF = Q/C_{wind} \ \text{x} \ \frac{3{,}600 \text{ sec/hr}}{0.036 \text{ x } (1 - V) \text{ x } (U_m / U_t)^3 \text{ x } F(x)}$$

where:

PEF = Particulate emission factor (m^3/kg)

Q/C_{wind} = Inverse of the ratio of the geometric mean air concentration to the emission flux at the center of a square source (g/m^2-s per kg/m^3)

V = Fraction of vegetative cover (unitless)

U_m = Mean annual windspeed (m/s)
U_t = Equivalent threshold value of windspeed at 7m (m/s)
F(x) = Function dependent on U_m/U_t derived using USEPA (1985) (unitless)

and:

$$Q/C_{wind} = A \times \exp\frac{(\ln A_{site} - B)^2}{C}$$

where:

A_{site} = Source Area (acre)
A, B, C = Air Dispersion Constants for LV (unitless)

The dust model and parameters utilized to generate the PEF are presented in Table 6-4.

The USEPA guidance for dust generated by construction activities (USEPA 2002b) was used for assessing short-term construction worker exposures:

$$PEF = \frac{1}{\left(\left(\frac{1}{PEF_{sc}}\right) + \left(\frac{1}{PEF_{sc\_road}}\right)\right)}$$

where:

PEF_{sc} = Subchronic particulate emission factor for construction activities (m^3/kg)
PEF_{sc_road} = Subchronic particulate emission factor for unpaved road traffic (m^3/kg)

Input soil concentrations for the model are the exposure point concentrations as described above. The construction dust model and all relevant equations and parameters utilized to generate the construction worker PEF from this guidance are provided in Table 6-5. Site-specific surface soil moisture data were collected in January, February, and August. The average of the surface soil data is 4.31 percent. This is considered an adequate representation of the annual average; therefore, this value is used for the percent moisture in dry road surface parameter instead of the NDEP model default value. Outdoor air concentrations based on soil data for all receptors are shown in Table 6-6.

6.2 EXPOSURE ASSESSMENT

In a risk assessment, the possible exposures of populations are examined to determine if the chemicals at a site could pose a threat to the health of identified receptors. The risks associated with exposure to chemicals depend not only on the concentration of the chemicals in the media, but also on the duration and frequency of exposure to those media. For example, the risks associated with exposure to chemicals for 1 hour a day are less than those associated with exposure to the same chemicals at the same concentrations for 2 hours a day. Potential health impacts from chemicals in a medium can occur via one or more exposure pathways. The exposure assessment step of a risk assessment combines information regarding impacted media at a site with assumptions about the people who could come into contact with these media. The result is an estimation of a person's potential rate of contact with impacted media from the Site. The intake rates are evaluated in the risk characterization step to estimate the risks they could pose.

In this section, assumptions regarding people's activities, such as the frequency with which a person could come into contact with impacted media, are discussed. Finally, the daily doses at the points of potential human contact were estimated using these assumptions, the models described in Section 6.1, and the chemical concentrations reported for soil and surface flux samples collected from the Site.

6.2.1 Exposure Parameters

In this section, the assumptions regarding the extent of exposure are presented for each of the exposure pathways for each medium of concern at the Site. Table 6-7 presents each of the exposure parameters used in the risk assessment for each receptor and each pathway. Many of the assumptions regarding the extent of exposure are default factors developed by USEPA's Superfund program. Default values were modified to reflect Site-specific conditions, where possible. The exposure parameters used in the risk assessment were those defined in Tables 9-2 through 9-5 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010).

6.2.2 Quantification of Exposure

In this section, the concentrations of COPCs at the points of potential human exposure are combined with assumptions about the behavior of the populations potentially at risk to estimate the dose of COPCs that may be taken in by the exposed individuals. Later, in the risk characterization step of the assessment, the doses are combined with toxicity parameters for COPCs to estimate whether the calculated intake levels pose a threat to human health.

The method used to estimate the average daily dose (ADD) for non-carcinogens COPCs via each of the complete exposure pathways is based on USEPA (1989, 1992b) guidance. For carcinogens, lifetime ADD (LADD) estimates are based on chronic lifetime exposure, extrapolated over the estimated average lifetime (assumed to be 70 years). This establishes consistency with cancer slope factors (CSFs), which are based on chronic lifetime exposures. For non-carcinogens, ADD estimates are averaged over the estimated exposure period. ADDs and LADDs were calculated for each exposure scenario using the following generic equation:

$$Dose = \frac{C \times IR \times ED \times EF}{BW \times AT \times 365\ d/yr}$$

where:

Dose	=	ADD for non-carcinogens and LADD for carcinogens (in mg/kg-day)
C	=	chemical concentration in the contact medium (e.g., mg/kg soil)
IR	=	intake rate (e.g., mg/day soil ingestion and dermal contact [requires a conversion factor of 10^{-6} kg/mg];
ED	=	exposure duration (years of exposure)
EF	=	exposure frequency (number of days per year)
BW	=	average body weight over the exposure period (kilograms)
BIO	=	relative bioavailability (unitless)
AF	=	absorption fraction (percent)
AT	=	averaging time; same as the ED for non-carcinogens and 70 years (average lifetime) for carcinogens

Risk estimates for inhalation exposures follow USEPA's *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)* (USEPA 2009). That is, the concentration of a chemical in air is used as the exposure metric (e.g., mg/m^3), rather than inhalation intake of a chemical in air based on inhalation rate and body weight (e.g., mg/kg-day). The generic equation for calculating inhalation exposures is:

$$EC = \frac{C_{air} \times ET \times ED \times EF}{AT}$$

where:

EC = exposure concentration (in mg/m^3)
C_{air} = chemical concentration in air (in mg/m^3)
ET = exposure time (hours per day)
ED = exposure duration (years of exposure)
EF = exposure frequency (number of days per year)
AT = averaging time; same as the ED for non-carcinogens and 613,200 hours (i.e., 70 years; average lifetime) for carcinogens

Pathway-specific equations for calculating ADDs and LADDs are provided in Table 9-6 of the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010). For conservatism, the relative oral bioavailability (BIO) of all COPCs was assumed to be 100 percent, except for arsenic. Consistent with the *BRC Closure Plan* (BRC, ERM, and DBS&A 2007; Section 9 revised March 2010), an arsenic oral bioavailability of 30 percent is used.

Chemical-specific dermal absorption values from USEPA guidance (USEPA 2004e [Part E RAGS]) were used in the risk assessment. USEPA does not recommend absorption factors for VOCs based on the rationale that VOCs from the soil are volatilized on skin and exposure is accounted for via inhalation routes. In addition, RAGS Part E (USEPA 2004e) states "For inorganics, the speciation of the compound is critical to the dermal absorption and there are too little data to extrapolate a reasonable default value." Therefore, dermal absorption factors are also not used for inorganics. The NDEP and its consultants have concurred with this decision.

Exposure levels of potentially carcinogenic and non-carcinogenic chemicals are calculated separately because different exposure assumptions apply (i.e., ADD for non-carcinogens and LADD for carcinogens). Exposure levels are estimated for each relevant exposure pathway (i.e., soil, air, and water), and for each exposure route (i.e., oral, inhalation, and dermal). Daily doses for the same route of exposure are summed. The total dose of each chemical is the sum of doses across all applicable exposure routes. As noted previously, radionuclides are consistent with background concentrations and are not addressed in this HHRA.

6.2.3 Asbestos

Although final USEPA guidance is unavailable at this time, USEPA recommends that site-specific risk assessments be performed for asbestos (USEPA 2004f). Risks associated with asbestos in soil are evaluated using the NDEP's *Technical Guidance for the Calculation of*

Asbestos-Related Risk in Soils (2009b) and *Workbook for the Calculation of Asbestos-Related Risk in Soils* (2010), and the draft methodology proposed by USEPA (2003b). This methodology is an update of the method described in *Methodology for Conducting Risk Assessments at Asbestos Superfund Sites-Part 1: Protocol* and *Part 2: Technical Background Document* (Berman and Crump 1999a,b). Because the risk assessment methodology for asbestos is unlike that for other COPCs, asbestos risks are evaluated separately from other chemical risks.

The intent of the risk assessment methodology is to predict the amount of airborne asbestos, which causes an unacceptable risk to a human receptor. Asbestos concentrations are measured in soil, and are then used to predict airborne asbestos concentrations using a dust emissions model. Asbestos data are collected from the top 2 inches of soil. While asbestos might exist below the top 2 inches of soil due to soil turnover, the concentrations in the surface soil are likely to be greater than concentrations beneath the surface, and the exposure pathway is to near-surface soils. Therefore, the “shallow” surface soils asbestos concentration estimate is used to represent the potential exposure to asbestos.

To interpret measurements of asbestos in soils, it is necessary to establish the relationship between the asbestos concentrations observed in soils and concentrations that will occur in air when such soil is disturbed by natural or anthropogenic forces. This is because asbestos is a hazard when inhaled (see, for example, Berman and Crump 2001; USEPA 2003b). Indeed, the Modified Elutriator Method (Berman and Kolk 2000), which was the method employed to perform the analyses presented in this report, was designed specifically to facilitate prediction of airborne asbestos exposures based on bulk measurements (see, for example, Berman and Chatfield 1990).

Briefly, the Modified Elutriator Method incorporates a procedure for isolating and concentrating asbestos structures as part of the respirable dust fraction of a sample, and analytical measurements are reported as the number of asbestos structures per mass of respirable dust in the sample. This turns out to be precisely the dimensions required to combine such measurements with published dust emission and dispersion models to convert them to asbestos emission and dispersion models. These models can be combined with measurements from the Modified Elutriator Method to predict airborne exposures and assess the attendant risks.

6.3 TOXICITY ASSESSMENT

This section describes the toxicity of the COPCs at the Site. Numerical toxicity values were developed for use in the calculation of the hazard quotients (HQs; for non-carcinogens) and risks (for carcinogens).

6.3.1 Toxicity Values

Toxicity values, when available, are published by the USEPA in the on-line Integrated Risk Information System [IRIS]; USEPA 2012). CSFs (in units of milligrams per kilogram per day $[mg/kg\text{-}d]^{-1}$) are chemical-specific and experimentally derived potency values that are used to calculate the risk of cancer resulting from exposure to potentially carcinogenic chemicals. Inhalation unit risks (IURs) represent the upper-bound excess lifetime cancer risk from continuous exposure to a chemical at a concentration of 1 microgram per cubic meter ($\mu g/m^3$). A higher value implies a more potent carcinogenic potential. Reference dosages (RfDs) are experimentally derived "no-effect" levels used to quantify the extent of toxic effects other than cancer due to exposure to chemicals (in units of mg/kg-d). Similarly, a reference concentration (RfC) is the derived "no-effect" concentration for a lifetime of continuous inhalation exposure (in units of milligrams per cubic meter [mg/m^3]). With RfDs or RfCs, a lower value implies a more potent toxicant. These criteria are generally developed by USEPA risk assessment work groups and listed in the USEPA risk assessment guidance documents and databases. Available toxicity values for all Site COPCs used in the risk assessment were obtained using the following hierarchy for selecting toxicity criteria (based on USEPA 2003c):

1. IRIS;
2. USEPA's Provisional Peer Reviewed Toxicity Values (PPRTVs);
3. National Center for Environmental Assessment (or other current USEPA sources);
4. Health Effects Assessment Summary Tables (HEAST);
5. USEPA Criteria Documents (e.g., drinking water criteria documents, drinking water Health Advisory summaries, ambient water quality criteria documents, and air quality criteria documents);
6. ATSDR toxicological profiles;
7. USEPA's Environmental Criteria and Assessment Office; and

8. Peer-reviewed scientific literature.

In addition, toxicity criteria and toxicological surrogates recommended by the NDEP are used in the risk assessment. Toxicity criteria are consistent with those used in the development of the NDEP's BCLs (NDEP 2012), unless newer values are available from USEPA. Toxicity criteria have not been developed by BRC for elements or compounds that do not have criteria published in the above sources.

Although USEPA has developed toxicity criteria for the oral and inhalation routes of exposure, it has not developed toxicity criteria for the dermal route of exposure. USEPA has proposed a method for extrapolating oral toxicity criteria to the dermal route in the *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)* (USEPA 2004e). USEPA states that the adjustment of the oral toxicity factor for dermal exposures is necessary only when the oral-gastrointestinal absorption efficiency of the chemical of interest is less than 50 percent (due to the variability inherent in absorption studies). For COPCs to which dermal exposure might occur at the Site, the oral-gastrointestinal absorption efficiencies are greater than 50 percent, except for total chromium, hexavalent chromium, mercury, nickel, and vanadium. Therefore, the USEPA indicated adjustment of the oral toxicity criteria to generate dermal criteria was performed for these COPCs.

6.3.2 Non-Carcinogenic Health Effects

For non-carcinogenic health effects, USEPA assumes that a dose threshold exists, below which adverse effects are not expected to occur. A chronic RfD or RfC of a chemical is an estimate of a lifetime daily dose to humans that is likely to be without appreciable deleterious non-carcinogenic health effects. To derive an RfD or RfC, a series of professional judgments is made to assess the quality and relevance of the human or animal data and to identify the critical study and the most critical toxic effect. Data typically used in developing the RfD or RfC are the highest no-observable-adverse-effect-levels (NOAELs) for the critical studies and effects of the non-carcinogen. For each factor representing a specific area of uncertainty inherent in the extrapolation from the available data, an uncertainty factor is applied. Uncertainty factors generally consist of multiples of 10, although values less than 10 are sometimes used.

Four major types of uncertainty factors are typically applied to NOAELs in the derivation of RfDs or RfCs. Uncertainty factors of 10 are used to (1) account for the variability between humans, (2) extrapolate from animals to humans, (3) account for a NOAEL based on a subchronic study instead of a chronic study, and (4) extrapolate from a lowest-observed-adverse-effect-level (LOAEL) to a NOAEL, if necessary. In addition, a modifying factor can be used to account for adequacy of the database. Typically, the modifying factor is set equal to one.

To obtain the RfD or RfC, all uncertainty factors associated with the NOAEL are multiplied together, and the NOAEL is divided by the total uncertainty factor. Therefore, each uncertainty factor adds a degree of conservatism (usually one order of magnitude) to the RfD or RfC. An understanding of the uncertainties associated with RfDs or RfCs is important in evaluating the significance of the HIs calculated in the risk characterization portion of the risk assessment. When available, sub-chronic RfDs or RfCs were used to evaluate construction worker exposures. The COPCs in this assessment with USEPA-established oral/dermal and inhalation RfDs or RfCs are presented in Tables 6-8 and 6-9, for surface flux and soil COPCs, respectively.

6.3.3 Carcinogenic Health Effects

USEPA develops CSFs and IURs from chronic animal studies or, where possible, epidemiological data. Because animal studies use much higher doses over shorter periods of time than the exposures generally expected for humans, the data from these studies are adjusted, typically using a linearized multi-stage (LMS) mathematical model. To ensure protectiveness, CSFs/IURs are typically derived from the 95th percentile UCL of the slope, and thus the actual risks are unlikely to be higher than those predicted using the CSF/IUR, and may be considerably lower. The COPCs in this assessment with USEPA-established oral/dermal and inhalation CSFs/IURs are presented in Tables 6-8 and 6-10, for surface flux and soil COPCs, respectively.

6.3.4 Asbestos

Asbestos toxicity criteria were obtained from Table 8-1 of Berman and Crump's (2001) document and Tables 8-2 and 8-3 in the USEPA (2003b) guidance. The toxicity criteria vary based on fiber type, endpoint (lung cancer, mesothelioma, or combined) and percent of fibers longer than 10 micrometers (µm) and less than 0.4 µm in width. For this risk assessment the toxicity criteria were based on a combined endpoint of lung cancer and mesothelioma averaged over the smokers and non-smokers of the population, with the assumption that 50 percent of fibers are greater than 10 µm in length. The resulting unit risk factors (structures/cubic centimeter) are presented in Appendix H (included on the report CD in Appendix B). A complete discussion on issues associated with risk estimates for asbestos is presented in the NDEP's *Technical Guidance for the Calculation of Asbestos-Related Risk in Soils* (2009b).

6.4 RISK CHARACTERIZATION

In the last step of a risk assessment, the estimated rate at which a receptor intakes a chemical is compared with information about the toxicity of that COPC to estimate the potential risks posed by exposure to the COPC. This step is known as risk characterization. The methods used for assessing cancer risks and non-cancer adverse health effects are discussed below.

6.4.1 Methods for Assessing Cancer Risks

In the risk characterization, carcinogenic risk is estimated separately as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to chemicals and asbestos. Carcinogenic risks for chemicals were evaluated by multiplying the estimated average exposure rate (i.e., LADD calculated in the exposure assessment) by the chemical's CSF or IUR. The CSF converts estimated daily doses averaged over a lifetime to incremental risk of an individual developing cancer. Because cancer risks are averaged over a person's lifetime, longer-term exposure to a carcinogen results in higher risks than shorter-term exposure to the same carcinogen, if all other exposure assumptions are constant. Theoretical risks associated with low levels of exposure in humans are assumed to be directly related to an observed cancer incidence in animals associated with high levels of exposure while the IUR converts estimated exposure concentrations averaged over a lifetime to incremental risk of an individual developing cancer. According to USEPA (1989), this approach is appropriate for theoretical upper-bound ILCRs of less than 1×10^{-2}. The following equations were used to calculate COPC-specific risks and total risks:

$$Risk = EC \times IUR \quad or \quad LADD \times CSF$$

where:

LADD	=	lifetime average daily dose (mg/kg-d)
EC	=	exposure concentration (mg/m^3)
IUR	=	inhalation unit risk $(mg/m^3)^{-1}$
CSF	=	cancer slope factor $(mg/kg\text{-}d)^{-1}$

and:

$$Total\ Carcinogenic\ Risk = \Sigma\, Individual\ Risk$$

It is assumed that cancer risks for different chemicals and from multiple exposure routes are additive, which introduces a protective bias in the result of the cancer risk assessment.

Carcinogenic risk estimates were compared to the USEPA acceptable, incremental risk range of 1 in 10,000 (10^{-4}) and 1 in 1 million (10^{-6}) and the NDEP's acceptable, incremental level of 10^{-6}. If the estimated incremental risk falls within or below this risk range, the chemical is considered unlikely to pose an unacceptable carcinogenic risk to individuals under the given exposure conditions. A risk level of 1×10^{-5} (1 E-5) represents an incremental probability of one in 100,000 that an individual could develop cancer from exposure to the potential carcinogen under a defined set of exposure assumptions.

6.4.2 Methods for Assessing Non-Cancer Health Effects

Non-cancer adverse health effects are estimated by comparing the estimated average exposure rate (i.e., ADDs estimated in the exposure assessment) with an exposure level at which no adverse health effects are expected to occur for a long period of exposure (e.g., the RfDs or RfCs). ADDs (or exposure concentrations [ECs]) and RfDs (or RfCs) are compared by dividing the ADD by the RfD (or EC by the RfC) to obtain the ADD:RfD (EC:RfC) ratio, as follows:

$$HQ = \frac{EC}{RfC} \text{ or } \frac{ADD}{RfD}$$

where:

HQ	=	hazard quotient
ADD	=	average daily dose (mg/kg-d)
EC	=	exposure concentration (mg/m^3)
RfD	=	reference dose (mg/kg-d)
RfC	=	reference concentration (mg/m^3)

The ADD-to-RfD (EC-to-RfC) ratio is known as an HQ. If a person's average exposure is less than the RfD or RfC (i.e., if the HQ is less than 1), the chemical is considered unlikely to pose a significant non-carcinogenic health hazard to individuals under the given exposure conditions. Unlike carcinogenic risk estimates, an HQ is not expressed as a probability. Therefore, while both cancer and non-cancer risk characterizations indicate a relative potential for adverse effects to occur from exposure to a chemical, a non-cancer adverse health effect estimate is not directly comparable with a cancer risk estimate.

If more than one pathway is evaluated, the HQs for each pathway are summed to determine whether exposure to a combination of pathways poses a health concern. This sum of the HQs is known as an HI.

$$Hazard\ Index = \Sigma\, Hazard\ Quotients$$

Any HI less than 1.0 indicates the exposure is unlikely to be associated with a potential health concern. If the HI is greater than 1.0, then the HQs are summed by the specific target organs affected by a particular chemical or chemicals. This is also summed across pathways and chemicals. Target organs are identified primarily by the source of the toxicity criteria (e.g., IRIS). Since a chemical may affect more than one organ, in addition to the source of the toxicity criteria Oak Ridge National Laboratory's (ORNL) Risk Assessment Information System's toxicity profiles were also searched for target organ information (ORNL 2012).

6.4.3 Methods for Assessing Asbestos Risks

For assessing asbestos risks, Table 8-2 (Based on Optimum Risk Coefficients) of USEPA (2003b) was used. Table 8-2 presents best estimate risks optimized based upon separation of fiber type, size and endpoint (mesothelioma/lung cancer), thereby reducing apparent variation between the studies utilized. The values in Table 8-2 are used because they are the authors' "best" estimates of potency based upon all the available data (whereas the "conservative values" presented in Table 8-3 present only the most conservative, and best "behaved" data). As described in USEPA (2003b), because the asbestos risks to male and female smokers/non-smokers are different, population averaged risks are evaluated based on Eqn. 8-1 of USEPA (2003b):

$$URF = 0.5 \times ((0.786 \times (NSM + NSF)) + ((0.214 \times (SM + SF)) \times CF$$

where:

URF	=	Population Averaged Unit Risk Factor (risk per fibers/cubic centimeter [cm^3])
NSM	=	risk for male non-smokers
NSF	=	risk for male non-smokers
SM	=	risk for male smokers
SF	=	risk for female smokers
CF	=	factor to convert risk from risk per 100,000 to risk per 1,000,000

This equation considers male smokers, male non-smokers, female smokers, and female non-smokers. In addition, because both chrysotile and amphibole have been detected at the BMI Common Areas, both amphibole and chrysotile fibers are evaluated in the risk assessments, regardless of if either was detected within an exposure area (as calculated using the 95 percent UCL of the mean of the assumed underlying Poisson distribution).

The basic equation for assessing inhalation cancer risk for asbestos is analogous to that recommended by USEPA for other inhalation carcinogens. As shown in Equation 11 of *Risk Assessment Guidance for Superfund, Part F* (USEPA, 2009) inhalation cancer risk is the product of an IUR factor and an exposure concentration. The exposure concentration is a function of the asbestos air concentration, the length of time an individual is exposed, and the averaging time for which carcinogenic effects are evaluated for the unit risk factor. This calculation of asbestos related risk (ARR) is also consistent with application of Berman and Crump (2003) to risk calculations described in Berman (2003a,b; 2005). The risk equation used in performing an asbestos inhalation risk assessment is:

$$ARR = \frac{C_{air} \times URF \times ET \times EF \times ED}{AT}$$

where:

C_{air}	=	air concentration of asbestos (f/cm^3) (fibers per centimeter cubed)
ET	=	exposure time (hours/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
AT	=	averaging time (hours)
URF	=	unit risk factor (risk per f/cm^3)

Asbestos risk estimates are compared to the USEPA acceptable, incremental risk range for carcinogens of 1 in 10,000 (10^{-4}) and 1 in 1 million (10^{-6}) and the NDEP's acceptable, incremental level of 10^{-6}, although the risk estimates represent the probability of death from mesothelioma or lung cancer rather than the probability of contracting cancer. If the estimated asbestos risk falls within or below this risk range, asbestos is considered unlikely to pose an unacceptable risk to individuals under the given exposure conditions. A risk level of 1×10^{-5} (1 E-5) represents a probability of one in 100,000 that an individual could die from contracting mesothelioma or lung cancer from exposure to asbestos under a defined set of exposure assumptions.

6.4.4 Risk Assessment Results

The calculation of theoretical upper-bound ILCRs and non-cancer health effects are presented by receptor in Tables 6-11 and 6-12 and are discussed in Section 8. These tables present the theoretical upper-bound ILCRs and non-cancer health effects calculations for construction worker and maintenance (outdoor) worker receptors. The risk of death from lung cancer or mesothelioma as a consequence of exposure to asbestos on a Sitewide basis is presented in Table 6-13. All calculation spreadsheets are provided in Appendix H (included on the report CD in Appendix B).

7.0 UNCERTAINTY ANALYSIS

Risk estimates are values that have uncertainties associated with them. These uncertainties, which arise at every step of a risk assessment, are evaluated to provide an indication of the uncertainty associated with a risk estimate. Risk assessments are not intended to estimate the true risk to a receptor associated with exposure to chemicals in the environment. In fact, estimating the true risk is impossible because of the variability in the exposed or potentially exposed populations. There are always gaps in knowledge because a true exposure for every individual human being cannot be measured. Therefore, risk assessment is a means of estimating the probability that an adverse health effect (e.g., cancer, impaired reproduction) will occur in a receptor to assist in decision-making regarding the protection of human health. The use of conservative values for a majority of the assumptions in risk assessments helps guard against the underestimation of risks.

Risk estimates are calculated by combining Site data, assumptions about individual receptor's exposures to impacted media, and toxicity data. The uncertainties in this HHRA can be grouped into four main categories that correspond to these steps:

- Uncertainties in environmental sampling and analysis;
- Uncertainties in fate and transport modeling (discussed in Section 9);
- Uncertainties in assumptions concerning exposure scenarios; and
- Uncertainties in toxicity data and dose-response extrapolations.

General uncertainties associated with the HHRA for the Site are summarized in Table 7-1. In this table, "Low," "Moderate," and "High" are qualitative indicators as to whether the source of uncertainty will likely have a small, medium, or large effect on the risk calculations, respectively. In general, the scenarios and parameters evaluated and used in this HHRA are considered conservative based on how the Site will be developed. This is a large source of potential conservative bias in this HHRA. Additional discussion on the uncertainties associated with the HHRA is provided below.

7.1 ENVIRONMENTAL SAMPLING

The HHRA for the Site was based on the sampling results obtained from investigations conducted in 2009 and 2010. Errors in sampling results can arise from the field sampling, laboratory analyses, and data analyses.

The environmental sampling at the Site is one source of uncertainty in the evaluation. However, the number of sampling locations and events is large, widespread and spatially distributed, with consistent analytical results (i.e., no hot spots), and sampling was performed using approved procedures; therefore, the sampling and analytical data are sufficient to characterize the impacts and the associated potential risks.

Because of the surface soil removal undertaken for certain chemicals, the new surface layer of the Site could have different chemical concentrations than those measured prior to soil removal. Because only the trigger constituents were reanalyzed for in the post-scrape samples, the original measured surface soil data at the Site for all other chemicals was retained for further evaluation. However, it is reasonable to assume that the concentrations are now lower for some chemicals (e.g., metals, if due to contamination), because of the removal of some soil.

The laboratory data are another potential source of uncertainty. Maximum SQLs for 1,2-diphenylhydrazine, 3,3-dichlorobenzidine, bis(2-chloroethyl) ether, dichloromethyl ether, hexachlorobenzene, and n-nitrosodi-n-propylamine exceeded one-tenth their respective residential soil BCL. These chemicals were not evaluated quantitatively in the HHRA as they were not detected in any Site samples. This may result in an underestimation of risk.

Three surface flux (EPA TO-15) analytes (2-Methyl-1-propanol, benzyl chloride, and dibromochloropropane) were qualified in all samples due to calibration recoveries below 50 percent. All three compounds were non-detect in all samples. This may result in an underestimation of risk.

Widespread blank contamination was noted for the full scan surface flux analysis of benzene. Benzene was associated with 13 censored data points (of 12 surface flux samples[42]). Benzene was detected at 12 of 12 surface flux locations, but was qualified as non-detect in 9 of 12 for the full scan analysis. For the SIM analysis, benzene was detected at 9 of 9 surface flux locations, but was qualified as non-detect in 4 of 9. Benzene has been detected in groundwater across the

[42] Twelve locations were analyzed using TO-15 full scan and nine were also analyzed using TO-15 SIM.

BMI Complex. The highest detected flux is 0.0531 μm^3,min^{-1}, while the highest censored result is nearly two times that result at 0.0939 μm^3,min^{-1}. The ILCR for the maintenance worker associated with a surface flux of 0.0939 μm^3,min^{-1} would be 1×10^{-8}. Therefore, censoring this data is not resulting in a significant underestimation of risk.

The types of analyses were chosen based on historical knowledge of the Site and BMI Common Areas. The data validation and data usability evaluations provided documentation that the HHRA database is adequate to support HHRA conclusions (Section 4 and Appendix E). Based on the data validation and data usability, the risk estimates are likely to be overestimated rather than underestimated.

NDEP has issued recent guidance regarding qualifying data due to blank contamination (NDEP 2011b). As noted in the guidance, NDEP requires that data validated before June 2011and impacted by blank contamination be discussed in any report that uses such data. In so doing, a semi-quantitative comparison of the potential differences between approaches taken previously and the requirements specified in the guidance will be described and explained. The discussion below provides this semi-quantitative comparison for data impacted by blank contamination for the Site.

All data for the Site were collected and validated prior to June 2011; therefore, data were qualified using existing USEPA and NDEP guidance. The issue of blank contamination is not one that affects the typical primary risk drivers for the project, including those for the Site. The primary risk drivers for the Site are aluminum, arsenic, lithium, manganese, thallium, and vanadium, only two of which, arsenic and thallium had blank contamination issues. There were only four arsenic results and five thallium results, out of 69 each for the Site, affected by blank contamination, with initial reported values slightly less than the qualified values used in the HHRA. Therefore, the impact of these samples on the background comparison statistics for arsenic and thallium is unlikely to be significant. The following other metals had samples qualified due to blank contamination: antimony (11 samples), beryllium (8 samples), boron (9 samples), cadmium (27 samples), chromium (VI) (7 samples), mercury (47 samples), molybdenum (22 samples), selenium (15 samples), silver (5 samples), tin (3 samples), and tungsten (6 samples). Given the number of samples qualified due to blank contamination for several of these, this may have an impact on the background comparison statistics. However, in all cases the maximum detected concentrations for these metals are less than one-tenth their respective BCLs (and their maximum non-detect concentrations are also less than one-tenth their BCLs). Therefore, this issue has no material effect on the selection of COPCs and the results of the HHRA for the Site.

Although background comparison results for thorium-228 do not pass the slippage test; all other background comparison test pass, as do all background tests for other radionuclides (except for uranium-235/236 as noted in Table 5-2). In addition, radionuclides are in secular equilibrium, therefore, thorium-228 is not considered to be greater than background at the Site. Therefore, this issue should have no material effect on the selection of COPCs and the results of the HHRA for the Site.

Uncertainties are also introduced into the risk assessment by assumptions that are made regarding the grading plan. As described in Section 3.1, the grading plan affects the interpretation of the data in terms of assigning samples to the surface or the subsurface. This was done to avoid the situation in which current surface samples might not be included in the evaluation of exposures to future surface soils. The data were subdivided by depth intervals as described in Section 3.1, and the maximum of the UCLs for the two subsets of data was used as the exposure point concentration. There is some uncertainty in the choice of subsetting on the concentrations of interest, and there is a potential small overestimation of risk by choosing the maximum of the two UCLs as the exposure point concentration. The effects are likely to be small given the data, since there is not much variation in the different UCLs.

7.2 ESTIMATES OF EXPOSURE

The selection of exposure pathways is a process, often based on best professional judgment, which attempts to identify the most probable potentially harmful exposure scenarios. In a risk assessment, it is possible that risks are not calculated for all of the exposure pathways that may occur, possibly causing some underestimation of risk.

7.2.1 Aggregation of Exposure Areas

Although land use is not residential, default residential exposure areas are $1/8^{th}$-acre in size. However, sampling has not been performed at the frequency of guaranteeing at least one sample per every $1/8^{th}$-acre exposure area. Instead, sampling has been performed at the scale of approximately once every 3 acres. This is considered sufficient if the concentration distribution for COPCs appears similar across the Site. To the extent that this assumption is not valid the risk assessment might underestimate risks. However, considering the sampling protocols employed and the physical remediation activities performed, the risk estimates are considered both reasonable from this perspective and unlikely to have resulted in an underestimation of risk at the Site.

7.2.2 Types of Exposures Examined

In an evaluation, risks are sometimes not calculated for all of the exposure pathways that may occur, possibly causing some underestimation of risk. However, in this case, all principal potential exposure pathways were evaluated. In this assessment, risks were estimated for future outdoor worker receptors. Risks for the most likely routes of exposure to these receptors were estimated. For example, risks to workers were estimated for soil ingestion, skin contact with soil, and inhalation of outdoor air (including dust generation). Although it is possible that other exposure routes could exist (e.g., downwind off-site residents), these exposures are expected to be lower than the risks associated with the pathways considered.

7.2.3 Intake Assumptions Used

The risks calculated depend largely on the assumptions used to calculate the rate of COPC intake. For this assessment, standard default values developed by USEPA are used for reasonable maximum exposures frequency and exposure duration for all receptors. These estimates are conservative values, and the possibility that they underestimate the risk is low. The uncertainties associated with particular parameters used in this risk assessment are described below.

The amount of COPCs the human body absorbs may be different from the amount of a COPC contacted, and the percentage absorbed may vary from one person to another. In this HHRA, with the exception of arsenic, absorption of ingested and inhaled COPCs is conservatively assumed to be 100 percent.

Current USEPA guidance (USEPA 2004e) states that "There are no default dermal absorption values presented for volatile organic compounds nor inorganic classes of compounds. The rationale for this is that in the considered soil exposure scenarios, volatile organic compounds would tend to be volatilized from the soil on skin and should be accounted for via inhalation routes in the combined exposure pathway analysis. For inorganics, the speciation of the compound is critical to the dermal absorption and there are too little data to extrapolate a reasonable default value." While USEPA guidance does not specifically state that this pathway should be dismissed, consistent with the approach utilized in current USEPA guidance, the risk estimates in this HHRA do not include a dermal absorption value for VOCs or inorganics (unless a specific value has been identified). Thus, the risks presented in this assessment could be underestimated as a result.

The construction activity dust emissions did not take into account dust control measures that would reduce the amount of dust generated to below those levels used in the HHRA. The Clark County Department of Air Quality and Environmental Management has dust control permitting requirements, and an inhalable particulate matter action level of 50 $\mu g/m^3$. The construction activity dust emissions predicted and used in the HHRA exceeded this level. Therefore, dust suppression activities would need to be implemented, thus reducing dust levels and exposures.

The dispersion factor for the construction worker is not adjusted to account for soil intrusion activities. Because these activities may cause increased air concentrations than that evaluated, risks to VOCs in soil may be underestimated for this receptor. However, VOCs are primarily associated with groundwater, this potential underestimation is considered low.

7.3 TOXICITY ASSESSMENT

The availability and quality of toxicological data is another source of uncertainty in the risk assessment. Uncertainties associated with animal and human studies may have influenced the toxicity criteria. Carcinogenic criteria are classified according to the amount of evidence available that suggests human carcinogenicity. In the establishment of the non-carcinogenic criteria, conservative safety factors, known as uncertainty and modifying factors, are used.

7.3.1 COPCs Lacking Toxicological Data

Toxicity criteria have not been established for some of the chemicals detected at the Site. These chemicals were not quantitatively evaluated in the HHRA. For example, potassium is an analyte for which no USEPA toxicity criteria have been established. The health effects and levels of concern for potassium in soil are not known. While not including potassium may have resulted in a low degree of underestimation of quantitative Site risk estimates, the available toxicological information suggests that this underestimation will not likely affect the decisions made relative to Site risks.

Because of the inconclusive nature of TICs as potentially SRCs, non-cancer surrogate toxicity criteria were not applied. Non-cancer surrogate toxicity criteria were not applied to the inorganic chemicals because of the complexity of ion and metal toxicity. A quantitative estimation of risk was not conducted for these COPCs. Thus, the risks presented in this assessment could be underestimated as a result.

For the surface flux results, a few organic chemicals detected (e.g., n-heptane, 2-hexanone, cymene) do not have toxicity criteria available. Surrogate toxicity criteria were applied for these chemicals. Thus, the risks presented in this assessment could be under- or overestimated as a result.

7.3.2 Uncertainties in Animal and Human Studies

Extrapolation of toxicological data from animal tests is one of the largest sources of uncertainty in a risk assessment. There may be important, but unidentified, differences in uptake, metabolism, and distribution of chemicals in the body between the test species and humans. For the most part, these uncertainties are addressed through use of conservative assumptions in establishing values for RfDs, RfCs, CSFs, and IURs, which results in the likelihood that the risk is overstated.

Typically, test animals are administered high doses (e.g., maximum tolerated dose) of a chemical in a standard diet or in air. Humans are generally exposed to much lower doses in the environment, which may affect the toxicity of the chemical. In these studies, test animals, often laboratory rodents, are exposed daily to the chemical agent for various periods of time up to their 2-year lifetimes. Humans have an average 70-year lifetime and may be exposed either intermittently or regularly for an exposure period ranging from weeks to a full lifetime. Because of these differences, it is not surprising that extrapolation error is a large source of uncertainty in a risk assessment.

7.3.3 Non-Carcinogenic Toxicity Criteria

In the establishment of the non-carcinogenic criteria, conservative safety factors, known as uncertainty factors, are used. Most of the chronic non-carcinogenic toxicity criteria that were located in the IRIS database have uncertainty factors of 1,000. This means that the dose corresponding to a toxicological effect level (e.g., LOAEL) is divided by 1,000 to deem a safe, or "reference," dose. The purpose of the uncertainty factor is to account for the extrapolation of toxicity data from animals to humans and to ensure the protection of sensitive individuals.

7.3.4 Sub-Chronic Non-Carcinogenic Toxicity Criteria

Construction worker exposures are evaluated for an exposure duration of 1 year, which is more representative of a sub-chronic exposure rather than a chronic exposure. As such, where available, sub-chronic RfDs were used to characterize non-cancer effects for the construction worker. However, for many COPCs, a sub-chronic RfD was not available and the chronic RfD was used. This likely presented an overestimation of non-cancer health risks to the construction worker.

7.3.5 Carcinogenic Toxicity Criteria

Uncertainty due to extrapolation of toxicological data for potential carcinogens tested in animals to human response is commonly the case for potentially carcinogenic chemicals. USEPA frequently uses the LMS model, or other non-threshold low-dose extrapolation models, to extrapolate the toxicological data to estimate human response. These low-dose extrapolation models assume that there is no threshold for carcinogenic substances; that is, exposure to even one molecule, fiber, or picocurie of a carcinogen is sufficient to cause cancer. This is a highly conservative assumption, because the body has several mechanisms to protect against cancer.

The use of the LMS model to extrapolate is a well-recognized source of significant uncertainty in the development of carcinogenic toxicity criteria and, subsequently, theoretical carcinogenic risk estimates. At high levels of exposure, there may indeed be a risk of cancer regardless of whether or not the effect occurs via a threshold mechanism. An animal bioassay cannot determine what happens at low levels of exposure, however, which are generally typical of human exposure levels.

At low levels of exposure, the probability of cancer cannot be measured but must be extrapolated from higher dosages. To do this, test animals are typically exposed to carcinogens at levels that are orders of magnitude greater than those likely to be encountered by humans in the environment. It would be difficult, if not impossible, to perform animal experiments with a large enough number of animals to directly estimate the level of risk at the low exposure levels typically encountered by humans. Thus, to estimate the risk to humans exposed at low levels, dose-response data derived from animals given high dosages are extrapolated downward using mathematical models such as the LMS model, which assumes that there is no threshold of response. The dose-response curve generated by the model is known as the maximum likelihood estimate. The slope of the 95 percent lower confidence interval (i.e., upper-bound limit) curve, which is a function of the variability in the input animal data, is taken as the CSF. CSFs are then used directly in cancer risk assessment.

The U.S. federal government, including USEPA itself, has acknowledged the limitations of the high-to-low dose extrapolation models, particularly the LMS model (USEPA 1991c). In fact, this aspect of cancer risk assessment has been criticized by many scientists (including regulatory scientists) in recent years. USEPA has recently released revised cancer risk assessment guidelines (USEPA 2005c).

Even for genotoxic (i.e., non-threshold) substances, there are two major sources of bias embedded in the LMS model: (1) its inherent conservatism at low doses and (2) the routine use of the linearized form in which the 95 percent upper confidence interval is used instead of the unbiased maximum likelihood estimate. The inherent conservatism at low doses is due in part to the fact that the LMS model ignores all of the numerous biological factors that argue against a linear dose-response relationship for genotoxic effects (e.g., DNA repair, immunosurveillance, toxicokinetic factors).

Several other factors inherent in the LMS model result in overestimated carcinogenic potency: (1) any exaggerations in the extrapolation that can be produced by some high dose responses (if they occur) are generally neglected; (2) UCLs on the actual response observed in the animal study are used rather than the actual response, resulting in upper-bound low dose extrapolations, which can greatly overestimate risk; and (3) non-genotoxic chemicals (i.e., threshold carcinogens) are modeled in the same manner as highly genotoxic chemicals.

7.3.6 Uncertainties with the Asbestos Risk Assessment

For the risk assessment, asbestos concentrations were presented two ways, as a best estimate and upper bound based upon the UCL of the mean of the Poisson distribution. Asbestos risk estimates are highly dependent on the number of samples to increase or decrease the pooled analytical sensitivity. That is, a larger number of non-detect samples with similar individual analytical sensitivity results in a lower pooled analytical sensitivity and subsequently a lower estimated ARR, whereas a smaller number of non-detect samples results in a higher ARR. Uncertainty is, thus, reduced as more samples are collected.

7.4 CUMULATIVE EFFECT OF UNCERTAINTIES

Uncertainties from different sources are compounded in the HHRA. For example, if a person's daily intake rate for a chemical is compared to an RfD to determine potential health risks, the uncertainties in the concentration measurements, exposure assumptions, and toxicities are all expressed in the result. Because the exposure assumptions and toxicity criteria are considered conservative, the risk estimates calculated in this HHRA are likely to overestimate rather than underestimate potential risks.

8.0 SUMMARY OF RESULTS

This HHRA has evaluated potential risks to human health associated with chemicals and asbestos detected in soil at the Galleria Dr. Right-of-Way located within the BMI Common Areas in Clark County, Nevada. All calculation spreadsheets for this HHRA are presented in Appendix H (on the report CD in Appendix B), including calculations of chemical theoretical upper-bound ILCRs and non-cancer health effects and asbestos risk calculations.

The risk estimates are based on reasonable maximum exposure scenarios, which results in estimates of the potential reasonable maximum, or high-end, risks associated with the Site. The calculated chemical theoretical upper-bound ILCRs and HIs are presented in Table 6-11and 6-12 for construction worker, and maintenance (outdoor) worker receptors, respectively. Asbestos estimated risk of death from lung cancer or mesothelioma on a Sitewide basis are presented in Table 6-13.

8.1 CONSTRUCTION WORKERS

For chemical exposures, the total cumulative non-cancer HI for construction worker receptors at the Site is 0.~~26~~56 (including the surface flux air risk estimates) (Table 6-11), with metals soil exposures via the oral ingestion pathway being the primary contributors. The HI does not exceed the target HI of 1.0. As a result, BRC did not evaluate target organ or background non-cancer HI values.

The maximum theoretical upper-bound ILCR for construction worker receptors at the Site is 2×10^{-7} (including the surface flux air risk estimates see Table 6-11) with arsenic soil exposures via the oral ingestion pathway the primary contributor. The theoretical upper-bound ILCRs are all below the low end of the risk goal of 1×10^{-6}.

The estimated risks for death from lung cancer or mesothelioma for asbestos exposures to construction workers were below 1×10^{-6}. For construction workers receptors, the best estimate and upper bound concentrations for chrysotile fibers are 0 and 5×10^{-9}; and 2×10^{-7} and 8×10^{-7} for amphibole fibers (Table 6-13). These estimated risks are below the low end of the risk goal of 1×10^{-6}. The upper-bound estimated risk of death from lung cancer or mesothelioma is estimated based on the 95 percent UCL of the count of the number of fibers detected, assuming a Poisson distribution for the count.

8.2 MAINTENANCE (OUTDOOR) WORKERS

For chemical exposures, the total cumulative non-cancer HI for commercial (outdoor) worker receptors at the Site is 0.096 (including the surface flux air risk estimates) (Table 6-12), with metals soil exposures via the oral ingestion pathway being the primary contributors. The HI does not exceed the target HI of 1.0. As a result, BRC did not evaluate background non-cancer HI values.

The maximum theoretical upper-bound ILCR for commercial (outdoor) worker receptors at the Site is 1×10^{-6} (including the surface flux air risk estimates see Table 6-12) with the soil theoretical upper-bound ILCRs for arsenic via the oral ingestion and dermal contact pathways the primary contributor. The theoretical upper-bound ILCRs are all below the low end of the risk goal of 1×10^{-6}.

The estimated risks for death from lung cancer or mesothelioma for asbestos exposures to maintenance (outdoor) workers were below 1×10^{-6}. For maintenance (outdoor) worker receptors, the best estimate and upper bound concentrations for chrysotile fibers are 0 and 1×10^{-9}; and 5×10^{-8} and 2×10^{-7} for amphibole fibers (Table 6-13). These estimated risks are below the low end of the risk goal of 1×10^{-6}.

9.0 DATA QUALITY ASSESSMENT

Sample size calculations were conducted for 11constituents (arsenic, benzo(a)pyrene, beta-BHC, total chromium, hexavalent chromium, thorium-228, formaldehyde, lead, perchlorate, 2,3,7,8-TCDD, and vanadium) for the Site. Rationale for the inclusion of these constituents in the sample size calculations is provided below:

- Arsenic – a chemical of primary concern for the overall project, often exceeding comparison levels;
- Benzo(a)pyrene – a COPC representative of SVOCs and PAHs with several detected results and a low residential BCL;
- beta-BHC – a COPC representative of organochlorine pesticides with several detected results and a low residential BCL;
- Chromium – the metal (besides arsenic) with the most exceedances of background concentrations;
- Hexavalent chromium – a metal with several results in excess of background concentrations resulting in high sample variability;
- Thorium-228 – a radionuclide with several results in excess of background concentrations resulting in high sample variability;
- Formaldehyde – the non-dioxins/furans/PCB congeners organic chemical with the highest number of detected results;
- Lead – a metal with a single high value in comparison to other results across the Site;
- Perchlorate – an inorganic chemical that is a primary risk contributor;
- 2,3,7,8-TCDD – a chemical of primary concern for the overall project; and
- Vanadium – a metal with several results in excess of background concentrations resulting in high sample variability.

The formula used here for calculation of sample size is based on a non-parametric test (the Wilcoxon signed rank test), and on simulation studies performed by Pacific Northwest National

Laboratories (PNNL 2009) that formed the basis for an approximate formula that is based on the normal distribution. Essentially, the formula is the one that would be used if a normal-based test were being performed, but an adjustment is made (multiply by 1.16) to account for the intent to perform a non-parametric test. The formula is as follows:

$$n = 1.16\left[\frac{s^2}{\Delta^2}(z_{1-\alpha} + z_{1-\beta(\mu)})^2 + 0.5z_{1-\alpha}^2\right]$$

where:

n	=	number of samples
s	=	estimated standard deviation of concentrations/fibers
Δ	=	width of the gray region (the difference between the threshold value stated in the null hypothesis and the point at which β is specified)
α	=	significance level or Type I error tolerance
β (μ)	=	Type II error tolerance; and
z	=	quantile from the standard normal distribution

For each chemical, inputs for the calculations include an estimate of the variance from the measured data, a desired significance level, and desired power of the test that must be specified at a concentration of interest (which determines the tolerable difference from the threshold value). For arsenic, the Site mean concentration exceeds its BCL based on the target cancer risk level of 10^{-6}. It is not appropriate to apply this calculation where the threshold value is less than the mean concentration. Therefore, the maximum shallow background concentration was used for its threshold value. The calculations provided here cover a range of Type I and Type II error tolerances, and the point at which the Type II error is specified. Results are presented in Table 9-1. In this table, various combinations of input values are used, including values of α of 5, 10, and 15 percent; values of β of 15, 20, and 25 percent; and a gray region of width 10, 20, and 30 percent of the threshold level. It is clear from Table 9-1 that the number of samples collected is adequate for the Site. That is, all calculated adequate sample numbers are less than those actually collected at the Site for use in the HHRA.

Note also that there are 30 samples collected for amphibole asbestos analysis. Amphibole was detected in one of these samples and because of the number of samples collected, the ARRs are at or less than 1×10^{-6}. Consequently, sufficient samples have been collected to address ARRs.

10.0SUMMARY

BRC has prepared this HHRA and Closure Report for the Site. The purpose of this report is to request an NFAD by the NDEP. The NDEP acknowledges that discrete portions of the Eastside may be issued an NFAD as remedial actions are completed for selected environmental media (NDEP 2006). The portion of the Eastside for which the NFAD is being requested based on this HHRA and Closure Report is shown in red on Figure 1. The legal description of the Site is provided in Appendix K.

The HHRA evaluated the potential for adverse human health impacts that may occur as a result of potential exposures to residual concentrations of chemicals in soil, groundwater, and air following remediation, and assessed whether any additional remedial actions are necessary in order to obtain an NFAD from the NDEP to allow redevelopment of the Site to proceed. The results of the risk assessment provide risk managers with an understanding of the potential human health risks associated with background conditions and additional risks associated with past Site activities.

For human health protection, and given the proposed land use for the Site, BRC's goal is to remediate the Site soils such that they are suitable for use as a road right-of-way. Human health risks are represented by estimated theoretical upper-bound cancer risks and non-cancer hazards derived in accordance with standard USEPA and NDEP methods. If the carcinogenic risks or non-cancer hazards exceed USEPA acceptable levels or NDEP risk goals, then remedial action alternatives must be considered. Findings of the HHRA are intended to support the Site closure process. The major findings of this report are the following:

- Data collected for use in the HHRA are adequate and usable for their intended purpose;
- All relevant and reasonable exposure scenarios and pathway have been evaluated; and
- Construction worker and maintenance (outdoor) worker cancer and non-cancer risk estimates are within or below the risk goals for the project.

Therefore, based on the results of the HHRA, and the conclusions in this report, exposures to residual levels of chemicals in soil at the Galleria Dr. Right-of-Wayshould not result in adverse health effects to all future receptors. Therefore, BRC concludes that an NFAD for the Galleria Dr. Right-of-Way is warranted and requests that the NDEP issue the NFAD (see Appendix K for the legal description of the Site).

APPENDIX B

GALLERIA DR. RIGHT-OF-WAY INVESTIGATION DATA TABLES
(Note that all report files, including the database,
are on the report CD included in this appendix)

LIST OF TABLES (APPENDIX B)

TABLE B-1
ASBESTOS RESULTS AND ANALYTICAL SENSITIVITIES
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 1 of 1)

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Analytical Sensitivity (10^6 s/gPM$_{10}$)	Concentration Protocol Structures[1] Chrysotile (10^6 s/gPM$_{10}$)		Concentration Protocol Structures[1] Amphibole (10^6 s/gPM$_{10}$)		Number of Protocol Structures[2] Chrysotile Total	Chrysotile Long	Amphibole Total	Amphibole Long
GNC1-BB16	0	NORM	1/26/09	2.998	<	8.963 E+6	<	8.963 E+6	0	0	0	0
GNC1-BC16	0	NORM	1/26/09	2.983	<	8.919 E+6	<	8.919 E+6	1	0	0	0
GNC1-BC18	0	NORM	1/26/09	2.983	<	8.919 E+6	<	8.919 E+6	0	0	0	0
GNC1-BC18	0	FD	1/26/09	2.960	<	8.851 E+6	<	8.851 E+6	0	0	0	0
GNC1-BC21	0	NORM	1/26/09	2.963	<	8.859 E+6	<	8.859 E+6	0	0	0	0
GNC1-BC22	0	NORM	1/28/09	2.966	<	8.869 E+6	<	8.869 E+6	0	0	0	0
GNC1-BC23	0	NORM	1/28/09	2.979	<	8.908 E+6	<	8.908 E+6	0	0	0	0
GNC1-BC27	0	NORM	1/28/09	2.967	<	1.095 E+7	<	1.095 E+7	1	0	0	0
GNC1-BC28	0	NORM	1/28/09	2.967	<	8.870 E+6	<	8.870 E+6	0	0	0	0
GNC1-BC29	0	NORM	1/28/09	2.963	<	8.859 E+6	<	8.859 E+6	0	0	0	0
GNC1-JB02	0	NORM	1/28/09	2.981	<	8.912 E+6	<	8.912 E+6	0	0	0	0
GNC1-JB03	0	NORM	1/28/09	2.965	<	8.864 E+6		1.405 E+7	0	0	1	1
GNC1-JB06	0	NORM	1/28/09	2.987	<	8.930 E+6	<	8.930 E+6	0	0	0	0
GNC1-JB07	0	NORM	1/28/09	2.983	<	8.919 E+6	<	8.919 E+6	0	0	0	0
GNC1-JB07	0	FD	1/28/09	2.991	<	8.944 E+6	<	8.944 E+6	0	0	0	0
GNC1-JD01	0	NORM	1/26/09	2.979		1.877 E+7	<	8.908 E+6	4	2	0	0
GNC1-JD02	0	NORM	1/26/09	2.967	<	8.870 E+6	<	8.870 E+6	0	0	0	0
GNC1-JD03	0	NORM	1/26/09	2.979	<	8.908 E+6	<	8.908 E+6	0	0	0	0
GNC1-JD06	0	NORM	1/26/09	2.983	<	8.919 E+6	<	8.919 E+6	0	0	0	0
GNC1-JP02	0	NORM	1/28/09	2.960	<	8.851 E+6	<	8.851 E+6	0	0	0	0
GNC1-JP02	0	FD	1/28/09	2.979	<	8.908 E+6	<	8.908 E+6	0	0	0	0
GNC1-JP04	0	NORM	1/28/09	2.959	<	8.846 E+6	<	8.846 E+6	0	0	0	0
GNC1-JP05	0	NORM	1/28/09	2.960	<	8.851 E+6	<	8.851 E+6	0	0	0	0
GNC1-JP06	0	NORM	1/28/09	2.958	<	8.845 E+6	<	8.845 E+6	0	0	0	0
GNC1-JS08	0	NORM	1/26/09	2.965	<	8.864 E+6	<	8.864 E+6	0	0	0	0
GNC1-JS17	0	NORM	1/28/09	2.981	<	8.912 E+6	<	8.912 E+6	0	0	0	0
GNC2-JD01	0	NORM	1/18/10	2.967	<	8.960 E+6	<	8.960 E+6	0	0	0	0
GNC2-JD01	0	FD	1/18/10	2.967	<	8.910 E+6	<	8.910 E+6	0	0	0	0
UPC1-BB28	0	NORM	1/12/09	2.981	<	8.912 E+6	<	8.912 E+6	0	0	0	0
UPC1-BB31	0	NORM	1/12/09	2.981	<	8.912 E+6	<	8.912 E+6	0	0	0	0
UPC1-BB32	0	NORM	1/12/09	2.965	<	8.864 E+6	<	8.864 E+6	0	0	0	0
UPC1-BB33	0	NORM	1/12/09	2.998	<	8.963 E+6	<	8.963 E+6	1	0	0	0

(1)Fiber dimensions are presented in the respective analytical reports for each sample.

(2)Only long structures (>10µm) present a potential risk and are used for estimating asbestos risks. Total fiber concentrations are presented for informational purposes only. Protocol structures are structures longer than 10 µm and thinner than 0.4 µm.

[shaded] = Data not included in risk assessment. Sample location excavated and data replaced with post-excavation data.

TABLE B-2
SOIL DIOXINS/FURANS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 1 of 4)

				Dioxins/Furans								
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8-HpCDD	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8-HxCDF	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDF	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HCDF	1,2,3,7,8,9-HxCDD
GNC1-BB16	0	NORM	1/27/2009	50	78 J-	21	28	< 0.84 U	19	< 1.9 U	< 1.6 U	< 1.8 U
GNC1-BC16	0	NORM	1/27/2009	52	78 J-	15	14	< 0.77 U	11	< 1.9 U	< 1.6 U	< 2 U
GNC1-BC18	0	NORM	1/27/2009	18 J	6.2 J	7.1 J	7.6	< 0.42 U	6.2	< 1.1 U	< 0.46 U	< 0.55 U
GNC1-BC18	0	FD	1/27/2009	6.7 J	78 J-	3.1 J	3.2 J	< 0.38 U	< 2.6 U	< 0.3 U	< 0.37 U	< 0.33 U
GNC1-BC21	0	NORM	1/29/2009	32	< 3.1 U	10	12	< 0.31 U	8	< 0.72 U	< 1.2 U	< 0.67 U
GNC1-BC22	0	NORM	3/2/2009	85	7	36	40	< 1.2 U	25	< 2.3 U	3.8 J	< 2.1 U
GNC1-BC23	0	NORM	2/10/2009	710	64	290	310	8.9	230	18	33	16
GNC1-BC27	0	NORM	2/4/2009	45 J	8.1	17 J	20 J	< 0.58 U	14 J	< 1.6 U	< 2 U	< 1.3 U
GNC1-BC27	0	FD	2/4/2009	14 J	3.2 J	4.8 J	6.1 J	< 0.3 U	4.1 J	< 0.63 U	< 0.66 U	< 0.45 U
GNC1-BC28	0	NORM	2/4/2009	280	66	100	130	4.5 J	80	9.4	15	8.5
GNC1-BC29	0	NORM	2/4/2009	82	9.7	41	45	< 1.3 U	29	< 2.5 U	5.6	3 J
GNC1-JA02	0	NORM	8/13/2009	17 J	< 4.9 UJ	9.2 J	15 J	< 4.9 U	9.2 J	< 4.9 U	< 4.9 U	< 4.9 U
GNC1-JA02	0	FD	8/13/2009	63 J	7.4 J	22 J	28 J	< 5 U	18 J	< 5 U	< 5 U	< 5 U
GNC1-JA03	0	NORM	8/13/2009	250	22	100	100	3 J	63	5.5	8.9	5.2
GNC1-JA09	0	NORM	8/13/2009	82	7.6	32	41	< 4.8 U	26	< 4.8 U	4.2 J	< 4.8 U
GNC1-JA10	0	NORM	8/13/2009	47	3.8 J	25	31	< 4.9 U	19	< 4.9 U	3.3 J	< 4.9 U
GNC1-JB02	0	NORM	2/11/2009	15	< 2.2 U	5.6	6.2	< 0.37 U	4.5 J	< 0.44 U	< 0.48 U	< 0.36 U
GNC1-JB03	0	NORM	2/13/2009	250 J	29 J	96	130 J	3.3 J	89 J	7.2	11	5.3
GNC1-JB03	0	FD	2/13/2009	130 J	15 J	61	77 J	< 1.6 U	50 J	3.8 J	7	3 J
GNC1-JB06	0	NORM	2/13/2009	150	15	56	76	< 1.8 U	51	3.7 J	7	3.3 J
GNC1-JB07	0	NORM	2/13/2009	16	8.9	5.8	7.3	< 0.5 U	4.9 J	< 0.98 U	< 0.98 U	< 0.86 U
GNC1-JD01	0	NORM	1/27/2009	140	78 J-	57	52	< 1.6 U	38	3.5 J	6.1	2.9 J
GNC1-JD02	0	NORM	1/27/2009	11 J	78 J	6.3 J	3.3 J	< 0.63 UJ	3.1 J	< 0.51 UJ	< 0.57 UJ	< 0.53 UJ
GNC1-JD06	0	NORM	2/13/2009	150	28	68	77	< 2.3 U	55	5.8	8.9	4.7 J
GNC1-JP02	0	NORM	2/12/2009	710	57	320	330	6.5	250	16	29	16
GNC1-JP02	0	FD	2/12/2009	840	69	380	400	8	300	21	37	21
GNC1-JP04	0	NORM	2/10/2009	260 J	24 J	120	110	3.3 J	84	6.3	13	6.1
GNC1-JP04	0	FD	2/10/2009	440 J	36 J	160	180	4.4 J	120	9.8	18	8.7
GNC1-JP05	0	NORM	2/4/2009	1200	100	450	590	16	370	28	45 J+	31
GNC1-JP06	0	NORM	2/12/2009	79	7.9	35	42	< 0.97 U	34	< 2.5 U	3.5 J	< 2.1 U
GNC1-JP06	0	FD	2/12/2009	84	8.6	40	51	< 1.2 U	39	3.1 J	4.5 J	2.6 J
GNC1-JS08	0	NORM	1/28/2009	180	22	73	87	< 2.3 U	56	4.9 J	7.1	4.1 J
GNC1-JS17	0	NORM	2/4/2009	630	60	280	320	9	200	16	36	18
GNC2-BC23C	0	NORM	1/7/2010	12	< 0.93 U	5.2	5.8	< 0.16 U	4.1 J	< 0.31 U	< 0.46 U	< 0.28 U
GNC2-BC28C	0	NORM	1/6/2010	< 1.7 U	< 0.27 U	< 0.73 U	< 0.86 U	< 0.094 U	< 0.4 U	< 0.086 U	< 0.29 U	< 0.13 U
GNC2-JB03C	0	NORM	1/7/2010	2.8 J	< 0.32 U	< 1.4 U	< 1.6 U	< 0.11 U	< 1.1 U	< 0.13 U	< 0.21 U	< 0.11 U

TABLE B-2
SOIL DIOXINS/FURANS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 2 of 4)

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Dioxins/Furans								
				1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8-HpCDD	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8-HxCDF	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDF	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HCDF	1,2,3,7,8,9-HxCDD
GNC2-JB03C	0	FD	1/7/2010	2.8 J	< 0.19 U	< 1.1 U	< 1.4 U	< 0.073 U	< 1.1 U	< 0.21 U	< 0.099 U	< 0.092 U
GNC2-JP02C	0	NORM	1/7/2010	2.9 J	< 0.25 U	< 0.95 U	< 1.1 U	< 0.094 U	< 0.68 U	< 0.084 U	< 0.19 U	< 0.13 U
GNC2-JP04C	0	NORM	1/7/2010	< 1.3 U	< 0.12 U	< 0.55 U	< 0.69 U	< 0.088 U	< 0.43 U	< 0.066 U	< 0.099 U	< 0.06 U
GNC2-JP05C	0	NORM	1/6/2010	2.9 J	< 0.26 U	< 0.86 U	< 1.2 U	< 0.046 U	< 0.65 U	< 0.16 U	< 0.2 U	< 0.22 U
GNC2-JP05NE	0	NORM	1/6/2010	< 1.1 U	< 0.16 U	< 0.29 U	< 0.43 U	< 0.056 U	< 0.27 U	< 0.065 U	< 0.068 U	< 0.064 U
GNC2-JP05NW	0	NORM	1/6/2010	< 2.3 UJ	< 0.31 UJ	< 0.99 UJ	< 1.3 U	< 0.18 U	< 0.73 U	< 0.083 U	< 0.15 U	< 0.083 U
GNC2-JP05SE	0	NORM	1/6/2010	3.2 J	< 0.27 U	< 1.6 U	2.6 J	< 0.12 U	< 1.6 U	< 0.15 U	< 0.24 U	< 0.09 U
GNC2-JP05SW	0	NORM	1/6/2010	< 0.26 UJ	< 0.23 UJ	< 0.26 UJ	< 0.24 U	< 0.082 U	< 0.2 U	< 0.065 U	< 0.23 U	< 0.06 U
GNC2-JS17C	0	NORM	1/6/2010	< 0.28 U	< 0.3 U	< 0.13 U	< 0.15 U	< 0.075 U	< 0.057 U	< 0.049 U	< 0.055 U	< 0.066 U
UPC1-BB28	0	NORM	11/3/2009	< 5.1 UJ	< 5.1 UJ	< 5.1 UJ	< 5.1 UJ	< 5.1 U	< 5.1 UJ	< 5.1 U	< 5.1 UJ	< 5.1 U
UPC1-BB28	0	FD	11/20/2009	95	8.5	47	59	< 5 U	44	3 J	8	2.8 J
UPC1-BB31	0	NORM	10/30/2009	6.9 J	< 5.1 UJ	2.8 J	3 J	< 5.1 U	< 5.1 UJ	< 5.1 U	< 5.1 UJ	< 5.1 U
UPC1-BB32	0	NORM	10/30/2009	< 5 UJ	< 5 UJ	< 5 UJ	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
UPC1-BB32	0	FD	10/30/2009	6.4	< 5.1 U	2.6 J	3.3 J	< 5.1 U	< 5.1 U	< 5.1 U	< 5.1 U	< 5.1 U
UPC1-BB33	0	NORM	10/29/2009	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
UPC1-BB34N	0	NORM	1/26/2010	29	3.8 J	11	15	< 6.2 U	9.3	< 6.2 U	< 6.2 U	< 6.2 U
UPC1-JP11	0	NORM	10/28/2009	90	6.2	33	40	< 5 U	31	< 5 U	4.2 J	< 5 U

All units in pg/g.

-- = no sample data.

= Data not included in risk assessment. Sample location excavated and data replaced with post-excavation data.

TABLE B-2
SOIL DIOXINS/FURANS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Dioxins/Furans								
				1,2,3,7,8-PeCDF	1,2,3,7,8-PeCDD	2,3,4,6,7,8-HxCDF	2,3,4,7,8-PeCDF	2,3,7,8-TCDF	2,3,7,8-TCDD	OCDD	OCDF	TCDD TEQ
GNC1-BB16	0	NORM	1/27/2009	19	< 1.3 U	5.6	8.9	12	< 0.34 U	29	130	13.6
GNC1-BC16	0	NORM	1/27/2009	8.7	< 0.65 U	3.5 J	4.3 J	5.7	0.52 J	420	150	9.9
GNC1-BC18	0	NORM	1/27/2009	4.6 J	< 0.65 U	< 1.9 U	< 2.3 U	3.3 J	< 0.26 U	28 J	64 J	3.4
GNC1-BC18	0	FD	1/27/2009	< 2 U	< 0.48 U	< 1 U	< 0.89 U	1.6 J	< 0.2 U	17 J	19 J	2.3
GNC1-BC21	0	NORM	1/29/2009	6.3	< 0.54 U	< 2.2 U	3.3 J	3.8	< 0.1 U	< 6.5 U	130	4.7
GNC1-BC22	0	NORM	3/2/2009	24	< 1.5 U	6.5	12	17	0.52 J	10	410	16.8
GNC1-BC23	0	NORM	2/10/2009	170	13	60	79	100	2.8	99 J	4200 J	137
GNC1-BC27	0	NORM	2/4/2009	8.7 J	< 0.75 U	3.7 J	4.3 J	4.1 J	< 0.24 U	17	130 J	7.4
GNC1-BC27	0	FD	2/4/2009	2.7 J	< 0.42 U	< 1.2 U	< 1.5 U	1.4 J	< 0.25 U	8.1 J	44 J	2.3
GNC1-BC28	0	NORM	2/4/2009	71	4.9 J	21	38	35	1.6	290	790	56.6
GNC1-BC29	0	NORM	2/4/2009	24	< 1.6 U	8.2	11	12	0.58 J	21	190	17.5
GNC1-JA02	0	NORM	8/13/2009	12	< 4.9 U	2.6 J	5.5	14	< 0.98 U	< 9.8 UJ	50 J	10.3
GNC1-JA02	0	FD	8/13/2009	14	< 5 U	4.8 J	6.9	11	< 1 U	< 22 UJ	230 J	13.7
GNC1-JA03	0	NORM	8/13/2009	49	3.7 J	14	23	42	1.3	< 35 U	1600	41.7
GNC1-JA09	0	NORM	8/13/2009	21	< 4.8 U	6.1	10	10	< 0.96 U	< 12 U	220	17.2
GNC1-JA10	0	NORM	8/13/2009	16	< 4.9 U	4.3 J	7.7	7.8	< 0.98 U	< 9.8 U	100	13.8
GNC1-JB02	0	NORM	2/11/2009	2.8 J	< 0.64 U	< 1.1 U	< 1.3 U	1.9 J+	< 0.29 U	8.1 J	73	2.5
GNC1-JB03	0	NORM	2/13/2009	63 J	4.4 J	21 J	33 J	27 J+	0.88 J	65 J	550 J	51.4
GNC1-JB03	0	FD	2/13/2009	36 J	< 2.3 U	12 J	19 J	17 J+	0.61 J	47 J	320 J	28.3
GNC1-JB06	0	NORM	2/13/2009	44	2.7 J	13	22	23 J+	0.68 J	26	380	32
GNC1-JB07	0	NORM	2/13/2009	3.1 J	< 0.57 U	< 1.5 U	< 1.9 U	1.6 J+	< 0.25 U	62	42	2.9
GNC1-JD01	0	NORM	1/27/2009	36	< 2.6 U	11	20	30	1.1	120	780	31.4
GNC1-JD02	0	NORM	1/27/2009	< 2.6 U	< 0.48 U	< 1.1 UJ	< 1.2 U	1.9	< 0.17 U	10 J	190 J	3
GNC1-JD06	0	NORM	2/13/2009	51	3.8 J	15	27	66 J+	1.3	120	760	42.6
GNC1-JP02	0	NORM	2/12/2009	170	13	70	74	73	3.4	67	2300	136
GNC1-JP02	0	FD	2/12/2009	210	16	83	98	93	4.3	84	2700	169
GNC1-JP04	0	NORM	2/10/2009	69	5.5	23 J	33	50	1.4	56	2000	54
GNC1-JP04	0	FD	2/10/2009	89	7.2	32 J	44	64	1.9	67	3300	77.1
GNC1-JP05	0	NORM	2/4/2009	280	18	90	140	110	4.7	130	3000	221
GNC1-JP06	0	NORM	2/12/2009	24 J	< 1.8 U	9.7	12	12	0.57 J	12	200	17.9
GNC1-JP06	0	FD	2/12/2009	30 J	< 2.4 U	11	15	16	0.63 J	11	220	21.9
GNC1-JS08	0	NORM	1/28/2009	58	3.8 J	13	28	50	1.5	76	920	42.3
GNC1-JS17	0	NORM	2/4/2009	160	11	48	76	70	2.6	100	1800	125
GNC2-BC23C	0	NORM	1/7/2010	3.4 J	< 0.24 U	< 1.1 U	< 1.2 U	2.7	< 0.13 U	< 1.5 U	55	2.2
GNC2-BC28C	0	NORM	1/6/2010	< 0.43 U	< 0.13 U	< 0.1 U	< 0.21 U	< 0.44 U	< 0.084 U	< 0.84 U	< 4.3 U	0.41
GNC2-JB03C	0	NORM	1/7/2010	< 0.84 U	< 0.16 U	< 0.24 U	< 0.31 U	0.96 J	< 0.092 U	< 0.79 U	6.4 J	0.63

TABLE B-2
SOIL DIOXINS/FURANS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Dioxins/Furans								
				1,2,3,7,8-PeCDF	1,2,3,7,8-PeCDD	2,3,4,6,7,8-HxCDF	2,3,4,7,8-PeCDF	2,3,7,8-TCDF	2,3,7,8-TCDD	OCDD	OCDF	TCDD TEQ
GNC2-JB03C	0	FD	1/7/2010	< 0.43 U	< 0.15 U	< 0.29 U	< 0.48 U	< 0.45 U	< 0.11 U	< 0.85 U	6 J	0.56
GNC2-JP02C	0	NORM	1/7/2010	< 0.23 U	< 0.24 U	< 0.11 U	< 0.25 U	0.57 J	< 0.16 U	< 0.72 U	7 J	0.59
GNC2-JP04C	0	NORM	1/7/2010	< 0.21 U	< 0.096 U	< 0.11 U	< 0.13 U	0.63 J	< 0.097 U	< 0.61 U	6.5 J	0.4
GNC2-JP05C	0	NORM	1/6/2010	< 0.51 U	< 0.049 U	< 0.12 U	< 0.3 U	0.86 J	< 0.038 U	< 0.69 U	6.6 J	0.48
GNC2-JP05NE	0	NORM	1/6/2010	< 0.28 U	< 0.058 U	< 0.068 U	< 0.093 U	< 0.28 U	< 0.045 U	< 0.44 U	< 1.1 U	0.27
GNC2-JP05NW	0	NORM	1/6/2010	< 0.41 U	< 0.14 U	< 0.32 U	< 0.15 U	0.58 J	< 0.08 U	< 0.27 UJ	< 4.7 UJ	0.5
GNC2-JP05SE	0	NORM	1/6/2010	< 1.3 U	< 0.11 U	< 0.36 U	< 0.61 U	1	< 0.077 U	< 0.15 U	9 J	0.87
GNC2-JP05SW	0	NORM	1/6/2010	< 0.12 U	< 0.12 U	< 0.12 U	< 0.12 U	< 0.24 U	< 0.08 U	< 0.36 UJ	< 0.71 UJ	0.32
GNC2-JS17C	0	NORM	1/6/2010	< 0.054 U	< 0.081 U	< 0.046 U	< 0.056 U	< 0.11 U	< 0.036 U	< 2.1 U	< 0.79 U	0.23
UPC1-BB28	0	NORM	11/3/2009	< 5.1 UJ	< 5.1 UJ	< 5.1 UJ	< 5.1 UJ	< 1 U	< 1 U	< 10 UJ	< 10 UJ	5.9
UPC1-BB28	0	FD	11/20/2009	40	2.6 J	9.1	20	20	0.86 J	8.5 J	260 J	27.4
UPC1-BB31	0	NORM	10/30/2009	< 5.1 U	< 5.1 U	< 5.1 UJ	< 5.1 U	1.2 J	< 1 U	< 10 UJ	18 J	6.1
UPC1-BB32	0	NORM	10/30/2009	< 5 U	< 5 U	< 5 U	< 5 U	< 1 U	< 1 U	< 10 UJ	< 10 UJ	5.8
UPC1-BB32	0	FD	10/30/2009	< 5.1 U	< 5.1 U	< 5.1 U	< 5.1 U	1.6	< 1 U	< 10 UJ	25 J	6.2
UPC1-BB33	0	NORM	10/29/2009	< 5 U	< 5 U	< 5 U	< 5 U	< 0.99 U	< 0.99 U	< 9.9 U	< 9.9 U	5.8
UPC1-BB34N	0	NORM	1/26/2010	7.8	< 6.2 U	< 6.2 U	3.9 J	5.2	< 1.2 U	11 J	92	10.1
UPC1-JP11	0	NORM	10/28/2009	23	< 5 U	7.5	12	13	< 0.99 U	6.6 J	330	19.3

All units in pg/g.
-- = no sample data.
= Data not included in risk assessment. Sample location excavated and data replaced with post-excavation data.

TABLE B-3
SOIL GENERAL CHEMISTRY/IONS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 1 of 2)

				General Chemistry/Ions												
Sample ID	**Depth (ft bgs)**	**Sample Type**	**Sample Date**	Ammonia	Bromide	Chlorate	Chloride	Cyanide (Total)	Fluoride	Nitrate (as N)	Nitrite (as N)	Orthophosphate as P	Perchlorate	Sulfate	Sulfide	Total Kjeldahl Nitrogen (TKN)
GNC1-BB16	0	NORM	1/27/2009	< 0.82 U	< 0.27 U	< 0.5 U	1 J	< 0.53 U	< 1.1 U	2.7	< 0.21 U	1.8 J	0.067	21.4	< 1.9 U	214
GNC1-BB16	10	NORM	1/27/2009	< 0.83 U	< 0.28 U	3.3 J	97	< 0.53 U	3.1	1.2	< 0.035 U	0.92 J	0.16	7440	< 1.9 U	57.1
GNC1-BC16	0	NORM	1/27/2009	< 5.2 U	< 0.27 U	< 0.49 U	41	< 0.52 U	< 0.1 U	58	0.47 J+	9.2	0.265	91.8	< 1.8 U	363
GNC1-BC16	10	NORM	1/27/2009	< 0.85 U	0.78 J	10.2	918	< 0.55 U	2.9	24.2	< 0.72 U	0.86 J	26.1	1460	< 1.9 U	78.4
GNC1-BC18	0	NORM	1/27/2009	< 5.3 U	< 0.28 U	< 0.5 U	4.2	< 0.53 U	< 1.1 U	5.9	0.54 J	1.1 J	0.0297 J	20.7	< 1.9 U	185
GNC1-BC18	0	FD	1/27/2009	< 5.3 U	< 0.27 U	< 0.5 U	2.9	< 0.53 U	< 1.1 U	4.9	0.95 J	1.1 J	< 0.0109 U	15.6	< 1.9 U	155
GNC1-BC18	10	NORM	1/27/2009	< 0.85 U	< 0.28 U	< 0.52 U	2.5	< 0.55 U	3.5	0.48	< 0.036 U	< 0.55 U	< 0.0107 U	711	< 1.9 U	55.7
GNC1-BC21	0	NORM	1/29/2009	< 0.79 U	< 0.26 U	< 0.48 U	2	< 0.08 U	< 0.1 U	1.6	< 0.033 U	< 5.1 U	0.856	10.4	< 1.8 U	122
GNC1-BC21	10	NORM	1/29/2009	< 0.83 U	0.52 J	5.2 J	446	< 0.53 U	1.7	6.9	< 0.035 U	< 0.53 U	3.15	549	< 1.9 U	54.4
GNC1-BC22	0	NORM	3/2/2009	< 0.8 U	< 0.27 U	< 0.48 U	1.2 J	< 0.51 U	0.32 J	1.2	0.085 J	< 5.1 U	0.241 J+	8.5	< 1.8 U	135
GNC1-BC22	11	NORM	3/2/2009	< 0.81 U	2.1 J	2.6 J	840	< 0.52 U	2.1	15.3	< 0.034 U	< 0.52 U	3.28 J+	647	< 1.8 U	57.5
GNC1-BC23	0	NORM	2/10/2009	< 0.82 U	< 0.28 U	< 0.5 U	0.49 J	< 0.084 U	0.16 J	0.73	< 0.035 U	< 5.3 U	0.0537	< 5.3 U	< 1.9 U	194
GNC1-BC23	10	NORM	2/10/2009	< 0.81 U	< 0.27 U	1.4 J	107	< 0.082 U	1.2	2.3	< 0.034 U	< 0.52 U	1.4	1960	< 1.8 U	< 52.1 U
GNC1-BC27	0	NORM	2/4/2009	< 5.1 U	< 0.27 U	< 0.48 U	1.9 J	< 0.51 UJ	< 0.1 U	2	< 0.034 U	1.6 J	0.0423	9.6	< 1.8 U	206
GNC1-BC27	0	FD	2/4/2009	< 5.1 U	< 0.26 U	< 0.48 U	1.4 J	< 0.08 UJ	< 0.1 U	1.8	0.12 J	1.8 J	0.0284 J	5.8	< 1.8 U	155
GNC1-BC27	10	NORM	2/4/2009	< 0.8 U	1.9 J	< 0.49 U	423	1.8 J	0.91 J	39.5	< 0.034 U	< 0.51 U	0.0715	163	< 1.8 U	75.6
GNC1-BC28	0	NORM	2/4/2009	< 5.2 UJ	< 0.27 U	< 0.49 U	1.7 J	1 J	< 0.1 U	3.6	< 0.034 U	3.9 J	0.043	9.7	< 1.8 U	1060
GNC1-BC28	11	NORM	2/4/2009	< 0.8 U	0.73 J	< 0.49 U	145	0.74 J	0.66 J	21.3	< 0.034 U	0.95 J	0.0592	31.2	< 1.8 U	113
GNC1-BC29	0	NORM	2/4/2009	< 5.2 U	< 0.27 U	< 0.49 U	45.7	0.55 J	0.53 J	6.4	0.48	0.9 J	0.0314 J	2220	< 1.8 U	186
GNC1-BC29	10	NORM	2/4/2009	< 0.8 U	< 0.27 U	< 0.48 U	28.8	< 0.51 UJ	0.87 J	8.8	< 0.034 U	0.79 J	0.14	56.3	< 1.8 U	55.8
GNC1-JB02	0	NORM	2/11/2009	< 0.81 U	< 0.27 U	< 0.49 U	0.57 J	< 0.083 U	< 0.1 U	0.8	< 0.035 U	< 0.52 U	< 0.0106 U	4.2 J	< 1.9 U	130
GNC1-JB02	5	NORM	2/11/2009	< 0.81 U	< 0.27 U	< 0.49 U	49.8	< 0.082 U	0.75 J	25.7	0.073 J	< 0.52 U	0.147	12	< 1.8 U	101
GNC1-JB02	15	NORM	2/11/2009	< 0.82 U	1.5 J	< 0.49 U	369	0.15 J	0.67 J	10.7	< 0.035 U	< 0.52 U	0.234	33.3	< 1.9 U	89.2
GNC1-JB03	0	NORM	2/13/2009	< 0.81 U	< 0.27 U	< 0.49 U	0.53 J	0.15 J	0.25 J	0.93 J	< 0.034 U	< 5.2 U	< 0.0106 U	3.1 J	< 1.8 U	201 J
GNC1-JB03	0	FD	2/13/2009	< 0.81 U	< 0.27 U	< 0.49 U	0.43 J	0.11 J	0.24 J	0.71 J	< 0.034 U	< 5.2 U	< 0.0106 U	2.8 J	< 1.8 U	140 J
GNC1-JB03	7	NORM	2/13/2009	< 0.8 U	0.47 J	< 0.48 U	82.1	0.12 J	0.91 J	15.5	< 0.034 U	< 0.51 U	0.084	214	< 1.8 U	95.9
GNC1-JB03	17	NORM	2/13/2009	< 0.81 U	< 2.6 U	< 0.49 U	216	< 0.082 U	1.4	6.7	< 0.034 U	< 0.52 U	0.0195 J	262	< 1.8 U	68.6
GNC1-JB06	0	NORM	2/13/2009	< 0.81 U	< 0.27 U	< 0.49 U	9.4	0.11 J	< 0.1 U	10.4	< 0.034 U	< 5.2 U	0.588	20.8	< 1.8 U	428
GNC1-JB06	6	NORM	2/17/2009	< 0.82 U	< 0.27 U	< 0.5 U	85.7	< 0.083 U	< 1 U	23.4	< 0.035 U	2.2 J	1.28	56.6	< 1.9 U	114
GNC1-JB06	16	NORM	2/17/2009	< 0.83 U	< 2.7 U	4.2 J	463	< 0.084 U	< 1.1 U	22	< 0.035 U	< 0.53 U	3.69	351	< 1.9 U	76.2
GNC1-JB07	0	NORM	2/13/2009	< 0.81 U	< 0.27 U	< 0.49 U	0.86 J	< 0.082 U	0.2 J	1.9	< 0.034 U	< 5.2 U	0.0373 J	5.4	< 1.8 U	146
GNC1-JB07	8	NORM	2/13/2009	< 0.8 U	3	< 0.49 U	670	0.11 J	1.5	75.2	< 0.034 U	< 0.51 U	0.075	370	< 1.8 U	97.5
GNC1-JB07	18	NORM	2/13/2009	< 0.8 U	< 2.6 U	< 0.48 U	313	0.13 J	1	28.4	< 0.034 U	< 0.51 U	< 0.0104 U	120	< 1.8 U	90
GNC1-JD01	0	NORM	1/27/2009	< 0.82 U	< 0.27 U	< 0.49 U	267	< 0.52 U	1.7	61.4	< 0.035 U	< 0.52 U	1.46	589	< 1.9 U	465
GNC1-JD01	3	NORM	1/27/2009	< 0.83 U	< 0.28 U	< 0.5 U	25.7	< 0.53 U	2.5	2	< 0.035 U	< 0.53 U	3.77	89.5	< 1.9 U	108
GNC1-JD01	13	NORM	1/27/2009	< 0.83 U	< 0.28 U	< 0.5 U	38.2	< 0.084 U	3.8	3.1	< 0.035 U	< 0.53 U	0.0767	205	< 1.9 U	236

TABLE B-3
SOIL GENERAL CHEMISTRY/IONS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 2 of 2)

				General Chemistry/Ions												
Sample ID	**Depth (ft bgs)**	**Sample Type**	**Sample Date**	Ammonia	Bromide	Chlorate	Chloride	Cyanide (Total)	Fluoride	Nitrate (as N)	Nitrite (as N)	Orthophosphate as P	Perchlorate	Sulfate	Sulfide	Total Kjeldahl Nitrogen (TKN)
GNC1-JD02	0	NORM	1/27/2009	< 0.85 U	< 0.28 U	3.3 J	483	< 0.086 U	1.3	40.3	< 0.036 U	1.5 J	3.58	4520	< 1.9 U	116
GNC1-JD02	10	NORM	1/27/2009	< 0.83 U	< 0.28 U	< 0.5 U	41.8	< 0.53 U	3.4	2.6	< 0.035 U	< 0.53 U	0.125	580	< 1.9 U	74.4
GNC1-JD06	0	NORM	2/13/2009	< 0.82 U	< 0.28 U	< 0.5 U	0.38 J	0.11 J	0.25 J	3.5	< 0.035 U	< 5.2 U	0.0163 J	6.8	< 1.9 U	308
GNC1-JD06	10	NORM	2/17/2009	< 0.82 U	< 0.28 U	1.9 J	153	0.099	1.2	6.8	< 0.035 U	< 0.53 U	2.18	303	< 1.9 U	70.5
GNC1-JP02	0	NORM	2/12/2009	< 0.8 U	< 0.27 U	< 0.49 U	0.64 J	< 0.52 U	< 0.1 U	0.91 J	< 0.034 U	2.5 J	0.0378 J	< 5.2 U	< 1.8 U	184
GNC1-JP02	0	FD	2/12/2009	< 0.81 U	< 0.27 U	< 0.49 U	1.1 J	< 0.52 U	< 0.1 U	2.8 J	0.082 J	2.5 J	0.0657	9	< 1.8 U	138
GNC1-JP02	10	NORM	2/12/2009	< 0.79 U	< 0.27 U	2.2 J	160	< 0.51 U	0.97 J	17	< 0.034 U	< 0.51 U	2.04	294	< 1.8 U	< 51 U
GNC1-JP04	0	NORM	2/10/2009	< 0.85 U	< 0.28 U	< 0.51 U	0.49 J	0.19 J	< 0.11 U	1.1 J	< 0.036 U	< 5.4 U	0.0273 J	3.8 J	< 1.9 U	427 J
GNC1-JP04	0	FD	2/10/2009	< 0.83 U	< 0.28 U	< 0.5 U	0.52 J	0.16 J	0.15 J	0.15 J	< 0.035 U	< 5.3 U	0.124 J	4 J	< 1.9 U	225 J
GNC1-JP04	10	NORM	2/10/2009	< 0.81 U	2.9	1.5 J	958	< 0.082 U	0.86 J	42.1	< 0.034 U	< 5.2 U	1.04	580	< 1.8 U	54.7
GNC1-JP05	0	NORM	2/4/2009	< 5.1 U	< 0.26 U	< 0.48 U	1.5 J	< 0.51 UJ	< 0.1 U	2.8	0.1 J	4.3 J	0.0628	9.8	< 1.8 U	483
GNC1-JP05	11	NORM	2/4/2009	< 0.8 U	0.56 J	< 0.49 U	174	< 0.52 UJ	0.55 J	14.2	< 0.034 U	< 0.52 U	1.9	327	< 1.8 U	105
GNC1-JP06	0	NORM	2/12/2009	< 0.81 U	< 0.27 U	< 0.49 U	0.55 J	< 0.52 U	0.36 J	1.6	< 0.034 U	2 J	0.0195 J	5.6	< 1.8 U	217 J
GNC1-JP06	0	FD	2/12/2009	< 0.81 U	< 0.27 U	< 0.49 U	0.57 J	< 0.52 U	0.44 J	1.2	< 0.034 U	1.2 J	0.0688 J	5.8	< 1.8 U	147 J
GNC1-JP06	3	NORM	2/12/2009	< 0.79 U	2.7	< 0.48 U	605	< 0.51 U	0.51 J	202	< 0.033 U	< 0.51 U	0.155	869	< 1.8 U	50.7
GNC1-JP06	13	NORM	2/12/2009	< 0.79 U	2.4 J	< 0.48 U	503	< 0.51 U	0.77 J	149	< 0.033 U	< 0.51 U	0.0622	484	< 1.8 U	56.9
GNC1-JS08	0	NORM	1/28/2009	1.8 J	< 0.27 U	< 0.49 U	5.1	< 0.52 UJ	0.44 J	2.5	< 0.034 U	< 5.2 U	5.76	25.8	< 1.8 U	237
GNC1-JS08	10	NORM	1/28/2009	< 0.81 U	< 0.27 U	2.3 J	195	< 0.52 UJ	0.84 J	10.9	< 0.034 U	< 0.52 U	1.75	292	< 1.8 U	86.8
GNC1-JS17	0	NORM	2/4/2009	< 5.1 U	< 0.27 U	< 0.48 U	4.9	0.82 J	< 0.1 U	9.1	< 0.034 U	4.3 J	0.0345 J	23.5	< 1.8 U	322
GNC1-JS17	10	NORM	2/4/2009	< 0.81 U	0.71 J	< 0.49 U	153	0.81 J	0.62 J	29.6	< 0.034 U	< 0.52 U	0.0348 J	31	< 1.8 U	55.9
UPC1-BB28	0	NORM	11/3/2009	< 0.51 U	< 0.27 U	< 0.48 U	1.7 J	< 0.11 U	1.1	0.76	< 0.034 U	< 0.51 U	0.0637	388	< 0.85 U	70.1
UPC1-BB28	0	FD	11/20/2009	0.57	< 0.26 U	< 0.48 U	9.8	< 0.11 U	0.82 J	2.3	0.091 J	1.6 J	0.0971	26.3	28.3	263
UPC1-BB28	8	NORM	11/3/2009	< 0.51 U	< 0.26 U	< 0.48 U	27.7	< 0.11 U	1.5	7.8	< 0.034 U	< 5.1 U	< 0.0102 U	190	16.3	90.9
UPC1-BB28	18	NORM	11/3/2009	< 0.52 U	0.97 J	< 0.49 U	181	< 0.12 U	1.5	46.4	< 0.034 U	< 0.52 U	< 0.0103 U	1780	16.6	37.9 J
UPC1-BB31	0	NORM	10/30/2009	0.67	< 0.26 U	< 0.48 U	18	< 0.11 U	0.48 J	20	< 0.033 U	< 5.1 U	1.35	32.2	< 0.84 U	193
UPC1-BB31	11	NORM	10/30/2009	0.25 J	0.42 J	< 0.49 U	98.6	< 0.12 U	1.3	4	< 0.034 U	< 5.2 U	< 0.0103 U	63.7	< 0.86 U	73.6
UPC1-BB32	0	NORM	10/30/2009	0.36 J	1.3 J	5 J	371 J	< 0.11 U	0.51 J	74.3 J	< 0.034 U	< 5.1 U	3.82	40.3 J	< 0.84 U	43.7 J
UPC1-BB32	0	FD	10/30/2009	0.41 J	< 0.26 U	< 0.48 U	17.8 J	< 0.11 U	0.63 J	7.8 J	< 0.033 U	< 5.1 U	3.52	106 J	< 0.84 U	94.2
UPC1-BB32	10	NORM	10/30/2009	0.13 J	0.79 J	< 0.49 U	173	< 0.12 U	0.81 J	4.6	< 0.034 U	< 5.2 U	0.0158 J	58.5	< 0.86 U	31.7 J
UPC1-BB33	0	NORM	10/29/2009	0.42 J	< 0.26 U	< 0.48 U	3.5	< 0.11 U	0.33 J	2.2	< 0.034 U	< 5.1 U	0.0908 J-	26.3	< 0.84 U	53.4
UPC1-BB33	10	NORM	10/29/2009	0.15 J	< 0.27 U	< 0.49 U	5.2	< 0.12 U	0.87 J	1	< 0.034 U	< 5.2 U	0.0235 J-	180	< 0.86 U	33.1 J
UPC1-JP11	0	NORM	10/28/2009	0.92	< 0.26 U	< 0.48 U	33.6 J+	< 0.11 UJ	0.88 J	2.5	0.15 J+	2.1 J	0.469	59.3 J+	< 0.84 U	86.2 J
UPC1-JP11	10	NORM	10/28/2009	0.31 J	< 0.27 U	< 0.49 U	523	< 0.12 U	1.8	10.6	< 0.034 U	< 0.52 U	0.99	999	< 0.86 U	25.9 J

All units in mg/kg.
-- = no sample data.

TABLE B-4
SOIL METALS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Metals							
				Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium
GNC1-BB16	0	NORM	1/27/2009	11700 J	< 0.315 U	< 5.3 UJ	270 J	0.69	< 16.5 U	0.16 J+	30200
GNC1-BB16	10	NORM	1/27/2009	9510 J	< 0.315 U	7.8 J+	246 J	0.58	< 16.5 U	< 0.1 U	27100
GNC1-BC16	0	NORM	1/27/2009	5280 J	< 0.315 U	< 5.2 UJ	119 J	0.38 J	< 16.5 U	0.21 J+	16100
GNC1-BC16	10	NORM	1/27/2009	10500 J	< 0.315 U	10.8 J+	457 J	0.59	< 16.5 U	< 0.1 U	56600
GNC1-BC18	0	NORM	1/27/2009	8600 J	< 0.315 U	< 5.3 UJ	233 J	0.63	< 16.5 U	< 0.1 U	21100 J
GNC1-BC18	0	FD	1/27/2009	10600 J	< 0.315 U	< 5.3 UJ	276 J	0.67	< 16.5 U	0.17 J+	36600 J
GNC1-BC18	10	NORM	1/27/2009	18700 J	< 0.315 U	14.2 J+	1300 J	1.2	< 16.5 U	0.15 J+	41700
GNC1-BC21	0	NORM	1/29/2009	9640	< 0.315 UJ	3.4 J	249 J+	0.57	< 16.5 U	< 0.1 U	26000
GNC1-BC21	10	NORM	1/29/2009	10100	< 0.315 UJ	4.7 J	495 J+	0.55	< 16.5 U	< 0.1 U	33500
GNC1-BC22	0	NORM	3/2/2009	13500	< 2.6 UJ	7.9	423 J	0.72	< 16.5 U	0.26 J+	27200
GNC1-BC22	11	NORM	3/2/2009	13300	< 0.315 UJ	7	482 J	0.7	< 16.5 U	0.16 J+	38300
GNC1-BC23	0	NORM	2/10/2009	7930 J	< 0.315 UJ	4.4 J	295 J+	0.49 J	< 16.5 U	0.11 J	17800 J
GNC1-BC23	10	NORM	2/10/2009	9570 J	< 0.315 UJ	7	355 J+	0.54	< 16.5 U	0.11 J	38400 J
GNC1-BC27	0	NORM	2/4/2009	9290 J	< 0.315 UJ	5.8	458 J	0.58	< 16.5 U	0.15 J	18200
GNC1-BC27	0	FD	2/4/2009	9060 J	< 2.5 UJ	6	447 J	0.65	< 16.5 U	0.18 J	17800
GNC1-BC27	10	NORM	2/4/2009	9170 J	< 0.315 UJ	5.7	730 J	0.58	< 16.5 U	0.12 J	26000
GNC1-BC28	0	NORM	2/4/2009	9390 J	< 2.6 UJ	5.2 J	584 J	0.64	< 16.5 U	0.37	26000
GNC1-BC28	11	NORM	2/4/2009	7330 J	< 0.315 UJ	5.9	400 J	0.53	< 16.5 U	< 0.1 U	20000
GNC1-BC29	0	NORM	2/4/2009	6230 J	< 0.315 UJ	5.9	571 J	0.48 J	< 16.5 U	0.17 J	86700
GNC1-BC29	10	NORM	2/4/2009	9800 J	< 0.315 UJ	6.9	655 J	0.59	< 16.5 U	0.13 J	25500
GNC1-JA03	0	NORM	8/13/2009	11600	< 2.5 UJ	13.3 J+	464 J	0.81	< 50.2 U	0.22 J+	32500 J
GNC1-JA10	0	NORM	8/13/2009	11700	< 0.225 UJ	7.9 J+	370 J	0.84	< 50.2 U	0.15 J+	21900 J
GNC1-JB02	0	NORM	2/11/2009	11700	< 0.315 UJ	6 J+	403	0.58	< 16.5 U	< 0.26 UJ	21500
GNC1-JB02	5	NORM	2/11/2009	13200	< 0.315 UJ	4.2 J+	429	0.63	< 16.5 U	< 0.26 UJ	29700
GNC1-JB02	15	NORM	2/11/2009	8830	< 0.315 UJ	7.3 J+	394	< 0.52 U	< 16.5 U	< 0.26 UJ	27700
GNC1-JB03	0	NORM	2/13/2009	11700 J	< 2.6 UJ	18 J	562 J	0.64	< 16.5 U	0.35 J+	69400 J
GNC1-JB03	0	FD	2/13/2009	10800 J	< 0.315 UJ	5.4 J	456 J	0.58	< 16.5 U	< 0.26 UJ	19200 J
GNC1-JB03	7	NORM	2/13/2009	10900 J	< 0.315 UJ	4.7 J	466 J	0.67	< 16.5 U	< 0.26 UJ	19800 J
GNC1-JB03	17	NORM	2/13/2009	9820 J	< 2.6 UJ	6.3	538 J	0.57	< 16.5 U	< 0.26 UJ	26300 J
GNC1-JB06	0	NORM	2/13/2009	10800 J	< 0.315 UJ	5 J	325 J	0.54	< 16.5 U	< 0.26 UJ	19900 J
GNC1-JB06	6	NORM	2/17/2009	10900 J	< 0.315 UJ	4.3 J	548 J	0.56	< 16.5 U	< 0.26 UJ	42200 J
GNC1-JB06	16	NORM	2/17/2009	9880 J	< 0.315 UJ	5.2 J	414 J	< 0.53 U	< 16.5 U	< 0.27 UJ	39500 J
GNC1-JB07	0	NORM	2/13/2009	9670 J	< 2.6 UJ	4.9 J	461 J	0.63	< 16.5 U	< 0.26 UJ	17100 J
GNC1-JB07	8	NORM	2/13/2009	12100 J	< 2.6 UJ	6.5	672 J	0.54	< 16.5 U	< 0.26 UJ	35200 J
GNC1-JB07	18	NORM	2/13/2009	9170 J	< 0.315 UJ	6.2	573 J	0.53	< 16.5 U	< 0.26 UJ	33000 J
GNC1-JD01	0	NORM	1/27/2009	8220 J	< 0.315 U	6.2 J+	268 J	0.56	< 16.5 U	0.33 J+	19200

TABLE B-4
SOIL METALS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Metals							
				Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium
GNC1-JD01	3	NORM	1/27/2009	12500 J	< 0.315 U	6 J+	450 J	0.73	< 16.5 U	0.12 J+	37000
GNC1-JD01	13	NORM	1/27/2009	11000 J	< 0.315 U	6.1 J+	284 J	0.66	< 16.5 U	0.11 J+	38200
GNC1-JD02	0	NORM	1/27/2009	13100 J	< 0.315 U	8.8 J+	306 J	0.74	< 16.5 U	0.11 J+	39300
GNC1-JD02	10	NORM	1/27/2009	11100 J	< 0.315 U	6.3 J+	312 J	0.66	< 16.5 U	0.11 J+	44200
GNC1-JD06	0	NORM	2/13/2009	13200 J	< 2.6 UJ	9.6	661 J	0.59	< 16.5 U	0.34 J+	26700 J
GNC1-JD06	10	NORM	2/17/2009	11500 J	< 0.315 UJ	7.7	472 J	0.55	< 16.5 U	< 0.27 UJ	51700 J
GNC1-JP02	0	NORM	2/12/2009	9460 J	< 0.315 UJ	5.7	341 J	0.61	< 16.5 U	< 0.26 UJ	17700 J
GNC1-JP02	0	FD	2/12/2009	9200 J	< 0.315 UJ	7.4	439 J	0.59	< 16.5 U	< 0.26 UJ	22000 J
GNC1-JP02	10	NORM	2/12/2009	12100 J	< 2.6 UJ	6.3	397 J	< 0.51 U	< 16.5 U	< 0.26 UJ	32800 J
GNC1-JP04	0	NORM	2/10/2009	10300 J	< 0.315 UJ	9.7	431 J+	0.61	< 16.5 U	0.24 J	19200 J
GNC1-JP04	0	FD	2/10/2009	9360 J	< 0.315 UJ	8.8	375 J+	0.64	< 16.5 U	0.15 J	19200 J
GNC1-JP04	10	NORM	2/10/2009	7760 J	< 0.315 UJ	5.8	1270 J+	0.49 J	< 16.5 U	0.14 J	61000 J
GNC1-JP05	0	NORM	2/4/2009	10900 J	< 2.5 UJ	6	480 J	0.68	< 16.5 U	0.26	23500
GNC1-JP05	11	NORM	2/4/2009	10100 J	< 0.315 UJ	6.4	485 J	0.65	< 16.5 U	0.13 J	23100
GNC1-JP06	0	NORM	2/12/2009	12600 J	< 0.315 UJ	6.3	351 J	0.73	< 16.5 U	< 0.26 UJ	21100 J
GNC1-JP06	0	FD	2/12/2009	13400 J	< 0.315 UJ	6.5	339 J	0.67	< 16.5 U	< 0.26 UJ	28500 J
GNC1-JP06	3	NORM	2/12/2009	10600 J	< 0.315 UJ	4.3 J	482 J	0.56	< 16.5 U	< 0.25 UJ	14600 J
GNC1-JP06	13	NORM	2/12/2009	9270 J	< 0.315 UJ	5.4	440 J	0.53	< 16.5 U	< 0.1 U	23600 J
GNC1-JS08	0	NORM	1/28/2009	9720	< 2.6 UJ	9.6	481 J+	0.64	< 16.5 U	0.22 J	24300
GNC1-JS08	10	NORM	1/28/2009	8870	< 0.315 UJ	5.5	324 J+	0.51 J	< 16.5 U	< 0.1 U	30400
GNC1-JS17	0	NORM	2/4/2009	9050 J	< 2.6 UJ	7.7	545 J	0.57	< 16.5 U	0.24 J	17800
GNC1-JS17	10	NORM	2/4/2009	9040 J	< 0.315 UJ	8	830 J	0.6	< 16.5 U	0.11 J	29800
GNC2-BC23C	0	NORM	1/7/2010	10700 J	< 0.225 U	6.1 J+	377 J	< 0.51 U	< 2.99 U	0.11 J+	17700 J
GNC2-JB03C	0	NORM	1/7/2010	10700 J	< 0.225 U	4.4 J+	403 J	0.53	< 50.6 U	0.21 J+	16800 J
GNC2-JB03C	0	FD	1/7/2010	10900 J	< 0.225 U	5.2 J+	340 J	< 0.51 U	< 50.6 U	0.13 J+	22200 J
GNC2-JD01C	0	NORM	1/7/2010	10600 J	< 0.225 U	3.8 J+	290 J	< 0.51 U	< 2.99 U	0.28 J+	18800 J
GNC2-JD01C	0	FD	1/7/2010	15400 J	< 0.225 U	6.5 J+	407 J	< 0.52 U	< 52.1 U	0.49 J+	37400 J
GNC2-JD06	0	NORM	8/2/2010	12500	< 0.84 UJ	5.8	514 J+	0.71	< 17.1 U	0.092 J	31700 J
GNC2-JP02C	0	NORM	1/7/2010	9870 J	< 0.225 U	4.3 J+	308 J	< 0.51 U	< 2.99 U	0.089 J+	27600 J
GNC2-JP04C	0	NORM	1/7/2010	13400 J	< 0.225 U	5.2 J+	372 J	< 0.51 U	< 2.99 U	0.11 J+	23900 J
GNC3-JD01C	0	NORM	8/2/2010	13600	< 0.84 UJ	8.8	340 J+	0.73	< 51.1 U	0.093 J	33400 J
UPC1-BB28	0	NORM	11/3/2009	13300	< 0.225 U	6.5 J+	507	0.8	< 51.3 U	< 0.26 U	21200 J
UPC1-BB28	0	FD	11/20/2009	9550	< 0.225 UJ	5.1	288	< 0.51 U	< 2.99 U	< 0.04 U	15700
UPC1-BB28	8	NORM	11/3/2009	9410	< 0.225 U	5.5 J+	425	0.58	< 2.99 U	< 0.26 U	14700 J
UPC1-BB28	18	NORM	11/3/2009	9280	< 0.225 U	3.8 J+	405	0.57	< 2.99 U	< 0.26 U	12900 J
UPC1-BB31	0	NORM	10/30/2009	9110 J	< 0.225 U	6.8 J+	489 J	0.55 J+	< 2.99 U	< 0.25 UJ	26700 J

TABLE B-4
SOIL METALS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Metals							
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium
UPC1-BB31	11	NORM	10/30/2009	10800 J	< 0.225 U	6.5 J+	699 J	0.66 J+	< 2.99 U	< 0.26 UJ	18800 J
UPC1-BB32	0	NORM	10/30/2009	14000 J	< 0.225 U	8.4 J+	507 J	0.83 J+	< 50.9 U	< 0.26 UJ	20800 J
UPC1-BB32	0	FD	10/30/2009	10600 J	< 0.225 U	6 J+	639 J	0.59 J+	< 2.99 U	< 0.25 UJ	18600 J
UPC1-BB32	10	NORM	10/30/2009	10400 J	< 0.225 U	6.9 J+	921 J	0.61 J+	< 2.99 U	< 0.26 UJ	43900 J
UPC1-BB33	0	NORM	10/29/2009	10100 J	< 0.225 U	6 J+	621 J	0.54 J+	< 2.99 U	< 0.25 UJ	12700 J
UPC1-BB33	10	NORM	10/29/2009	9730 J	< 0.225 U	7.8 J+	656 J	0.55 J+	< 51.7 U	< 0.26 UJ	18900 J
UPC1-JP11	0	NORM	10/28/2009	9740	< 0.225 UJ	6.7	366 J-	0.53	< 2.99 U	< 0.04 U	18300
UPC1-JP11	10	NORM	10/28/2009	7600 J	< 0.225 UJ	4.5 J	304	0.42 J	< 52 U	< 0.26 U	17700 J

All units in mg/kg.
-- = no sample data.
[grey box] = Data not included in risk assessment. Sample location excavated and data replaced with post-excavation data.

TABLE B-4
SOIL METALS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Metals							
				Chromium	Chromium (VI)	Cobalt	Copper	Iron	Lead	Lithium	Magnesium
GNC1-BB16	0	NORM	1/27/2009	11.7 J+	< 0.11 UJ	11 J+	22.1 J+	17900 J	24.7 J+	15.1 J+	12600 J
GNC1-BB16	10	NORM	1/27/2009	8.5 J+	< 0.11 UJ	7.4 J+	16 J+	12800 J	11.9 J+	35.4 J+	11400 J
GNC1-BC16	0	NORM	1/27/2009	8.4 J+	0.23 J-	3.6 J+	15.8 J+	6360 J	40.1 J+	7.3 J+	4770 J
GNC1-BC16	10	NORM	1/27/2009	14.2 J+	0.25 J-	8.8 J+	16.8 J+	14600 J	13.3 J+	29.7 J+	12600 J
GNC1-BC18	0	NORM	1/27/2009	8.3 J+	< 0.11 UJ	8.3 J+	15.7 J+	13000 J	10.5 J+	12.9 J+	10200 J
GNC1-BC18	0	FD	1/27/2009	9.4 J+	< 0.11 UJ	8.9 J+	16.3 J+	14500 J	13.2 J+	15.1 J+	11200 J
GNC1-BC18	10	NORM	1/27/2009	27.9 J+	< 0.11 UJ	13.2 J+	26.1 J+	24100 J	21.6 J+	25.2 J+	19700 J
GNC1-BC21	0	NORM	1/29/2009	11.4	< 0.41 U	8.5 J+	17.2 J+	14300 J	21.2	13.1	10100 J-
GNC1-BC21	10	NORM	1/29/2009	10	< 0.42 U	8.8 J+	17 J+	14400 J	11.5	17.7	10200 J-
GNC1-BC22	0	NORM	3/2/2009	23.6 J-	< 0.1 U	12.2	29.6 J-	24100	51.7 J	14.4	14500
GNC1-BC22	11	NORM	3/2/2009	19.1 J-	0.21 J+	11.7	22.4 J-	21800	15.6 J	16.5	13600
GNC1-BC23	0	NORM	2/10/2009	14.4	0.22 J	7.2	15.4	15800 J	27	11.5	7360 J
GNC1-BC23	10	NORM	2/10/2009	17	< 0.1 U	9.9	17	19000 J	12.8	20.5	9330 J
GNC1-BC27	0	NORM	2/4/2009	18.8 J+	< 0.1 U	8.4	19.5	18300 J	17.4	16.3	8380 J
GNC1-BC27	0	FD	2/4/2009	24.7 J+	< 0.1 U	9.5	20.3	19200 J	25.5	15.8	8400 J
GNC1-BC27	10	NORM	2/4/2009	22.5 J+	0.17 J	9.1	25.7	18900 J	15.4	18.1	7870 J
GNC1-BC28	0	NORM	2/4/2009	22.5 J+	0.39 J	9.5	20	18000 J	43.6	16.3	8980 J
GNC1-BC28	11	NORM	2/4/2009	16.3 J+	< 0.1 U	7.1	27.6	17400 J	13.9	16.8	6790 J
GNC1-BC29	0	NORM	2/4/2009	17 J+	0.39 J	6.8	63.7	16900 J	15.4	20.9	15000 J
GNC1-BC29	10	NORM	2/4/2009	18.9 J+	< 0.1 U	9.2	20.8	19300 J	14	21.6	8620 J
GNC1-JA03	0	NORM	8/13/2009	18.8	1	10.3	23.3 J+	17900	121 J+	15.8	11400
GNC1-JA10	0	NORM	8/13/2009	13.3	< 0.1 U	9.2	22.1 J+	18000	17.9 J+	18.3	10400
GNC1-JB02	0	NORM	2/11/2009	20.7 J+	< 0.1 U	10.2	23.7 J+	21500 J	26.1 J+	13.2	11100
GNC1-JB02	5	NORM	2/11/2009	18.8 J+	< 0.1 U	10.6	21.7 J+	22200 J	14.2 J+	12	10400
GNC1-JB02	15	NORM	2/11/2009	12.2 J+	0.2 J	7.9	18.3 J+	17300 J	9.2 J+	16.5	8690
GNC1-JB03	0	NORM	2/13/2009	19.2 J	0.13 J	10.2	82.3 J	21000 J	43.9 J	13.8	11500 J
GNC1-JB03	0	FD	2/13/2009	12.6 J	0.18 J	9.4	22.7 J	17500 J	25.3 J	11.3	9820 J
GNC1-JB03	7	NORM	2/13/2009	16.1 J-	< 0.1 U	12.1	18.9	17100 J	13.6 J-	14.8	9460 J
GNC1-JB03	17	NORM	2/13/2009	14.4 J-	0.23 J	7.9	18.6	15800 J	15.2 J-	15.6	9710 J
GNC1-JB06	0	NORM	2/13/2009	18 J-	0.18 J	8.9	20.5	18400 J	29.8 J-	11.5	11100 J
GNC1-JB06	6	NORM	2/17/2009	13.2 J-	< 0.1 U	8.1	16.9	16300 J	13.3 J-	12.3	8970 J
GNC1-JB06	16	NORM	2/17/2009	11.1 J-	< 0.11 U	7.8	16.9	14400 J	11.6 J-	18	10700 J
GNC1-JB07	0	NORM	2/13/2009	15.5 J-	< 0.1 U	7.3	18.3	15000 J	19.2 J-	13.9	8990 J
GNC1-JB07	8	NORM	2/13/2009	19.1 J-	0.13 J	8.1	18.7	17300 J	15.8 J-	14.6	11700 J
GNC1-JB07	18	NORM	2/13/2009	13.8 J-	< 0.1 U	7.7	19.7	14900 J	12.3 J-	18.3	9380 J
GNC1-JD01	0	NORM	1/27/2009	321 J+	2.6 J-	11.4 J+	70.1 J+	12700 J	29 J+	15.6 J+	9740 J

TABLE B-4
SOIL METALS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Metals							
				Chromium	Chromium (VI)	Cobalt	Copper	Iron	Lead	Lithium	Magnesium
GNC1-JD01	3	NORM	1/27/2009	13.4 J+	< 0.11 UJ	9.6 J+	24.5 J+	15200 J	11.8 J+	20.6 J+	11800 J
GNC1-JD01	13	NORM	1/27/2009	15.4 J+	< 0.11 UJ	8.8 J+	22.9 J+	15200 J	10.6 J+	22.8 J+	11100 J
GNC1-JD02	0	NORM	1/27/2009	16.1 J+	< 0.11 UJ	11.1 J+	23.7 J+	17100 J	13.6 J+	30.5 J+	15600 J
GNC1-JD02	10	NORM	1/27/2009	10.5 J+	< 0.11 UJ	8.9 J+	16.2 J+	15000 J	9.4 J+	17.8 J+	10900 J
GNC1-JD06	0	NORM	2/13/2009	22.8 J-	< 0.11 U	10.9	28.8	20800 J	121 J-	11.9	12400 J
GNC1-JD06	10	NORM	2/17/2009	12.9 J-	0.23 J	9.1	22.4	16500 J	15.7 J-	15.7	10700 J
GNC1-JP02	0	NORM	2/12/2009	16.8 J+	0.15 J+	9.7	18.2 J+	16900 J	36.3 J	17	9930 J
GNC1-JP02	0	FD	2/12/2009	16.6 J+	0.25 J+	8.5	20.1 J+	15400 J	72.8 J	14.4	10100 J
GNC1-JP02	10	NORM	2/12/2009	13.3 J+	0.2 J+	9	19 J+	17400 J	12.2 J+	13.5	9810 J
GNC1-JP04	0	NORM	2/10/2009	28.8	0.33 J	9.8	22.4	19800 J	127	14.5	10800 J
GNC1-JP04	0	FD	2/10/2009	22.5	0.87 J	10.6	28.5	21500 J	89.2	14	10100 J
GNC1-JP04	10	NORM	2/10/2009	12.4	0.21 J	6.5	14.3	12900 J	10.1	18.5	8120 J
GNC1-JP05	0	NORM	2/4/2009	27.8 J+	0.12 J	11.3	24.2	21600 J	50.9	16.8	11100 J
GNC1-JP05	11	NORM	2/4/2009	22.4 J+	< 0.1 U	9.6	20.7	21900 J	14.8	18.5	9470 J
GNC1-JP06	0	NORM	2/12/2009	17.4 J+	0.3 J+	9.7	21.1 J+	18300 J	23.3 J+	17.1	11500 J
GNC1-JP06	0	FD	2/12/2009	17.9 J+	0.11 J+	8.8	21.8 J+	19200 J	23.3 J+	15.3	11400 J
GNC1-JP06	3	NORM	2/12/2009	14.2 J+	0.15 J+	9.1	17.7 J+	17100 J	13.4 J+	12.8	8810 J
GNC1-JP06	13	NORM	2/12/2009	12.7 J+	0.1 J+	7.7	17.1 J+	15300 J	14.7 J+	13.5	9280 J
GNC1-JS08	0	NORM	1/28/2009	17.6	0.28 J-	9.3	18.1	16000	59.3	14.2	9890
GNC1-JS08	10	NORM	1/28/2009	9.9	< 0.1 UJ	7.2	13.5	12800	9.8	17.6	9210
GNC1-JS17	0	NORM	2/4/2009	27.3 J+	< 0.1 U	10.3	21.9	18300 J	74.3	16.6	9060 J
GNC1-JS17	10	NORM	2/4/2009	18.7 J+	< 0.1 U	6.9	18.2	17500 J	13.2	20.5	9030 J
GNC2-BC23C	0	NORM	1/7/2010	12.5 J+	< 0.41 U	11.1	21.2 J+	17500 J	22.8 J+	17.6 J+	11100 J
GNC2-JB03C	0	NORM	1/7/2010	13.3 J+	< 0.4 U	9.7	20.3 J+	16100 J	14.9 J+	15.2 J+	11000 J
GNC2-JB03C	0	FD	1/7/2010	14.2 J+	< 0.4 U	8.4	20.9 J+	16400 J	19 J+	17 J+	10900 J
GNC2-JD01C	0	NORM	1/7/2010	36.3 J+	0.57	12	127 J+	20400 J	28.9 J+	10.3 J	9680 J
GNC2-JD01C	0	FD	1/7/2010	56.9 J+	0.54	13.6	159 J+	21800 J	25.5 J+	16.6 J	14700 J
GNC2-JD06	0	NORM	8/2/2010	18.3	0.15 J	8.7	16.6	21900	13.3	19	12500
GNC2-JP02C	0	NORM	1/7/2010	11.7 J+	< 0.41 U	8.5	20.2 J+	16400 J	12.1 J+	16.1 J+	10700 J
GNC2-JP04C	0	NORM	1/7/2010	19 J+	< 0.41 U	11.5	22.1 J+	22000 J	16.1 J+	16.8 J+	13300 J
GNC3-JD01C	0	NORM	8/2/2010	20.5	< 0.1 U	8.7	21.4	21300	9.9	32	16300
UPC1-BB28	0	NORM	11/3/2009	20.7	0.11 J	11.6 J+	27.5	20900	27.8 J+	19.4	12100
UPC1-BB28	0	FD	11/20/2009	13.8	< 0.1 U	6.5	15.3	14700 J	12.9	13.4	8450 J
UPC1-BB28	8	NORM	11/3/2009	16.6	0.11 J	8.9 J+	17.9	16000	13.9 J+	17	9400
UPC1-BB28	18	NORM	11/3/2009	15.1	< 0.1 U	10.5 J+	21.8	15200	13.8 J+	16.1	8880
UPC1-BB31	0	NORM	10/30/2009	15.6 J+	< 0.1 U	7.2 J+	16.6 J+	13800	15.7 J+	15.7	8840 J

TABLE B-4
SOIL METALS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Metals							
Sample ID	**Depth (ft bgs)**	**Sample Type**	**Sample Date**	Chromium	Chromium (VI)	Cobalt	Copper	Iron	Lead	Lithium	Magnesium
UPC1-BB31	11	NORM	10/30/2009	19.5 J+	< 0.1 U	8.5 J+	21.9 J+	16300	16.5 J+	17.9	8430 J
UPC1-BB32	0	NORM	10/30/2009	21.5 J+	0.21 J	9.6 J+	22.8 J+	18300	23.8 J+	21.5	14300 J
UPC1-BB32	0	FD	10/30/2009	18.6 J+	< 0.1 U	8.5 J+	16.4 J+	14900	21.3 J+	16.3	9220 J
UPC1-BB32	10	NORM	10/30/2009	11.2 J+	< 0.1 U	7.6 J+	18.6 J+	13400	59.3 J+	19.4	8570 J
UPC1-BB33	0	NORM	10/29/2009	12 J+	0.11 J	7 J+	14.6 J+	12100	17.9 J+	14.3	6980 J
UPC1-BB33	10	NORM	10/29/2009	12.6 J+	0.12 J	7.6 J+	17.8 J+	13800	18.9 J+	20.5	9300 J
UPC1-JP11	0	NORM	10/28/2009	23	2.1	8.6	19.1	19500 J	47.7	13.3	9960 J
UPC1-JP11	10	NORM	10/28/2009	6.5	< 0.1 U	5.7	12	10800 J	9.4	14.8	7300 J

All units in mg/kg.
-- = no sample data.
(grey box) = Data not included in risk assessment. Sample location excavated and data replaced with post-excavation data.

TABLE B-4
SOIL METALS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Metals							
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium
GNC1-BB16	0	NORM	1/27/2009	663 J	< 0.0352 UJ	0.58 J	18.1 J+	2380 J	< 0.4 U	0.12 J+	482
GNC1-BB16	10	NORM	1/27/2009	383 J	< 0.005 UJ	1.6 J	12.6 J+	1980 J	< 0.4 U	< 0.11 U	1470
GNC1-BC16	0	NORM	1/27/2009	376 J	< 0.0346 UJ	0.63 J	6.6 J+	2680 J	< 0.4 U	< 0.11 U	452
GNC1-BC16	10	NORM	1/27/2009	415 J	< 0.0363 UJ	1.5 J	16 J+	1900 J	< 0.4 U	< 0.11 U	1660
GNC1-BC18	0	NORM	1/27/2009	491 J	< 0.0353 UJ	< 0.47 U	19.3 J+	1550 J	< 0.4 U	< 0.11 U	258
GNC1-BC18	0	FD	1/27/2009	611 J	< 0.035 UJ	< 0.47 U	14.6 J+	1800 J	< 0.4 U	< 0.11 U	244
GNC1-BC18	10	NORM	1/27/2009	617 J	< 0.0364 UJ	1.8 J	28.9 J+	3710 J	< 0.4 U	0.12 J+	1170
GNC1-BC21	0	NORM	1/29/2009	482	< 0.0338 U	< 0.47 U	13.2	2030 J+	< 0.4 U	< 0.11 U	199
GNC1-BC21	10	NORM	1/29/2009	530	< 0.0354 U	< 0.47 U	13.6	1720 J+	< 0.4 U	< 0.11 U	1580
GNC1-BC22	0	NORM	3/2/2009	719	0.0208 J	1.2 J	23	2610	< 0.4 U	0.16 J+	209
GNC1-BC22	11	NORM	3/2/2009	605	0.0064 J	0.92 J	20.2	2570	< 0.4 U	0.14 J+	1240
GNC1-BC23	0	NORM	2/10/2009	465 J	0.0053 J	< 0.47 U	12.7	1700 J	< 0.4 U	< 0.11 U	158
GNC1-BC23	10	NORM	2/10/2009	475 J	0.0127 J	0.78 J	15.5	2220 J	< 0.4 U	< 0.11 U	666
GNC1-BC27	0	NORM	2/4/2009	518	< 0.0342 U	0.67 J	16.5	2150	< 0.4 U	0.11 J+	134
GNC1-BC27	0	FD	2/4/2009	690	< 0.0338 U	0.83 J	18.2	2130	< 0.4 U	0.17 J+	136
GNC1-BC27	10	NORM	2/4/2009	455	< 0.0343 U	1.8 J	18.3	1680	< 0.4 U	< 0.11 U	772
GNC1-BC28	0	NORM	2/4/2009	681	< 0.0345 U	0.9 J	21.2	2390	< 0.4 U	0.18 J+	125
GNC1-BC28	11	NORM	2/4/2009	381	< 0.0343 U	0.84 J	15.7	1240	< 0.4 U	< 0.11 U	441
GNC1-BC29	0	NORM	2/4/2009	397	< 0.0345 U	2.1 J	16.5	1270	< 0.4 U	< 0.11 U	285
GNC1-BC29	10	NORM	2/4/2009	751	< 0.0342 U	1 J	17.3	1820	< 0.4 U	< 0.11 U	745
GNC1-JA03	0	NORM	8/13/2009	720 J	< 0.0334 UJ	< 2.5 U	17.7	2480 J+	< 0.225 U	0.21 J	184
GNC1-JA10	0	NORM	8/13/2009	549 J	< 0.0335 UJ	< 2.5 U	19	3020 J+	< 2.5 U	0.11 J	219
GNC1-JB02	0	NORM	2/11/2009	639 J	< 0.0349 U	0.86 J+	21.2 J+	2050	< 0.4 U	< 0.11 U	203
GNC1-JB02	5	NORM	2/11/2009	573 J	< 0.0345 U	< 0.47 U	18.6 J+	2870	< 0.4 U	0.11 J+	294
GNC1-JB02	15	NORM	2/11/2009	420 J	< 0.005 U	< 0.47 U	16.2 J+	1430	< 0.4 U	< 0.11 U	586
GNC1-JB03	0	NORM	2/13/2009	1770 J	< 0.0346 U	1.3 J	20.1	2520 J	< 0.4 U	0.15 J+	159
GNC1-JB03	0	FD	2/13/2009	873 J	< 0.0348 U	0.54 J	15.5	2280 J	< 0.4 U	0.12 J+	160
GNC1-JB03	7	NORM	2/13/2009	516 J	< 0.005 U	0.52 J	16.2	2660 J	< 0.4 U	< 0.11 U	462
GNC1-JB03	17	NORM	2/13/2009	594 J	< 0.005 U	0.8 J	14.5	2060 J	< 0.4 U	< 0.11 U	834
GNC1-JB06	0	NORM	2/13/2009	576 J	< 0.0348 U	0.63 J	16.6	2490 J	< 0.4 U	0.12 J+	172
GNC1-JB06	6	NORM	2/17/2009	460 J	< 0.005 U	< 0.47 U	14.9	2290 J	< 0.4 U	< 0.11 U	347
GNC1-JB06	16	NORM	2/17/2009	399 J	0.0075 J	< 0.47 U	14.3	1640 J	< 0.4 U	< 0.11 U	1280
GNC1-JB07	0	NORM	2/13/2009	491 J	< 0.0347 U	0.54 J	15.4	2430 J	< 0.4 U	< 0.11 U	162
GNC1-JB07	8	NORM	2/13/2009	448 J	< 0.005 U	0.66 J	17.1	3350 J	< 0.4 U	< 0.11 U	870
GNC1-JB07	18	NORM	2/13/2009	399 J	< 0.005 U	0.6 J	14.8	1740 J	< 0.4 U	< 0.11 U	889
GNC1-JD01	0	NORM	1/27/2009	804 J	0.0414 J-	3.8	29.4 J+	1600 J	< 0.4 U	0.78 J+	855

TABLE B-4
SOIL METALS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 8 of 12)

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Metals							
				Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium
GNC1-JD01	3	NORM	1/27/2009	572 J	< 0.0355 UJ	0.56 J	17.5 J+	2440 J	< 0.4 U	0.11 J+	720
GNC1-JD01	13	NORM	1/27/2009	472 J	< 0.0353 UJ	0.8 J	15.4 J+	2140 J	< 0.4 U	0.11 J+	530
GNC1-JD02	0	NORM	1/27/2009	523 J	< 0.0364 UJ	0.92 J	21 J+	2600 J	< 0.4 U	< 0.11 U	1250
GNC1-JD02	10	NORM	1/27/2009	445 J	< 0.0356 UJ	0.57 J	14.6 J+	2050 J	< 0.4 U	< 0.11 U	555
GNC1-JD06	0	NORM	2/13/2009	896 J	< 0.0353 U	1.1 J	18.4	2650 J	< 0.4 U	0.27 J+	271
GNC1-JD06	10	NORM	2/17/2009	491 J	0.0056 J	0.88 J	13.7	1570 J	< 0.4 U	< 0.11 U	796
GNC1-JP02	0	NORM	2/12/2009	678 J	< 0.0344 U	0.66 J	16.8	1870 J	< 0.4 U	< 0.11 U	187
GNC1-JP02	0	FD	2/12/2009	786 J	< 0.0345 U	0.91 J	16	2000 J	< 0.4 U	0.15 J+	172
GNC1-JP02	10	NORM	2/12/2009	471 J	< 0.005 U	0.52 J	14.9	1560 J	< 0.4 U	< 0.11 U	679
GNC1-JP04	0	NORM	2/10/2009	934 J	0.0212 J	1.3 J	19	2040 J	< 0.4 U	0.19 J+	198
GNC1-JP04	0	FD	2/10/2009	745 J	0.0217 J	1 J	19	1730 J	< 0.4 U	0.14 J+	198
GNC1-JP04	10	NORM	2/10/2009	393 J	< 0.005 U	0.62 J	12.9	1360 J	< 0.4 U	< 0.11 U	756
GNC1-JP05	0	NORM	2/4/2009	867	< 0.0339 U	1.1 J	21.8	2380	< 0.4 U	0.2 J+	173
GNC1-JP05	11	NORM	2/4/2009	561	< 0.0344 U	0.74 J	18.6	1940	< 0.4 U	0.11 J+	664
GNC1-JP06	0	NORM	2/12/2009	612 J	0.0369	0.6 J	18.9	3640 J	< 0.4 U	0.12 J+	160
GNC1-JP06	0	FD	2/12/2009	539 J	< 0.0345 U	0.67 J	18.4	3660 J	< 0.4 U	0.12 J+	144
GNC1-JP06	3	NORM	2/12/2009	557 J	< 0.0338 U	0.57 J	14.7	2510 J	< 0.4 U	< 0.11 U	865
GNC1-JP06	13	NORM	2/12/2009	621 J	< 0.0338 U	0.69 J	15	1800 J	< 0.4 U	< 0.11 U	620
GNC1-JS08	0	NORM	1/28/2009	671	< 0.0344 U	0.71 J	16.3	1620 J+	< 0.4 U	0.18 J+	207
GNC1-JS08	10	NORM	1/28/2009	408	< 0.0348 U	0.66 J	11.9	1290 J+	< 0.4 U	< 0.11 UJ	737
GNC1-JS17	0	NORM	2/4/2009	819	< 0.0341 U	1.4 J	20.3	2310	< 0.4 U	0.2 J+	147
GNC1-JS17	10	NORM	2/4/2009	330	< 0.0347 U	0.68 J	15.3	1440	< 0.4 U	< 0.11 U	484
GNC2-BC23C	0	NORM	1/7/2010	596 J	< 0.0339 U	< 2.5 UJ	21.1	1940 J	< 2.5 UJ	< 1 UJ	229 J+
GNC2-JB03C	0	NORM	1/7/2010	576 J	< 0.0337 U	< 2.5 UJ	17.8	2100 J	< 2.5 UJ	< 1 UJ	252 J+
GNC2-JB03C	0	FD	1/7/2010	457 J	< 0.0337 U	< 2.5 UJ	16.6	2510 J	< 2.5 UJ	< 1 UJ	222 J+
GNC2-JD01C	0	NORM	1/7/2010	853 J	0.0501	< 2.6 UJ	23.9	1710 J	< 2.6 UJ	< 1 UJ	1290 J+
GNC2-JD01C	0	FD	1/7/2010	601 J	0.0548	< 2.6 UJ	27.7	2900 J	< 2.6 UJ	< 1 UJ	1880 J+
GNC2-JD06	0	NORM	8/2/2010	457 J+	< 0.0061 U	< 2.6 U	16.6	2330 J+	< 2.6 U	< 0.041 U	784
GNC2-JP02C	0	NORM	1/7/2010	421 J	< 0.034 U	< 2.5 UJ	16.9	1800 J	< 2.5 UJ	< 1 UJ	227 J+
GNC2-JP04C	0	NORM	1/7/2010	574 J	< 0.0339 U	< 2.5 UJ	19.8	2560 J	< 2.5 UJ	< 1 UJ	307 J+
GNC3-JD01C	0	NORM	8/2/2010	404 J+	< 0.0061 U	< 2.6 U	16.6	3050 J+	< 2.6 U	< 0.041 U	1020
UPC1-BB28	0	NORM	11/3/2009	626	0.0413	< 2.6 UJ	20.5	2980 J+	< 2.6 UJ	0.12 J+	228 J-
UPC1-BB28	0	FD	11/20/2009	361 J	< 0.0337 UJ	< 2.5 U	13.8	2360	< 0.225 U	< 0.04 U	125
UPC1-BB28	8	NORM	11/3/2009	437	< 0.0339 U	< 2.6 UJ	17.4	2200 J+	< 2.6 UJ	0.058 J+	336 J-
UPC1-BB28	18	NORM	11/3/2009	685	< 0.005 U	< 2.6 UJ	18	2210 J+	< 2.6 UJ	0.071 J+	382 J-
UPC1-BB31	0	NORM	10/30/2009	439	< 0.0338 UJ	< 2.5 UJ	16.3	2410 J	< 2.5 UJ	0.059 J+	241 J+

TABLE B-4
SOIL METALS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Metals							
				Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium
UPC1-BB31	11	NORM	10/30/2009	498	< 0.0344 UJ	< 2.6 UJ	16.7	2400 J	< 0.225 U	0.068 J+	606 J+
UPC1-BB32	0	NORM	10/30/2009	513	< 0.0339 UJ	< 2.6 UJ	20.3	3530 J	< 2.6 UJ	0.1 J+	236 J+
UPC1-BB32	0	FD	10/30/2009	528	< 0.0338 UJ	< 2.5 UJ	15.8	3300 J	< 2.5 UJ	0.074 J+	335 J+
UPC1-BB32	10	NORM	10/30/2009	706	0.0529 J-	< 2.6 UJ	15.2	2160 J	< 2.6 UJ	0.061 J+	862 J+
UPC1-BB33	0	NORM	10/29/2009	494	< 0.0339 UJ	< 2.5 UJ	13.7	2650 J	0.33 J+	0.055 J+	309 J+
UPC1-BB33	10	NORM	10/29/2009	425	< 0.0344 UJ	< 2.6 UJ	15.7	1890 J	< 0.225 U	0.062 J+	1220 J+
UPC1-JP11	0	NORM	10/28/2009	514 J	0.0136 J-	< 2.5 U	16.5	2030	< 0.225 U	0.06 J	221
UPC1-JP11	10	NORM	10/28/2009	301 J	0.0144 J-	< 2.6 U	10.2	1040 J	< 0.225 U	< 0.04 U	660

All units in mg/kg.

-- = no sample data.

= Data not included in risk assessment. Sample location excavated and data replaced with post-excavation data.

TABLE B-4
SOIL METALS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Metals							
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Strontium	Thallium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc
GNC1-BB16	0	NORM	1/27/2009	302 J	< 0.75 U	< 0.75 U	892 J	< 1.25 U	0.88	55.4 J+	55.9 J+
GNC1-BB16	10	NORM	1/27/2009	691 J	< 0.75 U	< 0.75 U	554 J	< 1.25 U	2.7	44.2 J+	34.5 J+
GNC1-BC16	0	NORM	1/27/2009	105 J	< 0.75 U	< 0.75 U	438 J	< 1.25 U	0.91	20.7 J+	93.1 J+
GNC1-BC16	10	NORM	1/27/2009	553 J	< 0.75 U	< 0.75 U	642 J	1.7 J	1.9	53 J+	38.2 J+
GNC1-BC18	0	NORM	1/27/2009	262 J	< 0.75 U	< 0.75 U	492 J	< 1.25 U	0.8	36.2 J+	41.1 J+
GNC1-BC18	0	FD	1/27/2009	305 J	< 0.75 U	< 0.75 U	611 J	< 1.25 U	0.91	43 J+	45.4 J+
GNC1-BC18	10	NORM	1/27/2009	838 J	< 0.75 U	< 0.75 U	430 J	< 1.25 U	3.9	75.3 J+	65.9 J+
GNC1-BC21	0	NORM	1/29/2009	268 J	< 0.75 U	< 0.75 U	430	< 1.25 U	0.66 J	41.2	44.4 J+
GNC1-BC21	10	NORM	1/29/2009	351 J	< 0.75 U	< 0.75 U	556	< 1.25 U	1.7 J	49	39.6 J+
GNC1-BC22	0	NORM	3/2/2009	308	< 0.75 U	0.93 J	921	1.9 J-	1.1	64.8 J-	69.7
GNC1-BC22	11	NORM	3/2/2009	491	< 0.75 U	< 0.75 U	963	< 1.25 UJ	1.2	63.7 J-	57.2
GNC1-BC23	0	NORM	2/10/2009	219 J	< 0.75 U	< 0.75 U	609	< 1.25 UJ	0.68	46.5	42
GNC1-BC23	10	NORM	2/10/2009	523 J	< 0.75 U	< 0.75 U	900	8.5 J-	2.4	64.4	40.9
GNC1-BC27	0	NORM	2/4/2009	207	< 0.75 U	< 1 U	744	< 1.25 U	0.83	55.7 J-	46.4 J+
GNC1-BC27	0	FD	2/4/2009	187	< 0.75 U	1.4	888	< 1.25 U	0.94	65.6 J-	50.8 J+
GNC1-BC27	10	NORM	2/4/2009	336	< 0.75 U	< 0.75 U	662	< 1.25 U	1.1	52 J-	41.9 J+
GNC1-BC28	0	NORM	2/4/2009	212	< 0.75 U	1.6	778	1.5 J	0.85	63.9 J-	62.5 J+
GNC1-BC28	11	NORM	2/4/2009	238	< 0.75 U	< 0.75 U	559	< 1.25 U	1.2	45.6 J-	38.9 J+
GNC1-BC29	0	NORM	2/4/2009	298	< 0.75 U	< 1 U	506	< 1.25 U	1.1	36.1 J-	42.3 J+
GNC1-BC29	10	NORM	2/4/2009	373	< 0.75 U	< 0.75 U	805	< 1.25 U	1.3	60.4 J-	47.8 J+
GNC1-JA03	0	NORM	8/13/2009	287 J-	< 1 U	0.99 J	705 J+	3.2 J-	0.97 J+	60.3 J+	59.2 J+
GNC1-JA10	0	NORM	8/13/2009	168 J-	< 1 U	< 0.75 U	502 J+	< 2.5 UJ	0.89 J+	51.5 J+	52.4 J+
GNC1-JB02	0	NORM	2/11/2009	256	< 0.75 U	< 0.75 U	889	< 1.25 UJ	0.67	64.8 J+	59.4 J+
GNC1-JB02	5	NORM	2/11/2009	337	< 0.75 U	< 0.75 U	1030	< 1.25 UJ	0.87	66.4 J+	59 J+
GNC1-JB02	15	NORM	2/11/2009	354	< 0.75 U	< 0.75 U	647	< 1.25 UJ	1.1	51.8 J+	41.8 J+
GNC1-JB03	0	NORM	2/13/2009	263 J	< 0.75 U	< 0.75 U	749 J	1.5 J-	0.81 J	64.5 J-	65.6 J-
GNC1-JB03	0	FD	2/13/2009	249 J	< 0.75 U	< 0.75 U	789 J	< 1.25 UJ	0.64 J	52.5 J-	55.1 J-
GNC1-JB03	7	NORM	2/13/2009	213 J	< 0.75 U	< 0.75 U	735 J	2.3 J-	0.98 J	49.4 J-	47.7 J-
GNC1-JB03	17	NORM	2/13/2009	343 J	< 0.75 U	< 0.75 U	635 J	2.1 J-	0.83 J	45.3 J-	43.1 J-
GNC1-JB06	0	NORM	2/13/2009	180 J	< 0.75 U	< 0.75 U	844 J	1.3 J-	0.66 J	59.1 J-	55.4 J-
GNC1-JB06	6	NORM	2/17/2009	301 J	< 0.75 U	< 0.75 U	776 J	< 1.25 UJ	0.84 J	48.3 J-	42.9 J-
GNC1-JB06	16	NORM	2/17/2009	343 J	< 0.75 U	< 0.75 U	612 J	< 1.25 UJ	0.87 J	48 J-	38.9 J-
GNC1-JB07	0	NORM	2/13/2009	190 J	< 0.75 U	< 0.75 U	628 J	< 1.25 UJ	0.64 J	44.5 J-	43 J-
GNC1-JB07	8	NORM	2/13/2009	361 J	< 0.75 U	< 0.75 U	685 J	< 1.25 UJ	0.68 J	49.1 J-	45.3 J-
GNC1-JB07	18	NORM	2/13/2009	422 J	< 0.75 U	< 0.75 U	608 J	< 1.25 UJ	0.84 J	46 J-	42 J-
GNC1-JD01	0	NORM	1/27/2009	192 J	< 0.75 U	37.6 J+	2410 J	15.4	7.8	547 J+	81.4 J+

TABLE B-4
SOIL METALS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Metals							
				Strontium	Thallium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc
GNC1-JD01	3	NORM	1/27/2009	358 J	< 0.75 U	0.86 J+	819 J	< 1.25 U	1.1	54.9 J+	47.2 J+
GNC1-JD01	13	NORM	1/27/2009	283 J	< 0.75 U	< 0.75 U	768 J	< 1.25 U	1.5	54.3 J+	43.6 J+
GNC1-JD02	0	NORM	1/27/2009	522 J	< 0.75 U	< 0.75 U	602 J	< 1.25 U	1.9	54.6 J+	54.5 J+
GNC1-JD02	10	NORM	1/27/2009	495 J	< 0.75 U	< 0.75 U	703 J	< 1.25 U	1.1	47.6 J+	39.7 J+
GNC1-JD06	0	NORM	2/13/2009	373 J	< 0.75 U	1.6	1200 J	2.2 J-	0.95 J	79.9 J-	84.7 J-
GNC1-JD06	10	NORM	2/17/2009	456 J	< 0.75 U	< 0.75 U	735 J	< 1.25 UJ	1.4 J	49.6 J-	45 J-
GNC1-JP02	0	NORM	2/12/2009	175 J	< 0.75 U	< 0.75 U	667 J	1.6 J	0.77 J	53.1 J+	50.9 J+
GNC1-JP02	0	FD	2/12/2009	213 J	< 0.75 U	< 0.75 U	771 J	2 J	0.75 J	51 J+	52.7 J+
GNC1-JP02	10	NORM	2/12/2009	432 J	< 0.75 U	< 0.75 U	724 J	< 1.25 U	1.1 J	52.4 J+	47.3 J+
GNC1-JP04	0	NORM	2/10/2009	219 J	< 0.75 U	1.6	986	2 J-	0.95	74.6	68.5
GNC1-JP04	0	FD	2/10/2009	223 J	< 0.75 U	< 1.1 U	958	1.7 J-	0.8	73.1	59.7
GNC1-JP04	10	NORM	2/10/2009	579 J	< 0.75 U	< 0.75 U	393	< 1.25 UJ	1.6	37.1	32.6
GNC1-JP05	0	NORM	2/4/2009	188	< 0.75 U	1.5	923	1.6 J	0.99	74.8 J-	63.8 J+
GNC1-JP05	11	NORM	2/4/2009	280	< 0.75 U	< 0.75 U	849	< 1.25 U	1.2	63.2 J-	49.9 J+
GNC1-JP06	0	NORM	2/12/2009	170 J	< 0.75 U	< 0.75 U	646 J	< 1.25 U	0.75 J	49.4 J+	58.5 J+
GNC1-JP06	0	FD	2/12/2009	172 J	< 0.75 U	< 0.75 U	702 J	< 1.25 U	0.7 J	49.1 J+	58.3 J+
GNC1-JP06	3	NORM	2/12/2009	278 J	< 0.75 U	< 0.75 U	685 J	< 1.25 U	0.66 J	51.7	48.3 J+
GNC1-JP06	13	NORM	2/12/2009	304 J	< 0.75 U	< 0.75 U	628 J	< 1.25 U	1.1 J	45.9 J+	40.8 J+
GNC1-JS08	0	NORM	1/28/2009	253	< 0.75 U	1.1	637	2.1 J-	1.1	62.2	56.6
GNC1-JS08	10	NORM	1/28/2009	328	< 0.75 U	< 0.75 U	451	< 1.25 UJ	1.3	42.9	36.1
GNC1-JS17	0	NORM	2/4/2009	182	< 0.75 U	1.7	860	2.2 J	0.99	62.4 J-	56 J+
GNC1-JS17	10	NORM	2/4/2009	403	< 0.75 U	< 0.75 U	719	< 1.25 U	1.6	50.8 J-	40.4 J+
GNC2-BC23C	0	NORM	1/7/2010	212 J	< 0.105 U	< 0.75 U	509 J	< 0.185 U	0.9 J+	51.5 J+	51.7 J+
GNC2-JB03C	0	NORM	1/7/2010	170 J	< 1 UJ	< 0.75 U	419 J	< 2.5 U	0.88 J+	43.2 J+	63.6 J+
GNC2-JB03C	0	FD	1/7/2010	157 J	< 1 UJ	0.91 J	441 J	< 2.5 U	0.89 J+	43.3 J+	51.3 J+
GNC2-JD01C	0	NORM	1/7/2010	240 J	< 0.105 U	8.5	1070 J	< 2.6 U	1.7 J	79.4 J+	79.9 J
GNC2-JD01C	0	FD	1/7/2010	287 J	< 1 UJ	7.5	1290 J	< 2.6 U	2.5 J	71.6 J+	156 J
GNC2-JD06	0	NORM	8/2/2010	417	< 1 U	< 1 U	895	< 2.6 UJ	1.4	55.9	44.5
GNC2-JP02C	0	NORM	1/7/2010	169 J	< 0.105 U	< 0.75 U	455 J	< 0.185 U	0.98 J+	44.6 J+	46.5 J+
GNC2-JP04C	0	NORM	1/7/2010	244 J	< 0.105 U	< 0.75 U	660 J	< 0.185 U	0.9 J+	63.4 J+	56.6 J+
GNC3-JD01C	0	NORM	8/2/2010	800	1.1	1	919	< 2.6 UJ	2.4	56.8	44.3
UPC1-BB28	0	NORM	11/3/2009	199 J	< 0.105 U	0.88 J+	741	< 0.185 U	1.3 J+	69.7 J+	72
UPC1-BB28	0	FD	11/20/2009	140	< 0.105 U	< 0.75 U	418	< 0.185 UJ	0.7	39.4	38.2
UPC1-BB28	8	NORM	11/3/2009	127 J	< 0.105 U	< 0.75 U	557	< 0.185 U	1.1 J+	53.9 J+	41.4
UPC1-BB28	18	NORM	11/3/2009	121 J	< 0.105 U	< 0.75 U	611	< 0.185 U	0.9 J+	49.9 J+	43.2
UPC1-BB31	0	NORM	10/30/2009	187	< 0.105 U	3.8 J+	463 J	< 0.185 U	0.86 J+	43.6 J+	40.7 J+

TABLE B-4
SOIL METALS DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Metals							
				Strontium	Thallium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc
UPC1-BB31	11	NORM	10/30/2009	237	< 0.105 U	3.9 J+	537 J	5.4	1.2 J+	51.2 J+	43.6 J+
UPC1-BB32	0	NORM	10/30/2009	150	< 0.105 U	< 0.75 U	673 J	< 0.185 U	1.1 J+	52 J+	60.7 J+
UPC1-BB32	0	FD	10/30/2009	194	< 0.105 U	< 0.75 U	543 J	< 0.185 U	0.81 J+	46.6 J+	43 J+
UPC1-BB32	10	NORM	10/30/2009	419	< 0.105 U	< 0.75 U	437 J	< 0.185 U	1.3 J+	42.8 J+	42.1 J+
UPC1-BB33	0	NORM	10/29/2009	211	< 0.105 U	< 0.75 U	434 J	< 0.185 U	0.85 J+	41.8 J+	38 J+
UPC1-BB33	10	NORM	10/29/2009	250	< 0.105 U	< 0.75 U	526 J	< 2.6 U	1.6 J+	48.4 J+	42.9 J+
UPC1-JP11	0	NORM	10/28/2009	194	< 0.105 U	< 0.75 U	679	3.7 J-	0.96	58.9	49.1
UPC1-JP11	10	NORM	10/28/2009	421 J	< 0.105 U	< 0.75 U	306	< 0.185 UJ	0.94	38	34.6

All units in mg/kg.

-- = no sample data.

= Data not included in risk asses

TABLE B-5
SOIL ORGANOCHLORINE PESTICIDES DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Organochlorine Pesticides							
				2,4-DDD	2,4-DDE	4,4-DDD	4,4-DDE	4,4-DDT	Aldrin	alpha-BHC	alpha-Chlordane
GNC1-BB16	0	NORM	1/27/2009	< 0.00032 U	< 0.00021 U	< 0.000094 U	0.0026 J+	0.0026	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-BB16	10	NORM	1/27/2009	< 0.00032 U	< 0.00021 U	< 0.000095 U	< 0.0002 U	< 0.00021 U	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-BC16	0	NORM	1/27/2009	< 0.00032 U	< 0.00021 U	< 0.000092 U	< 0.0002 U	< 0.00021 U	< 0.000099 U	< 0.00029 U	< 0.00022 U
GNC1-BC16	10	NORM	1/27/2009	< 0.00033 U	< 0.00022 U	< 0.000097 U	< 0.00021 U	< 0.00022 U	< 0.0001 U	< 0.00031 U	< 0.00023 U
GNC1-BC18	0	NORM	1/27/2009	< 0.00032 U	< 0.00021 U	< 0.000094 U	< 0.0002 U	< 0.00021 U	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-BC18	0	FD	1/27/2009	< 0.00032 U	< 0.00021 U	< 0.000094 U	< 0.0002 U	< 0.00021 U	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-BC18	10	NORM	1/27/2009	< 0.00033 U	< 0.00022 U	< 0.000097 U	< 0.00021 U	< 0.00022 U	< 0.0001 U	< 0.00031 U	< 0.00023 U
GNC1-BC21	0	NORM	1/29/2009	< 0.00031 U	< 0.0002 U	< 0.00009 U	< 0.00019 U	< 0.0002 U	< 0.000096 U	< 0.00029 U	< 0.00021 U
GNC1-BC21	10	NORM	1/29/2009	< 0.00032 U	< 0.00021 U	< 0.000094 U	< 0.0002 U	< 0.00021 U	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-BC22	0	NORM	3/2/2009	< 0.00031 U	0.0027	< 0.000091 U	0.0077	0.0018 J-	< 0.000097 U	< 0.00029 U	< 0.00021 U
GNC1-BC22	11	NORM	3/2/2009	< 0.00032 U	< 0.00021 U	< 0.000093 U	< 0.0002 U	< 0.00021 UJ	< 0.000099 U	< 0.00029 U	< 0.00022 U
GNC1-BC23	0	NORM	2/10/2009	< 0.00032 U	0.0088 J+	< 0.000094 U	0.02 J+	0.0074 J+	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-BC23	10	NORM	2/10/2009	< 0.00032 U	< 0.00021 U	< 0.000093 U	< 0.0002 U	< 0.00021 U	< 0.000099 U	< 0.00029 U	< 0.00022 U
GNC1-BC27	0	NORM	2/4/2009	< 0.00031 U	0.0034 J	< 0.000091 U	0.0043 J	< 0.00021 U	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-BC27	0	FD	2/4/2009	< 0.00031 U	0.014 J	< 0.00009 U	0.017 J	0.005 J	< 0.000096 U	< 0.00029 U	< 0.00021 U
GNC1-BC27	10	NORM	2/4/2009	< 0.00031 U	< 0.00021 U	< 0.000092 U	< 0.0002 U	< 0.00021 U	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-BC28	0	NORM	2/4/2009	< 0.00032 U	0.008	< 0.000092 U	0.011 J+	0.003	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-BC28	11	NORM	2/4/2009	< 0.00031 U	< 0.00021 U	< 0.000091 U	< 0.0002 U	< 0.00021 U	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-BC29	0	NORM	2/4/2009	< 0.00032 U	0.0038 J+	< 0.000092 U	0.0073 J+	0.0026 J	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-BC29	10	NORM	2/4/2009	< 0.00031 U	< 0.00021 U	< 0.000091 U	< 0.0002 U	< 0.00021 U	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-JB02	0	NORM	2/11/2009	< 0.00032 U	< 0.00021 U	< 0.000093 U	< 0.0002 U	< 0.00021 UJ	< 0.000099 U	< 0.00029 U	< 0.00022 U
GNC1-JB02	5	NORM	2/11/2009	< 0.00032 U	< 0.00021 U	< 0.000092 U	< 0.0002 U	< 0.00021 UJ	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-JB02	15	NORM	2/11/2009	< 0.00032 U	< 0.00021 U	< 0.000093 U	< 0.0002 U	< 0.00021 UJ	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-JB03	0	NORM	2/13/2009	< 0.00032 U	0.0057	< 0.000092 U	0.01 J+	0.0061 J	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-JB03	0	FD	2/13/2009	< 0.00032 U	0.0072	< 0.000093 U	0.015 J+	0.0093 J	< 0.000099 U	< 0.00029 U	< 0.00022 U
GNC1-JB03	7	NORM	2/13/2009	< 0.00031 U	< 0.00021 U	< 0.000091 U	< 0.0002 U	< 0.00021 UJ	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-JB03	17	NORM	2/13/2009	< 0.00032 U	< 0.00021 U	< 0.000092 U	< 0.0002 U	< 0.00021 UJ	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-JB06	0	NORM	2/13/2009	0.0042 J+	0.023 J+	0.015 J+	0.055 J	0.045 J	< 0.000099 U	0.0029 J+	< 0.00022 U
GNC1-JB06	6	NORM	2/17/2009	< 0.00032 U	< 0.00021 U	< 0.000093 U	< 0.0002 U	< 0.00021 UJ	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-JB06	16	NORM	2/17/2009	< 0.00032 U	< 0.00021 U	< 0.000095 U	< 0.0002 U	< 0.00022 UJ	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-JB07	0	NORM	2/13/2009	< 0.00032 U	0.0055	< 0.000093 U	0.0065 J+	0.0022 J-	< 0.000099 U	< 0.00029 U	< 0.00022 U
GNC1-JB07	8	NORM	2/13/2009	< 0.00031 U	< 0.00021 U	< 0.000092 U	< 0.0002 U	< 0.00021 UJ	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-JB07	18	NORM	2/13/2009	< 0.00031 U	< 0.0002 U	< 0.000091 U	< 0.0002 U	< 0.00021 UJ	< 0.000097 U	< 0.00029 U	< 0.00021 U
GNC1-JD01	0	NORM	1/27/2009	< 0.00032 U	0.0066 J	< 0.000093 U	0.037 J+	0.025 J	< 0.000099 U	< 0.0003 U	< 0.00022 U
GNC1-JD01	3	NORM	1/27/2009	< 0.00032 U	< 0.00021 U	< 0.000095 U	< 0.0002 U	< 0.00021 U	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-JD01	13	NORM	1/27/2009	< 0.00032 U	< 0.00021 U	< 0.000094 U	0.003 J+	0.0037	< 0.0001 U	< 0.0003 U	< 0.00022 U

TABLE B-5
SOIL ORGANOCHLORINE PESTICIDES DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Organochlorine Pesticides							
				2,4-DDD	2,4-DDE	4,4-DDD	4,4-DDE	4,4-DDT	Aldrin	alpha-BHC	alpha-Chlordane
GNC1-JD02	0	NORM	1/27/2009	< 0.00033 U	< 0.00022 U	< 0.000097 U	0.0025	0.0033	< 0.0001 U	< 0.00031 U	< 0.00023 U
GNC1-JD02	10	NORM	1/27/2009	< 0.00033 U	< 0.00021 U	< 0.000095 U	< 0.00021 U	< 0.00022 U	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-JD06	0	NORM	2/13/2009	< 0.00032 U	0.0049	< 0.000094 U	0.011 J+	0.0038 J-	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-JD06	10	NORM	2/17/2009	< 0.00032 U	< 0.00021 U	< 0.000094 U	< 0.0002 U	< 0.00021 UJ	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-JP02	0	NORM	2/12/2009	0.0048 J+	0.022 J+	< 0.000092 U	0.084 J+	0.033 J	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-JP02	0	FD	2/12/2009	0.0052 J+	0.025 J+	< 0.000092 U	0.092 J+	0.032 J	< 0.000098 U	0.0026 J+	< 0.00022 U
GNC1-JP02	10	NORM	2/12/2009	< 0.00031 U	< 0.0002 U	< 0.000091 U	< 0.0002 U	< 0.00021 UJ	< 0.000097 U	< 0.00029 U	< 0.00021 U
GNC1-JP04	0	NORM	2/10/2009	< 0.00033 U	< 0.00022 UJ	< 0.000097 U	0.0042 J	0.0019 J	< 0.0001 U	< 0.00031 U	< 0.00023 U
GNC1-JP04	0	FD	2/10/2009	< 0.00033 U	0.007 J	< 0.000095 U	0.015 J	0.0045 J	< 0.0001 U	< 0.0003 U	< 0.00022 U
GNC1-JP04	10	NORM	2/10/2009	< 0.00032 U	< 0.00021 U	< 0.000093 U	< 0.0002 U	< 0.00021 U	< 0.000099 U	< 0.00029 U	< 0.00022 U
GNC1-JP05	0	NORM	2/4/2009	0.0017 J	0.015 J+	< 0.00009 U	0.029 J+	0.012 J+	< 0.000097 U	< 0.00029 U	< 0.00021 U
GNC1-JP05	11	NORM	2/4/2009	< 0.00031 U	< 0.00021 U	< 0.000092 U	< 0.0002 U	< 0.00021 U	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-JP06	0	NORM	2/12/2009	< 0.00032 U	0.0027	< 0.000092 U	0.0044	< 0.00021 UJ	< 0.000099 U	< 0.00029 U	< 0.00022 U
GNC1-JP06	0	FD	2/12/2009	< 0.00032 U	0.0026	< 0.000092 U	0.0053	0.0021 J	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-JP06	3	NORM	2/12/2009	< 0.00031 U	< 0.0002 U	< 0.00009 U	< 0.00019 U	< 0.0002 UJ	< 0.000096 U	< 0.00029 U	< 0.00021 U
GNC1-JP06	13	NORM	2/12/2009	< 0.00031 U	< 0.0002 U	< 0.00009 U	< 0.00019 U	< 0.0002 UJ	< 0.000096 U	< 0.00029 U	< 0.00021 U
GNC1-JS08	0	NORM	1/28/2009	< 0.00031 U	< 0.00021 U	< 0.000092 U	< 0.0002 U	< 0.00021 U	< 0.000098 U	< 0.00029 U	< 0.00022 U
GNC1-JS08	10	NORM	1/28/2009	< 0.00032 U	< 0.00021 U	< 0.000093 U	< 0.0002 U	< 0.00021 U	< 0.000099 U	< 0.00029 U	< 0.00022 U
GNC1-JS17	0	NORM	2/4/2009	< 0.00031 U	0.0099 J+	< 0.000091 U	0.019 J+	0.0068 J+	< 0.000097 U	< 0.00029 U	< 0.00021 U
GNC1-JS17	10	NORM	2/4/2009	< 0.00032 U	< 0.00021 U	< 0.000093 U	< 0.0002 U	< 0.00021 U	< 0.000099 U	< 0.00029 U	< 0.00022 U
UPC1-BB28	0	NORM	11/3/2009	< 0.00014 U	0.0038	< 0.00011 U	0.0059	0.0022	< 0.000093 U	< 0.000096 U	< 0.00011 U
UPC1-BB28	0	FD	11/20/2009	< 0.00014 U	< 0.00013 U	< 0.00011 U	0.002	< 0.00025 U	< 0.000092 U	< 0.000095 U	< 0.00011 U
UPC1-BB28	8	NORM	11/3/2009	< 0.00014 U	< 0.00013 U	< 0.00011 U	< 0.00043 U	< 0.00025 U	< 0.000093 U	< 0.000096 U	< 0.00011 U
UPC1-BB28	18	NORM	11/3/2009	< 0.00015 U	< 0.00013 U	< 0.00011 U	< 0.00044 U	< 0.00025 U	< 0.000094 U	< 0.000097 U	< 0.00011 U
UPC1-BB31	0	NORM	10/30/2009	< 0.00014 U	0.003	< 0.00011 U	0.0044	< 0.00025 U	< 0.000092 U	< 0.000095 U	< 0.00011 U
UPC1-BB31	11	NORM	10/30/2009	< 0.00015 U	< 0.00013 U	< 0.00011 U	< 0.00044 U	< 0.00025 U	< 0.000094 U	< 0.000097 U	< 0.00011 U
UPC1-BB32	0	NORM	10/30/2009	< 0.00014 U	< 0.00013 U	< 0.00011 U	< 0.00043 U	< 0.00025 U	< 0.000093 U	< 0.000096 U	< 0.00011 U
UPC1-BB32	0	FD	10/30/2009	< 0.00014 U	< 0.00013 U	< 0.00011 U	< 0.00043 U	< 0.00025 U	< 0.000092 U	< 0.000095 U	< 0.00011 U
UPC1-BB32	10	NORM	10/30/2009	< 0.00015 U	< 0.00013 U	< 0.00011 U	< 0.00044 U	< 0.00025 U	< 0.000094 U	< 0.000097 U	< 0.00011 U
UPC1-BB33	0	NORM	10/29/2009	< 0.00014 U	< 0.00013 U	< 0.00011 U	< 0.00043 U	< 0.00025 U	< 0.000092 U	< 0.000095 U	< 0.00011 U
UPC1-BB33	10	NORM	10/29/2009	< 0.00015 U	< 0.00013 U	< 0.00011 U	< 0.00044 U	< 0.00025 U	< 0.000094 U	< 0.000097 U	< 0.00011 U
UPC1-JP11	0	NORM	10/28/2009	< 0.00014 U	0.0043	< 0.00011 U	0.013	0.0051	< 0.000092 U	< 0.000095 U	< 0.0001 U
UPC1-JP11	10	NORM	10/28/2009	< 0.00015 U	< 0.00013 U	< 0.00012 U	< 0.00044 U	< 0.00025 U	< 0.000095 U	< 0.000098 U	< 0.00011 U

All units in mg/kg.

-- = no sample data.

TABLE B-5
SOIL ORGANOCHLORINE PESTICIDES DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Organochlorine Pesticides							
				beta-BHC	Chlordane	delta-BHC	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin
GNC1-BB16	0	NORM	1/27/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000096 U	< 0.00011 U	< 0.000098 U	< 0.00028 U	< 0.000088 U
GNC1-BB16	10	NORM	1/27/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000097 U	< 0.00011 U	< 0.000099 U	< 0.00028 U	< 0.000088 U
GNC1-BC16	0	NORM	1/27/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000086 U
GNC1-BC16	10	NORM	1/27/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000099 U	< 0.00011 U	< 0.0001 U	< 0.00029 U	< 0.00009 U
GNC1-BC18	0	NORM	1/27/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000096 U	< 0.00011 U	< 0.000098 U	< 0.00028 U	< 0.000088 U
GNC1-BC18	0	FD	1/27/2009	< 0.0002 U	< 0.0024 U	< 0.00018 U	< 0.000096 U	< 0.00011 U	< 0.000098 U	< 0.00028 U	< 0.000087 U
GNC1-BC18	10	NORM	1/27/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000099 U	< 0.00011 U	< 0.0001 U	< 0.00029 U	< 0.000091 U
GNC1-BC21	0	NORM	1/29/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000092 U	< 0.00011 U	< 0.000094 U	< 0.00027 U	< 0.000084 U
GNC1-BC21	10	NORM	1/29/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000097 U	< 0.00011 U	< 0.000099 U	< 0.00028 U	< 0.000088 U
GNC1-BC22	0	NORM	3/2/2009	0.0027	< 0.0024 U	< 0.00017 U	< 0.000093 U	< 0.00011 U	< 0.000095 U	< 0.00027 U	< 0.000085 U
GNC1-BC22	11	NORM	3/2/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000095 U	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000087 U
GNC1-BC23	0	NORM	2/10/2009	0.0049 J+	< 0.0025 U	< 0.00018 U	< 0.000096 U	< 0.00011 U	< 0.000098 U	< 0.00028 U	< 0.000088 U
GNC1-BC23	10	NORM	2/10/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000095 U	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000087 U
GNC1-BC27	0	NORM	2/4/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000093 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000085 U
GNC1-BC27	0	FD	2/4/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000092 U	< 0.00011 U	< 0.000094 U	< 0.00027 U	< 0.000084 U
GNC1-BC27	10	NORM	2/4/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000085 U
GNC1-BC28	0	NORM	2/4/2009	0.0029	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000086 U
GNC1-BC28	11	NORM	2/4/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000085 U
GNC1-BC29	0	NORM	2/4/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000086 U
GNC1-BC29	10	NORM	2/4/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000093 U	< 0.00011 U	< 0.000095 U	< 0.00027 U	< 0.000085 U
GNC1-JB02	0	NORM	2/11/2009	0.002 J	< 0.0024 U	< 0.00017 U	< 0.000095 U	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000087 U
GNC1-JB02	5	NORM	2/11/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000086 U
GNC1-JB02	15	NORM	2/11/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000095 U	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000087 U
GNC1-JB03	0	NORM	2/13/2009	0.004	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000086 U
GNC1-JB03	0	FD	2/13/2009	0.0036	< 0.0024 U	< 0.00017 U	< 0.000095 U	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000087 U
GNC1-JB03	7	NORM	2/13/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000093 U	< 0.00011 U	< 0.000095 U	< 0.00027 U	< 0.000085 U
GNC1-JB03	17	NORM	2/13/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000086 U
GNC1-JB06	0	NORM	2/13/2009	0.0045 J+	< 0.0024 U	< 0.00017 U	< 0.000095 U	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000087 U
GNC1-JB06	6	NORM	2/17/2009	< 0.0002 U	< 0.0024 U	< 0.00018 U	< 0.000095 U	< 0.00011 U	< 0.000098 U	< 0.00027 U	< 0.000087 U
GNC1-JB06	16	NORM	2/17/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000097 U	< 0.00011 U	< 0.000099 U	< 0.00028 U	< 0.000088 U
GNC1-JB07	0	NORM	2/13/2009	0.0032	< 0.0024 U	< 0.00017 U	< 0.000095 U	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000086 U
GNC1-JB07	8	NORM	2/13/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000085 U
GNC1-JB07	18	NORM	2/13/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000093 U	< 0.00011 U	< 0.000095 U	< 0.00027 U	< 0.000085 U
GNC1-JD01	0	NORM	1/27/2009	0.0034 J+	< 0.0024 U	< 0.00017 U	0.0025 J	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000087 U
GNC1-JD01	3	NORM	1/27/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000097 U	< 0.00011 U	< 0.000099 U	< 0.00028 U	< 0.000088 U
GNC1-JD01	13	NORM	1/27/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000096 U	< 0.00011 U	< 0.000099 U	< 0.00028 U	< 0.000088 U

TABLE B-5
SOIL ORGANOCHLORINE PESTICIDES DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Organochlorine Pesticides							
				beta-BHC	Chlordane	delta-BHC	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin
GNC1-JD02	0	NORM	1/27/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000099 U	< 0.00011 U	< 0.0001 U	< 0.00029 U	< 0.000091 U
GNC1-JD02	10	NORM	1/27/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000097 U	< 0.00011 U	< 0.000099 U	< 0.00028 U	< 0.000089 U
GNC1-JD06	0	NORM	2/13/2009	0.0024	< 0.0025 U	< 0.00018 U	< 0.000096 U	< 0.00011 U	< 0.000098 U	< 0.00028 U	< 0.000088 U
GNC1-JD06	10	NORM	2/17/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000096 U	< 0.00011 U	< 0.000098 U	< 0.00028 U	< 0.000088 U
GNC1-JP02	0	NORM	2/12/2009	0.0066 J+	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000086 U
GNC1-JP02	0	FD	2/12/2009	0.0051 J+	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000086 U
GNC1-JP02	10	NORM	2/12/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000093 U	< 0.00011 U	< 0.000095 U	< 0.00027 U	< 0.000085 U
GNC1-JP04	0	NORM	2/10/2009	< 0.0002 U	< 0.0025 U	< 0.00018 U	< 0.000099 U	< 0.00011 U	< 0.0001 U	< 0.00029 U	< 0.00009 U
GNC1-JP04	0	FD	2/10/2009	0.0028 J+	< 0.0025 U	< 0.00018 U	< 0.000097 U	< 0.00011 U	< 0.000099 U	< 0.00028 U	< 0.000088 U
GNC1-JP04	10	NORM	2/10/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000095 U	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000086 U
GNC1-JP05	0	NORM	2/4/2009	0.0037 J+	< 0.0024 U	< 0.00017 U	< 0.000092 U	< 0.00011 U	< 0.000095 U	< 0.00027 U	< 0.000084 U
GNC1-JP05	11	NORM	2/4/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000086 U
GNC1-JP06	0	NORM	2/12/2009	0.011	< 0.0024 U	< 0.00017 U	< 0.000095 U	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000086 U
GNC1-JP06	0	FD	2/12/2009	0.017	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000086 U
GNC1-JP06	3	NORM	2/12/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000092 U	< 0.00011 U	< 0.000094 U	< 0.00027 U	< 0.000084 U
GNC1-JP06	13	NORM	2/12/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000092 U	< 0.00011 U	< 0.000094 U	< 0.00027 U	< 0.000084 U
GNC1-JS08	0	NORM	1/28/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000094 U	< 0.00011 U	< 0.000096 U	< 0.00027 U	< 0.000086 U
GNC1-JS08	10	NORM	1/28/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000095 U	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000087 U
GNC1-JS17	0	NORM	2/4/2009	0.0081 J+	< 0.0024 U	< 0.00017 U	< 0.000093 U	< 0.00011 U	< 0.000095 U	< 0.00027 U	< 0.000085 U
GNC1-JS17	10	NORM	2/4/2009	< 0.00019 U	< 0.0024 U	< 0.00017 U	< 0.000095 U	< 0.00011 U	< 0.000097 U	< 0.00027 U	< 0.000086 U
UPC1-BB28	0	NORM	11/3/2009	0.0067	< 0.0015 U	< 0.00011 U	< 0.000098 U	< 0.000097 U	< 0.00012 U	< 0.00014 U	< 0.00011 U
UPC1-BB28	0	FD	11/20/2009	0.013	< 0.0015 U	< 0.00011 U	< 0.000097 U	< 0.000096 U	< 0.00012 U	< 0.00013 U	< 0.00011 U
UPC1-BB28	8	NORM	11/3/2009	< 0.00013 U	< 0.0015 U	< 0.00011 U	< 0.000098 U	< 0.000097 U	< 0.00012 U	< 0.00014 U	< 0.00011 U
UPC1-BB28	18	NORM	11/3/2009	< 0.00013 U	< 0.0015 U	< 0.00011 U	< 0.000099 U	< 0.000098 U	< 0.00012 U	< 0.00014 U	< 0.00011 U
UPC1-BB31	0	NORM	10/30/2009	< 0.00013 U	< 0.0015 U	< 0.00011 U	< 0.000097 U	< 0.000096 U	< 0.00012 U	< 0.00014 U	< 0.00011 U
UPC1-BB31	11	NORM	10/30/2009	< 0.00013 U	< 0.0015 U	< 0.00011 U	< 0.000099 U	< 0.000098 U	< 0.00012 U	< 0.00014 U	< 0.00011 U
UPC1-BB32	0	NORM	10/30/2009	< 0.00013 U	< 0.0015 U	< 0.00011 U	< 0.000098 U	< 0.000097 U	< 0.00012 U	< 0.00014 U	< 0.00011 U
UPC1-BB32	0	FD	10/30/2009	< 0.00013 U	< 0.0015 U	< 0.00011 U	< 0.000097 U	< 0.000096 U	< 0.00012 U	< 0.00013 U	< 0.00011 U
UPC1-BB32	10	NORM	10/30/2009	< 0.00013 U	< 0.0015 U	< 0.00011 U	< 0.000099 U	< 0.000098 U	< 0.00012 U	< 0.00014 U	< 0.00011 U
UPC1-BB33	0	NORM	10/29/2009	< 0.00013 U	< 0.0015 U	< 0.00011 U	< 0.000097 U	< 0.000096 U	< 0.00012 U	< 0.00014 U	< 0.00011 U
UPC1-BB33	10	NORM	10/29/2009	< 0.00013 U	< 0.0015 U	< 0.00011 U	< 0.000099 U	< 0.000098 U	< 0.00012 U	< 0.00014 U	< 0.00011 U
UPC1-JP11	0	NORM	10/28/2009	0.0033	< 0.0015 U	< 0.00011 U	< 0.000097 U	< 0.000096 U	< 0.00011 U	< 0.00013 U	< 0.00011 U
UPC1-JP11	10	NORM	10/28/2009	< 0.00013 U	< 0.0015 U	< 0.00011 U	< 0.0001 U	< 0.000099 U	< 0.00012 U	< 0.00014 U	< 0.00011 U

All units in mg/kg.
-- = no sample data.

TABLE B-5
SOIL ORGANOCHLORINE PESTICIDES DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Organochlorine Pesticides							
				Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	Toxaphene
GNC1-BB16	0	NORM	1/27/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000088 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.0061 U
GNC1-BB16	10	NORM	1/27/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000088 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.0062 U
GNC1-BC16	0	NORM	1/27/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.006 U
GNC1-BC16	10	NORM	1/27/2009	< 0.0002 U	< 0.00018 U	< 0.00013 U	< 0.00009 U	< 0.00019 U	< 0.00014 U	< 0.00034 U	< 0.0063 U
GNC1-BC18	0	NORM	1/27/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000088 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.0061 U
GNC1-BC18	0	FD	1/27/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000087 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.0061 U
GNC1-BC18	10	NORM	1/27/2009	< 0.0002 U	< 0.00018 U	< 0.00013 U	< 0.000091 U	< 0.00019 U	< 0.00014 U	< 0.00034 U	< 0.0063 U
GNC1-BC21	0	NORM	1/29/2009	< 0.00018 U	< 0.00017 U	< 0.00012 U	< 0.000084 U	< 0.00017 U	< 0.00013 U	< 0.00032 U	< 0.0059 U
GNC1-BC21	10	NORM	1/29/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000088 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.0062 U
GNC1-BC22	0	NORM	3/2/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000085 U	< 0.00018 U	< 0.00013 U	< 0.00032 U	< 0.0059 U
GNC1-BC22	11	NORM	3/2/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000087 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.0061 U
GNC1-BC23	0	NORM	2/10/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000088 U	< 0.00018 UJ	< 0.00014 U	< 0.00033 U	< 0.0061 UJ
GNC1-BC23	10	NORM	2/10/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000087 U	< 0.00018 UJ	< 0.00014 U	< 0.00033 U	< 0.006 UJ
GNC1-BC27	0	NORM	2/4/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000085 U	< 0.00018 U	< 0.00013 U	< 0.00032 U	< 0.006 U
GNC1-BC27	0	FD	2/4/2009	< 0.00018 U	< 0.00017 U	< 0.00012 U	< 0.000084 U	< 0.00017 U	< 0.00013 U	< 0.00032 U	< 0.0059 U
GNC1-BC27	10	NORM	2/4/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000085 U	< 0.00018 U	< 0.00013 U	< 0.00032 U	< 0.006 U
GNC1-BC28	0	NORM	2/4/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.006 U
GNC1-BC28	11	NORM	2/4/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000085 U	< 0.00018 U	< 0.00013 U	< 0.00032 U	< 0.006 U
GNC1-BC29	0	NORM	2/4/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.006 U
GNC1-BC29	10	NORM	2/4/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000085 U	< 0.00018 U	< 0.00013 U	< 0.00032 U	< 0.006 U
GNC1-JB02	0	NORM	2/11/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000087 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.0061 U
GNC1-JB02	5	NORM	2/11/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.006 U
GNC1-JB02	15	NORM	2/11/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000087 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.0061 U
GNC1-JB03	0	NORM	2/13/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.006 U
GNC1-JB03	0	FD	2/13/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000087 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.0061 U
GNC1-JB03	7	NORM	2/13/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000085 U	< 0.00018 U	< 0.00013 U	< 0.00032 UJ	< 0.006 U
GNC1-JB03	17	NORM	2/13/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.006 U
GNC1-JB06	0	NORM	2/13/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000087 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.0061 U
GNC1-JB06	6	NORM	2/17/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000087 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.0061 U
GNC1-JB06	16	NORM	2/17/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000088 U	< 0.00018 U	< 0.00014 U	< 0.00034 UJ	< 0.0062 U
GNC1-JB07	0	NORM	2/13/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.006 U
GNC1-JB07	8	NORM	2/13/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000085 U	< 0.00018 U	< 0.00013 U	< 0.00032 UJ	< 0.006 U
GNC1-JB07	18	NORM	2/13/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000085 U	< 0.00018 U	< 0.00013 U	< 0.00032 UJ	< 0.0059 U
GNC1-JD01	0	NORM	1/27/2009	0.0022 J	< 0.00017 U	< 0.00013 U	0.002 J	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.0061 U
GNC1-JD01	3	NORM	1/27/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000088 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.0062 U
GNC1-JD01	13	NORM	1/27/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000088 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.0061 U

TABLE B-5
SOIL ORGANOCHLORINE PESTICIDES DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Organochlorine Pesticides							
Sample ID	**Depth (ft bgs)**	**Sample Type**	**Sample Date**	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	Toxaphene
GNC1-JD02	0	NORM	1/27/2009	< 0.0002 U	< 0.00018 U	< 0.00013 U	< 0.000091 U	< 0.00019 U	< 0.00014 U	< 0.00034 U	< 0.0063 U
GNC1-JD02	10	NORM	1/27/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000089 U	< 0.00018 U	< 0.00014 U	< 0.00034 U	< 0.0062 U
GNC1-JD06	0	NORM	2/13/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000088 U	< 0.00018 U	< 0.00014 U	0.0044 J-	< 0.0061 U
GNC1-JD06	10	NORM	2/17/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000088 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.0061 U
GNC1-JP02	0	NORM	2/12/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	0.0038 J	< 0.006 U
GNC1-JP02	0	FD	2/12/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.006 U
GNC1-JP02	10	NORM	2/12/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000085 U	< 0.00018 U	< 0.00013 U	< 0.00032 UJ	< 0.0059 U
GNC1-JP04	0	NORM	2/10/2009	< 0.00019 U	< 0.00018 U	< 0.00013 U	< 0.00009 U	< 0.00019 UJ	< 0.00014 U	< 0.00034 U	< 0.0063 UJ
GNC1-JP04	0	FD	2/10/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000088 U	< 0.00018 UJ	< 0.00014 U	< 0.00034 U	< 0.0062 UJ
GNC1-JP04	10	NORM	2/10/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 UJ	< 0.00014 U	< 0.00033 U	< 0.006 UJ
GNC1-JP05	0	NORM	2/4/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000084 U	< 0.00017 U	< 0.00013 U	< 0.00032 U	< 0.0059 U
GNC1-JP05	11	NORM	2/4/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.006 U
GNC1-JP06	0	NORM	2/12/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	0.0038 J	< 0.006 U
GNC1-JP06	0	FD	2/12/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.006 U
GNC1-JP06	3	NORM	2/12/2009	< 0.00018 U	< 0.00017 U	< 0.00012 U	< 0.000084 U	< 0.00017 U	< 0.00013 U	< 0.00032 UJ	< 0.0059 U
GNC1-JP06	13	NORM	2/12/2009	< 0.00018 U	< 0.00017 U	< 0.00012 U	< 0.000084 U	< 0.00017 U	< 0.00013 U	< 0.00032 UJ	< 0.0059 U
GNC1-JS08	0	NORM	1/28/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00013 U	< 0.00032 U	< 0.006 U
GNC1-JS08	10	NORM	1/28/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000087 U	< 0.00018 U	< 0.00014 U	< 0.00033 UJ	< 0.006 U
GNC1-JS17	0	NORM	2/4/2009	< 0.00018 U	< 0.00017 U	< 0.00013 U	< 0.000085 U	< 0.00018 U	< 0.00013 U	< 0.00032 U	< 0.0059 U
GNC1-JS17	10	NORM	2/4/2009	< 0.00019 U	< 0.00017 U	< 0.00013 U	< 0.000086 U	< 0.00018 U	< 0.00014 U	< 0.00033 U	< 0.006 U
UPC1-BB28	0	NORM	11/3/2009	< 0.00016 U	< 0.00014 U	< 0.00011 U	< 0.000089 U	< 0.000097 U	< 0.00012 U	< 0.00034 U	< 0.0057 U
UPC1-BB28	0	FD	11/20/2009	< 0.00015 U	< 0.00013 U	< 0.00011 U	< 0.000088 U	< 0.000096 U	< 0.00012 U	< 0.00034 U	< 0.0057 U
UPC1-BB28	8	NORM	11/3/2009	< 0.00016 U	< 0.00013 U	< 0.00011 U	< 0.000089 U	< 0.000097 U	< 0.00012 U	< 0.00034 U	< 0.0057 U
UPC1-BB28	18	NORM	11/3/2009	< 0.00016 U	< 0.00014 U	< 0.00011 U	< 0.00009 U	< 0.000098 U	< 0.00012 U	< 0.00034 U	< 0.0058 U
UPC1-BB31	0	NORM	10/30/2009	< 0.00016 U	< 0.00013 U	< 0.00011 U	< 0.000088 U	< 0.000096 U	< 0.00012 U	< 0.00034 U	< 0.0057 U
UPC1-BB31	11	NORM	10/30/2009	< 0.00016 U	< 0.00014 U	< 0.00011 U	< 0.00009 U	< 0.000098 U	< 0.00012 U	< 0.00034 U	< 0.0058 U
UPC1-BB32	0	NORM	10/30/2009	< 0.00016 U	< 0.00013 U	< 0.00011 U	< 0.000089 U	< 0.000097 U	< 0.00012 U	< 0.00034 U	< 0.0057 U
UPC1-BB32	0	FD	10/30/2009	< 0.00016 U	< 0.00013 U	< 0.00011 U	< 0.000088 U	< 0.000096 U	< 0.00012 U	< 0.00034 U	< 0.0057 U
UPC1-BB32	10	NORM	10/30/2009	< 0.00016 U	< 0.00014 U	< 0.00011 U	< 0.00009 U	< 0.000098 U	< 0.00012 U	< 0.00034 U	< 0.0058 U
UPC1-BB33	0	NORM	10/29/2009	< 0.00016 U	< 0.00013 U	< 0.00011 U	< 0.000088 U	< 0.000096 U	< 0.00012 U	< 0.00034 U	< 0.0057 U
UPC1-BB33	10	NORM	10/29/2009	< 0.00016 U	< 0.00014 U	< 0.00011 U	< 0.00009 U	< 0.000098 U	< 0.00012 U	< 0.00034 U	< 0.0058 U
UPC1-JP11	0	NORM	10/28/2009	< 0.00015 U	< 0.00013 U	< 0.0001 U	< 0.000088 U	< 0.000096 U	< 0.00012 U	< 0.00034 U	< 0.0057 U
UPC1-JP11	10	NORM	10/28/2009	< 0.00016 U	< 0.00014 U	< 0.00011 U	< 0.00009 U	< 0.000099 U	< 0.00012 U	< 0.00035 U	< 0.0058 U

All units in mg/kg.
-- = no sample data.

TABLE B-6
SOIL POLYNUCLEAR AROMATIC HYDROCARBONS (PAHs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Polynuclear Aromatic Hydrocarbons (PAHs)												
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
GNC1-BB16	0	NORM	1/27/2009	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U
GNC1-BB16	10	NORM	1/27/2009	< 0.0018 U	< 0.0018 U	< 0.0018 U	0.00186 J	< 0.0018 U	0.0019 J	< 0.0018 U	< 0.0018 U	< 0.0018 U	0.0023 J	0.0018 J	< 0.0018 U	< 0.0018 U
GNC1-BC16	0	NORM	1/27/2009	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	0.00181 J	0.0018 J	0.00181 J	< 0.00174 U	< 0.00174 U	0.00184 J	< 0.00174 U	< 0.00174 U	< 0.00174 U
GNC1-BC16	10	NORM	1/27/2009	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U
GNC1-BC18	0	NORM	1/27/2009	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U
GNC1-BC18	0	FD	1/27/2009	< 0.00182 U	< 0.00182 U	< 0.00182 U	< 0.00182 U	0.00199 J	0.00239 J	0.00192 J	< 0.00182 U	< 0.00182 U	< 0.00182 U	0.00198 J	< 0.00182 U	< 0.00182 U
GNC1-BC18	10	NORM	1/27/2009	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U
GNC1-BC21	0	NORM	1/29/2009	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U
GNC1-BC21	10	NORM	1/29/2009	< 0.00177 U	< 0.00177 U	< 0.00177 U	< 0.00177 U	< 0.00177 U	< 0.00177 U	< 0.00177 U	< 0.00177 U	< 0.00177 U	< 0.00177 U	< 0.00177 U	< 0.00177 U	< 0.00177 U
GNC1-BC22	0	NORM	3/2/2009	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U
GNC1-BC22	11	NORM	3/2/2009	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U
GNC1-BC23	0	NORM	2/10/2009	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U
GNC1-BC23	10	NORM	2/10/2009	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U
GNC1-BC27	0	NORM	2/4/2009	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U
GNC1-BC27	0	FD	2/4/2009	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U
GNC1-BC27	10	NORM	2/4/2009	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U
GNC1-BC28	0	NORM	2/4/2009	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U
GNC1-BC28	11	NORM	2/4/2009	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U
GNC1-BC29	0	NORM	2/4/2009	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	0.00822	0.00597 J	0.00973	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	0.00247 J
GNC1-BC29	10	NORM	2/4/2009	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	0.0021 J	0.00236 J	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	0.00676 J
GNC1-JB02	0	NORM	2/11/2009	< 0.00175 U	< 0.00175 U	0.00451 J	< 0.00175 U	0.00581 J	0.00597 J	0.0051 J	0.00548 J	0.00585 J	0.00551 J	0.00484 J	0.00545 J	0.00536 J
GNC1-JB02	5	NORM	2/11/2009	< 0.00171 U	< 0.00171 U	0.00177 J	< 0.00171 U	0.00212 J	0.00208 J	0.00221 J	0.00222 J	0.00193 J	0.00245 J	0.00183 J	0.00191 J	0.00217 J
GNC1-JB02	15	NORM	2/11/2009	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	0.00198 J	0.00203 J	< 0.00174 U	0.00204 J	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	0.00181 J
GNC1-JB03	0	NORM	2/13/2009	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	0.0175	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U
GNC1-JB03	0	FD	2/13/2009	< 0.00175 U	< 0.00175 U	< 0.00175 U	0.00208 J	0.00213 J	0.0198	0.00274 J	< 0.00175 U	0.00297 J	< 0.00175 U	0.00179 J	< 0.00175 U	0.00344 J
GNC1-JB03	7	NORM	2/13/2009	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U
GNC1-JB03	17	NORM	2/13/2009	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U
GNC1-JB06	0	NORM	2/13/2009	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	0.00218 J
GNC1-JB06	6	NORM	2/17/2009	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	0.0165	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U
GNC1-JB06	16	NORM	2/17/2009	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U	< 0.00174 U
GNC1-JB07	0	NORM	2/13/2009	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U
GNC1-JB07	8	NORM	2/13/2009	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U
GNC1-JB07	18	NORM	2/13/2009	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U
GNC1-JD01	0	NORM	1/27/2009	< 0.00177 U	< 0.00177 U	< 0.00177 U	0.00371 J	0.00468 J	0.00708	0.00465 J	0.00401 J	0.00523 J	0.00971	0.0054 J	0.00276 J	0.00615 J
GNC1-JD01	3	NORM	1/27/2009	< 0.00176 U	< 0.00176 U	0.0022 J	0.00664 J	0.00576 J	0.00698 J	0.00377 J	0.00493 J	0.00691 J	0.00309 J	0.0043 J	0.00554 J	0.0095
GNC1-JD01	13	NORM	1/27/2009	< 0.00175 U	< 0.00175 U	0.00207 J	0.00282 J	0.00267 J	0.00307 J	0.00217 J	0.00237 J	0.00262 J	0.00204 J	0.00223 J	0.00253 J	0.00496 J

TABLE B-6
SOIL POLYNUCLEAR AROMATIC HYDROCARBONS (PAHs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Polynuclear Aromatic Hydrocarbons (PAHs)												
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
GNC1-JD02	0	NORM	1/27/2009	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	0.00192 J	0.00212 J	< 0.00178 U	< 0.00178 U	0.00196 J	0.00185 J	< 0.00178 U	< 0.00178 U
GNC1-JD02	10	NORM	1/27/2009	< 0.0018 U	< 0.0018 U	< 0.0018 U	0.00191 J	0.00195 J	0.002 J	0.00191 J	0.00194 J	0.00189 J	0.00238 J	0.00214 J	< 0.0018 U	0.00189 J
GNC1-JD06	0	NORM	2/13/2009	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	0.00231 J	0.02	0.00236 J	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	0.00322 J
GNC1-JD06	10	NORM	2/17/2009	< 0.00179 U	< 0.00179 U	< 0.00179 U	< 0.00179 U	< 0.00179 U	0.0174	0.00371 J	< 0.00179 U	< 0.00179 U	< 0.00179 U	< 0.00179 U	< 0.00179 U	0.00209 J
GNC1-JP02	0	NORM	2/12/2009	< 0.00177 U	< 0.00177 U	< 0.00177 U	0.00309 J	0.00315 J	0.0216	0.00378 J	< 0.00177 U	0.00396 J	0.0174	0.00259 J	0.00215 J	0.00504 J
GNC1-JP02	0	FD	2/12/2009	< 0.00176 U	< 0.00176 U	< 0.00176 U	0.00457 J	0.00183 J	0.0189	< 0.00176 U	< 0.00176 U	< 0.00176 U	0.0167	< 0.00176 U	< 0.00176 U	0.00322 J
GNC1-JP02	10	NORM	2/12/2009	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U
GNC1-JP04	0	NORM	2/10/2009	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U
GNC1-JP04	0	FD	2/10/2009	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	0.00223	0.00542	0.00191	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	0.0039
GNC1-JP04	10	NORM	2/10/2009	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U
GNC1-JP05	0	NORM	2/4/2009	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	0.00325 J	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	0.00218 J
GNC1-JP05	11	NORM	2/4/2009	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U
GNC1-JP06	0	NORM	2/12/2009	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	0.0176	< 0.00176 U	< 0.00176 U	< 0.00176 U	0.0167	< 0.00176 U	< 0.00176 U	< 0.00176 U
GNC1-JP06	0	FD	2/12/2009	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	< 0.00178 U	0.0185	< 0.00178 U	< 0.00178 U	< 0.00178 U	0.0171	< 0.00178 U	< 0.00178 U	0.00234 J
GNC1-JP06	3	NORM	2/12/2009	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U
GNC1-JP06	13	NORM	2/12/2009	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U
GNC1-JS08	0	NORM	1/28/2009	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	0.00227 J	0.00193 J	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U
GNC1-JS08	10	NORM	1/28/2009	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U	< 0.00175 U
GNC1-JS17	0	NORM	2/4/2009	< 0.00169 U	< 0.00169 U	< 0.00169 U	< 0.00169 U	< 0.00169 U	0.00386 J	< 0.00169 U	< 0.00169 U	0.00188 J	< 0.00169 U	< 0.00169 U	< 0.00169 U	0.00296 J
GNC1-JS17	10	NORM	2/4/2009	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U
UPC1-BB28	0	NORM	11/3/2009	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U
UPC1-BB28	0	FD	11/20/2009	< 0.00168 U	< 0.00168 U	< 0.00168 U	< 0.00168 U	< 0.00168 U	< 0.00168 U	< 0.00168 U	< 0.00168 U	< 0.00168 U	< 0.00168 U	< 0.00168 U	< 0.00168 U	< 0.00168 U
UPC1-BB28	8	NORM	11/3/2009	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U
UPC1-BB28	18	NORM	11/3/2009	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U
UPC1-BB31	0	NORM	10/30/2009	< 0.00169 U	< 0.00169 U	< 0.00169 U	< 0.00169 U	< 0.00169 U	< 0.00169 U	< 0.00169 U	< 0.00169 U	< 0.00169 U	< 0.00169 U	< 0.00169 U	< 0.00169 U	< 0.00169 U
UPC1-BB31	11	NORM	10/30/2009	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U	< 0.00171 U
UPC1-BB32	0	NORM	10/30/2009	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U
UPC1-BB32	0	FD	10/30/2009	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U	< 0.0017 U
UPC1-BB32	10	NORM	10/30/2009	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U	< 0.00173 U
UPC1-BB33	0	NORM	10/29/2009	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U
UPC1-BB33	10	NORM	10/29/2009	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U	< 0.00172 U
UPC1-JP11	0	NORM	10/28/2009	< 0.00168 U	< 0.00168 U	< 0.00168 U	< 0.00168 U	0.00187 J	0.00394 J	< 0.00168 U	< 0.00168 U	0.00182 J	< 0.00168 U	< 0.00168 U	< 0.00168 U	0.00276 J
UPC1-JP11	10	NORM	10/28/2009	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U	< 0.00176 U

All units in mg/kg.

-- = no sample data.

TABLE B-7
SOIL POLYCHLORINATED BIPHENYLS (PCBs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Polychlorinated Biphenyls (PCBs)												
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	PCB 105	PCB 114	PCB 118	PCB 123	PCB 126	PCB 156	PCB 157	PCB 167	PCB 169	PCB 189	PCB 209	PCB 77	PCB 81
GNC1-BB16	0	NORM	1/27/2009	62	6.7	120	< 2.1 U	12	25	5.5	13	< 2.1 U	9.4	1200	< 2.1 U	< 2.1 U
GNC1-BC16	0	NORM	1/27/2009	200	9.3	360	< 2.1 U	21	130	26	41	< 2.1 U	26	640	< 2.1 U	< 2.1 U
GNC1-BC18	0	NORM	1/27/2009	28 J	6.1 J	63 J	< 2.1 U	< 2.1 U	9.5 J	< 2.1 U	4	< 2.1 U	2.2	460 J	< 2.1 U	< 2.1 U
GNC1-BC18	0	FD	1/27/2009	14 J	2.6 J	28 J	< 2.1 U	< 2.1 U	4.5 J	< 2.1 U	< 2.1 U	< 2.1 U	< 2.1 U	210 J	< 2.1 U	< 2.1 U
GNC1-BC21	0	NORM	1/29/2009	8.7	2.2	20	< 2 U	< 2 U	2.8	< 2 U	< 2 U	< 2 U	< 2 U	440	< 2 U	< 2 U
GNC1-BC22	0	NORM	3/2/2009	55	8.1	120	< 2 U	3	17	3.8	6.5	< 2 U	4.9	2500 J	< 2 U	< 2 U
GNC1-BC23	0	NORM	2/10/2009	340	71	770	< 2.1 U	22	120	30	63	5.8	40	19000 J	< 2.1 U	< 2.1 U
GNC1-BC27	0	NORM	2/4/2009	46 J	34 J	110 J	< 2.1 U	< 2.1 U	16 J	3.4	6.8 J	< 2.1 U	2.5	590 J	< 2.1 U	< 2.1 U
GNC1-BC27	0	FD	2/4/2009	24 J	20 J	54 J	< 2 U	< 2 U	8 J	< 2 U	3.5 J	< 2 U	< 2 U	180 J	< 2 U	< 2 U
GNC1-BC28	0	NORM	2/4/2009	310	200	660	< 2.1 U	13	110	21	46	2.7	22	4400 J	< 2.1 U	< 2.1 U
GNC1-BC29	0	NORM	2/4/2009	40	20	80	< 2.1 U	2.1	14	3.3	7	< 2.1 U	5.7	1700	< 2.1 U	< 2.1 U
GNC1-JB02	0	NORM	2/11/2009	< 6.3 U	< 2.1 U	< 14 U	< 2.1 U	< 2.1 U	< 2.1 U	< 2.1 U	< 2.1 U	< 2.1 U	< 2.1 U	380	< 2.1 U	< 2.1 U
GNC1-JB03	0	NORM	2/13/2009	130	62	280	< 2.1 U	8.8 J	40	8.7	18	2.6	14 J	3500 J	< 2.1 U	< 2.1 U
GNC1-JB03	0	FD	2/13/2009	110	42	260	< 2.1 U	4.8 J	38	8.2	15	< 2.1 U	9.6 J	2100	< 2.1 U	< 2.1 U
GNC1-JB06	0	NORM	2/13/2009	86	29	190	< 2.1 U	5.2	32	6.9	14	< 2.1 U	12	2800 J	< 2.1 U	< 2.1 U
GNC1-JB07	0	NORM	2/13/2009	20	17	43	< 2.1 U	< 2.1 U	6.3	< 2.1 U	< 2.1 U	< 2.1 U	< 2.1 U	200	< 2.1 U	< 2.1 U
GNC1-JD01	0	NORM	1/27/2009	980	55	1900	< 2.1 U	43	510	98	190	3	85	8100 J	< 2.1 U	< 2.1 U
GNC1-JD02	0	NORM	1/27/2009	55	< 2.2 U	79	< 2.2 U	4.1	30	7.5	12	< 2.2 U	8.4	1700	< 2.2 U	< 2.2 U
GNC1-JD06	0	NORM	2/13/2009	710	43	1100	< 2.1 U	17	130	32	54	2.3 J	19	6200 J	< 2.1 U	< 2.1 U
GNC1-JP02	0	NORM	2/12/2009	150 J	38 J	340 J	< 2.1 U	15 J	< 50 UJ	13 J	29 J	5.5	40	11000	< 2.1 U	< 2.1 U
GNC1-JP02	0	FD	2/12/2009	380 J	67 J	850 J	< 2.1 U	26 J	140 J	33 J	60 J	8.1 J	58	14000	< 2.1 U	< 2.1 U
GNC1-JP04	0	NORM	2/10/2009	160	41	330	< 2.2 U	8.2	54	16	24	< 2.2 U	13	7500 J	< 2.2 U	< 2.2 U
GNC1-JP04	0	FD	2/10/2009	200	33	410	< 2.1 U	9.7	77	20	33	2.6	18	11000 J	< 2.1 U	< 2.1 U
GNC1-JP05	0	NORM	2/4/2009	240	100	540	< 2 U	16	94	21	47	6.6	50	12000 J	< 2 U	< 2 U
GNC1-JP06	0	NORM	2/12/2009	< 48 U	23	< 100 U	< 2.1 U	3.5	< 15 U	3.2	< 6.2 U	< 2.1 U	< 6 U	1400	< 2.1 U	< 2.1 U
GNC1-JP06	0	FD	2/12/2009	< 63 U	33	< 140 U	< 2.1 U	4.8	< 19 U	4	< 8 U	< 2.1 U	< 7.7 U	1500	< 2.1 U	< 2.1 U
GNC1-JS08	0	NORM	1/28/2009	670	32	1000	< 2.1 U	14	94	24	38	< 2.1 U	12	5800 J	< 2.1 U	< 2.1 U
GNC1-JS17	0	NORM	2/4/2009	260	130	570	< 2 U	13	100	22	55	3.2	34	8300 J	< 2 U	< 2 U
GNC2-BC23C	0	NORM	1/7/2010	6.9	< 2 U	15	< 2 U	< 2 U	2.3	< 2 U	< 2 U	< 2 U	< 2 U	420	< 2 U	< 2 U
GNC2-BC28C	0	NORM	1/6/2010	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	26	< 2 U	< 2 U
GNC2-JB03C	0	NORM	1/7/2010	< 2 U	< 2 U	< 2 U	2.4	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	60	< 2 U	< 2 U
GNC2-JB03C	0	FD	1/7/2010	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	44	< 2 U	< 2 U
GNC2-JP02C	0	NORM	1/7/2010	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	41	< 2 U	< 2 U
GNC2-JP04C	0	NORM	1/7/2010	< 2 U	< 2 U	2.4	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	71	< 2 U	< 2 U
GNC2-JP05C	0	NORM	1/6/2010	< 2 U	< 2 U	3.2	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	44	< 2 U	< 2 U
GNC2-JP05NE	0	NORM	1/6/2010	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U

TABLE B-7
SOIL POLYCHLORINATED BIPHENYLS (PCBs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

							Polychlorinated Biphenyls (PCBs)									
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	PCB 105	PCB 114	PCB 118	PCB 123	PCB 126	PCB 156	PCB 157	PCB 167	PCB 169	PCB 189	PCB 209	PCB 77	PCB 81
GNC2-JP05NW	0	NORM	1/6/2010	< 2.2 U	< 2.2 U	< 2.2 U	< 2.2 U	< 2.2 U	< 2.2 U	< 2.2 U	< 2.2 U	< 2.2 U	< 2.2 U	42	< 2.2 U	< 2.2 U
GNC2-JP05SE	0	NORM	1/6/2010	5.2	< 2 U	13	< 2 U	< 2 U	2.3	< 2 U	< 2 U	< 2 U	< 2 U	140	< 2 U	< 2 U
GNC2-JP05SW	0	NORM	1/6/2010	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
GNC2-JS17C	0	NORM	1/6/2010	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
UPC1-BB28	0	NORM	11/3/2009	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	2.1	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
UPC1-BB28	0	FD	11/20/2009	28	23	72	< 2 U	3.1	12	3	6.4	< 2 U	6.2	1300 J	< 2 U	< 2 U
UPC1-BB31	0	NORM	10/30/2009	9.2	5.8	21	< 2 U	< 2 U	2.9	< 2 U	< 2 U	< 2 U	< 2 U	250	< 2 U	< 2 U
UPC1-BB32	0	NORM	10/30/2009	< 2 UJ	< 2 UJ	< 2 UJ	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 UJ	< 2 U	< 2 U
UPC1-BB32	0	FD	10/30/2009	10 J	12 J	22 J	< 2 U	< 2 U	3.2	< 2 U	< 2 U	< 2 U	< 2 U	140 J	< 2 U	< 2 U
UPC1-BB33	0	NORM	10/29/2009	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	22	< 2 U	< 2 U
UPC1-JP11	0	NORM	10/28/2009	29	7.1	65	< 2 U	2.4	10	2.6	6.2	< 2 U	5.3	2100 J	< 2 U	< 2 U

All units in pg/g.

-- = no sample data.

(grey box) = Data not included in risk assessment. Sample location excavated and data replaced with post-excavation data.

TABLE B-8
SOIL RADIONUCLIDES DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Radionuclides							
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Radium-226	Radium-228	Thorium-228	Thorium-230	Thorium-232	Uranium-233/234	Uranium-235/236	Uranium-238
GNC1-BB16	0	NORM	1/27/2009	1.36	1.4	1.93	1.51	0.966	0.798	0.13 U	0.732
GNC1-BB16	10	NORM	1/27/2009	2.37	1.07	1.48	2.23	1.7	2	0.0288 U	1.33
GNC1-BC16	0	NORM	1/27/2009	1.29	2.46	1.76	1.33	1.78	0.739	-0.0434 U	0.867
GNC1-BC16	10	NORM	1/27/2009	1.79	1.61	1.2	1.08	1.01	1.73	0.0887 U	1.05
GNC1-BC18	0	NORM	1/27/2009	1.46 J	2.57	2.3	1.06	1.3	1.16	0.115 U	0.569
GNC1-BC18	0	FD	1/27/2009	0.331 UJ	1.73	1.75	1.25	1.44	1.16	0.0526 U	0.851
GNC1-BC18	10	NORM	1/27/2009	1.59	2.39	0.763	1	1.16	1.31	0.0531 U	1.28
GNC1-BC21	0	NORM	1/29/2009	1.21	1.18 J	1.59	1.16	1.87	0.576	-0.0124 U	0.826
GNC1-BC21	10	NORM	1/29/2009	1.62	1.68 J	1.05	1.35	1.15	2.03	0.148 U	1.54
GNC1-BC22	0	NORM	3/2/2009	0.526	2.88	1.38	1.4	1.36	0.995	0.0729 U	1 U
GNC1-BC22	11	NORM	3/2/2009	0.782	1.9	1.98	1.84	1.57	0.826	0.107 U	1 U
GNC1-BC23	0	NORM	2/10/2009	1 U	1.71	1.65	1.05	1.74	0.794	0.041 U	0.63
GNC1-BC23	10	NORM	2/10/2009	1.23	2.15	1.04	1.56	1.35	1.35	0.0543 U	1.33
GNC1-BC27	0	NORM	2/4/2009	1.44	1.58	1.58	0.621	2.02	0.993	0.0596 U	0.796
GNC1-BC27	0	FD	2/4/2009	1.39	0.82	1.35	0.924	1.62	1.2	0.172	0.765
GNC1-BC27	10	NORM	2/4/2009	1.44	1.32	1.72	0.768	1.64	1.01	0.131 U	0.821
GNC1-BC28	0	NORM	2/4/2009	1.47	0.937 U	1.52	1.67	2.42	1.22	0.116 U	0.805
GNC1-BC28	11	NORM	2/4/2009	0.323 U	2.13	1.23	0.569	1.51	1.65	0.449 U	1.2
GNC1-BC29	0	NORM	2/4/2009	1.01	0.525 U	0.76	1.38	0.812	0.759	0.0552 U	0.536
GNC1-BC29	10	NORM	2/4/2009	1.19	1.72	1.49	1.27	1.88	0.922	0.0905 U	0.934
GNC1-JA10	0	NORM	8/13/2009	0.575	1.19	1.12	1.38	1.46	0.5 U	0 U	1.25
GNC1-JB02	0	NORM	2/11/2009	0.19 U	1.5	2.26	1.38	1.36	0.653	0.167 U	0.664
GNC1-JB02	5	NORM	2/11/2009	0.702	1.74	2.02	1.09	1.19	1.16	0.129 U	1.2
GNC1-JB02	15	NORM	2/11/2009	0.61	1.65	2.14	1.61	1.38	1.33	-0.0146 U	1.06
GNC1-JB03	0	NORM	2/13/2009	1.03	2.41 J	1.33	0.705	1.38	0.662	-0.0417 U	1.43
GNC1-JB03	0	FD	2/13/2009	0.447	1.16 J	1.78	0.416 U	1.66	0.877	-0.012 U	1.23
GNC1-JB03	7	NORM	2/13/2009	0.813	1.43	1.58	0.993	2.24	0.67	0.117 U	0.533
GNC1-JB03	17	NORM	2/13/2009	1.09	1.44	1.1	1.38	1.08	0.609	0 U	0.798
GNC1-JB06	0	NORM	2/13/2009	1.55	1.26	1.3	0.9	1.28	1.12	0.0863 U	0.689
GNC1-JB06	6	NORM	2/17/2009	1.27	2.62	1.63	1.04	1.55	0.66	0.0386 U	0.657
GNC1-JB06	16	NORM	2/17/2009	1.25	1.69	1.16	0.898	1.02	0.47	0.0582 U	0.753
GNC1-JB07	0	NORM	2/13/2009	0.492 U	2.57	1.66	1.36	1.99	0.879	0 U	0.733
GNC1-JB07	8	NORM	2/13/2009	0.168 U	2.4	1.51	1.16	0.969	0.548	0.0956 U	0.747
GNC1-JB07	18	NORM	2/13/2009	0.29 U	1.93	2.21	0.662	1.4	0.799	0.0409 U	1
GNC1-JD01	0	NORM	1/27/2009	1.35	1.57	1.41	1.24	1.64	1.11	0.0265 U	0.922
GNC1-JD01	3	NORM	1/27/2009	1.65	3.37	1.8	1.3	1.54	0.704	0.00214 U	0.802

TABLE B-8
SOIL RADIONUCLIDES DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 2 of 2)

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Radionuclides Radium-226	Radium-228	Thorium-228	Thorium-230	Thorium-232	Uranium-233/234	Uranium-235/236	Uranium-238
GNC1-JD01	13	NORM	1/27/2009	2.42	1.09	1.39	0.809	1.04	0.614	0.0775 U	1.24
GNC1-JD02	0	NORM	1/27/2009	1.81	1 U	0.854	0.787	1.25	1.56	0.159	1.33
GNC1-JD02	10	NORM	1/27/2009	1.12	1.5	1.42	1.12	1.29	1.32	0.0287 U	0.624
GNC1-JD06	0	NORM	2/13/2009	1.32	1.91	1.76	1.49	1.64	1.2	0.106 U	0.93
GNC1-JD06	10	NORM	2/17/2009	1.2	1.18	2	1.23	1.3	1.61	0.127 U	0.625
GNC1-JP02	0	NORM	2/12/2009	0.415	1.03	1.14	0.721	0.881	0.726	0.0566 U	0.652
GNC1-JP02	0	FD	2/12/2009	0.921	1.32	1.48	1.02	0.657	0.831	0.0418 U	0.676
GNC1-JP02	10	NORM	2/12/2009	0.883	1.47	2.37	1.33	1.53	1.17	0.0438 U	0.956
GNC1-JP04	0	NORM	2/10/2009	1 U	1.15	1.91	1.28	1.77	0.753	0.0212 U	0.842
GNC1-JP04	0	FD	2/10/2009	0.458 U	1.44	1.45	1.11	1.92	0.844	0.0433 U	1.19
GNC1-JP04	10	NORM	2/10/2009	1.46	1.93	1.15	0.826	1.64	1	0.0551 U	0.781
GNC1-JP05	0	NORM	2/4/2009	1.1	0.613 U	2.8	1.2	2.12	1.23	0.161 U	1.09
GNC1-JP05	11	NORM	2/4/2009	1.25	1.07	1.49	1.77	1.29	1.34	0.1 U	1.5
GNC1-JP06	0	NORM	2/12/2009	0.724	1.58	1.74	0.776	1.06	0.79	0.0706 U	0.914
GNC1-JP06	0	FD	2/12/2009	0.523	1.08	1.82	1.66	1.46	0.797	0.103	0.852
GNC1-JP06	3	NORM	2/12/2009	0.751	0.78 U	1.26	0.863	1.07	0.659	0.0699 U	0.701
GNC1-JP06	13	NORM	2/12/2009	0.687	1.19	1.36	1.29	1.86	0.679	0.0379 U	0.613
GNC1-JS08	0	NORM	1/28/2009	1.28	1.57	3.15	0.863	2.12	0.898	0.0458 U	0.817
GNC1-JS08	10	NORM	1/28/2009	1.03	1.31	1.2	1.1	1.34	1.13	0.0273 U	0.767
GNC1-JS17	0	NORM	2/4/2009	1.26	1.32	2.52	1.18	2.93	1.29	0.0835 U	1.39
GNC1-JS17	10	NORM	2/4/2009	0.863	1.38	1.69	1.78	1.38	1.01	0.0688 U	1.01
UPC1-BB28	0	NORM	11/3/2009	0.761	1.6	1.65	1.24 J	1.71 J	0.91	0.248 U	0.768
UPC1-BB28	0	FD	11/20/2009	0.968	1.69	1.65	1.03	1.25	0.591 U	-0.0422 U	0.501 J
UPC1-BB28	8	NORM	11/3/2009	0.9	1.18	1.53	0.901 J	1.3 J	0.638	0.2 U	1.17
UPC1-BB28	18	NORM	11/3/2009	0.751	1.68	0.742	1.2 J	0.934 J	1.82	0.0982 U	1.33
UPC1-BB31	0	NORM	10/30/2009	0.674	2.34	1.37	1.22	1.01 J	0.909	0.0963 U	0.701
UPC1-BB31	11	NORM	10/30/2009	0.188 U	1.45	1.57	1.5	0.889 J	0.717	0.0358 U	0.405
UPC1-BB32	0	NORM	10/30/2009	0.337	1.56	2.26	0.816	1.15 J	0.694	0.0543 U	0.682
UPC1-BB32	0	FD	10/30/2009	0.538	2.02	1.55	1.02	1.29 J	0.312 U	0.0955 U	0.969
UPC1-BB32	10	NORM	10/30/2009	0.546	1.36	1.13	1.1	1.47 J	1.29	0.00241 U	0.799
UPC1-BB33	0	NORM	10/29/2009	0.756	1.41	1.87	0.699	0.963	1.48	0.136 U	0.87
UPC1-BB33	10	NORM	10/29/2009	0.553	1.77	1.24	0.976	1.03	0.536	0 U	1.06
UPC1-JP11	0	NORM	10/28/2009	1.13	2.36	2.42	2.13 J	1.98	0.605	0.111 U	0.689
UPC1-JP11	10	NORM	10/28/2009	1.13	2.01	1.38	1.27 J	1.43	2.34	0.0578 U	1.58

All units in pCi/g.
-- = no sample data.

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Aldehydes		Semi-Volatile Organic Compounds (SVOCs)							
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Acetaldehyde	Formaldehyde	1,2,4,5-Tetrachloro-benzene	1,2-Diphenylhydrazine	1,4-Dioxane	2,2'-Dichlorobenzil	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol
GNC1-BB16	0	NORM	1/27/2009	< 0.315 U	0.498 J	< 0.07 U	< 0.07 U	< 0.07 U	< 0.116 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U
GNC1-BB16	10	NORM	1/27/2009	< 0.314 U	0.255 J	< 0.0718 U	< 0.0718 U	< 0.0718 U	< 0.119 U	< 0.0718 U	< 0.0718 U	< 0.0718 U	< 0.0718 U
GNC1-BC16	0	NORM	1/27/2009	< 0.309 U	0.243 J	< 0.0697 U	< 0.0697 U	< 0.0697 U	< 0.115 U	< 0.0697 U	< 0.0697 U	< 0.0697 U	< 0.0697 U
GNC1-BC16	10	NORM	1/27/2009	< 0.323 U	< 0.216 U	< 0.0711 U	< 0.0711 U	< 0.0711 U	< 0.117 U	< 0.0711 U	< 0.0711 U	< 0.0711 U	< 0.0711 U
GNC1-BC18	0	NORM	1/27/2009	< 0.317 U	0.337 J	< 0.0698 U	< 0.0698 U	< 0.0698 U	< 0.115 U	< 0.0698 U	< 0.0698 U	< 0.0698 U	< 0.0698 U
GNC1-BC18	0	FD	1/27/2009	< 0.314 U	0.402 J	< 0.0727 U	< 0.0727 U	< 0.0727 U	< 0.12 U	< 0.0727 U	< 0.0727 U	< 0.0727 U	< 0.0727 U
GNC1-BC18	10	NORM	1/27/2009	< 0.322 U	< 0.214 U	< 0.0713 U	< 0.0713 U	< 0.0713 U	< 0.118 U	< 0.0713 U	< 0.0713 U	< 0.0713 U	< 0.0713 U
GNC1-BC21	0	NORM	1/29/2009	0.379 J	< 0.206 U	< 0.0691 U	< 0.0691 U	< 0.0691 UJ	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.0691 U
GNC1-BC21	10	NORM	1/29/2009	0.594 J	0.269 J	< 0.071 U	< 0.071 U	< 0.071 UJ	< 0.117 U	< 0.071 U	< 0.071 U	< 0.071 U	< 0.071 U
GNC1-BC22	0	NORM	3/2/2009	< 0.308 U	0.253	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.114 U	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.0692 U
GNC1-BC22	11	NORM	3/2/2009	< 0.316 U	< 0.211 U	< 0.0699 U	< 0.0699 U	< 0.0699 U	< 0.115 U	< 0.0699 U	< 0.0699 U	< 0.0699 U	< 0.0699 U
GNC1-BC23	0	NORM	2/10/2009	< 0.325 U	0.362 J	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.116 U	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.0705 U
GNC1-BC23	10	NORM	2/10/2009	< 0.312 U	0.316 J	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.116 U	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.0704 U
GNC1-BC27	0	NORM	2/4/2009	< 0.303 U	< 0.202 U	< 0.068 U	< 0.068 U	< 0.068 U	< 0.112 U	< 0.068 U	< 0.068 U	< 0.068 U	< 0.068 U
GNC1-BC27	0	FD	2/4/2009	< 0.311 U	< 0.207 U	< 0.068 U	< 0.068 U	< 0.068 U	< 0.112 U	< 0.068 U	< 0.068 U	< 0.068 U	< 0.068 U
GNC1-BC27	10	NORM	2/4/2009	< 0.305 U	0.237 J	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.114 U	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.0692 U
GNC1-BC28	0	NORM	2/4/2009	< 0.318 U	0.33 J	< 0.0681 U	< 0.0681 U	< 0.0681 U	< 0.112 U	< 0.0681 U	< 0.0681 U	< 0.0681 U	< 0.0681 U
GNC1-BC28	11	NORM	2/4/2009	< 0.306 U	0.258 J	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.0687 U
GNC1-BC29	0	NORM	2/4/2009	< 0.307 U	< 0.204 U	< 0.0684 U	< 0.0684 U	< 0.0684 U	< 0.113 U	< 0.0684 U	< 0.0684 U	< 0.0684 U	< 0.0684 U
GNC1-BC29	10	NORM	2/4/2009	< 0.307 U	< 0.205 U	< 0.0688 U	< 0.0688 U	< 0.0688 U	< 0.114 U	< 0.0688 U	< 0.0688 U	< 0.0688 U	< 0.0688 U
GNC1-JB02	0	NORM	2/11/2009	< 0.314 U	0.276 J	< 0.07 U	< 0.07 U	< 0.07 U	< 0.116 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U
GNC1-JB02	5	NORM	2/11/2009	< 0.309 U	0.447 J	< 0.0683 U	< 0.0683 U	< 0.0683 U	< 0.113 U	< 0.0683 U	< 0.0683 U	< 0.0683 U	< 0.0683 U
GNC1-JB02	15	NORM	2/11/2009	< 0.309 U	0.209 J	< 0.0696 U	< 0.0696 U	< 0.0696 U	< 0.115 U	< 0.0696 U	< 0.0696 U	< 0.0696 U	< 0.0696 U
GNC1-JB03	0	NORM	2/13/2009	< 0.305 U	0.284 J	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.116 U	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.0705 U
GNC1-JB03	0	FD	2/13/2009	< 0.317 U	< 0.286 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.115 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U
GNC1-JB03	7	NORM	2/13/2009	< 0.311 U	< 0.207 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.0691 U
GNC1-JB03	17	NORM	2/13/2009	< 0.307 U	< 0.369 U	< 0.0688 U	< 0.0688 U	< 0.0688 U	< 0.114 U	< 0.0688 U	< 0.0688 U	< 0.0688 U	< 0.0688 U
GNC1-JB06	0	NORM	2/13/2009	< 0.306 U	< 0.381 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U
GNC1-JB06	6	NORM	2/17/2009	< 0.309 U	< 0.546 U	< 0.0693 U	< 0.0693 U	< 0.0693 U	< 0.114 U	< 0.0693 U	< 0.0693 U	< 0.0693 U	< 0.0693 U
GNC1-JB06	16	NORM	2/17/2009	< 0.312 U	< 0.208 U	< 0.0694 U	< 0.0694 U	< 0.0694 U	< 0.115 U	< 0.0694 U	< 0.0694 U	< 0.0694 U	< 0.0694 U
GNC1-JB07	0	NORM	2/13/2009	< 0.304 U	< 0.202 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.116 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.0702 U
GNC1-JB07	8	NORM	2/13/2009	< 0.312 U	< 0.287 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.0687 U
GNC1-JB07	18	NORM	2/13/2009	< 0.306 U	< 0.244 U	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.114 U	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.0689 U
GNC1-JD01	0	NORM	1/27/2009	< 0.319 U	0.528 J	< 0.0707 U	< 0.0707 U	< 0.0707 U	< 0.117 U	< 0.0707 U	< 0.0707 U	< 0.0707 U	< 0.0707 U
GNC1-JD01	3	NORM	1/27/2009	< 0.315 U	< 0.21 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U
GNC1-JD01	13	NORM	1/27/2009	< 0.317 U	0.444 J	< 0.0699 U	< 0.0699 U	< 0.0699 U	< 0.115 U	< 0.0699 U	< 0.0699 U	< 0.0699 U	< 0.0699 U

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 2 of 14)

				Aldehydes		Semi-Volatile Organic Compounds (SVOCs)							
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Acetaldehyde	Formaldehyde	1,2,4,5-Tetrachloro-benzene	1,2-Diphenylhydrazine	1,4-Dioxane	2,2'-Dichlorobenzil	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol
GNC1-JD02	0	NORM	1/27/2009	< 0.308 U	0.245 J	< 0.0714 U	< 0.0714 U	< 0.0714 U	< 0.118 U	< 0.0714 U	< 0.0714 U	< 0.0714 U	< 0.0714 U
GNC1-JD02	10	NORM	1/27/2009	< 0.319 U	0.241 J	< 0.0722 U	< 0.0722 U	< 0.0722 U	< 0.119 U	< 0.0722 U	< 0.0722 U	< 0.0722 U	< 0.0722 U
GNC1-JD06	0	NORM	2/13/2009	< 0.316 U	< 0.372 U	< 0.0711 U	< 0.0711 U	< 0.0711 U	< 0.117 U	< 0.0711 U	< 0.0711 U	< 0.0711 U	< 0.0711 U
GNC1-JD06	10	NORM	2/17/2009	< 0.315 U	< 0.254 U	< 0.0716 U	< 0.0716 U	< 0.0716 U	< 0.118 U	< 0.0716 U	< 0.0716 U	< 0.0716 U	< 0.0716 U
GNC1-JP02	0	NORM	2/12/2009	< 0.319 U	< 0.213 U	< 0.0707 U	< 0.0707 U	< 0.0707 U	< 0.117 U	< 0.0707 U	< 0.0707 U	< 0.0707 U	< 0.0707 U
GNC1-JP02	0	FD	2/12/2009	< 0.318 U	< 0.212 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U
GNC1-JP02	10	NORM	2/12/2009	< 0.309 U	< 0.206 U	< 0.0686 U	< 0.0686 U	< 0.0686 U	< 0.113 U	< 0.0686 U	< 0.0686 U	< 0.0686 U	< 0.0686 U
GNC1-JP04	0	NORM	2/10/2009	< 0.328 U	0.438 J	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U
GNC1-JP04	0	FD	2/10/2009	< 0.326 U	0.233 J	< 0.0712 U	< 0.0712 U	< 0.0712 U	< 0.117 U	< 0.0712 U	< 0.0712 U	< 0.0712 U	< 0.0712 U
GNC1-JP04	10	NORM	2/10/2009	< 0.314 U	0.253 J	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.116 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.0702 U
GNC1-JP05	0	NORM	2/4/2009	< 0.301 U	0.22 J	< 0.0681 U	< 0.0681 U	< 0.0681 U	< 0.112 U	< 0.0681 U	< 0.0681 U	< 0.0681 U	< 0.0681 U
GNC1-JP05	11	NORM	2/4/2009	< 0.308 U	< 0.206 U	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.114 U	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.0692 U
GNC1-JP06	0	NORM	2/12/2009	< 0.315 U	0.241 J	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.116 U	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.0704 U
GNC1-JP06	0	FD	2/12/2009	< 0.323 U	0.231 J	< 0.071 U	< 0.071 U	< 0.071 U	< 0.117 U	< 0.071 U	< 0.071 U	< 0.071 U	< 0.071 U
GNC1-JP06	3	NORM	2/12/2009	< 0.308 U	< 0.206 U	< 0.0685 U	< 0.0685 U	< 0.0685 U	< 0.113 U	< 0.0685 U	< 0.0685 U	< 0.0685 U	< 0.0685 U
GNC1-JP06	13	NORM	2/12/2009	< 0.309 U	0.215 J	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.0687 U
GNC1-JS08	0	NORM	1/28/2009	< 0.306 U	0.325	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.0691 U
GNC1-JS08	10	NORM	1/28/2009	< 0.311 U	< 0.207 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.116 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.0702 U
GNC1-JS17	0	NORM	2/4/2009	< 0.302 U	0.221 J	< 0.0678 U	< 0.0678 U	< 0.0678 U	< 0.112 U	< 0.0678 U	< 0.0678 U	< 0.0678 U	< 0.0678 U
GNC1-JS17	10	NORM	2/4/2009	< 0.306 U	< 0.204 U	< 0.069 U	< 0.069 U	< 0.069 U	< 0.114 U	< 0.069 U	< 0.069 U	< 0.069 U	< 0.069 U
UPC1-BB28	0	NORM	11/3/2009	< 0.302 U	0.224	< 0.0679 U	< 0.0679 U	< 0.0679 U	< 0.112 U	< 0.0679 U	< 0.0679 U	< 0.0679 U	< 0.0679 U
UPC1-BB28	0	FD	11/20/2009	< 0.3 U	< 0.861 U	< 0.0673 U	< 0.0673 U	< 0.0673 U	< 0.111 U	< 0.0673 U	< 0.0673 U	< 0.0673 U	< 0.0673 U
UPC1-BB28	8	NORM	11/3/2009	< 0.307 U	0.25	< 0.0682 U	< 0.0682 U	< 0.0682 U	< 0.113 U	< 0.0682 U	< 0.0682 U	< 0.0682 U	< 0.0682 U
UPC1-BB28	18	NORM	11/3/2009	< 0.308 U	0.306	< 0.0685 U	< 0.0685 U	< 0.0685 U	< 0.113 U	< 0.0685 U	< 0.0685 U	< 0.0685 U	< 0.0685 U
UPC1-BB31	0	NORM	10/30/2009	0.456	0.566	< 0.0676 U	< 0.0676 U	< 0.0676 U	< 0.111 U	< 0.0676 U	< 0.0676 U	< 0.0676 U	< 0.0676 U
UPC1-BB31	11	NORM	10/30/2009	< 0.304 U	0.423	< 0.0684 U	< 0.0684 U	< 0.0684 U	< 0.113 U	< 0.0684 U	< 0.0684 U	< 0.0684 U	< 0.0684 U
UPC1-BB32	0	NORM	10/30/2009	0.334	0.354	< 0.0681 U	< 0.0681 U	< 0.0681 U	< 0.112 U	< 0.0681 U	< 0.0681 U	< 0.0681 U	< 0.0681 U
UPC1-BB32	0	FD	10/30/2009	< 0.3 U	0.378	< 0.0678 U	< 0.0678 U	< 0.0678 U	< 0.112 U	< 0.0678 U	< 0.0678 U	< 0.0678 U	< 0.0678 U
UPC1-BB32	10	NORM	10/30/2009	0.464	0.526	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.0691 U
UPC1-BB33	0	NORM	10/29/2009	< 0.303 U	0.284	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.0687 U
UPC1-BB33	10	NORM	10/29/2009	< 0.309 U	0.426	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.114 U	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.0689 U
UPC1-JP11	0	NORM	10/28/2009	0.425 J	0.335	< 0.067 U	< 0.067 U	< 0.067 U	< 0.111 U	< 0.067 U	< 0.067 U	< 0.067 U	< 0.067 U
UPC1-JP11	10	NORM	10/28/2009	0.349	0.291	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U

All units in mg/kg.
-- = no sample data.

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Semi-Volatile Organic Compounds (SVOCs)									
				2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Nitroaniline	2-Nitrophenol	3,3-Dichlorobenzidine	3-Nitroaniline
GNC1-BB16	0	NORM	1/27/2009	< 0.133 U	< 0.035 U	< 0.035 U	< 0.0123 U	< 0.07 U	< 0.007 U	< 0.07 U	< 0.035 U	< 0.105 U	< 0.07 UJ
GNC1-BB16	10	NORM	1/27/2009	< 0.136 U	< 0.0359 U	< 0.0359 U	< 0.0126 U	< 0.0718 U	< 0.00718 U	< 0.0718 U	< 0.0359 U	< 0.108 U	< 0.0718 UJ
GNC1-BC16	0	NORM	1/27/2009	< 0.132 U	< 0.0348 U	< 0.0348 U	< 0.0122 U	< 0.0697 U	< 0.00697 U	< 0.0697 U	< 0.0348 U	< 0.104 U	< 0.0697 UJ
GNC1-BC16	10	NORM	1/27/2009	< 0.135 U	< 0.0356 U	< 0.0356 U	< 0.0125 U	< 0.0711 U	< 0.00711 U	< 0.0711 U	< 0.0356 U	< 0.107 U	< 0.0711 UJ
GNC1-BC18	0	NORM	1/27/2009	< 0.133 U	< 0.0349 U	< 0.0349 U	< 0.0122 U	< 0.0698 U	< 0.00698 U	< 0.0698 U	< 0.0349 U	< 0.105 U	< 0.0698 UJ
GNC1-BC18	0	FD	1/27/2009	< 0.138 U	< 0.0364 U	< 0.0364 U	< 0.0127 U	< 0.0727 U	< 0.00727 U	< 0.0727 U	< 0.0364 U	< 0.109 U	< 0.0727 U
GNC1-BC18	10	NORM	1/27/2009	< 0.136 U	< 0.0357 U	< 0.0357 U	< 0.0125 U	< 0.0713 U	< 0.00713 U	< 0.0713 U	< 0.0357 U	< 0.107 U	< 0.0713 UJ
GNC1-BC21	0	NORM	1/29/2009	< 0.131 U	< 0.0345 U	< 0.0345 U	< 0.0121 U	< 0.0691 U	< 0.00691 U	< 0.0691 U	< 0.0345 U	< 0.104 UJ	< 0.0691 U
GNC1-BC21	10	NORM	1/29/2009	< 0.135 U	< 0.0355 U	< 0.0355 U	< 0.0124 U	< 0.071 U	< 0.0071 U	< 0.071 U	< 0.0355 U	< 0.106 UJ	< 0.071 U
GNC1-BC22	0	NORM	3/2/2009	< 0.132 U	< 0.0346 U	< 0.0346 U	< 0.0121 U	< 0.0692 U	< 0.00692 U	< 0.0692 U	< 0.0346 U	< 0.104 U	< 0.0692 U
GNC1-BC22	11	NORM	3/2/2009	< 0.133 U	< 0.0349 U	< 0.0349 U	< 0.0122 U	< 0.0699 U	< 0.00699 U	< 0.0699 U	< 0.0349 U	< 0.105 U	< 0.0699 U
GNC1-BC23	0	NORM	2/10/2009	< 0.134 U	< 0.0353 U	< 0.0353 U	< 0.0123 U	< 0.0705 U	< 0.00705 U	< 0.0705 U	< 0.0353 U	< 0.106 U	< 0.0705 U
GNC1-BC23	10	NORM	2/10/2009	< 0.134 U	< 0.0352 U	< 0.0352 U	< 0.0123 U	< 0.0704 U	< 0.00704 U	< 0.0704 U	< 0.0352 U	< 0.106 U	< 0.0704 U
GNC1-BC27	0	NORM	2/4/2009	< 0.129 U	< 0.034 U	< 0.034 U	< 0.0119 U	< 0.068 U	< 0.0068 U	< 0.068 U	< 0.034 U	< 0.102 U	< 0.068 UJ
GNC1-BC27	0	FD	2/4/2009	< 0.129 U	< 0.034 U	< 0.034 U	< 0.0119 U	< 0.068 U	< 0.0068 U	< 0.068 U	< 0.034 U	< 0.102 U	< 0.068 UJ
GNC1-BC27	10	NORM	2/4/2009	< 0.131 U	< 0.0346 U	< 0.0346 U	< 0.0121 U	< 0.0692 U	< 0.00692 U	< 0.0692 U	< 0.0346 U	< 0.104 U	< 0.0692 UJ
GNC1-BC28	0	NORM	2/4/2009	< 0.129 U	< 0.0341 U	< 0.0341 U	< 0.0119 U	< 0.0681 U	< 0.00681 U	< 0.0681 U	< 0.0341 U	< 0.102 U	< 0.0681 UJ
GNC1-BC28	11	NORM	2/4/2009	< 0.131 U	< 0.0343 U	< 0.0343 U	< 0.012 U	< 0.0687 U	< 0.00687 U	< 0.0687 U	< 0.0343 U	< 0.103 U	< 0.0687 UJ
GNC1-BC29	0	NORM	2/4/2009	< 0.13 U	< 0.0342 U	< 0.0342 U	< 0.012 U	< 0.0684 U	< 0.00684 U	< 0.0684 U	< 0.0342 U	< 0.103 U	< 0.0684 UJ
GNC1-BC29	10	NORM	2/4/2009	< 0.131 U	< 0.0344 U	< 0.0344 U	< 0.012 U	< 0.0688 U	< 0.00688 U	< 0.0688 U	< 0.0344 U	< 0.103 U	< 0.0688 UJ
GNC1-JB02	0	NORM	2/11/2009	< 0.133 U	< 0.035 U	< 0.035 U	< 0.0123 U	< 0.07 U	< 0.007 U	< 0.07 U	< 0.035 U	< 0.105 U	< 0.07 U
GNC1-JB02	5	NORM	2/11/2009	< 0.13 U	< 0.0342 U	< 0.0342 U	< 0.012 U	< 0.0683 U	< 0.00683 U	< 0.0683 U	< 0.0342 U	< 0.102 U	< 0.0683 U
GNC1-JB02	15	NORM	2/11/2009	< 0.132 U	< 0.0348 U	< 0.0348 U	< 0.0122 U	< 0.0696 U	< 0.00696 U	< 0.0696 U	< 0.0348 U	< 0.104 U	< 0.0696 U
GNC1-JB03	0	NORM	2/13/2009	< 0.134 U	< 0.0352 U	< 0.0352 U	< 0.0123 U	< 0.0705 U	< 0.00705 U	< 0.0705 U	< 0.0352 U	< 0.106 U	< 0.0705 U
GNC1-JB03	0	FD	2/13/2009	< 0.133 U	< 0.035 U	< 0.035 U	< 0.0122 U	< 0.07 U	< 0.007 U	< 0.07 U	< 0.035 U	< 0.105 U	< 0.07 U
GNC1-JB03	7	NORM	2/13/2009	< 0.131 U	< 0.0346 U	< 0.0346 U	< 0.0121 U	< 0.0691 U	< 0.00691 U	< 0.0691 U	< 0.0346 U	< 0.104 U	< 0.0691 U
GNC1-JB03	17	NORM	2/13/2009	< 0.131 U	< 0.0344 U	< 0.0344 U	< 0.012 U	< 0.0688 U	< 0.00688 U	< 0.0688 U	< 0.0344 U	< 0.103 U	< 0.0688 U
GNC1-JB06	0	NORM	2/13/2009	< 0.134 U	< 0.0352 U	< 0.0352 U	< 0.0123 U	< 0.0703 U	< 0.00703 U	< 0.0703 U	< 0.0352 U	< 0.106 U	< 0.0703 U
GNC1-JB06	6	NORM	2/17/2009	< 0.132 U	< 0.0346 U	< 0.0346 U	< 0.0121 U	< 0.0693 U	< 0.00693 U	< 0.0693 U	< 0.0346 U	< 0.104 U	< 0.0693 U
GNC1-JB06	16	NORM	2/17/2009	< 0.132 U	< 0.0347 U	< 0.0347 U	< 0.0122 U	< 0.0694 U	< 0.00694 U	< 0.0694 U	< 0.0347 U	< 0.104 U	< 0.0694 U
GNC1-JB07	0	NORM	2/13/2009	< 0.133 U	< 0.0351 U	< 0.0351 U	< 0.0123 U	< 0.0702 U	< 0.00702 U	< 0.0702 U	< 0.0351 U	< 0.105 U	< 0.0702 U
GNC1-JB07	8	NORM	2/13/2009	< 0.13 U	< 0.0343 U	< 0.0343 U	< 0.012 U	< 0.0687 U	< 0.00687 U	< 0.0687 U	< 0.0343 U	< 0.103 U	< 0.0687 U
GNC1-JB07	18	NORM	2/13/2009	< 0.131 U	< 0.0344 U	< 0.0344 U	< 0.0121 U	< 0.0689 U	< 0.00689 U	< 0.0689 U	< 0.0344 U	< 0.103 U	< 0.0689 U
GNC1-JD01	0	NORM	1/27/2009	< 0.134 U	< 0.0354 U	< 0.0354 U	< 0.0124 U	< 0.0707 U	< 0.00707 U	< 0.0707 U	< 0.0354 U	< 0.106 U	< 0.0707 UJ
GNC1-JD01	3	NORM	1/27/2009	< 0.134 U	< 0.0351 U	< 0.0351 U	< 0.0123 U	< 0.0703 U	< 0.00703 U	< 0.0703 U	< 0.0351 U	< 0.105 U	< 0.0703 UJ
GNC1-JD01	13	NORM	1/27/2009	< 0.133 U	< 0.035 U	< 0.035 U	< 0.0122 U	< 0.0699 U	< 0.00699 U	< 0.0699 U	< 0.035 U	< 0.105 U	< 0.0699 UJ

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Semi-Volatile Organic Compounds (SVOCs)									
				2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Nitroaniline	2-Nitrophenol	3,3-Dichlorobenzidine	3-Nitroaniline
GNC1-JD02	0	NORM	1/27/2009	< 0.136 U	< 0.0357 U	< 0.0357 U	< 0.0125 U	< 0.0714 U	< 0.00714 U	< 0.0714 U	< 0.0357 U	< 0.107 U	< 0.0714 UJ
GNC1-JD02	10	NORM	1/27/2009	< 0.137 U	< 0.0361 U	< 0.0361 U	< 0.0126 U	< 0.0722 U	< 0.00722 U	< 0.0722 U	< 0.0361 U	< 0.108 U	< 0.0722 UJ
GNC1-JD06	0	NORM	2/13/2009	< 0.135 U	< 0.0355 U	< 0.0355 U	< 0.0124 U	< 0.0711 U	< 0.00711 U	< 0.0711 U	< 0.0355 U	< 0.107 U	< 0.0711 U
GNC1-JD06	10	NORM	2/17/2009	< 0.136 U	< 0.0358 U	< 0.0358 U	< 0.0125 U	< 0.0716 U	< 0.00716 U	< 0.0716 U	< 0.0358 U	< 0.107 U	< 0.0716 U
GNC1-JP02	0	NORM	2/12/2009	< 0.134 U	< 0.0353 U	< 0.0353 U	< 0.0124 U	< 0.0707 U	< 0.00707 U	< 0.0707 U	< 0.0353 U	< 0.106 U	< 0.0707 U
GNC1-JP02	0	FD	2/12/2009	< 0.134 U	< 0.0352 U	< 0.0352 U	< 0.0123 U	< 0.0703 U	< 0.00703 U	< 0.0703 U	< 0.0352 U	< 0.105 U	< 0.0703 U
GNC1-JP02	10	NORM	2/12/2009	< 0.13 U	< 0.0343 U	< 0.0343 U	< 0.012 U	< 0.0686 U	< 0.00686 U	< 0.0686 U	< 0.0343 U	< 0.103 U	< 0.0686 U
GNC1-JP04	0	NORM	2/10/2009	< 0.134 U	< 0.0352 U	< 0.0352 U	< 0.0123 U	< 0.0703 U	< 0.00703 U	< 0.0703 U	< 0.0352 U	< 0.106 U	< 0.0703 U
GNC1-JP04	0	FD	2/10/2009	< 0.135 U	< 0.0356 U	< 0.0356 U	< 0.0125 U	< 0.0712 U	< 0.00712 U	< 0.0712 U	< 0.0356 U	< 0.107 U	< 0.0712 U
GNC1-JP04	10	NORM	2/10/2009	< 0.133 U	< 0.0351 U	< 0.0351 U	< 0.0123 U	< 0.0702 U	< 0.00702 U	< 0.0702 U	< 0.0351 U	< 0.105 U	< 0.0702 U
GNC1-JP05	0	NORM	2/4/2009	< 0.129 U	< 0.034 U	< 0.034 U	< 0.0119 U	< 0.0681 U	< 0.00681 U	< 0.0681 U	< 0.034 U	< 0.102 U	< 0.0681 UJ
GNC1-JP05	11	NORM	2/4/2009	< 0.132 U	< 0.0346 U	< 0.0346 U	< 0.0121 U	< 0.0692 U	< 0.00692 U	< 0.0692 U	< 0.0346 U	< 0.104 U	< 0.0692 UJ
GNC1-JP06	0	NORM	2/12/2009	< 0.134 U	< 0.0352 U	< 0.0352 U	< 0.0123 U	< 0.0704 U	< 0.00704 U	< 0.0704 U	< 0.0352 U	< 0.106 U	< 0.0704 U
GNC1-JP06	0	FD	2/12/2009	< 0.135 U	< 0.0355 U	< 0.0355 U	< 0.0124 U	< 0.071 U	< 0.0071 U	< 0.071 U	< 0.0355 U	< 0.107 U	< 0.071 U
GNC1-JP06	3	NORM	2/12/2009	< 0.13 U	< 0.0342 U	< 0.0342 U	< 0.012 U	< 0.0685 U	< 0.00685 U	< 0.0685 U	< 0.0342 U	< 0.103 U	< 0.0685 U
GNC1-JP06	13	NORM	2/12/2009	< 0.131 U	< 0.0343 U	< 0.0343 U	< 0.012 U	< 0.0687 U	< 0.00687 U	< 0.0687 U	< 0.0343 U	< 0.103 U	< 0.0687 U
GNC1-JS08	0	NORM	1/28/2009	< 0.131 U	< 0.0345 U	< 0.0345 U	< 0.0121 U	< 0.0691 U	< 0.00691 U	< 0.0691 U	< 0.0345 U	< 0.104 U	< 0.0691 UJ
GNC1-JS08	10	NORM	1/28/2009	< 0.133 U	< 0.0351 U	< 0.0351 U	< 0.0123 U	< 0.0702 U	< 0.00702 U	< 0.0702 U	< 0.0351 U	< 0.105 U	< 0.0702 UJ
GNC1-JS17	0	NORM	2/4/2009	< 0.129 U	< 0.0339 U	< 0.0339 U	< 0.0119 U	< 0.0678 U	< 0.00678 U	< 0.0678 U	< 0.0339 U	< 0.102 U	< 0.0678 UJ
GNC1-JS17	10	NORM	2/4/2009	< 0.131 U	< 0.0345 U	< 0.0345 U	< 0.0121 U	< 0.069 U	< 0.0069 U	< 0.069 U	< 0.0345 U	< 0.103 U	< 0.069 UJ
UPC1-BB28	0	NORM	11/3/2009	< 0.129 U	< 0.0339 U	< 0.0339 U	< 0.0119 U	< 0.0679 U	< 0.00679 U	< 0.0679 U	< 0.0339 U	< 0.102 U	< 0.0679 UJ
UPC1-BB28	0	FD	11/20/2009	< 0.128 U	< 0.0337 U	< 0.0337 U	< 0.0118 U	< 0.0673 U	< 0.00673 U	< 0.0673 U	< 0.0337 U	< 0.101 U	< 0.0673 UJ
UPC1-BB28	8	NORM	11/3/2009	< 0.13 U	< 0.0341 U	< 0.0341 U	< 0.0119 U	< 0.0682 U	< 0.00682 U	< 0.0682 U	< 0.0341 U	< 0.102 U	< 0.0682 UJ
UPC1-BB28	18	NORM	11/3/2009	< 0.13 U	< 0.0343 U	< 0.0343 U	< 0.012 U	< 0.0685 U	< 0.00685 U	< 0.0685 U	< 0.0343 U	< 0.103 U	< 0.0685 UJ
UPC1-BB31	0	NORM	10/30/2009	< 0.128 U	< 0.0338 U	< 0.0338 U	< 0.0118 U	< 0.0676 U	< 0.00676 U	< 0.0676 U	< 0.0338 U	< 0.101 U	< 0.0676 UJ
UPC1-BB31	11	NORM	10/30/2009	< 0.13 U	< 0.0342 U	< 0.0342 U	< 0.012 U	< 0.0684 U	< 0.00684 U	< 0.0684 U	< 0.0342 U	< 0.103 U	< 0.0684 UJ
UPC1-BB32	0	NORM	10/30/2009	< 0.129 U	< 0.034 U	< 0.034 U	< 0.0119 U	< 0.0681 U	< 0.00681 U	< 0.0681 U	< 0.034 U	< 0.102 U	< 0.0681 UJ
UPC1-BB32	0	FD	10/30/2009	< 0.129 U	< 0.0339 U	< 0.0339 U	< 0.0119 U	< 0.0678 U	< 0.00678 U	< 0.0678 U	< 0.0339 U	< 0.102 U	< 0.0678 UJ
UPC1-BB32	10	NORM	10/30/2009	< 0.131 U	< 0.0345 U	< 0.0345 U	< 0.0121 U	< 0.0691 U	< 0.00691 U	< 0.0691 U	< 0.0345 U	< 0.104 U	< 0.0691 UJ
UPC1-BB33	0	NORM	10/29/2009	< 0.131 U	< 0.0344 U	< 0.0344 U	< 0.012 U	< 0.0687 U	< 0.00687 U	< 0.0687 U	< 0.0344 U	< 0.103 U	< 0.0687 U
UPC1-BB33	10	NORM	10/29/2009	< 0.131 U	< 0.0345 U	< 0.0345 U	< 0.0121 U	< 0.0689 U	< 0.00689 U	< 0.0689 U	< 0.0345 U	< 0.103 U	< 0.0689 U
UPC1-JP11	0	NORM	10/28/2009	< 0.127 U	< 0.0335 U	< 0.0335 U	< 0.0117 U	< 0.067 U	< 0.0067 U	< 0.067 U	< 0.0335 U	< 0.101 U	< 0.067 U
UPC1-JP11	10	NORM	10/28/2009	< 0.133 U	< 0.0351 U	< 0.0351 U	< 0.0123 U	< 0.0703 U	< 0.00703 U	< 0.0703 U	< 0.0351 U	< 0.105 U	< 0.0703 UJ

All units in mg/kg.
-- = no sample data.

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Semi-Volatile Organic Compounds (SVOCs)									
				4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chlorophenyl phenyl ether	4-Chlorothioanisole	4-Nitroaniline	4-Nitrophenol	Acetophenone	Aniline	Benzenethiol	Benzoic acid
GNC1-BB16	0	NORM	1/27/2009	< 0.035 U	< 0.035 U	< 0.035 U	< 0.116 U	< 0.07 UJ	< 0.07 UJ	< 0.035 U	< 0.123 U	< 0.116 U	< 0.175 U
GNC1-BB16	10	NORM	1/27/2009	< 0.0359 U	< 0.0359 U	< 0.0359 U	< 0.119 U	< 0.0718 UJ	< 0.0718 UJ	< 0.0359 U	< 0.126 U	< 0.119 U	< 0.18 U
GNC1-BC16	0	NORM	1/27/2009	< 0.0348 U	< 0.0348 U	< 0.0348 U	< 0.115 U	< 0.0697 UJ	< 0.0697 UJ	< 0.0348 U	< 0.122 U	< 0.115 U	< 0.174 U
GNC1-BC16	10	NORM	1/27/2009	< 0.0356 U	< 0.0356 U	< 0.0356 U	< 0.117 U	< 0.0711 UJ	< 0.0711 UJ	< 0.0356 U	< 0.125 U	< 0.117 U	< 0.178 U
GNC1-BC18	0	NORM	1/27/2009	< 0.0349 U	< 0.0349 U	< 0.0349 U	< 0.115 U	< 0.0698 UJ	< 0.0698 UJ	< 0.0349 U	< 0.122 U	< 0.115 U	< 0.174 U
GNC1-BC18	0	FD	1/27/2009	< 0.0364 U	< 0.0364 U	< 0.0364 U	< 0.12 U	< 0.0727 U	< 0.0727 U	< 0.0364 U	< 0.127 U	< 0.12 U	< 0.182 U
GNC1-BC18	10	NORM	1/27/2009	< 0.0357 U	< 0.0357 U	< 0.0357 U	< 0.118 U	< 0.0713 UJ	< 0.0713 UJ	< 0.0357 U	< 0.125 U	< 0.118 U	< 0.178 U
GNC1-BC21	0	NORM	1/29/2009	< 0.0345 U	< 0.0345 U	< 0.0345 U	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0345 UJ	< 0.121 U	< 0.114 U	< 0.173 U
GNC1-BC21	10	NORM	1/29/2009	< 0.0355 U	< 0.0355 U	< 0.0355 U	< 0.117 U	< 0.071 U	< 0.071 U	< 0.0355 UJ	< 0.124 U	< 0.117 U	< 0.177 U
GNC1-BC22	0	NORM	3/2/2009	< 0.0346 U	< 0.0346 U	< 0.0346 U	< 0.114 U	< 0.0692 U	< 0.0692 U	< 0.0346 U	< 0.121 U	< 0.114 U	< 0.173 U
GNC1-BC22	11	NORM	3/2/2009	< 0.0349 U	< 0.0349 U	< 0.0349 U	< 0.115 U	< 0.0699 U	< 0.0699 U	< 0.0349 U	< 0.122 U	< 0.115 U	< 0.175 U
GNC1-BC23	0	NORM	2/10/2009	< 0.0353 U	< 0.0353 U	< 0.0353 U	< 0.116 U	< 0.0705 U	< 0.0705 U	< 0.0353 U	< 0.123 U	< 0.116 U	< 0.176 UJ
GNC1-BC23	10	NORM	2/10/2009	< 0.0352 U	< 0.0352 U	< 0.0352 U	< 0.116 U	< 0.0704 U	< 0.0704 U	< 0.0352 U	< 0.123 U	< 0.116 U	< 0.176 UJ
GNC1-BC27	0	NORM	2/4/2009	< 0.034 U	< 0.034 U	< 0.034 U	< 0.112 U	< 0.068 UJ	< 0.068 U	< 0.034 U	< 0.119 UJ	< 0.112 U	< 0.17 U
GNC1-BC27	0	FD	2/4/2009	< 0.034 U	< 0.034 U	< 0.034 U	< 0.112 U	< 0.068 UJ	< 0.068 U	< 0.034 U	< 0.119 UJ	< 0.112 U	< 0.17 U
GNC1-BC27	10	NORM	2/4/2009	< 0.0346 U	< 0.0346 U	< 0.0346 U	< 0.114 U	< 0.0692 UJ	< 0.0692 U	< 0.0346 U	< 0.121 UJ	< 0.114 U	< 0.173 U
GNC1-BC28	0	NORM	2/4/2009	< 0.0341 U	< 0.0341 U	< 0.0341 U	< 0.112 U	< 0.0681 UJ	< 0.0681 U	< 0.0341 U	< 0.119 UJ	< 0.112 U	< 0.17 U
GNC1-BC28	11	NORM	2/4/2009	< 0.0343 U	< 0.0343 U	< 0.0343 U	< 0.113 U	< 0.0687 UJ	< 0.0687 U	< 0.0343 U	< 0.12 UJ	< 0.113 U	< 0.172 U
GNC1-BC29	0	NORM	2/4/2009	< 0.0342 U	< 0.0342 U	< 0.0342 U	< 0.113 U	< 0.0684 UJ	< 0.0684 U	< 0.0342 U	< 0.12 UJ	< 0.113 U	< 0.171 U
GNC1-BC29	10	NORM	2/4/2009	< 0.0344 U	< 0.0344 U	< 0.0344 U	< 0.114 U	< 0.0688 UJ	< 0.0688 U	< 0.0344 U	< 0.12 UJ	< 0.114 U	< 0.172 U
GNC1-JB02	0	NORM	2/11/2009	< 0.035 U	< 0.035 U	< 0.035 U	< 0.116 U	< 0.07 U	< 0.07 U	< 0.035 U	< 0.123 U	< 0.116 U	< 0.175 UJ
GNC1-JB02	5	NORM	2/11/2009	< 0.0342 U	< 0.0342 U	< 0.0342 U	< 0.113 U	< 0.0683 U	< 0.0683 U	< 0.0342 U	< 0.12 U	< 0.113 U	< 0.171 UJ
GNC1-JB02	15	NORM	2/11/2009	< 0.0348 U	< 0.0348 U	< 0.0348 U	< 0.115 U	< 0.0696 U	< 0.0696 U	< 0.0348 U	< 0.122 U	< 0.115 U	< 0.174 UJ
GNC1-JB03	0	NORM	2/13/2009	< 0.0352 U	< 0.0352 U	< 0.0352 U	< 0.116 U	< 0.0705 U	< 0.0705 U	< 0.0352 U	< 0.123 U	< 0.116 U	< 0.176 U
GNC1-JB03	0	FD	2/13/2009	< 0.035 U	< 0.035 U	< 0.035 U	< 0.115 U	< 0.07 U	< 0.07 U	< 0.035 U	< 0.122 U	< 0.115 U	< 0.175 U
GNC1-JB03	7	NORM	2/13/2009	< 0.0346 U	< 0.0346 U	< 0.0346 U	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0346 U	< 0.121 U	< 0.114 U	< 0.173 U
GNC1-JB03	17	NORM	2/13/2009	< 0.0344 U	< 0.0344 U	< 0.0344 U	< 0.114 U	< 0.0688 U	< 0.0688 U	< 0.0344 U	< 0.12 U	< 0.114 U	< 0.172 U
GNC1-JB06	0	NORM	2/13/2009	< 0.0352 U	< 0.0352 U	< 0.0352 U	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0352 U	< 0.123 U	< 0.116 U	< 0.176 U
GNC1-JB06	6	NORM	2/17/2009	< 0.0346 U	< 0.0346 U	< 0.0346 U	< 0.114 U	< 0.0693 U	< 0.0693 U	< 0.0346 U	< 0.121 U	< 0.114 U	< 0.173 U
GNC1-JB06	16	NORM	2/17/2009	< 0.0347 U	< 0.0347 U	< 0.0347 U	< 0.115 U	< 0.0694 U	< 0.0694 U	< 0.0347 U	< 0.122 U	< 0.115 U	< 0.174 U
GNC1-JB07	0	NORM	2/13/2009	< 0.0351 U	< 0.0351 U	< 0.0351 U	< 0.116 U	< 0.0702 U	< 0.0702 U	< 0.0351 U	< 0.123 U	< 0.116 U	< 0.175 U
GNC1-JB07	8	NORM	2/13/2009	< 0.0343 U	< 0.0343 U	< 0.0343 U	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0343 U	< 0.12 U	< 0.113 U	< 0.172 U
GNC1-JB07	18	NORM	2/13/2009	< 0.0344 U	< 0.0344 U	< 0.0344 U	< 0.114 U	< 0.0689 U	< 0.0689 U	< 0.0344 U	< 0.121 U	< 0.114 U	< 0.172 U
GNC1-JD01	0	NORM	1/27/2009	< 0.0354 U	< 0.0354 U	< 0.0354 U	< 0.117 U	< 0.0707 UJ	< 0.0707 UJ	< 0.0354 U	< 0.124 U	< 0.117 U	< 0.177 U
GNC1-JD01	3	NORM	1/27/2009	< 0.0351 U	< 0.0351 U	< 0.0351 U	< 0.116 U	< 0.0703 UJ	< 0.0703 UJ	< 0.0351 U	< 0.123 U	< 0.116 U	< 0.176 U
GNC1-JD01	13	NORM	1/27/2009	< 0.035 U	< 0.035 U	< 0.035 U	< 0.115 U	< 0.0699 UJ	< 0.0699 UJ	< 0.035 U	< 0.122 U	< 0.115 U	< 0.175 U

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Semi-Volatile Organic Compounds (SVOCs)									
				4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chlorophenyl phenyl ether	4-Chlorothioanisole	4-Nitroaniline	4-Nitrophenol	Acetophenone	Aniline	Benzenethiol	Benzoic acid
GNC1-JD02	0	NORM	1/27/2009	< 0.0357 U	< 0.0357 U	< 0.0357 U	< 0.118 U	< 0.0714 UJ	< 0.0714 UJ	< 0.0357 U	< 0.125 U	< 0.118 U	< 0.178 U
GNC1-JD02	10	NORM	1/27/2009	< 0.0361 U	< 0.0361 U	< 0.0361 U	< 0.119 U	< 0.0722 UJ	< 0.0722 UJ	< 0.0361 U	< 0.126 U	< 0.119 U	< 0.18 U
GNC1-JD06	0	NORM	2/13/2009	< 0.0355 U	< 0.0355 U	< 0.0355 U	< 0.117 U	< 0.0711 U	< 0.0711 U	< 0.0355 U	< 0.124 U	< 0.117 U	< 0.178 U
GNC1-JD06	10	NORM	2/17/2009	< 0.0358 U	< 0.0358 U	< 0.0358 U	< 0.118 U	< 0.0716 U	< 0.0716 U	< 0.0358 U	< 0.125 U	< 0.118 U	< 0.179 U
GNC1-JP02	0	NORM	2/12/2009	< 0.0353 U	< 0.0353 U	< 0.0353 U	< 0.117 U	< 0.0707 UJ	< 0.0707 U	< 0.0353 U	< 0.124 U	< 0.117 U	< 0.177 U
GNC1-JP02	0	FD	2/12/2009	< 0.0352 U	< 0.0352 U	< 0.0352 U	< 0.116 U	< 0.0703 UJ	< 0.0703 U	< 0.0352 U	< 0.123 U	< 0.116 U	< 0.176 U
GNC1-JP02	10	NORM	2/12/2009	< 0.0343 U	< 0.0343 U	< 0.0343 U	< 0.113 U	< 0.0686 UJ	< 0.0686 U	< 0.0343 U	< 0.12 U	< 0.113 U	< 0.172 U
GNC1-JP04	0	NORM	2/10/2009	< 0.0352 U	< 0.0352 U	< 0.0352 U	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0352 U	< 0.123 U	< 0.116 U	< 0.176 UJ
GNC1-JP04	0	FD	2/10/2009	< 0.0356 U	< 0.0356 U	< 0.0356 U	< 0.117 U	< 0.0712 U	< 0.0712 U	< 0.0356 U	< 0.125 U	< 0.117 U	< 0.178 UJ
GNC1-JP04	10	NORM	2/10/2009	< 0.0351 U	< 0.0351 U	< 0.0351 U	< 0.116 U	< 0.0702 U	< 0.0702 U	< 0.0351 U	< 0.123 U	< 0.116 U	< 0.175 UJ
GNC1-JP05	0	NORM	2/4/2009	< 0.034 U	< 0.034 U	< 0.034 U	< 0.112 U	< 0.0681 UJ	< 0.0681 U	< 0.034 U	< 0.119 UJ	< 0.112 U	< 0.17 U
GNC1-JP05	11	NORM	2/4/2009	< 0.0346 U	< 0.0346 U	< 0.0346 U	< 0.114 U	< 0.0692 UJ	< 0.0692 U	< 0.0346 U	< 0.121 UJ	< 0.114 U	< 0.173 U
GNC1-JP06	0	NORM	2/12/2009	< 0.0352 U	< 0.0352 U	< 0.0352 U	< 0.116 U	< 0.0704 UJ	< 0.0704 U	< 0.0352 U	< 0.123 U	< 0.116 U	< 0.176 U
GNC1-JP06	0	FD	2/12/2009	< 0.0355 U	< 0.0355 U	< 0.0355 U	< 0.117 U	< 0.071 UJ	< 0.071 U	< 0.0355 U	< 0.124 U	< 0.117 U	< 0.178 U
GNC1-JP06	3	NORM	2/12/2009	< 0.0342 U	< 0.0342 U	< 0.0342 U	< 0.113 U	< 0.0685 UJ	< 0.0685 U	< 0.0342 U	< 0.12 U	< 0.113 U	< 0.171 U
GNC1-JP06	13	NORM	2/12/2009	< 0.0343 U	< 0.0343 U	< 0.0343 U	< 0.113 U	< 0.0687 UJ	< 0.0687 U	< 0.0343 U	< 0.12 U	< 0.113 U	< 0.172 U
GNC1-JS08	0	NORM	1/28/2009	< 0.0345 U	< 0.0345 U	< 0.0345 U	< 0.114 U	< 0.0691 UJ	< 0.0691 U	< 0.0345 U	< 0.121 U	< 0.114 U	< 0.173 U
GNC1-JS08	10	NORM	1/28/2009	< 0.0351 U	< 0.0351 U	< 0.0351 U	< 0.116 U	< 0.0702 UJ	< 0.0702 U	< 0.0351 U	< 0.123 U	< 0.116 U	< 0.175 U
GNC1-JS17	0	NORM	2/4/2009	< 0.0339 U	< 0.0339 U	< 0.0339 U	< 0.112 U	< 0.0678 UJ	< 0.0678 U	< 0.0339 U	< 0.119 UJ	< 0.112 U	< 0.169 U
GNC1-JS17	10	NORM	2/4/2009	< 0.0345 U	< 0.0345 U	< 0.0345 U	< 0.114 U	< 0.069 UJ	< 0.069 U	< 0.0345 U	< 0.121 UJ	< 0.114 U	< 0.172 U
UPC1-BB28	0	NORM	11/3/2009	< 0.0339 U	< 0.0339 U	< 0.0339 U	< 0.112 U	< 0.0679 UJ	< 0.0679 U	< 0.0339 U	< 0.119 U	< 0.112 U	< 0.17 U
UPC1-BB28	0	FD	11/20/2009	< 0.0337 U	< 0.0337 U	< 0.0337 U	< 0.111 U	< 0.0673 U	< 0.0673 U	< 0.0337 U	< 0.118 U	< 0.111 U	< 0.168 U
UPC1-BB28	8	NORM	11/3/2009	< 0.0341 U	< 0.0341 U	< 0.0341 U	< 0.113 U	< 0.0682 UJ	< 0.0682 U	< 0.0341 U	< 0.119 U	< 0.113 U	< 0.171 U
UPC1-BB28	18	NORM	11/3/2009	< 0.0343 U	< 0.0343 U	< 0.0343 U	< 0.113 U	< 0.0685 UJ	< 0.0685 U	< 0.0343 U	< 0.12 U	< 0.113 U	< 0.171 U
UPC1-BB31	0	NORM	10/30/2009	< 0.0338 U	< 0.0338 U	< 0.0338 U	< 0.111 U	< 0.0676 UJ	< 0.0676 U	< 0.0338 U	< 0.118 U	< 0.111 U	< 0.169 U
UPC1-BB31	11	NORM	10/30/2009	< 0.0342 U	< 0.0342 U	< 0.0342 U	< 0.113 U	< 0.0684 UJ	< 0.0684 U	< 0.0342 U	< 0.12 U	< 0.113 U	< 0.171 U
UPC1-BB32	0	NORM	10/30/2009	< 0.034 U	< 0.034 U	< 0.034 U	< 0.112 U	< 0.0681 UJ	< 0.0681 U	< 0.034 U	< 0.119 U	< 0.112 U	< 0.17 U
UPC1-BB32	0	FD	10/30/2009	< 0.0339 U	< 0.0339 U	< 0.0339 U	< 0.112 U	< 0.0678 UJ	< 0.0678 U	< 0.0339 U	< 0.119 U	< 0.112 U	< 0.169 U
UPC1-BB32	10	NORM	10/30/2009	< 0.0345 U	< 0.0345 U	< 0.0345 U	< 0.114 U	< 0.0691 UJ	< 0.0691 U	< 0.0345 U	< 0.121 U	< 0.114 U	< 0.173 U
UPC1-BB33	0	NORM	10/29/2009	< 0.0344 U	< 0.0344 U	< 0.0344 U	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0344 U	< 0.12 U	< 0.113 U	< 0.172 U
UPC1-BB33	10	NORM	10/29/2009	< 0.0345 U	< 0.0345 U	< 0.0345 U	< 0.114 U	< 0.0689 U	< 0.0689 U	< 0.0345 U	< 0.121 U	< 0.114 U	< 0.172 U
UPC1-JP11	0	NORM	10/28/2009	< 0.0335 U	< 0.0335 U	< 0.0335 U	< 0.111 U	< 0.067 U	< 0.067 U	< 0.0335 U	< 0.117 U	< 0.111 U	< 0.168 U
UPC1-JP11	10	NORM	10/28/2009	< 0.0351 U	< 0.0351 U	< 0.0351 U	< 0.116 U	< 0.0703 UJ	< 0.0703 UJ	< 0.0351 U	< 0.123 U	< 0.116 UJ	< 0.176 U

All units in mg/kg.
-- = no sample data.

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Semi-Volatile Organic Compounds (SVOCs)									
Sample ID	**Depth (ft bgs)**	**Sample Type**	**Sample Date**	Benzyl alcohol	bis(2-Chloroethoxy) methane	bis(2-Chloroethyl) ether	bis(2-Chloroisopropyl) ether	bis(2-Ethylhexyl) phthalate	bis(p-Chlorophenyl) sulfone	bis(p-Chlorophenyl) disulfide	Butylbenzyl phthalate	Carbazole	Dibenzofuran
GNC1-BB16	0	NORM	1/27/2009	< 0.105 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.116 U	< 0.116 U	< 0.07 U	< 0.0105 UJ	< 0.07 U
GNC1-BB16	10	NORM	1/27/2009	< 0.108 U	< 0.0718 U	< 0.0718 U	< 0.0718 U	< 0.0718 U	< 0.119 U	< 0.119 U	< 0.0718 U	< 0.0108 UJ	< 0.0718 U
GNC1-BC16	0	NORM	1/27/2009	< 0.104 U	< 0.0697 U	< 0.0697 U	< 0.0697 U	< 0.0697 U	< 0.115 U	< 0.115 U	< 0.0697 U	< 0.0104 UJ	< 0.0697 U
GNC1-BC16	10	NORM	1/27/2009	< 0.107 U	< 0.0711 U	< 0.0711 U	< 0.0711 U	< 0.0711 U	< 0.117 U	< 0.117 U	< 0.0711 U	< 0.0107 UJ	< 0.0711 U
GNC1-BC18	0	NORM	1/27/2009	< 0.105 U	< 0.0698 U	< 0.0698 U	< 0.0698 U	< 0.0698 U	< 0.115 U	< 0.115 U	< 0.0698 U	< 0.0105 UJ	< 0.0698 U
GNC1-BC18	0	FD	1/27/2009	< 0.109 U	< 0.0727 U	< 0.0727 U	< 0.0727 U	< 0.0727 U	< 0.12 U	< 0.12 U	< 0.0727 U	< 0.0109 U	< 0.0727 U
GNC1-BC18	10	NORM	1/27/2009	< 0.107 U	< 0.0713 U	< 0.0713 U	< 0.0713 U	< 0.0713 U	< 0.118 U	< 0.118 U	< 0.0713 U	< 0.0107 UJ	< 0.0713 U
GNC1-BC21	0	NORM	1/29/2009	< 0.104 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.114 U	< 0.0691 U	< 0.0104 U	< 0.0691 U
GNC1-BC21	10	NORM	1/29/2009	< 0.106 U	< 0.071 U	< 0.071 U	< 0.071 U	< 0.071 U	< 0.117 U	< 0.117 U	< 0.071 U	< 0.0106 U	< 0.071 U
GNC1-BC22	0	NORM	3/2/2009	< 0.104 U	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.114 U	< 0.114 U	< 0.0692 U	< 0.0104 U	< 0.0692 U
GNC1-BC22	11	NORM	3/2/2009	< 0.105 U	< 0.0699 U	< 0.0699 U	< 0.0699 U	< 0.0699 U	< 0.115 U	< 0.115 U	< 0.0699 U	< 0.0105 U	< 0.0699 U
GNC1-BC23	0	NORM	2/10/2009	< 0.106 UJ	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.116 U	< 0.116 U	< 0.0705 U	< 0.0106 U	< 0.0705 U
GNC1-BC23	10	NORM	2/10/2009	< 0.106 UJ	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.116 U	< 0.116 U	< 0.0704 U	< 0.0106 U	< 0.0704 U
GNC1-BC27	0	NORM	2/4/2009	< 0.102 UJ	< 0.068 U	< 0.068 UJ	< 0.068 UJ	< 0.068 U	< 0.112 U	< 0.112 U	< 0.068 U	< 0.0102 U	< 0.068 U
GNC1-BC27	0	FD	2/4/2009	< 0.102 UJ	< 0.068 U	< 0.068 UJ	< 0.068 UJ	< 0.068 U	< 0.112 U	< 0.112 U	< 0.068 U	< 0.0102 U	< 0.068 U
GNC1-BC27	10	NORM	2/4/2009	< 0.104 UJ	< 0.0692 U	< 0.0692 UJ	< 0.0692 UJ	< 0.0692 U	< 0.114 U	< 0.114 U	< 0.0692 U	< 0.0104 U	< 0.0692 U
GNC1-BC28	0	NORM	2/4/2009	< 0.102 UJ	< 0.0681 U	< 0.0681 UJ	< 0.0681 UJ	< 0.0681 U	< 0.112 U	< 0.112 U	< 0.0681 U	< 0.0102 U	< 0.0681 U
GNC1-BC28	11	NORM	2/4/2009	< 0.103 UJ	< 0.0687 U	< 0.0687 UJ	< 0.0687 UJ	< 0.0687 U	< 0.113 U	< 0.113 U	< 0.0687 U	< 0.0103 U	< 0.0687 U
GNC1-BC29	0	NORM	2/4/2009	< 0.103 UJ	< 0.0684 U	< 0.0684 UJ	< 0.0684 UJ	< 0.0684 U	< 0.113 U	< 0.113 U	< 0.0684 U	< 0.0103 U	< 0.0684 U
GNC1-BC29	10	NORM	2/4/2009	< 0.103 UJ	< 0.0688 U	< 0.0688 UJ	< 0.0688 UJ	< 0.0688 U	< 0.114 U	< 0.114 U	< 0.0688 U	< 0.0103 U	< 0.0688 U
GNC1-JB02	0	NORM	2/11/2009	< 0.105 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.116 U	< 0.116 U	< 0.07 U	< 0.0105 U	< 0.07 U
GNC1-JB02	5	NORM	2/11/2009	< 0.102 U	< 0.0683 U	< 0.0683 U	< 0.0683 U	< 0.0683 U	< 0.113 U	< 0.113 U	< 0.0683 U	< 0.0102 U	< 0.0683 U
GNC1-JB02	15	NORM	2/11/2009	< 0.104 U	< 0.0696 U	< 0.0696 U	< 0.0696 U	< 0.0696 U	< 0.115 U	< 0.115 U	< 0.0696 U	< 0.0104 U	< 0.0696 U
GNC1-JB03	0	NORM	2/13/2009	< 0.106 U	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.116 U	< 0.116 U	< 0.0705 U	< 0.0106 U	< 0.0705 U
GNC1-JB03	0	FD	2/13/2009	< 0.105 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.115 U	< 0.115 U	< 0.07 U	< 0.0105 U	< 0.07 U
GNC1-JB03	7	NORM	2/13/2009	< 0.104 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.114 U	< 0.0691 U	< 0.0104 U	< 0.0691 U
GNC1-JB03	17	NORM	2/13/2009	< 0.103 U	< 0.0688 U	< 0.0688 U	< 0.0688 U	< 0.0688 U	< 0.114 U	< 0.114 U	< 0.0688 U	< 0.0103 U	< 0.0688 U
GNC1-JB06	0	NORM	2/13/2009	< 0.106 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.116 U	< 0.0703 U	< 0.0106 U	< 0.0703 U
GNC1-JB06	6	NORM	2/17/2009	< 0.104 U	< 0.0693 U	< 0.0693 U	< 0.0693 U	< 0.0693 U	< 0.114 U	< 0.114 U	< 0.0693 U	< 0.0104 U	< 0.0693 U
GNC1-JB06	16	NORM	2/17/2009	< 0.104 U	< 0.0694 U	< 0.0694 U	< 0.0694 U	< 0.0694 U	< 0.115 U	< 0.115 U	< 0.0694 U	< 0.0104 U	< 0.0694 U
GNC1-JB07	0	NORM	2/13/2009	< 0.105 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.116 U	< 0.116 U	< 0.0702 U	< 0.0105 U	< 0.0702 U
GNC1-JB07	8	NORM	2/13/2009	< 0.103 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.113 U	< 0.0687 U	< 0.0103 U	< 0.0687 U
GNC1-JB07	18	NORM	2/13/2009	< 0.103 U	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.114 U	< 0.114 U	< 0.0689 U	< 0.0103 U	< 0.0689 U
GNC1-JD01	0	NORM	1/27/2009	< 0.106 U	< 0.0707 U	< 0.0707 U	< 0.0707 U	< 0.0707 U	< 0.117 U	< 0.117 U	< 0.0707 U	< 0.0106 UJ	< 0.0707 U
GNC1-JD01	3	NORM	1/27/2009	< 0.105 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.116 U	< 0.0703 U	< 0.0105 UJ	< 0.0703 U
GNC1-JD01	13	NORM	1/27/2009	< 0.105 U	< 0.0699 U	< 0.0699 U	< 0.0699 U	< 0.0699 U	< 0.115 U	< 0.115 U	< 0.0699 U	< 0.0105 UJ	< 0.0699 U

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Semi-Volatile Organic Compounds (SVOCs)									
				Benzyl alcohol	bis(2-Chloroethoxy) methane	bis(2-Chloroethyl) ether	bis(2-Chloroisopropyl) ether	bis(2-Ethylhexyl) phthalate	bis(p-Chlorophenyl) sulfone	bis(p-Chlorophenyl) disulfide	Butylbenzyl phthalate	Carbazole	Dibenzofuran
GNC1-JD02	0	NORM	1/27/2009	< 0.107 U	< 0.0714 U	< 0.0714 U	< 0.0714 U	< 0.0714 U	< 0.118 U	< 0.118 U	< 0.0714 U	< 0.0107 UJ	< 0.0714 U
GNC1-JD02	10	NORM	1/27/2009	< 0.108 U	< 0.0722 U	< 0.0722 U	< 0.0722 U	< 0.0722 U	< 0.119 U	< 0.119 U	< 0.0722 U	< 0.0108 UJ	< 0.0722 U
GNC1-JD06	0	NORM	2/13/2009	< 0.107 U	< 0.0711 U	< 0.0711 U	< 0.0711 U	0.0747 J	< 0.117 U	< 0.117 U	< 0.0711 U	< 0.0107 U	< 0.0711 U
GNC1-JD06	10	NORM	2/17/2009	< 0.107 U	< 0.0716 U	< 0.0716 U	< 0.0716 U	< 0.0716 U	< 0.118 U	< 0.118 U	< 0.0716 U	< 0.0107 U	< 0.0716 U
GNC1-JP02	0	NORM	2/12/2009	< 0.106 U	< 0.0707 U	< 0.0707 U	< 0.0707 U	< 0.0707 U	< 0.117 U	< 0.117 U	< 0.0707 U	< 0.0106 U	< 0.0707 U
GNC1-JP02	0	FD	2/12/2009	< 0.105 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.116 U	< 0.0703 U	< 0.0105 U	< 0.0703 U
GNC1-JP02	10	NORM	2/12/2009	< 0.103 U	< 0.0686 U	< 0.0686 U	< 0.0686 U	< 0.0686 U	< 0.113 U	< 0.113 U	< 0.0686 U	< 0.0103 U	< 0.0686 U
GNC1-JP04	0	NORM	2/10/2009	< 0.106 UJ	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.116 U	< 0.0703 U	< 0.0106 U	< 0.0703 U
GNC1-JP04	0	FD	2/10/2009	< 0.107 UJ	< 0.0712 U	< 0.0712 U	< 0.0712 U	< 0.0712 U	< 0.117 U	< 0.117 U	< 0.0712 U	< 0.0107 U	< 0.0712 U
GNC1-JP04	10	NORM	2/10/2009	< 0.105 UJ	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.116 U	< 0.116 U	< 0.0702 U	< 0.0105 U	< 0.0702 U
GNC1-JP05	0	NORM	2/4/2009	< 0.102 UJ	< 0.0681 U	< 0.0681 UJ	< 0.0681 UJ	< 0.0681 U	< 0.112 U	< 0.112 U	< 0.0681 U	< 0.0102 U	< 0.0681 U
GNC1-JP05	11	NORM	2/4/2009	< 0.104 UJ	< 0.0692 U	< 0.0692 UJ	< 0.0692 UJ	< 0.0692 U	< 0.114 U	< 0.114 U	< 0.0692 U	< 0.0104 U	< 0.0692 U
GNC1-JP06	0	NORM	2/12/2009	< 0.106 U	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.116 U	< 0.116 U	< 0.0704 U	< 0.0106 U	< 0.0704 U
GNC1-JP06	0	FD	2/12/2009	< 0.107 U	< 0.071 U	< 0.071 U	< 0.071 U	< 0.071 U	< 0.117 U	< 0.117 U	< 0.071 U	< 0.0107 U	< 0.071 U
GNC1-JP06	3	NORM	2/12/2009	< 0.103 U	< 0.0685 U	< 0.0685 U	< 0.0685 U	< 0.0685 U	< 0.113 U	< 0.113 U	< 0.0685 U	< 0.0103 U	< 0.0685 U
GNC1-JP06	13	NORM	2/12/2009	< 0.103 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.113 U	< 0.0687 U	< 0.0103 U	< 0.0687 U
GNC1-JS08	0	NORM	1/28/2009	< 0.104 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.107 U	< 0.114 U	< 0.114 UJ	< 0.0691 U	< 0.0104 UJ	< 0.0691 U
GNC1-JS08	10	NORM	1/28/2009	< 0.105 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.0933 U	< 0.116 U	< 0.116 UJ	< 0.0702 U	< 0.0105 UJ	< 0.0702 U
GNC1-JS17	0	NORM	2/4/2009	< 0.102 UJ	< 0.0678 U	< 0.0678 UJ	< 0.0678 UJ	< 0.0678 U	< 0.112 U	< 0.112 U	< 0.0678 U	< 0.0102 U	< 0.0678 U
GNC1-JS17	10	NORM	2/4/2009	< 0.103 UJ	< 0.069 U	< 0.069 UJ	< 0.069 UJ	< 0.069 U	< 0.114 U	< 0.114 U	< 0.069 U	< 0.0103 U	< 0.069 U
UPC1-BB28	0	NORM	11/3/2009	< 0.102 U	< 0.0679 U	< 0.0679 U	< 0.0679 U	< 0.0679 U	< 0.112 U	< 0.112 U	< 0.0679 U	< 0.0102 UJ	< 0.0679 U
UPC1-BB28	0	FD	11/20/2009	< 0.101 U	< 0.0673 U	< 0.0673 U	< 0.0673 U	< 0.0673 U	< 0.111 U	< 0.111 U	< 0.0673 U	< 0.0101 U	< 0.0673 U
UPC1-BB28	8	NORM	11/3/2009	< 0.102 U	< 0.0682 U	< 0.0682 U	< 0.0682 U	< 0.0682 U	< 0.113 U	< 0.113 U	< 0.0682 U	< 0.0102 UJ	< 0.0682 U
UPC1-BB28	18	NORM	11/3/2009	< 0.103 U	< 0.0685 U	< 0.0685 U	< 0.0685 U	< 0.0685 U	< 0.113 U	< 0.113 U	< 0.0685 U	< 0.0103 UJ	< 0.0685 U
UPC1-BB31	0	NORM	10/30/2009	< 0.101 U	< 0.0676 U	< 0.0676 U	< 0.0676 U	< 0.0676 U	< 0.111 U	< 0.111 U	< 0.0676 U	< 0.0101 UJ	< 0.0676 U
UPC1-BB31	11	NORM	10/30/2009	< 0.103 U	< 0.0684 U	< 0.0684 U	< 0.0684 U	< 0.0684 U	< 0.113 U	< 0.113 U	< 0.0684 U	< 0.0103 UJ	< 0.0684 U
UPC1-BB32	0	NORM	10/30/2009	< 0.102 U	< 0.0681 U	< 0.0681 U	< 0.0681 U	< 0.0681 U	< 0.112 U	< 0.112 U	< 0.0681 U	< 0.0102 UJ	< 0.0681 U
UPC1-BB32	0	FD	10/30/2009	< 0.102 U	< 0.0678 U	< 0.0678 U	< 0.0678 U	< 0.0678 U	< 0.112 U	< 0.112 U	< 0.0678 U	< 0.0102 UJ	< 0.0678 U
UPC1-BB32	10	NORM	10/30/2009	< 0.104 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.114 U	< 0.0691 U	< 0.0104 UJ	< 0.0691 U
UPC1-BB33	0	NORM	10/29/2009		< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.113 U	< 0.0687 U	< 0.0103 U	< 0.0687 U
UPC1-BB33	10	NORM	10/29/2009	< 0.103 UJ	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.114 U	< 0.114 U	< 0.0689 U	< 0.0103 U	< 0.0689 U
UPC1-JP11	0	NORM	10/28/2009	< 0.101 U	< 0.067 U	< 0.067 U	< 0.067 U	< 0.067 U	< 0.111 U	< 0.111 U	< 0.067 U	< 0.0101 U	< 0.067 U
UPC1-JP11	10	NORM	10/28/2009	< 0.105 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.116 U	< 0.0703 U	< 0.0105 UJ	< 0.0703 U

All units in mg/kg.
-- = no sample data.

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 9 of 14)

				Semi-Volatile Organic Compounds (SVOCs)									
Sample ID	**Depth (ft bgs)**	**Sample Type**	**Sample Date**	Dichloromethyl ether	Diethyl phthalate	Dimethyl phthalate	Di-n-butyl phthalate	Di-n-octyl phthalate	Diphenyl disulfide	Diphenyl sulfide	Diphenyl sulfone	Diphenylamine	Fluoranthene
GNC1-BB16	0	NORM	1/27/2009	< 0.116 U	< 0.07 U	< 0.07 U	< 0.035 U	< 0.07 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.07 U	< 0.0105 U
GNC1-BB16	10	NORM	1/27/2009	< 0.119 U	< 0.0718 U	< 0.0718 U	< 0.0359 U	< 0.0718 U	< 0.119 U	< 0.119 U	< 0.119 U	< 0.0718 U	< 0.0108 U
GNC1-BC16	0	NORM	1/27/2009	< 0.115 U	< 0.0697 U	< 0.0697 U	< 0.0348 U	< 0.0697 U	< 0.115 U	< 0.115 U	< 0.115 U	< 0.0697 U	< 0.0104 U
GNC1-BC16	10	NORM	1/27/2009	< 0.117 U	< 0.0711 U	< 0.0711 U	< 0.0356 U	< 0.0711 U	< 0.117 U	< 0.117 U	< 0.117 U	< 0.0711 U	< 0.0107 U
GNC1-BC18	0	NORM	1/27/2009	< 0.115 U	< 0.0698 U	< 0.0698 U	< 0.0349 U	< 0.0698 U	< 0.115 U	< 0.115 U	< 0.115 U	< 0.0698 U	< 0.0105 U
GNC1-BC18	0	FD	1/27/2009	< 0.12 U	< 0.0727 U	< 0.0727 U	< 0.0364 U	< 0.0727 U	< 0.12 U	< 0.12 U	< 0.12 U	< 0.0727 U	< 0.0109 U
GNC1-BC18	10	NORM	1/27/2009	< 0.118 U	< 0.0713 U	< 0.0713 U	< 0.0357 U	< 0.0713 U	< 0.118 U	< 0.118 U	< 0.118 U	< 0.0713 U	< 0.0107 U
GNC1-BC21	0	NORM	1/29/2009	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0345 U	< 0.0691 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.0691 U	< 0.0104 U
GNC1-BC21	10	NORM	1/29/2009	< 0.117 U	< 0.071 U	< 0.071 U	< 0.0355 U	< 0.071 U	< 0.117 U	< 0.117 U	< 0.117 U	< 0.071 U	< 0.0106 U
GNC1-BC22	0	NORM	3/2/2009	< 0.114 U	< 0.0692 U	< 0.0692 U	< 0.0346 U	< 0.0692 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.0692 U	< 0.0104 U
GNC1-BC22	11	NORM	3/2/2009	< 0.115 U	< 0.0699 U	< 0.0699 U	< 0.0349 U	< 0.0699 U	< 0.115 U	< 0.115 U	< 0.115 U	< 0.0699 U	< 0.0105 U
GNC1-BC23	0	NORM	2/10/2009	< 0.116 U	< 0.0705 U	< 0.0705 U	< 0.0353 U	< 0.0705 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.0705 U	< 0.0106 U
GNC1-BC23	10	NORM	2/10/2009	< 0.116 U	< 0.0704 U	< 0.0704 U	< 0.0352 U	< 0.0704 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.0704 U	< 0.0106 U
GNC1-BC27	0	NORM	2/4/2009	< 0.112 U	< 0.068 U	< 0.068 U	< 0.034 U	< 0.068 U	< 0.112 U	< 0.112 U	< 0.112 U	< 0.068 U	< 0.0102 U
GNC1-BC27	0	FD	2/4/2009	< 0.112 U	< 0.068 U	< 0.068 U	< 0.034 U	< 0.068 U	< 0.112 U	< 0.112 U	< 0.112 U	< 0.068 U	< 0.0102 U
GNC1-BC27	10	NORM	2/4/2009	< 0.114 U	< 0.0692 U	< 0.0692 U	< 0.0346 U	< 0.0692 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.0692 U	< 0.0104 U
GNC1-BC28	0	NORM	2/4/2009	< 0.112 U	< 0.0681 U	< 0.0681 U	< 0.0341 U	< 0.0681 U	< 0.112 U	< 0.112 U	< 0.112 U	< 0.0681 U	< 0.0102 U
GNC1-BC28	11	NORM	2/4/2009	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0343 U	< 0.0687 U	< 0.113 U	< 0.113 U	< 0.113 U	< 0.0687 U	< 0.0103 U
GNC1-BC29	0	NORM	2/4/2009	< 0.113 U	< 0.0684 U	< 0.0684 U	< 0.0342 U	< 0.0684 U	< 0.113 U	< 0.113 U	< 0.113 U	< 0.0684 U	< 0.0103 U
GNC1-BC29	10	NORM	2/4/2009	< 0.114 U	< 0.0688 U	< 0.0688 U	< 0.0344 U	< 0.0688 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.0688 U	< 0.0103 U
GNC1-JB02	0	NORM	2/11/2009	< 0.116 U	< 0.07 U	< 0.07 U	< 0.035 U	< 0.07 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.07 U	< 0.0105 U
GNC1-JB02	5	NORM	2/11/2009	< 0.113 U	< 0.0683 U	< 0.0683 U	< 0.0342 U	< 0.0683 U	< 0.113 U	< 0.113 U	< 0.113 U	< 0.0683 U	< 0.0102 U
GNC1-JB02	15	NORM	2/11/2009	< 0.115 U	< 0.0696 U	< 0.0696 U	< 0.0348 U	< 0.0696 U	< 0.115 U	< 0.115 U	< 0.115 U	< 0.0696 U	< 0.0104 U
GNC1-JB03	0	NORM	2/13/2009	< 0.116 U	< 0.0705 U	< 0.0705 U	< 0.0352 U	< 0.0705 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.0705 U	< 0.0106 U
GNC1-JB03	0	FD	2/13/2009	< 0.115 U	< 0.07 U	< 0.07 U	< 0.035 U	< 0.07 U	< 0.115 U	< 0.115 U	< 0.115 U	< 0.07 U	< 0.0105 U
GNC1-JB03	7	NORM	2/13/2009	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0346 U	< 0.0691 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.0691 U	< 0.0104 U
GNC1-JB03	17	NORM	2/13/2009	< 0.114 U	< 0.0688 U	< 0.0688 U	< 0.0344 U	< 0.0688 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.0688 U	< 0.0103 U
GNC1-JB06	0	NORM	2/13/2009	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0352 U	< 0.0703 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.0703 U	< 0.0106 U
GNC1-JB06	6	NORM	2/17/2009	< 0.114 U	< 0.0693 U	< 0.0693 U	< 0.0346 U	< 0.0693 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.0693 U	< 0.0104 U
GNC1-JB06	16	NORM	2/17/2009	< 0.115 U	< 0.0694 U	< 0.0694 U	< 0.0347 U	< 0.0694 U	< 0.115 U	< 0.115 U	< 0.115 U	< 0.0694 U	< 0.0104 U
GNC1-JB07	0	NORM	2/13/2009	< 0.116 U	< 0.0702 U	< 0.0702 U	< 0.0351 U	< 0.0702 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.0702 U	< 0.0105 U
GNC1-JB07	8	NORM	2/13/2009	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0343 U	< 0.0687 U	< 0.113 U	< 0.113 U	< 0.113 U	< 0.0687 U	< 0.0103 U
GNC1-JB07	18	NORM	2/13/2009	< 0.114 U	< 0.0689 U	< 0.0689 U	< 0.0344 U	< 0.0689 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.0689 U	< 0.0103 U
GNC1-JD01	0	NORM	1/27/2009	< 0.117 U	< 0.0707 U	< 0.0707 U	< 0.0354 U	< 0.0707 U	< 0.117 U	< 0.117 U	< 0.117 U	< 0.0707 U	< 0.0106 U
GNC1-JD01	3	NORM	1/27/2009	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0351 U	< 0.0703 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.0703 U	< 0.0105 U
GNC1-JD01	13	NORM	1/27/2009	< 0.115 U	< 0.0699 U	< 0.0699 U	< 0.035 U	< 0.0699 U	< 0.115 U	< 0.115 U	< 0.115 U	< 0.0699 U	< 0.0105 U

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Semi-Volatile Organic Compounds (SVOCs)									
				Dichloromethyl ether	Diethyl phthalate	Dimethyl phthalate	Di-n-butyl phthalate	Di-n-octyl phthalate	Diphenyl disulfide	Diphenyl sulfide	Diphenyl sulfone	Diphenylamine	Fluoranthene
GNC1-JD02	0	NORM	1/27/2009	< 0.118 U	< 0.0714 U	< 0.0714 U	< 0.0357 U	< 0.0714 U	< 0.118 U	< 0.118 U	< 0.118 U	< 0.0714 U	< 0.0107 U
GNC1-JD02	10	NORM	1/27/2009	< 0.119 U	< 0.0722 U	< 0.0722 U	< 0.0361 U	< 0.0722 U	< 0.119 U	< 0.119 U	< 0.119 U	< 0.0722 U	< 0.0108 U
GNC1-JD06	0	NORM	2/13/2009	< 0.117 U	< 0.0711 U	< 0.0711 U	< 0.0355 U	< 0.0711 U	< 0.117 U	< 0.117 U	< 0.117 U	< 0.0711 U	< 0.0107 U
GNC1-JD06	10	NORM	2/17/2009	< 0.118 U	< 0.0716 U	< 0.0716 U	< 0.0358 U	< 0.0716 U	< 0.118 U	< 0.118 U	< 0.118 U	< 0.0716 U	< 0.0107 U
GNC1-JP02	0	NORM	2/12/2009	< 0.117 U	< 0.0707 U	< 0.0707 U	< 0.0353 U	< 0.0707 U	< 0.117 U	< 0.117 U	< 0.117 U	< 0.0707 U	< 0.0106 U
GNC1-JP02	0	FD	2/12/2009	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0352 U	< 0.0703 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.0703 U	< 0.0105 U
GNC1-JP02	10	NORM	2/12/2009	< 0.113 U	< 0.0686 U	< 0.0686 U	< 0.0343 U	< 0.0686 U	< 0.113 U	< 0.113 U	< 0.113 U	< 0.0686 U	< 0.0103 U
GNC1-JP04	0	NORM	2/10/2009	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0352 U	< 0.0703 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.0703 U	< 0.0106 U
GNC1-JP04	0	FD	2/10/2009	< 0.117 U	< 0.0712 U	< 0.0712 U	< 0.0356 U	< 0.0712 U	< 0.117 U	< 0.117 U	< 0.117 U	< 0.0712 U	< 0.0107 U
GNC1-JP04	10	NORM	2/10/2009	< 0.116 U	< 0.0702 U	< 0.0702 U	< 0.0351 U	< 0.0702 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.0702 U	< 0.0105 U
GNC1-JP05	0	NORM	2/4/2009	< 0.112 U	< 0.0681 U	< 0.0681 U	< 0.034 U	< 0.0681 U	< 0.112 U	< 0.112 U	< 0.112 U	< 0.0681 U	< 0.0102 U
GNC1-JP05	11	NORM	2/4/2009	< 0.114 U	< 0.0692 U	< 0.0692 U	< 0.0346 U	< 0.0692 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.0692 U	< 0.0104 U
GNC1-JP06	0	NORM	2/12/2009	< 0.116 U	< 0.0704 U	< 0.0704 U	< 0.0352 U	< 0.0704 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.0704 U	< 0.0106 U
GNC1-JP06	0	FD	2/12/2009	< 0.117 U	< 0.071 U	< 0.071 U	< 0.0355 U	< 0.071 U	< 0.117 U	< 0.117 U	< 0.117 U	< 0.071 U	< 0.0107 U
GNC1-JP06	3	NORM	2/12/2009	< 0.113 U	< 0.0685 U	< 0.0685 U	< 0.0342 U	< 0.0685 U	< 0.113 U	< 0.113 U	< 0.113 U	< 0.0685 U	< 0.0103 U
GNC1-JP06	13	NORM	2/12/2009	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0343 U	< 0.0687 U	< 0.113 U	< 0.113 U	< 0.113 U	< 0.0687 U	< 0.0103 U
GNC1-JS08	0	NORM	1/28/2009	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0345 U	< 0.0691 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.0691 U	< 0.0104 U
GNC1-JS08	10	NORM	1/28/2009	< 0.116 U	< 0.0702 U	< 0.0702 U	< 0.0351 U	< 0.0702 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.0702 U	< 0.0105 U
GNC1-JS17	0	NORM	2/4/2009	< 0.112 U	< 0.0678 U	< 0.0678 U	< 0.0339 U	< 0.0678 U	< 0.112 U	< 0.112 U	< 0.112 U	< 0.0678 U	< 0.0102 U
GNC1-JS17	10	NORM	2/4/2009	< 0.114 U	< 0.069 U	< 0.069 U	< 0.0345 U	< 0.069 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.069 U	< 0.0103 U
UPC1-BB28	0	NORM	11/3/2009	< 0.112 U	< 0.0679 U	< 0.0679 U	< 0.0339 U	< 0.0679 U	< 0.112 U	< 0.112 U	< 0.112 U	< 0.0679 U	< 0.0102 U
UPC1-BB28	0	FD	11/20/2009	< 0.111 U	< 0.0673 U	< 0.0673 U	< 0.0337 U	< 0.0673 U	< 0.111 U	< 0.111 U	< 0.111 U	< 0.0673 U	< 0.0101 U
UPC1-BB28	8	NORM	11/3/2009	< 0.113 U	< 0.0682 U	< 0.0682 U	< 0.0341 U	< 0.0682 U	< 0.113 U	< 0.113 U	< 0.113 U	< 0.0682 U	< 0.0102 U
UPC1-BB28	18	NORM	11/3/2009	< 0.113 U	< 0.0685 U	< 0.0685 U	< 0.0343 U	< 0.0685 U	< 0.113 U	< 0.113 U	< 0.113 U	< 0.0685 U	< 0.0103 U
UPC1-BB31	0	NORM	10/30/2009	< 0.111 U	< 0.0676 U	< 0.0676 U	< 0.0338 U	< 0.0676 U	< 0.111 U	< 0.111 U	< 0.111 U	< 0.0676 U	< 0.0101 U
UPC1-BB31	11	NORM	10/30/2009	< 0.113 U	< 0.0684 U	< 0.0684 U	< 0.0342 U	< 0.0684 U	< 0.113 U	< 0.113 U	< 0.113 U	< 0.0684 U	< 0.0103 U
UPC1-BB32	0	NORM	10/30/2009	< 0.112 U	< 0.0681 U	< 0.0681 U	< 0.034 U	< 0.0681 U	< 0.112 U	< 0.112 U	< 0.112 U	< 0.0681 U	< 0.0102 U
UPC1-BB32	0	FD	10/30/2009	< 0.112 U	< 0.0678 U	< 0.0678 U	< 0.0339 U	< 0.0678 U	< 0.112 U	< 0.112 U	< 0.112 U	< 0.0678 U	< 0.0102 U
UPC1-BB32	10	NORM	10/30/2009	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0345 U	< 0.0691 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.0691 U	< 0.0104 U
UPC1-BB33	0	NORM	10/29/2009	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0344 U	< 0.0687 U	< 0.113 U	< 0.113 U	< 0.113 U	< 0.0687 U	< 0.0103 U
UPC1-BB33	10	NORM	10/29/2009	< 0.114 U	< 0.0689 U	< 0.0689 U	< 0.0345 U	< 0.0689 U	< 0.114 U	< 0.114 U	< 0.114 U	< 0.0689 U	< 0.0103 U
UPC1-JP11	0	NORM	10/28/2009	< 0.111 U	< 0.067 U	< 0.067 U	< 0.0335 U	< 0.067 U	< 0.111 U	< 0.111 U	< 0.111 U	< 0.067 U	< 0.0101 U
UPC1-JP11	10	NORM	10/28/2009	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0351 U	< 0.0703 U	< 0.116 U	< 0.116 U	< 0.116 U	< 0.0703 U	< 0.0105 U

All units in mg/kg.
-- = no sample data.

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Semi-Volatile Organic Compounds (SVOCs)									
				Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclo-pentadiene	Hexachloroethane	Hydroxymethyl phthalimide	Isophorone	m,p-Cresols	Naphthalene	Nitrobenzene
GNC1-BB16	0	NORM	1/27/2009	< 0.0105 U	< 0.07 U	< 0.07 U	< 0.07 UJ	< 0.07 U	< 0.116 U	< 0.07 U	< 0.14 U	< 0.0105 U	< 0.07 U
GNC1-BB16	10	NORM	1/27/2009	< 0.0108 U	< 0.0718 U	< 0.0718 U	< 0.0718 UJ	< 0.0718 U	< 0.119 U	< 0.0718 U	< 0.144 U	< 0.0108 U	< 0.0718 U
GNC1-BC16	0	NORM	1/27/2009	< 0.0104 U	< 0.0697 U	< 0.0697 U	< 0.0697 UJ	< 0.0697 U	< 0.115 U	< 0.0697 U	< 0.139 U	< 0.0104 U	< 0.0697 U
GNC1-BC16	10	NORM	1/27/2009	< 0.0107 U	< 0.0711 U	< 0.0711 U	< 0.0711 UJ	< 0.0711 U	< 0.117 U	< 0.0711 U	< 0.142 U	< 0.0107 U	< 0.0711 U
GNC1-BC18	0	NORM	1/27/2009	< 0.0105 U	< 0.0698 U	< 0.0698 U	< 0.0698 UJ	< 0.0698 U	< 0.115 U	< 0.0698 U	< 0.14 U	< 0.0105 U	< 0.0698 U
GNC1-BC18	0	FD	1/27/2009	< 0.0109 U	< 0.0727 U	< 0.0727 U	< 0.0727 U	< 0.0727 U	< 0.12 U	< 0.0727 U	< 0.145 U	< 0.0109 U	< 0.0727 U
GNC1-BC18	10	NORM	1/27/2009	< 0.0107 U	< 0.0713 U	< 0.0713 U	< 0.0713 UJ	< 0.0713 U	< 0.118 U	< 0.0713 U	< 0.143 U	< 0.0107 U	< 0.0713 U
GNC1-BC21	0	NORM	1/29/2009	< 0.0104 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.138 U	< 0.0104 U	< 0.0691 U
GNC1-BC21	10	NORM	1/29/2009	< 0.0106 U	< 0.071 U	< 0.071 U	< 0.071 U	< 0.071 U	< 0.117 U	< 0.071 U	< 0.142 U	< 0.0106 U	< 0.071 U
GNC1-BC22	0	NORM	3/2/2009	< 0.0104 U	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.114 U	< 0.0692 U	< 0.138 U	< 0.0104 U	< 0.0692 U
GNC1-BC22	11	NORM	3/2/2009	< 0.0105 U	< 0.0699 U	< 0.0699 U	< 0.0699 U	< 0.0699 U	< 0.115 U	< 0.0699 U	< 0.14 U	< 0.0105 U	< 0.0699 U
GNC1-BC23	0	NORM	2/10/2009	< 0.0106 U	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.116 U	< 0.0705 U	< 0.141 U	< 0.0106 U	< 0.0705 U
GNC1-BC23	10	NORM	2/10/2009	< 0.0106 U	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.116 U	< 0.0704 U	< 0.141 U	< 0.0106 U	< 0.0704 U
GNC1-BC27	0	NORM	2/4/2009	< 0.0102 U	< 0.068 U	< 0.068 U	< 0.068 UJ	< 0.068 U	< 0.112 UJ	< 0.068 U	< 0.136 U	< 0.0102 U	< 0.068 U
GNC1-BC27	0	FD	2/4/2009	< 0.0102 U	< 0.068 U	< 0.068 U	< 0.068 UJ	< 0.068 U	< 0.112 UJ	< 0.068 U	< 0.136 U	< 0.0102 U	< 0.068 U
GNC1-BC27	10	NORM	2/4/2009	< 0.0104 U	< 0.0692 U	< 0.0692 U	< 0.0692 UJ	< 0.0692 U	< 0.114 UJ	< 0.0692 U	< 0.138 U	< 0.0104 U	< 0.0692 U
GNC1-BC28	0	NORM	2/4/2009	< 0.0102 U	< 0.0681 U	< 0.0681 U	< 0.0681 UJ	< 0.0681 U	< 0.112 UJ	< 0.0681 U	< 0.136 U	< 0.0102 U	< 0.0681 U
GNC1-BC28	11	NORM	2/4/2009	< 0.0103 U	< 0.0687 U	< 0.0687 U	< 0.0687 UJ	< 0.0687 U	< 0.113 UJ	< 0.0687 U	< 0.137 U	< 0.0103 U	< 0.0687 U
GNC1-BC29	0	NORM	2/4/2009	< 0.0103 U	< 0.0684 U	< 0.0684 U	< 0.0684 UJ	< 0.0684 U	< 0.113 UJ	< 0.0684 U	< 0.137 U	< 0.0103 U	< 0.0684 U
GNC1-BC29	10	NORM	2/4/2009	< 0.0103 U	< 0.0688 U	< 0.0688 U	< 0.0688 UJ	< 0.0688 U	< 0.114 UJ	< 0.0688 U	< 0.138 U	< 0.0103 U	< 0.0688 U
GNC1-JB02	0	NORM	2/11/2009	< 0.0105 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.116 U	< 0.07 U	< 0.14 U	< 0.0105 U	< 0.07 U
GNC1-JB02	5	NORM	2/11/2009	< 0.0102 U	< 0.0683 U	< 0.0683 U	< 0.0683 U	< 0.0683 U	< 0.113 U	< 0.0683 U	< 0.137 U	< 0.0102 U	< 0.0683 U
GNC1-JB02	15	NORM	2/11/2009	< 0.0104 U	< 0.0696 U	< 0.0696 U	< 0.0696 U	< 0.0696 U	< 0.115 U	< 0.0696 U	< 0.139 U	< 0.0104 U	< 0.0696 U
GNC1-JB03	0	NORM	2/13/2009	< 0.0106 U	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.116 U	< 0.0705 U	< 0.141 U	< 0.0106 U	< 0.0705 U
GNC1-JB03	0	FD	2/13/2009	< 0.0105 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.115 U	< 0.07 U	< 0.14 U	< 0.0105 U	< 0.07 U
GNC1-JB03	7	NORM	2/13/2009	< 0.0104 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.138 U	< 0.0104 U	< 0.0691 U
GNC1-JB03	17	NORM	2/13/2009	< 0.0103 U	< 0.0688 U	< 0.0688 U	< 0.0688 U	< 0.0688 U	< 0.114 U	< 0.0688 U	< 0.138 U	< 0.0103 U	< 0.0688 U
GNC1-JB06	0	NORM	2/13/2009	< 0.0106 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.141 U	< 0.0106 U	< 0.0703 U
GNC1-JB06	6	NORM	2/17/2009	< 0.0104 U	< 0.0693 U	< 0.0693 U	< 0.0693 U	< 0.0693 U	< 0.114 U	< 0.0693 U	< 0.139 U	< 0.0104 U	< 0.0693 U
GNC1-JB06	16	NORM	2/17/2009	< 0.0104 U	< 0.0694 U	< 0.0694 U	< 0.0694 U	< 0.0694 U	< 0.115 U	< 0.0694 U	< 0.139 U	< 0.0104 U	< 0.0694 U
GNC1-JB07	0	NORM	2/13/2009	< 0.0105 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.116 U	< 0.0702 U	< 0.14 U	< 0.0105 U	< 0.0702 U
GNC1-JB07	8	NORM	2/13/2009	< 0.0103 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.137 U	< 0.0103 U	< 0.0687 U
GNC1-JB07	18	NORM	2/13/2009	< 0.0103 U	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.114 U	< 0.0689 U	< 0.138 U	< 0.0103 U	< 0.0689 U
GNC1-JD01	0	NORM	1/27/2009	< 0.0106 U	< 0.0707 U	< 0.0707 U	< 0.0707 UJ	< 0.0707 U	< 0.117 U	< 0.0707 U	< 0.141 U	< 0.0106 U	< 0.0707 U
GNC1-JD01	3	NORM	1/27/2009	< 0.0105 U	< 0.0703 U	< 0.0703 U	< 0.0703 UJ	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.141 U	< 0.0105 U	< 0.0703 U
GNC1-JD01	13	NORM	1/27/2009	< 0.0105 U	< 0.0699 U	< 0.0699 U	< 0.0699 UJ	< 0.0699 U	< 0.115 U	< 0.0699 U	< 0.14 U	< 0.0105 U	< 0.0699 U

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 12 of 14)

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Semi-Volatile Organic Compounds (SVOCs)									
				Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclo-pentadiene	Hexachloroethane	Hydroxymethyl phthalimide	Isophorone	m,p-Cresols	Naphthalene	Nitrobenzene
GNC1-JD02	0	NORM	1/27/2009	< 0.0107 U	< 0.0714 U	< 0.0714 U	< 0.0714 UJ	< 0.0714 U	< 0.118 U	< 0.0714 U	< 0.143 U	< 0.0107 U	< 0.0714 U
GNC1-JD02	10	NORM	1/27/2009	< 0.0108 U	< 0.0722 U	< 0.0722 U	< 0.0722 UJ	< 0.0722 U	< 0.119 U	< 0.0722 U	< 0.144 U	< 0.0108 U	< 0.0722 U
GNC1-JD06	0	NORM	2/13/2009	< 0.0107 U	< 0.0711 U	< 0.0711 U	< 0.0711 U	< 0.0711 U	< 0.117 U	< 0.0711 U	< 0.142 U	< 0.0107 U	< 0.0711 U
GNC1-JD06	10	NORM	2/17/2009	< 0.0107 U	< 0.0716 U	< 0.0716 U	< 0.0716 U	< 0.0716 U	< 0.118 U	< 0.0716 U	< 0.143 U	< 0.0107 U	< 0.0716 U
GNC1-JP02	0	NORM	2/12/2009	< 0.0106 U	< 0.0707 U	< 0.0707 U	< 0.0707 U	< 0.0707 U	< 0.117 U	< 0.0707 U	< 0.141 U	< 0.0106 U	< 0.0707 U
GNC1-JP02	0	FD	2/12/2009	< 0.0105 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.141 U	< 0.0105 U	< 0.0703 U
GNC1-JP02	10	NORM	2/12/2009	< 0.0103 U	< 0.0686 U	< 0.0686 U	< 0.0686 U	< 0.0686 U	< 0.113 U	< 0.0686 U	< 0.137 U	< 0.0103 U	< 0.0686 U
GNC1-JP04	0	NORM	2/10/2009	< 0.0106 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.141 U	< 0.0106 U	< 0.0703 U
GNC1-JP04	0	FD	2/10/2009	< 0.0107 U	< 0.0712 U	< 0.0712 U	< 0.0712 U	< 0.0712 U	< 0.117 U	< 0.0712 U	< 0.142 U	< 0.0107 U	< 0.0712 U
GNC1-JP04	10	NORM	2/10/2009	< 0.0105 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.116 U	< 0.0702 U	< 0.14 U	< 0.0105 U	< 0.0702 U
GNC1-JP05	0	NORM	2/4/2009	< 0.0102 U	< 0.0681 U	< 0.0681 U	< 0.0681 UJ	< 0.0681 U	< 0.112 UJ	< 0.0681 U	< 0.136 U	< 0.0102 U	< 0.0681 U
GNC1-JP05	11	NORM	2/4/2009	< 0.0104 U	< 0.0692 U	< 0.0692 U	< 0.0692 UJ	< 0.0692 U	< 0.114 UJ	< 0.0692 U	< 0.138 U	< 0.0104 U	< 0.0692 U
GNC1-JP06	0	NORM	2/12/2009	< 0.0106 U	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.116 U	< 0.0704 U	< 0.141 U	< 0.0106 U	< 0.0704 U
GNC1-JP06	0	FD	2/12/2009	< 0.0107 U	< 0.071 U	< 0.071 U	< 0.071 U	< 0.071 U	< 0.117 U	< 0.071 U	< 0.142 U	< 0.0107 U	< 0.071 U
GNC1-JP06	3	NORM	2/12/2009	< 0.0103 U	< 0.0685 U	< 0.0685 U	< 0.0685 U	< 0.0685 U	< 0.113 U	< 0.0685 U	< 0.137 U	< 0.0103 U	< 0.0685 U
GNC1-JP06	13	NORM	2/12/2009	< 0.0103 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.137 U	< 0.0103 U	< 0.0687 U
GNC1-JS08	0	NORM	1/28/2009	< 0.0104 U	< 0.0691 U	< 0.0691 U	< 0.0691 UJ	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.138 U	< 0.0104 U	< 0.0691 U
GNC1-JS08	10	NORM	1/28/2009	< 0.0105 U	< 0.0702 U	< 0.0702 U	< 0.0702 UJ	< 0.0702 U	< 0.116 U	< 0.0702 U	< 0.14 U	< 0.0105 U	< 0.0702 U
GNC1-JS17	0	NORM	2/4/2009	< 0.0102 U	< 0.0678 U	< 0.0678 U	< 0.0678 UJ	< 0.0678 U	< 0.112 UJ	< 0.0678 U	< 0.136 U	< 0.0102 U	< 0.0678 U
GNC1-JS17	10	NORM	2/4/2009	< 0.0103 U	< 0.069 U	< 0.069 U	< 0.069 UJ	< 0.069 U	< 0.114 UJ	< 0.069 U	< 0.138 U	< 0.0103 U	< 0.069 U
UPC1-BB28	0	NORM	11/3/2009	< 0.0102 U	< 0.0679 U	< 0.0679 U	< 0.0679 UJ	< 0.0679 U	< 0.112 U	< 0.0679 U	< 0.136 U	< 0.0102 U	< 0.0679 U
UPC1-BB28	0	FD	11/20/2009	< 0.0101 U	< 0.0673 U	< 0.0673 U	< 0.0673 UJ	< 0.0673 U	< 0.111 U	< 0.0673 U	< 0.135 U	< 0.0101 U	< 0.0673 U
UPC1-BB28	8	NORM	11/3/2009	< 0.0102 U	< 0.0682 U	< 0.0682 U	< 0.0682 UJ	< 0.0682 U	< 0.113 U	< 0.0682 U	< 0.136 U	< 0.0102 U	< 0.0682 U
UPC1-BB28	18	NORM	11/3/2009	< 0.0103 U	< 0.0685 U	< 0.0685 U	< 0.0685 UJ	< 0.0685 U	< 0.113 U	< 0.0685 U	< 0.137 U	< 0.0103 U	< 0.0685 U
UPC1-BB31	0	NORM	10/30/2009	< 0.0101 U	< 0.0676 U	< 0.0676 U	< 0.0676 UJ	< 0.0676 U	< 0.111 U	< 0.0676 U	< 0.135 U	< 0.0101 U	< 0.0676 U
UPC1-BB31	11	NORM	10/30/2009	< 0.0103 U	< 0.0684 U	< 0.0684 U	< 0.0684 UJ	< 0.0684 U	< 0.113 U	< 0.0684 U	< 0.137 U	< 0.0103 U	< 0.0684 U
UPC1-BB32	0	NORM	10/30/2009	< 0.0102 U	< 0.0681 U	< 0.0681 U	< 0.0681 UJ	< 0.0681 U	< 0.112 U	< 0.0681 U	< 0.136 U	< 0.0102 U	< 0.0681 U
UPC1-BB32	0	FD	10/30/2009	< 0.0102 U	< 0.0678 U	< 0.0678 U	< 0.0678 UJ	< 0.0678 U	< 0.112 U	< 0.0678 U	< 0.136 U	< 0.0102 U	< 0.0678 U
UPC1-BB32	10	NORM	10/30/2009	< 0.0104 U	< 0.0691 U	< 0.0691 U	< 0.0691 UJ	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.138 U	< 0.0104 U	< 0.0691 U
UPC1-BB33	0	NORM	10/29/2009	< 0.0103 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.137 U	< 0.0103 U	< 0.0687 U
UPC1-BB33	10	NORM	10/29/2009	< 0.0103 U	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.114 U	< 0.0689 U	< 0.138 U	< 0.0103 U	< 0.0689 U
UPC1-JP11	0	NORM	10/28/2009	< 0.0101 U	< 0.067 U	< 0.067 U	< 0.067 UJ	< 0.067 U	< 0.111 U	< 0.067 U	< 0.134 U	< 0.0101 U	< 0.067 U
UPC1-JP11	10	NORM	10/28/2009	< 0.0105 U	< 0.0703 U	< 0.0703 U	< 0.0703 UJ	< 0.0703 U	< 0.116 UJ	< 0.0703 U	< 0.141 U	< 0.0105 U	< 0.0703 U

All units in mg/kg.

-- = no sample data.

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Semi-Volatile Organic Compounds (SVOCs)									
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	N-nitrosodi-n-propyl-amine	o-Cresol	Octachlorostyrene	p-Chloroaniline	p-Chlorobenzenethiol	Pentachlorobenzene	Pentachlorophenol	Phenol	Phthalic acid	Pyridine
GNC1-BB16	0	NORM	1/27/2009	< 0.07 U	< 0.07 U	< 0.116 U	< 0.07 U	< 0.116 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.116 UJ	< 0.07 U
GNC1-BB16	10	NORM	1/27/2009	< 0.0718 U	< 0.0718 U	< 0.119 U	< 0.0718 U	< 0.119 U	< 0.0718 U	< 0.0718 U	< 0.0718 U	< 0.119 UJ	< 0.0718 U
GNC1-BC16	0	NORM	1/27/2009	< 0.0697 U	< 0.0697 U	< 0.115 U	< 0.0697 U	< 0.115 U	< 0.0697 U	< 0.0697 U	< 0.0697 U	< 0.115 UJ	< 0.0697 U
GNC1-BC16	10	NORM	1/27/2009	< 0.0711 U	< 0.0711 U	< 0.117 U	< 0.0711 U	< 0.117 U	< 0.0711 U	< 0.0711 U	< 0.0711 U	< 0.117 UJ	< 0.0711 U
GNC1-BC18	0	NORM	1/27/2009	< 0.0698 U	< 0.0698 U	< 0.115 U	< 0.0698 U	< 0.115 U	< 0.0698 U	< 0.0698 U	< 0.0698 U	< 0.115 UJ	< 0.0698 U
GNC1-BC18	0	FD	1/27/2009	< 0.0727 U	< 0.0727 U	< 0.12 U	< 0.0727 U	< 0.12 U	< 0.0727 U	< 0.0727 U	< 0.0727 U	< 0.12 UJ	< 0.0727 U
GNC1-BC18	10	NORM	1/27/2009	< 0.0713 U	< 0.0713 U	< 0.118 U	< 0.0713 U	< 0.118 U	< 0.0713 U	< 0.0713 U	< 0.0713 U	< 0.118 UJ	< 0.0713 U
GNC1-BC21	0	NORM	1/29/2009	< 0.0691 U	< 0.0691 U	< 0.114 UJ	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.0691 U
GNC1-BC21	10	NORM	1/29/2009	< 0.071 U	< 0.071 U	< 0.117 UJ	< 0.071 U	< 0.117 U	< 0.071 U	< 0.071 U	< 0.071 U	< 0.117 U	< 0.071 U
GNC1-BC22	0	NORM	3/2/2009	< 0.0692 U	< 0.0692 U	< 0.114 U	< 0.0692 U	< 0.114 U	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.114 UJ	< 0.0692 U
GNC1-BC22	11	NORM	3/2/2009	< 0.0699 U	< 0.0699 U	< 0.115 U	< 0.0699 U	< 0.115 U	< 0.0699 U	< 0.0699 U	< 0.0699 U	< 0.115 UJ	< 0.0699 U
GNC1-BC23	0	NORM	2/10/2009	< 0.0705 U	< 0.0705 U	< 0.116 U	< 0.0705 U	< 0.116 U	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.116 UJ	< 0.0705 U
GNC1-BC23	10	NORM	2/10/2009	< 0.0704 U	< 0.0704 U	< 0.116 U	< 0.0704 U	< 0.116 U	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.116 UJ	< 0.0704 U
GNC1-BC27	0	NORM	2/4/2009	< 0.068 U	< 0.068 U	< 0.112 U	< 0.068 U	< 0.112 U	< 0.068 U	< 0.068 U	< 0.068 U	< 0.112 UJ	< 0.068 U
GNC1-BC27	0	FD	2/4/2009	< 0.068 U	< 0.068 U	< 0.112 U	< 0.068 U	< 0.112 U	< 0.068 U	< 0.068 U	< 0.068 U	< 0.112 UJ	< 0.068 U
GNC1-BC27	10	NORM	2/4/2009	< 0.0692 U	< 0.0692 U	< 0.114 U	< 0.0692 U	< 0.114 U	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.114 UJ	< 0.0692 U
GNC1-BC28	0	NORM	2/4/2009	< 0.0681 U	< 0.0681 U	< 0.112 U	< 0.0681 U	< 0.112 U	< 0.0681 U	< 0.0681 U	< 0.0681 U	< 0.112 UJ	< 0.0681 U
GNC1-BC28	11	NORM	2/4/2009	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 UJ	< 0.0687 U
GNC1-BC29	0	NORM	2/4/2009	< 0.0684 U	< 0.0684 U	< 0.113 U	< 0.0684 U	< 0.113 U	< 0.0684 U	< 0.0684 U	< 0.0684 U	< 0.113 UJ	< 0.0684 U
GNC1-BC29	10	NORM	2/4/2009	< 0.0688 U	< 0.0688 U	< 0.114 U	< 0.0688 U	< 0.114 U	< 0.0688 U	< 0.0688 U	< 0.0688 U	< 0.114 UJ	< 0.0688 U
GNC1-JB02	0	NORM	2/11/2009	< 0.07 U	< 0.07 U	< 0.116 U	< 0.07 U	< 0.116 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.116 U	< 0.07 U
GNC1-JB02	5	NORM	2/11/2009	< 0.0683 U	< 0.0683 U	< 0.113 U	< 0.0683 U	< 0.113 U	< 0.0683 U	< 0.0683 U	< 0.0683 U	< 0.113 U	< 0.0683 U
GNC1-JB02	15	NORM	2/11/2009	< 0.0696 U	< 0.0696 U	< 0.115 U	< 0.0696 U	< 0.115 U	< 0.0696 U	< 0.0696 U	< 0.0696 U	< 0.115 U	< 0.0696 U
GNC1-JB03	0	NORM	2/13/2009	< 0.0705 U	< 0.0705 U	< 0.116 U	< 0.0705 U	< 0.116 U	< 0.0705 U	< 0.0705 U	< 0.0705 U	< 0.116 UJ	< 0.0705 U
GNC1-JB03	0	FD	2/13/2009	< 0.07 U	< 0.07 U	< 0.115 U	< 0.07 U	< 0.115 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.115 UJ	< 0.07 U
GNC1-JB03	7	NORM	2/13/2009	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.114 UJ	< 0.0691 U
GNC1-JB03	17	NORM	2/13/2009	< 0.0688 U	< 0.0688 U	< 0.114 U	< 0.0688 U	< 0.114 U	< 0.0688 U	< 0.0688 U	< 0.0688 U	< 0.114 UJ	< 0.0688 U
GNC1-JB06	0	NORM	2/13/2009	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 UJ	< 0.0703 U
GNC1-JB06	6	NORM	2/17/2009	< 0.0693 U	< 0.0693 U	< 0.114 U	< 0.0693 U	< 0.114 U	< 0.0693 U	< 0.0693 U	< 0.0693 U	< 0.114 UJ	< 0.0693 U
GNC1-JB06	16	NORM	2/17/2009	< 0.0694 U	< 0.0694 U	< 0.115 U	< 0.0694 U	< 0.115 U	< 0.0694 U	< 0.0694 U	< 0.0694 U	< 0.115 UJ	< 0.0694 U
GNC1-JB07	0	NORM	2/13/2009	< 0.0702 U	< 0.0702 U	< 0.116 U	< 0.0702 U	< 0.116 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.116 UJ	< 0.0702 U
GNC1-JB07	8	NORM	2/13/2009	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 UJ	< 0.0687 U
GNC1-JB07	18	NORM	2/13/2009	< 0.0689 U	< 0.0689 U	< 0.114 U	< 0.0689 U	< 0.114 U	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.114 UJ	< 0.0689 U
GNC1-JD01	0	NORM	1/27/2009	< 0.0707 U	< 0.0707 U	< 0.117 U	< 0.0707 U	< 0.117 U	< 0.0707 U	< 0.0707 U	< 0.0707 U	< 0.117 UJ	< 0.0707 U
GNC1-JD01	3	NORM	1/27/2009	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 UJ	< 0.0703 U
GNC1-JD01	13	NORM	1/27/2009	< 0.0699 U	< 0.0699 U	< 0.115 U	< 0.0699 U	< 0.115 U	< 0.0699 U	< 0.0699 U	< 0.0699 U	< 0.115 UJ	< 0.0699 U

TABLE B-9
SOIL ALDEHYDES AND SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Semi-Volatile Organic Compounds (SVOCs)									
				N-nitrosodi-n-propyl-amine	o-Cresol	Octachlorostyrene	p-Chloroaniline	p-Chlorobenzenethiol	Pentachlorobenzene	Pentachlorophenol	Phenol	Phthalic acid	Pyridine
GNC1-JD02	0	NORM	1/27/2009	< 0.0714 U	< 0.0714 U	< 0.118 U	< 0.0714 U	< 0.118 U	< 0.0714 U	< 0.0714 U	< 0.0714 U	< 0.118 UJ	< 0.0714 U
GNC1-JD02	10	NORM	1/27/2009	< 0.0722 U	< 0.0722 U	< 0.119 U	< 0.0722 U	< 0.119 U	< 0.0722 U	< 0.0722 U	< 0.0722 U	< 0.119 UJ	< 0.0722 U
GNC1-JD06	0	NORM	2/13/2009	< 0.0711 U	< 0.0711 U	< 0.117 U	< 0.0711 U	< 0.117 U	< 0.0711 U	< 0.0711 U	< 0.0711 U	< 0.117 UJ	< 0.0711 U
GNC1-JD06	10	NORM	2/17/2009	< 0.0716 U	< 0.0716 U	< 0.118 U	< 0.0716 U	< 0.118 U	< 0.0716 U	< 0.0716 U	< 0.0716 U	< 0.118 U	< 0.0716 U
GNC1-JP02	0	NORM	2/12/2009	< 0.0707 U	< 0.0707 U	< 0.117 U	< 0.0707 U	< 0.117 U	< 0.0707 U	< 0.0707 U	< 0.0707 U	< 0.117 UJ	< 0.0707 U
GNC1-JP02	0	FD	2/12/2009	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 UJ	< 0.0703 U
GNC1-JP02	10	NORM	2/12/2009	< 0.0686 U	< 0.0686 U	< 0.113 U	< 0.0686 U	< 0.113 U	< 0.0686 U	< 0.0686 U	< 0.0686 U	< 0.113 UJ	< 0.0686 U
GNC1-JP04	0	NORM	2/10/2009	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 UJ	< 0.0703 U
GNC1-JP04	0	FD	2/10/2009	< 0.0712 U	< 0.0712 U	< 0.117 U	< 0.0712 U	< 0.117 U	< 0.0712 U	< 0.0712 U	< 0.0712 U	< 0.117 UJ	< 0.0712 U
GNC1-JP04	10	NORM	2/10/2009	< 0.0702 U	< 0.0702 U	< 0.116 U	< 0.0702 U	< 0.116 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.116 UJ	< 0.0702 U
GNC1-JP05	0	NORM	2/4/2009	< 0.0681 U	< 0.0681 U	< 0.112 U	< 0.0681 U	< 0.112 U	< 0.0681 U	< 0.0681 U	< 0.0681 U	< 0.112 UJ	< 0.0681 U
GNC1-JP05	11	NORM	2/4/2009	< 0.0692 U	< 0.0692 U	< 0.114 U	< 0.0692 U	< 0.114 U	< 0.0692 U	< 0.0692 U	< 0.0692 U	< 0.114 UJ	< 0.0692 U
GNC1-JP06	0	NORM	2/12/2009	< 0.0704 U	< 0.0704 U	< 0.116 U	< 0.0704 U	< 0.116 U	< 0.0704 U	< 0.0704 U	< 0.0704 U	< 0.116 UJ	< 0.0704 U
GNC1-JP06	0	FD	2/12/2009	< 0.071 U	< 0.071 U	< 0.117 U	< 0.071 U	< 0.117 U	< 0.071 U	< 0.071 U	< 0.071 U	< 0.117 UJ	< 0.071 U
GNC1-JP06	3	NORM	2/12/2009	< 0.0685 U	< 0.0685 U	< 0.113 U	< 0.0685 U	< 0.113 U	< 0.0685 U	< 0.0685 U	< 0.0685 U	< 0.113 UJ	< 0.0685 U
GNC1-JP06	13	NORM	2/12/2009	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 UJ	< 0.0687 U
GNC1-JS08	0	NORM	1/28/2009	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.0691 U
GNC1-JS08	10	NORM	1/28/2009	< 0.0702 U	< 0.0702 U	< 0.116 U	< 0.0702 U	< 0.116 U	< 0.0702 U	< 0.0702 U	< 0.0702 U	< 0.116 U	< 0.0702 U
GNC1-JS17	0	NORM	2/4/2009	< 0.0678 U	< 0.0678 U	< 0.112 U	< 0.0678 U	< 0.112 U	< 0.0678 U	< 0.0678 U	< 0.0678 U	< 0.112 UJ	< 0.0678 U
GNC1-JS17	10	NORM	2/4/2009	< 0.069 U	< 0.069 U	< 0.114 U	< 0.069 U	< 0.114 U	< 0.069 U	< 0.069 U	< 0.069 U	< 0.114 UJ	< 0.069 U
UPC1-BB28	0	NORM	11/3/2009	< 0.0679 U	< 0.0679 U	< 0.112 U	< 0.0679 U	< 0.112 UJ	< 0.0679 U	< 0.0679 U	< 0.0679 U	< 0.112 U	< 0.0679 U
UPC1-BB28	0	FD	11/20/2009	< 0.0673 U	< 0.0673 U	< 0.111 U	< 0.0673 U	< 0.111 U	< 0.0673 U	< 0.0673 U	< 0.0673 U	< 0.111 U	< 0.0673 U
UPC1-BB28	8	NORM	11/3/2009	< 0.0682 U	< 0.0682 U	< 0.113 U	< 0.0682 U	< 0.113 UJ	< 0.0682 U	< 0.0682 U	< 0.0682 U	< 0.113 U	< 0.0682 U
UPC1-BB28	18	NORM	11/3/2009	< 0.0685 U	< 0.0685 U	< 0.113 U	< 0.0685 U	< 0.113 UJ	< 0.0685 U	< 0.0685 U	< 0.0685 U	< 0.113 U	< 0.0685 U
UPC1-BB31	0	NORM	10/30/2009	< 0.0676 U	< 0.0676 U	< 0.111 U	< 0.0676 U	< 0.111 UJ	< 0.0676 U	< 0.0676 U	< 0.0676 U	< 0.111 U	< 0.0676 U
UPC1-BB31	11	NORM	10/30/2009	< 0.0684 U	< 0.0684 U	< 0.113 U	< 0.0684 U	< 0.113 UJ	< 0.0684 U	< 0.0684 U	< 0.0684 U	< 0.113 U	< 0.0684 U
UPC1-BB32	0	NORM	10/30/2009	< 0.0681 U	< 0.0681 U	< 0.112 U	< 0.0681 U	< 0.112 UJ	< 0.0681 U	< 0.0681 U	< 0.0681 U	< 0.112 U	< 0.0681 U
UPC1-BB32	0	FD	10/30/2009	< 0.0678 U	< 0.0678 U	< 0.112 U	< 0.0678 U	< 0.112 UJ	< 0.0678 U	< 0.0678 U	< 0.0678 U	< 0.112 U	< 0.0678 U
UPC1-BB32	10	NORM	10/30/2009	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.0691 U	< 0.114 UJ	< 0.0691 U	< 0.0691 U	< 0.0691 U	< 0.114 U	< 0.0691 U
UPC1-BB33	0	NORM	10/29/2009	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.113 U	< 0.0687 U	< 0.0687 U	< 0.0687 U	< 0.113 U	< 0.0687 U
UPC1-BB33	10	NORM	10/29/2009	< 0.0689 U	< 0.0689 U	< 0.114 U	< 0.0689 U	< 0.114 U	< 0.0689 U	< 0.0689 U	< 0.0689 U	< 0.114 U	< 0.0689 U
UPC1-JP11	0	NORM	10/28/2009	< 0.067 U	< 0.067 U	< 0.111 U	< 0.067 U	< 0.111 U	< 0.067 U	< 0.067 U	< 0.067 U	< 0.111 UJ	< 0.067 U
UPC1-JP11	10	NORM	10/28/2009	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U	< 0.116 UJ	< 0.0703 U	< 0.0703 U	< 0.0703 U	< 0.116 U	< 0.0703 U

All units in mg/kg.
-- = no sample data.

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Volatile Organic Compounds (VOCs)											
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dichlorobenzene
GNC1-BB16	0	NORM	1/27/2009	< 0.00019 U	< 0.00011 U	< 0.000082 UJ	< 0.000071 U	< 0.000074 U	< 0.00013 U	< 0.000092 U	< 0.00041 UJ	< 0.00026 UJ	< 0.00035 UJ	< 0.00043 UJ	< 0.00013 UJ
GNC1-BB16	10	NORM	1/27/2009	< 0.00019 U	< 0.00011 U	< 0.000083 UJ	< 0.000071 U	< 0.000074 U	< 0.00013 U	< 0.000092 U	< 0.00041 UJ	< 0.00027 UJ	< 0.00035 UJ	< 0.00014 UJ	< 0.00013 UJ
GNC1-BC16	0	NORM	1/27/2009	< 0.00018 U	< 0.00011 U	< 0.000081 U	< 0.00007 U	< 0.000073 U	< 0.00012 U	< 0.00009 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00035 U	< 0.00013 U
GNC1-BC16	10	NORM	1/27/2009	< 0.00019 U	< 0.00011 U	< 0.000085 U	< 0.000073 U	< 0.000076 U	< 0.00013 U	< 0.000095 U	< 0.00042 U	< 0.00027 U	< 0.00036 U	< 0.00028 U	< 0.00013 U
GNC1-BC18	0	NORM	1/27/2009	< 0.00019 U	< 0.00011 U	< 0.000083 U	< 0.000071 U	< 0.000074 U	< 0.00013 U	< 0.000092 U	< 0.00041 U	< 0.00026 U	< 0.00035 U	< 0.0003 U	< 0.00013 U
GNC1-BC18	0	FD	1/27/2009	< 0.00019 U	< 0.00011 U	< 0.000082 UJ	< 0.00007 U	< 0.000074 U	< 0.00013 U	< 0.000091 U	< 0.00041 UJ	< 0.00026 UJ	< 0.00035 UJ	< 0.00037 UJ	< 0.00013 UJ
GNC1-BC18	10	NORM	1/27/2009	< 0.00019 U	< 0.00011 U	< 0.000085 U	< 0.000073 U	< 0.000076 U	< 0.00013 U	< 0.000095 U	< 0.00042 U	< 0.00027 U	< 0.00036 U	< 0.00028 U	< 0.00013 U
GNC1-BC21	0	NORM	1/29/2009	< 0.00018 U	< 0.00011 U	< 0.000079 UJ	< 0.000068 U	< 0.000071 U	< 0.00012 U	< 0.000088 U	< 0.00039 UJ	< 0.00025 UJ	< 0.00033 UJ	< 0.00013 UJ	< 0.00012 UJ
GNC1-BC21	10	NORM	1/29/2009	< 0.00019 U	< 0.00011 U	< 0.000083 UJ	< 0.000071 U	< 0.000074 U	< 0.00013 U	< 0.000092 U	< 0.00041 UJ	< 0.00027 UJ	< 0.00035 UJ	< 0.00025 UJ	< 0.00013 UJ
GNC1-BC22	0	NORM	3/2/2009	< 0.00018 U	< 0.00011 U	< 0.00008 U	< 0.000068 U	< 0.000071 U	< 0.00012 U	< 0.000089 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00048 U	< 0.00012 U
GNC1-BC22	11	NORM	3/2/2009	< 0.00019 U	< 0.00011 U	< 0.000081 U	< 0.00007 U	< 0.000073 U	< 0.00013 U	< 0.000091 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00056 U	< 0.00013 U
GNC1-BC23	0	NORM	2/10/2009	< 0.00019 U	< 0.00011 U	< 0.000083 U	< 0.000071 U	< 0.000074 U	< 0.00013 U	< 0.000092 U	< 0.00041 U	< 0.00026 U	< 0.00035 U	< 0.00028 U	< 0.00013 U
GNC1-BC23	10	NORM	2/10/2009	< 0.00019 U	< 0.00011 U	< 0.000081 U	< 0.00007 U	< 0.000073 U	< 0.00013 U	< 0.000091 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00034 U	< 0.00013 U
GNC1-BC27	0	NORM	2/4/2009	< 0.00018 U	< 0.00011 U	< 0.00008 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.000089 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00027 U	< 0.00012 U
GNC1-BC27	0	FD	2/4/2009	< 0.00018 U	< 0.00011 U	< 0.000079 U	< 0.000068 U	< 0.000071 U	< 0.00012 U	< 0.000088 U	< 0.00039 U	< 0.00025 U	< 0.00033 U	< 0.00023 U	< 0.00012 U
GNC1-BC27	10	NORM	2/4/2009	< 0.00018 U	< 0.00011 U	< 0.00008 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.00009 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00031 U	< 0.00012 U
GNC1-BC28	0	NORM	2/4/2009	< 0.00018 U	< 0.00011 U	< 0.000081 UJ	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.00009 U	< 0.0004 UJ	< 0.00026 UJ	< 0.00034 UJ	< 0.00043 UJ	< 0.00013 UJ
GNC1-BC28	11	NORM	2/4/2009	< 0.00018 U	< 0.00011 U	< 0.00008 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.000089 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00051 U	< 0.00012 U
GNC1-BC29	0	NORM	2/4/2009	< 0.00018 U	< 0.00011 U	< 0.000081 U	< 0.000069 U	< 0.000073 U	< 0.00012 U	< 0.00009 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00046 U	< 0.00013 U
GNC1-BC29	10	NORM	2/4/2009	< 0.00018 U	< 0.00011 U	< 0.00008 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.000089 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00034 U	< 0.00012 U
GNC1-JB02	0	NORM	2/11/2009	< 0.00019 U	< 0.00011 U	< 0.000082 U	< 0.00007 U	< 0.000073 U	< 0.00013 U	< 0.000091 U	< 0.00041 U	< 0.00026 U	< 0.00035 U	< 0.00054 U	< 0.00013 U
GNC1-JB02	5	NORM	2/11/2009	< 0.00018 U	< 0.00011 U	< 0.000081 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.00009 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00053 U	< 0.00013 U
GNC1-JB02	15	NORM	2/11/2009	< 0.00019 U	< 0.00011 U	< 0.000082 U	< 0.00007 U	< 0.000073 U	< 0.00013 U	< 0.000091 U	< 0.00041 U	< 0.00026 U	< 0.00035 U	< 0.00049 U	< 0.00013 U
GNC1-JB03	0	NORM	2/13/2009	< 0.00018 U	< 0.00011 U	< 0.000081 U	< 0.000069 U	< 0.000073 U	< 0.00012 U	< 0.00009 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00054 U	0.0002 J
GNC1-JB03	0	FD	2/13/2009	< 0.00019 U	< 0.00011 U	< 0.000081 U	< 0.00007 U	< 0.000073 U	< 0.00013 U	< 0.000091 U	< 0.00041 U	< 0.00026 U	< 0.00034 U	< 0.00044 U	0.00019 J
GNC1-JB03	7	NORM	2/13/2009	< 0.00018 U	< 0.00011 U	< 0.00008 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.000089 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00054 U	0.00016 J
GNC1-JB03	17	NORM	2/13/2009	< 0.00018 U	< 0.00011 U	< 0.000081 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.00009 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00063 U	0.00014 J
GNC1-JB06	0	NORM	2/13/2009	< 0.00019 U	< 0.00011 U	< 0.000082 U	< 0.00007 U	< 0.000073 U	< 0.00013 U	< 0.000091 U	< 0.00041 U	< 0.00026 U	< 0.00034 U	< 0.0005 U	0.00021 J
GNC1-JB06	6	NORM	2/17/2009	< 0.00019 U	< 0.00011 U	< 0.000082 U	< 0.00007 U	< 0.000073 U	< 0.00013 U	< 0.000091 U	< 0.00041 U	< 0.00026 U	< 0.00035 U	0.00098 J	< 0.00013 U
GNC1-JB06	16	NORM	2/17/2009	< 0.00019 U	< 0.00011 U	< 0.000083 U	< 0.000071 U	< 0.000075 U	< 0.00013 U	< 0.000093 U	< 0.00041 U	< 0.00027 U	< 0.00035 U	< 0.00074 U	< 0.00017 U
GNC1-JB07	0	NORM	2/13/2009	< 0.00019 U	< 0.00011 U	< 0.000081 U	< 0.00007 U	< 0.000073 U	< 0.00012 U	< 0.000091 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00053 U	< 0.00013 U
GNC1-JB07	8	NORM	2/13/2009	< 0.00018 U	< 0.00011 U	< 0.00008 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.00009 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00063 U	< 0.00012 U
GNC1-JB07	18	NORM	2/13/2009	< 0.00018 U	< 0.00011 U	< 0.00008 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.000089 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00045 U	< 0.00014 U
GNC1-JD01	0	NORM	1/27/2009	< 0.00019 UJ	< 0.00011 UJ	< 0.000082 UJ	< 0.00007 UJ	< 0.000073 UJ	< 0.00013 UJ	< 0.000091 UJ	< 0.00041 UJ	< 0.00026 UJ	< 0.00035 UJ	0.0012 J	< 0.00013 UJ
GNC1-JD01	3	NORM	1/27/2009	< 0.00019 U	< 0.00011 U	< 0.000083 UJ	< 0.000071 U	< 0.000074 U	< 0.00013 U	< 0.000093 U	< 0.00041 UJ	< 0.00027 UJ	< 0.00035 UJ	< 0.00044 UJ	< 0.00013 UJ
GNC1-JD01	13	NORM	1/27/2009	< 0.00019 U	< 0.00011 U	< 0.000083 UJ	< 0.000071 U	< 0.000074 U	< 0.00013 U	< 0.000092 U	< 0.00041 UJ	< 0.00026 UJ	< 0.00035 UJ	< 0.00033 UJ	< 0.00013 UJ

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Volatile Organic Compounds (VOCs)											
				1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dichlorobenzene
GNC1-JD02	0	NORM	1/27/2009	< 0.00019 U	< 0.00011 U	< 0.000085 UJ	< 0.000073 U	< 0.000076 U	< 0.00013 U	< 0.000095 U	< 0.00042 UJ	< 0.00027 UJ	< 0.00036 UJ	< 0.00042 UJ	< 0.00013 UJ
GNC1-JD02	10	NORM	1/27/2009	< 0.00019 U	< 0.00011 U	< 0.000083 UJ	< 0.000072 U	< 0.000075 U	< 0.00013 U	< 0.000093 U	< 0.00041 UJ	< 0.00027 UJ	< 0.00035 UJ	< 0.00037 UJ	< 0.00013 UJ
GNC1-JD06	0	NORM	2/13/2009	< 0.00019 U	< 0.00011 U	< 0.000083 U	< 0.000071 U	< 0.000074 U	< 0.00013 U	< 0.000092 U	< 0.00041 U	< 0.00026 U	< 0.00035 U	< 0.00045 U	0.00021 J
GNC1-JD06	10	NORM	2/17/2009	< 0.00019 U	< 0.00011 U	< 0.000083 U	< 0.000071 U	< 0.000074 U	< 0.00013 U	< 0.000092 U	< 0.00041 U	< 0.00026 U	< 0.00035 U	< 0.00069 U	< 0.00015 U
GNC1-JP02	0	NORM	2/12/2009	< 0.00018 U	< 0.00011 U	< 0.000081 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.00009 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00033 U	< 0.00012 U
GNC1-JP02	0	FD	2/12/2009	< 0.00018 U	< 0.00011 U	< 0.000081 U	< 0.000069 U	< 0.000073 U	< 0.00012 U	< 0.00009 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00061 U	0.00019 J
GNC1-JP02	10	NORM	2/12/2009	< 0.00018 U	< 0.00011 U	< 0.00008 U	< 0.000068 U	< 0.000071 U	< 0.00012 U	< 0.000089 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00052 U	0.00016 J
GNC1-JP04	0	NORM	2/10/2009	< 0.00019 U	< 0.00011 U	< 0.000085 U	< 0.000073 U	< 0.000076 U	< 0.00013 U	< 0.000095 U	< 0.00042 U	< 0.00027 U	< 0.00036 U	< 0.00048 U	< 0.00013 U
GNC1-JP04	0	FD	2/10/2009	< 0.00019 U	< 0.00011 U	< 0.000083 U	< 0.000071 U	< 0.000075 U	< 0.00013 U	< 0.000093 U	< 0.00041 U	< 0.00027 U	< 0.00035 U	< 0.00046 U	< 0.00013 U
GNC1-JP04	10	NORM	2/10/2009	< 0.00019 U	< 0.00011 U	< 0.000081 U	< 0.00007 U	< 0.000073 U	< 0.00012 U	< 0.000091 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	0.00051 J	< 0.00013 U
GNC1-JP05	0	NORM	2/4/2009	< 0.00018 U	< 0.00011 U	< 0.000079 U	< 0.000068 U	< 0.000071 U	< 0.00012 U	< 0.000088 U	< 0.00039 U	< 0.00025 U	< 0.00034 U	< 0.00039 U	< 0.00012 U
GNC1-JP05	11	NORM	2/4/2009	< 0.00018 U	< 0.00011 U	< 0.000081 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.00009 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00044 U	< 0.00012 U
GNC1-JP06	0	NORM	2/12/2009	< 0.00018 U	< 0.00011 U	< 0.000081 U	< 0.00007 U	< 0.000073 U	< 0.00012 U	< 0.00009 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00038 U	< 0.00013 U
GNC1-JP06	0	FD	2/12/2009	< 0.00018 U	< 0.00011 U	< 0.000081 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.00009 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00036 U	< 0.00013 U
GNC1-JP06	3	NORM	2/12/2009	< 0.00018 U	< 0.00011 U	< 0.000079 U	< 0.000068 U	< 0.000071 U	< 0.00012 U	< 0.000088 U	< 0.00039 U	< 0.00025 U	< 0.00033 U	< 0.00045 U	< 0.00012 U
GNC1-JP06	13	NORM	2/12/2009	< 0.00018 U	< 0.00011 U	< 0.000079 U	< 0.000068 U	< 0.000071 U	< 0.00012 U	< 0.000088 U	< 0.00039 U	< 0.00025 U	< 0.00033 U	< 0.00036 U	< 0.00012 U
GNC1-JS08	0	NORM	1/28/2009	< 0.00018 UJ	< 0.00011 U	< 0.00008 UJ	< 0.000069 UJ	< 0.000072 U	< 0.00012 U	< 0.00009 U	< 0.0004 UJ	< 0.00026 UJ	< 0.00034 UJ	< 0.00014 UJ	< 0.00012 UJ
GNC1-JS08	10	NORM	1/28/2009	< 0.00019 U	< 0.00011 U	< 0.000081 U	< 0.00007 U	< 0.000073 U	< 0.00013 U	< 0.000091 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00027 U	< 0.00013 U
GNC1-JS17	0	NORM	2/4/2009	< 0.00018 U	< 0.00011 U	< 0.00008 U	< 0.000069 U	< 0.000072 U	< 0.00012 U	< 0.000089 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00045 U	< 0.00012 U
GNC1-JS17	10	NORM	2/4/2009	< 0.00019 U	< 0.00011 U	< 0.000081 U	< 0.00007 U	< 0.000073 U	< 0.00012 U	< 0.000091 U	< 0.0004 U	< 0.00026 U	< 0.00034 U	< 0.00039 U	< 0.00013 U
UPC1-BB28	0	NORM	11/3/2009	< 0.00039 U	< 0.00024 U	< 0.00045 U	< 0.00037 U	< 0.00038 U	< 0.00024 U	< 0.00022 U	< 0.00046 U	< 0.00049 U	< 0.00031 U	< 0.0004 U	< 0.00036 U
UPC1-BB28	0	FD	11/20/2009	< 0.00038 U	< 0.00024 U	< 0.00044 U	< 0.00036 U	< 0.00037 U	< 0.00024 U	< 0.00022 U	< 0.00045 U	< 0.00049 U	< 0.00031 U	0.0012 J	< 0.00036 U
UPC1-BB28	8	NORM	11/3/2009	< 0.00038 U	< 0.00024 U	< 0.00045 U	< 0.00037 U	< 0.00037 U	< 0.00024 U	< 0.00022 U	< 0.00046 U	< 0.00049 U	< 0.00031 U	< 0.0004 U	< 0.00036 U
UPC1-BB28	18	NORM	11/3/2009	< 0.00039 U	< 0.00024 U	< 0.00046 U	< 0.00037 U	< 0.00038 U	< 0.00024 U	< 0.00023 U	< 0.00047 U	< 0.0005 U	< 0.00032 U	< 0.00041 U	< 0.00037 U
UPC1-BB31	0	NORM	10/30/2009	< 0.00038 U	< 0.00024 U	< 0.00045 U	< 0.00036 U	< 0.00037 U	< 0.00024 U	< 0.00022 U	< 0.00046 U	< 0.00049 U	< 0.00031 U	< 0.0004 U	< 0.00036 U
UPC1-BB31	11	NORM	10/30/2009	< 0.00039 U	< 0.00024 U	< 0.00045 U	< 0.00037 U	< 0.00038 U	< 0.00024 U	< 0.00023 U	< 0.00046 U	< 0.0005 U	< 0.00031 U	< 0.00041 U	< 0.00037 U
UPC1-BB32	0	NORM	10/30/2009	< 0.00038 U	< 0.00024 U	< 0.00045 U	< 0.00037 U	< 0.00037 U	< 0.00024 U	< 0.00022 U	< 0.00046 U	< 0.00049 U	< 0.00031 U	< 0.0004 U	< 0.00036 U
UPC1-BB32	0	FD	10/30/2009	< 0.00038 U	< 0.00024 U	< 0.00045 U	< 0.00036 U	< 0.00037 U	< 0.00024 U	< 0.00022 U	< 0.00046 U	< 0.00049 U	< 0.00031 U	< 0.0004 U	< 0.00036 U
UPC1-BB32	10	NORM	10/30/2009	< 0.00039 U	< 0.00024 U	< 0.00045 U	< 0.00037 U	< 0.00038 U	< 0.00024 U	< 0.00023 U	< 0.00046 U	< 0.0005 U	< 0.00031 U	< 0.00041 U	< 0.00037 U
UPC1-BB33	0	NORM	10/29/2009	< 0.00038 U	< 0.00024 U	< 0.00045 U	< 0.00036 U	< 0.00037 U	< 0.00024 U	< 0.00022 U	< 0.00046 U	< 0.00049 U	< 0.00031 U	< 0.0004 U	< 0.00036 U
UPC1-BB33	10	NORM	10/29/2009	< 0.00039 U	< 0.00024 U	< 0.00045 U	< 0.00037 U	< 0.00038 U	< 0.00024 U	< 0.00023 U	< 0.00046 U	< 0.0005 U	< 0.00032 U	< 0.00041 U	< 0.00037 U
UPC1-JP11	0	NORM	10/28/2009	< 0.00038 U	< 0.00024 U	< 0.00044 U	< 0.00036 U	< 0.00037 U	< 0.00024 U	< 0.00022 U	< 0.00045 U	< 0.00049 U	< 0.00031 U	0.00088 J	< 0.00036 U
UPC1-JP11	10	NORM	10/28/2009	< 0.00039 U	< 0.00024 U	< 0.00046 U	< 0.00037 U	< 0.00038 U	< 0.00024 U	< 0.00023 U	< 0.00047 U	< 0.0005 U	< 0.00032 U	< 0.00041 U	< 0.00037 U

All units in mg/kg.

-- = no sample data.

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 3 of 14)

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Volatile Organic Compounds (VOCs)											
				1,2-Dichloroethane	1,2-Dichloroethene	1,2-Dichloropropane	1,3,5-Trichlorobenzene	1,3,5-Trimethylbenzene	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2,3-Trimethylbutane	2,2-Dichloropropane	2,2-Dimethylpentane	2,3-Dimethylpentane
GNC1-BB16	0	NORM	1/27/2009	< 0.00007 U	< 0.00011 U	< 0.00012 U	< 0.00039 UJ	< 0.0001 UJ	< 0.00014 UJ	< 0.000054 U	< 0.00014 UJ	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00024 U
GNC1-BB16	10	NORM	1/27/2009	< 0.00007 U	< 0.00011 U	< 0.00012 U	< 0.00039 UJ	< 0.0001 UJ	< 0.00014 UJ	< 0.000054 U	< 0.00014 UJ	< 0.00022 U	< 0.00025 U	< 0.00029 U	< 0.00024 U
GNC1-BC16	0	NORM	1/27/2009	< 0.000069 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-BC16	10	NORM	1/27/2009	< 0.000072 U	< 0.00012 U	< 0.00012 U	< 0.0004 U	< 0.00011 U	< 0.00014 U	< 0.000056 U	< 0.00015 U	< 0.00023 U	< 0.00025 U	< 0.0003 U	< 0.00024 U
GNC1-BC18	0	NORM	1/27/2009	< 0.00007 U	< 0.00011 U	< 0.00012 U	< 0.00039 U	< 0.0001 U	< 0.00014 U	< 0.000054 U	< 0.00014 U	< 0.00022 U	< 0.00025 U	< 0.00029 U	< 0.00024 U
GNC1-BC18	0	FD	1/27/2009	< 0.000069 U	< 0.00011 U	< 0.00012 U	< 0.00039 UJ	< 0.0001 UJ	< 0.00014 UJ	< 0.000054 U	< 0.00014 UJ	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00024 U
GNC1-BC18	10	NORM	1/27/2009	< 0.000072 U	< 0.00012 U	< 0.00012 U	< 0.0004 U	< 0.00011 U	< 0.00014 U	< 0.000056 U	< 0.00015 U	< 0.00023 U	< 0.00025 U	< 0.0003 U	< 0.00024 U
GNC1-BC21	0	NORM	1/29/2009	< 0.000067 U	< 0.00011 U	< 0.00011 U	< 0.00037 UJ	< 0.000098 UJ	< 0.00013 UJ	< 0.000052 U	< 0.00014 UJ	< 0.00021 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-BC21	10	NORM	1/29/2009	< 0.00007 U	< 0.00011 U	< 0.00012 U	< 0.00039 UJ	< 0.0001 UJ	< 0.00014 UJ	< 0.000054 U	< 0.00014 UJ	< 0.00022 U	< 0.00025 U	< 0.00029 U	< 0.00024 U
GNC1-BC22	0	NORM	3/2/2009	< 0.000067 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.000099 U	< 0.00013 U	< 0.000052 U	< 0.00014 U	< 0.00021 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-BC22	11	NORM	3/2/2009	< 0.000069 U	< 0.00011 U	< 0.00011 U	< 0.00039 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-BC23	0	NORM	2/10/2009	< 0.00007 U	< 0.00011 U	< 0.00012 U	< 0.00039 U	< 0.0001 U	< 0.00014 U	< 0.000054 U	< 0.00014 U	< 0.00022 U	< 0.00025 U	< 0.00029 U	< 0.00024 U
GNC1-BC23	10	NORM	2/10/2009	< 0.000069 U	< 0.00011 U	< 0.00011 U	< 0.00039 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-BC27	0	NORM	2/4/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00013 U	< 0.000052 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-BC27	0	FD	2/4/2009	< 0.000067 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.000098 U	< 0.00013 U	< 0.000052 U	< 0.00014 U	< 0.00021 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-BC27	10	NORM	2/4/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00013 U	< 0.000052 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-BC28	0	NORM	2/4/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 UJ	< 0.0001 UJ	< 0.00014 UJ	< 0.000053 U	< 0.00014 UJ	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-BC28	11	NORM	2/4/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00016 U	< 0.000052 U	< 0.00025 U	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-BC29	0	NORM	2/4/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-BC29	10	NORM	2/4/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00013 U	< 0.000052 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JB02	0	NORM	2/11/2009	< 0.000069 U	< 0.00011 U	< 0.00012 U	< 0.00039 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-JB02	5	NORM	2/11/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JB02	15	NORM	2/11/2009	< 0.000069 U	< 0.00011 U	< 0.00012 U	< 0.00039 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-JB03	0	NORM	2/13/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-JB03	0	FD	2/13/2009	< 0.000069 U	< 0.00011 U	< 0.00011 U	< 0.00039 U	< 0.0001 U	0.00017 J	< 0.000053 U	0.00019 J	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-JB03	7	NORM	2/13/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	0.00012 J	0.00018 J	< 0.000052 U	0.00019 J	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JB03	17	NORM	2/13/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	0.00013 J	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JB06	0	NORM	2/13/2009	< 0.000069 U	< 0.00011 U	< 0.00011 U	< 0.00039 U	0.00012 J	0.00019 J	< 0.000053 U	0.00031 J	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-JB06	6	NORM	2/17/2009	< 0.000069 U	< 0.00011 U	< 0.00012 U	< 0.00039 U	< 0.00015 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-JB06	16	NORM	2/17/2009	< 0.00007 U	< 0.00011 U	< 0.00012 U	< 0.00039 U	< 0.00016 U	< 0.00019 U	< 0.000054 U	< 0.00019 U	< 0.00022 U	< 0.00025 U	< 0.00029 U	< 0.00024 U
GNC1-JB07	0	NORM	2/13/2009	< 0.000069 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-JB07	8	NORM	2/13/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	0.00015 J	< 0.000052 U	0.00016 J	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JB07	18	NORM	2/13/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.00012 U	< 0.00013 U	< 0.000052 U	< 0.00014 U	< 0.00021 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JD01	0	NORM	1/27/2009	< 0.000069 UJ	< 0.00011 UJ	< 0.00012 UJ	< 0.00039 UJ	0.00042 J	< 0.00014 UJ	< 0.000053 UJ	< 0.00014 UJ	< 0.00022 UJ	< 0.00024 UJ	< 0.00029 UJ	< 0.00023 UJ
GNC1-JD01	3	NORM	1/27/2009	< 0.00007 U	< 0.00011 U	< 0.00012 U	< 0.00039 UJ	< 0.0001 UJ	< 0.00014 UJ	< 0.000054 U	< 0.00014 UJ	< 0.00022 U	< 0.00025 U	< 0.00029 U	< 0.00024 U
GNC1-JD01	13	NORM	1/27/2009	< 0.00007 U	< 0.00011 U	< 0.00012 U	< 0.00039 UJ	< 0.0001 UJ	< 0.00014 UJ	< 0.000054 U	< 0.00014 UJ	< 0.00022 U	< 0.00025 U	< 0.00029 U	< 0.00024 U

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Volatile Organic Compounds (VOCs)											
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	1,2-Dichloroethane	1,2-Dichloroethene	1,2-Dichloropropane	1,3,5-Trichlorobenzene	1,3,5-Trimethylbenzene	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2,3-Trimethylbutane	2,2-Dichloropropane	2,2-Dimethylpentane	2,3-Dimethylpentane
GNC1-JD02	0	NORM	1/27/2009	< 0.000072 U	< 0.00012 U	< 0.00012 U	< 0.0004 UJ	< 0.00011 UJ	< 0.00014 UJ	< 0.000056 U	< 0.00015 UJ	< 0.00023 U	< 0.00025 U	< 0.0003 U	< 0.00024 U
GNC1-JD02	10	NORM	1/27/2009	< 0.000071 U	< 0.00012 U	< 0.00012 U	< 0.0004 UJ	< 0.0001 UJ	< 0.00014 UJ	< 0.000054 U	< 0.00015 UJ	< 0.00022 U	< 0.00025 U	< 0.00029 U	< 0.00024 U
GNC1-JD06	0	NORM	2/13/2009	< 0.00007 U	< 0.00011 U	< 0.00012 U	< 0.00039 U	< 0.0001 U	0.00022 J	< 0.000054 U	0.00024 J	< 0.00022 U	< 0.00025 U	< 0.00029 U	< 0.00024 U
GNC1-JD06	10	NORM	2/17/2009	< 0.00007 U	< 0.00011 U	< 0.00012 U	< 0.00039 U	< 0.00014 U	< 0.00014 U	< 0.000054 U	< 0.00014 U	< 0.00022 U	< 0.00025 U	< 0.00029 U	< 0.00024 U
GNC1-JP02	0	NORM	2/12/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JP02	0	FD	2/12/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	0.00012 J	0.00017 J	< 0.000053 U	0.00028 J	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JP02	10	NORM	2/12/2009	< 0.000067 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	0.00013 J	0.00019 J	< 0.000052 U	0.00023 J	< 0.00021 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JP04	0	NORM	2/10/2009	< 0.000072 U	< 0.00012 U	< 0.00012 U	< 0.0004 U	< 0.00011 U	< 0.00014 U	< 0.000055 U	< 0.00015 U	< 0.00023 U	< 0.00025 U	< 0.0003 U	< 0.00024 U
GNC1-JP04	0	FD	2/10/2009	< 0.00007 U	< 0.00012 U	< 0.00012 U	< 0.00039 U	< 0.0001 U	< 0.00014 U	< 0.000054 U	< 0.00014 U	< 0.00022 U	< 0.00025 U	< 0.00029 U	< 0.00024 U
GNC1-JP04	10	NORM	2/10/2009	< 0.000069 U	< 0.00011 U	< 0.00011 U	< 0.00039 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-JP05	0	NORM	2/4/2009	< 0.000067 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.000099 U	< 0.00013 U	< 0.000052 U	< 0.00014 U	< 0.00021 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JP05	11	NORM	2/4/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JP06	0	NORM	2/12/2009	< 0.000069 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-JP06	0	FD	2/12/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JP06	3	NORM	2/12/2009	< 0.000067 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.000098 U	< 0.00013 U	< 0.000052 U	< 0.00014 U	< 0.00021 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JP06	13	NORM	2/12/2009	< 0.000067 U	< 0.00011 U	< 0.00011 U	< 0.00037 U	< 0.000098 U	< 0.00013 U	< 0.000052 U	< 0.00014 U	< 0.00021 U	< 0.00023 U	< 0.00028 U	< 0.00023 U
GNC1-JS08	0	NORM	1/28/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 UJ	< 0.0001 UJ	< 0.00013 UJ	< 0.000053 UJ	< 0.00014 UJ	< 0.00022 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JS08	10	NORM	1/28/2009	< 0.000069 U	< 0.00011 U	< 0.00011 U	< 0.00039 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
GNC1-JS17	0	NORM	2/4/2009	< 0.000068 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.000099 U	< 0.00013 U	< 0.000052 U	< 0.00014 U	< 0.00021 U	< 0.00024 U	< 0.00028 U	< 0.00023 U
GNC1-JS17	10	NORM	2/4/2009	< 0.000069 U	< 0.00011 U	< 0.00011 U	< 0.00038 U	< 0.0001 U	< 0.00014 U	< 0.000053 U	< 0.00014 U	< 0.00022 U	< 0.00024 U	< 0.00029 U	< 0.00023 U
UPC1-BB28	0	NORM	11/3/2009	< 0.00033 U	< 0.00064 U	< 0.00038 U	< 0.00052 U	< 0.00026 U	< 0.00045 U	< 0.00042 U	< 0.00031 U	< 0.00054 U	< 0.00031 U	< 0.00054 U	< 0.00044 U
UPC1-BB28	0	FD	11/20/2009	< 0.00032 U	< 0.00063 U	< 0.00037 U	< 0.00051 U	0.00027 J	< 0.00044 U	< 0.00042 U	< 0.00031 U	< 0.00053 U	< 0.00031 U	< 0.00053 U	< 0.00044 U
UPC1-BB28	8	NORM	11/3/2009	< 0.00033 U	< 0.00063 U	< 0.00038 U	< 0.00052 U	< 0.00025 U	< 0.00044 U	< 0.00042 U	< 0.00031 U	< 0.00053 U	< 0.00031 U	< 0.00053 U	< 0.00044 U
UPC1-BB28	18	NORM	11/3/2009	< 0.00033 U	< 0.00064 U	< 0.00038 U	< 0.00052 U	< 0.00026 U	< 0.00045 U	< 0.00043 U	< 0.00032 U	< 0.00054 U	< 0.00032 U	< 0.00054 U	< 0.00045 U
UPC1-BB31	0	NORM	10/30/2009	< 0.00033 U	< 0.00063 U	< 0.00037 U	< 0.00051 U	< 0.00025 U	< 0.00044 U	< 0.00042 U	< 0.00031 U	< 0.00053 U	< 0.00031 U	< 0.00053 U	< 0.00044 U
UPC1-BB31	11	NORM	10/30/2009	< 0.00033 U	< 0.00064 U	< 0.00038 U	< 0.00052 U	< 0.00026 U	< 0.00045 U	< 0.00042 U	< 0.00032 U	< 0.00054 U	< 0.00031 U	< 0.00054 U	< 0.00045 U
UPC1-BB32	0	NORM	10/30/2009	< 0.00033 U	< 0.00063 U	< 0.00038 U	< 0.00052 U	< 0.00025 U	< 0.00044 U	< 0.00042 U	< 0.00031 U	< 0.00053 U	< 0.00031 U	< 0.00053 U	< 0.00044 U
UPC1-BB32	0	FD	10/30/2009	< 0.00033 U	< 0.00063 U	< 0.00037 U	< 0.00051 U	< 0.00025 U	< 0.00044 U	< 0.00042 U	< 0.00031 U	< 0.00053 U	< 0.00031 U	< 0.00053 U	< 0.00044 U
UPC1-BB32	10	NORM	10/30/2009	< 0.00033 U	< 0.00064 U	< 0.00038 U	< 0.00052 U	< 0.00026 U	< 0.00045 U	< 0.00042 U	< 0.00032 U	< 0.00054 U	< 0.00031 U	< 0.00054 U	< 0.00045 U
UPC1-BB33	0	NORM	10/29/2009	< 0.00033 U	< 0.00063 U	< 0.00037 U	< 0.00051 U	< 0.00025 U	< 0.00044 U	< 0.00042 U	< 0.00031 U	< 0.00053 U	< 0.00031 U	< 0.00053 U	< 0.00044 U
UPC1-BB33	10	NORM	10/29/2009	< 0.00033 U	< 0.00064 U	< 0.00038 U	< 0.00052 U	< 0.00026 U	< 0.00045 U	< 0.00042 U	< 0.00032 U	< 0.00054 U	< 0.00032 U	< 0.00054 U	< 0.00045 U
UPC1-JP11	0	NORM	10/28/2009	< 0.00032 U	< 0.00063 U	< 0.00037 U	< 0.00051 U	< 0.00025 U	< 0.00044 U	< 0.00041 U	< 0.00031 U	< 0.00053 U	< 0.00031 U	< 0.00053 U	< 0.00044 U
UPC1-JP11	10	NORM	10/28/2009	< 0.00033 U	< 0.00065 U	< 0.00038 U	< 0.00053 U	< 0.00026 U	< 0.00045 U	< 0.00043 U	< 0.00032 U	< 0.00055 U	< 0.00032 U	< 0.00055 U	< 0.00045 U

All units in mg/kg.

-- = no sample data.

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Volatile Organic Compounds (VOCs)											
				2,4-Dimethylpentane	2-Chlorotoluene	2-Hexanone	2-Methylhexane	2-Nitropropane	3,3-Dimethylpentane	3-Ethylpentane	3-Methylhexane	4-Chlorotoluene	4-Methyl-2-pentanone (MIBK)	Acetone	Acetonitrile
GNC1-BB16	0	NORM	1/27/2009	< 0.0002 U	< 0.00026 UJ	< 0.00025 U	< 0.00021 U	< 0.00064 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 UJ	< 0.0003 U	< 0.0018 U	< 0.0057 UJ
GNC1-BB16	10	NORM	1/27/2009	< 0.00021 U	< 0.00026 UJ	< 0.00025 U	< 0.00022 U	< 0.00064 U	< 0.00022 U	< 0.00022 U	< 0.00015 U	< 0.00018 UJ	< 0.00031 U	< 0.0018 U	< 0.0057 UJ
GNC1-BC16	0	NORM	1/27/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.0018 U	< 0.0056 UJ
GNC1-BC16	10	NORM	1/27/2009	< 0.00021 U	< 0.00027 U	< 0.00026 U	< 0.00022 U	< 0.00066 U	< 0.00022 U	< 0.00023 U	< 0.00015 U	< 0.00019 U	< 0.00031 U	0.0037 J	< 0.0059 UJ
GNC1-BC18	0	NORM	1/27/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00064 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.0018 U	< 0.0057 UJ
GNC1-BC18	0	FD	1/27/2009	< 0.0002 U	< 0.00026 UJ	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 UJ	< 0.0003 U	< 0.0018 U	< 0.0057 UJ
GNC1-BC18	10	NORM	1/27/2009	< 0.00021 U	< 0.00027 U	< 0.00026 U	< 0.00022 U	< 0.00066 U	< 0.00022 U	< 0.00023 U	< 0.00015 U	< 0.00019 U	< 0.00031 U	0.0089 J	< 0.0059 UJ
GNC1-BC21	0	NORM	1/29/2009	< 0.0002 U	< 0.00025 UJ	< 0.00024 U	< 0.00021 U	< 0.00061 U	< 0.00021 U	< 0.00021 U	< 0.00014 U	< 0.00017 UJ	< 0.00029 U	0.017 J	< 0.0055 UJ
GNC1-BC21	10	NORM	1/29/2009	< 0.0002 U	< 0.00026 UJ	< 0.00025 U	< 0.00022 U	< 0.00064 U	< 0.00022 U	< 0.00022 U	< 0.00015 U	< 0.00018 UJ	< 0.00031 U	< 0.0018 U	< 0.0057 UJ
GNC1-BC22	0	NORM	3/2/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00061 U	< 0.00021 U	< 0.00021 U	< 0.00014 U	< 0.00017 U	< 0.00029 U	< 0.0068 U	< 0.0055 UJ
GNC1-BC22	11	NORM	3/2/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.012 U	< 0.0056 UJ
GNC1-BC23	0	NORM	2/10/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00064 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.01 U	< 0.0057 UJ
GNC1-BC23	10	NORM	2/10/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.016 U	< 0.0056 UJ
GNC1-BC27	0	NORM	2/4/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 U	< 0.0003 U	< 0.0017 U	< 0.0056 UJ
GNC1-BC27	0	FD	2/4/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00061 U	< 0.00021 U	< 0.00021 U	< 0.00014 U	< 0.00017 U	< 0.00029 U	< 0.0017 U	< 0.0055 UJ
GNC1-BC27	10	NORM	2/4/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 U	< 0.0003 U	< 0.0075 UJ	< 0.0056 UJ
GNC1-BC28	0	NORM	2/4/2009	< 0.0002 U	< 0.00026 UJ	< 0.00025 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 UJ	< 0.0003 U	< 0.0018 U	< 0.0056 UJ
GNC1-BC28	11	NORM	2/4/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 U	< 0.0003 U	< 0.0091 UJ	< 0.0056 UJ
GNC1-BC29	0	NORM	2/4/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.0029 UJ	< 0.0056 UJ
GNC1-BC29	10	NORM	2/4/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 U	< 0.0003 U	< 0.0017 U	< 0.0056 UJ
GNC1-JB02	0	NORM	2/11/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.017 U	< 0.0057 UJ
GNC1-JB02	5	NORM	2/11/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 U	< 0.0003 U	< 0.015 U	< 0.0056 UJ
GNC1-JB02	15	NORM	2/11/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.014 U	< 0.0057 UJ
GNC1-JB03	0	NORM	2/13/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.013 U	< 0.0056 UJ
GNC1-JB03	0	FD	2/13/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.014 U	< 0.0057 UJ
GNC1-JB03	7	NORM	2/13/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 U	< 0.0003 U	< 0.02 U	< 0.0056 UJ
GNC1-JB03	17	NORM	2/13/2009	< 0.0002 U	< 0.00026 U	< 0.00024 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 U	< 0.0003 U	< 0.021 U	< 0.0056 UJ
GNC1-JB06	0	NORM	2/13/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.013 U	< 0.0057 UJ
GNC1-JB06	6	NORM	2/17/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.013 U	< 0.0057 UJ
GNC1-JB06	16	NORM	2/17/2009	< 0.00021 U	< 0.00026 U	< 0.00025 U	< 0.00022 U	< 0.00064 U	< 0.00022 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.00031 U	< 0.013 U	< 0.0058 UJ
GNC1-JB07	0	NORM	2/13/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.013 U	< 0.0056 UJ
GNC1-JB07	8	NORM	2/13/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 U	< 0.0003 U	< 0.019 U	< 0.0056 UJ
GNC1-JB07	18	NORM	2/13/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00021 U	< 0.00014 U	< 0.00017 U	< 0.00029 U	< 0.011 U	< 0.0055 UJ
GNC1-JD01	0	NORM	1/27/2009	< 0.0002 UJ	< 0.00026 UJ	< 0.00025 UJ	< 0.00021 UJ	< 0.00063 UJ	< 0.00021 UJ	< 0.00022 UJ	< 0.00015 UJ	< 0.00018 UJ	< 0.0003 UJ	< 0.0018 UJ	< 0.0057 UJ
GNC1-JD01	3	NORM	1/27/2009	< 0.00021 U	< 0.00026 UJ	< 0.00025 U	< 0.00022 U	< 0.00064 U	< 0.00022 U	< 0.00022 U	< 0.00015 U	< 0.00018 UJ	< 0.00031 U	0.0091 J	< 0.0058 UJ
GNC1-JD01	13	NORM	1/27/2009	< 0.0002 U	< 0.00026 UJ	< 0.00025 U	< 0.00022 U	< 0.00064 U	< 0.00022 U	< 0.00022 U	< 0.00015 U	< 0.00018 UJ	< 0.00031 U	0.01 J	< 0.0057 UJ

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Volatile Organic Compounds (VOCs)											
				2,4-Dimethylpentane	2-Chlorotoluene	2-Hexanone	2-Methylhexane	2-Nitropropane	3,3-Dimethylpentane	3-Ethylpentane	3-Methylhexane	4-Chlorotoluene	4-Methyl-2-pentanone (MIBK)	Acetone	Acetonitrile
GNC1-JD02	0	NORM	1/27/2009	< 0.00021 U	< 0.00027 UJ	< 0.00026 U	< 0.00022 U	< 0.00066 U	< 0.00022 U	< 0.00023 U	< 0.00015 U	< 0.00019 UJ	< 0.00031 U	< 0.0019 U	< 0.0059 UJ
GNC1-JD02	10	NORM	1/27/2009	< 0.00021 U	< 0.00026 UJ	< 0.00025 U	< 0.00022 U	< 0.00064 U	< 0.00022 U	< 0.00022 U	< 0.00015 U	< 0.00018 UJ	< 0.00031 U	< 0.0018 U	< 0.0058 UJ
GNC1-JD06	0	NORM	2/13/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00064 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.0018 U	< 0.0057 UJ
GNC1-JD06	10	NORM	2/17/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00064 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	0.013 J	< 0.0057 UJ
GNC1-JP02	0	NORM	2/12/2009	< 0.0002 U	< 0.00026 U	< 0.00024 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 U	< 0.0003 U	< 0.0018 U	< 0.0056 UJ
GNC1-JP02	0	FD	2/12/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.018 U	< 0.0056 UJ
GNC1-JP02	10	NORM	2/12/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00061 U	< 0.00021 U	< 0.00021 U	< 0.00014 U	< 0.00017 U	< 0.00029 U	< 0.016 U	< 0.0055 UJ
GNC1-JP04	0	NORM	2/10/2009	< 0.00021 U	< 0.00027 U	< 0.00026 U	< 0.00022 U	< 0.00065 U	< 0.00022 U	< 0.00023 U	< 0.00015 U	< 0.00019 U	< 0.00031 U	< 0.019 U	< 0.0059 UJ
GNC1-JP04	0	FD	2/10/2009	< 0.00021 U	< 0.00026 U	< 0.00025 U	< 0.00022 U	< 0.00064 U	< 0.00022 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.00031 U	< 0.016 U	< 0.0058 UJ
GNC1-JP04	10	NORM	2/10/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.014 U	< 0.0056 UJ
GNC1-JP05	0	NORM	2/4/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00061 U	< 0.00021 U	< 0.00021 U	< 0.00014 U	< 0.00017 U	< 0.00029 U	< 0.0017 U	< 0.0055 UJ
GNC1-JP05	11	NORM	2/4/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 U	< 0.0003 U	< 0.0021 UJ	< 0.0056 UJ
GNC1-JP06	0	NORM	2/12/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.01 U	< 0.0056 UJ
GNC1-JP06	0	FD	2/12/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 U	< 0.0003 U	< 0.0018 U	< 0.0056 UJ
GNC1-JP06	3	NORM	2/12/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00061 U	< 0.00021 U	< 0.00021 U	< 0.00014 U	< 0.00017 U	< 0.00029 U	< 0.011 U	< 0.0055 UJ
GNC1-JP06	13	NORM	2/12/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00061 U	< 0.00021 U	< 0.00021 U	< 0.00014 U	< 0.00017 U	< 0.00029 U	< 0.011 U	< 0.0055 UJ
GNC1-JS08	0	NORM	1/28/2009	< 0.0002 U	< 0.00025 UJ	< 0.00024 UJ	< 0.00021 U	< 0.00062 UJ	< 0.00021 U	< 0.00022 U	< 0.00014 U	< 0.00018 UJ	< 0.0003 UJ	0.0069 J	< 0.0056 UJ
GNC1-JS08	10	NORM	1/28/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.0018 U	< 0.0056 UJ
GNC1-JS17	0	NORM	2/4/2009	< 0.0002 U	< 0.00025 U	< 0.00024 U	< 0.00021 U	< 0.00062 U	< 0.00021 U	< 0.00021 U	< 0.00014 U	< 0.00018 U	< 0.00029 U	< 0.0017 U	< 0.0055 UJ
GNC1-JS17	10	NORM	2/4/2009	< 0.0002 U	< 0.00026 U	< 0.00025 U	< 0.00021 U	< 0.00063 U	< 0.00021 U	< 0.00022 U	< 0.00015 U	< 0.00018 U	< 0.0003 U	< 0.0057 UJ	< 0.0056 UJ
UPC1-BB28	0	NORM	11/3/2009	< 0.0005 U	< 0.00034 U	< 0.00029 U	< 0.00051 U	< 0.00033 U	< 0.00049 U	< 0.00046 U	< 0.00048 U	< 0.00026 U	< 0.00031 U	< 0.0066 U	< 0.0036 UJ
UPC1-BB28	0	FD	11/20/2009	< 0.00049 U	< 0.00034 U	< 0.00028 U	< 0.00051 U	< 0.00032 U	< 0.00048 U	< 0.00045 U	< 0.00047 U	< 0.00025 U	< 0.00031 U	0.048	< 0.0035 UJ
UPC1-BB28	8	NORM	11/3/2009	< 0.00049 U	< 0.00034 U	< 0.00029 U	< 0.00051 U	< 0.00032 U	< 0.00048 U	< 0.00045 U	< 0.00047 U	< 0.00025 U	< 0.00031 U	< 0.0066 U	< 0.0035 UJ
UPC1-BB28	18	NORM	11/3/2009	< 0.0005 U	< 0.00035 U	< 0.00029 U	< 0.00052 U	< 0.00033 U	< 0.00049 U	< 0.00046 U	< 0.00048 U	< 0.00026 U	< 0.00032 U	< 0.0067 U	< 0.0036 UJ
UPC1-BB31	0	NORM	10/30/2009	< 0.00049 U	< 0.00034 U	< 0.00028 U	< 0.00051 U	< 0.00032 U	< 0.00048 U	< 0.00045 U	< 0.00047 U	< 0.00025 U	< 0.00031 U	< 0.0066 U	< 0.0035 UJ
UPC1-BB31	11	NORM	10/30/2009	< 0.0005 U	< 0.00035 U	< 0.00029 U	< 0.00052 U	< 0.00033 U	< 0.00049 U	< 0.00046 U	< 0.00048 U	< 0.00026 U	< 0.00032 U	< 0.0067 U	< 0.0036 UJ
UPC1-BB32	0	NORM	10/30/2009	< 0.00049 U	< 0.00034 U	< 0.00029 U	< 0.00051 U	< 0.00032 U	< 0.00048 U	< 0.00045 U	< 0.00047 U	< 0.00025 U	< 0.00031 U	< 0.0066 U	< 0.0035 UJ
UPC1-BB32	0	FD	10/30/2009	< 0.00049 U	< 0.00034 U	< 0.00028 U	< 0.00051 U	< 0.00032 U	< 0.00048 U	< 0.00045 U	< 0.00047 U	< 0.00025 U	< 0.00031 U	< 0.0066 U	< 0.0035 UJ
UPC1-BB32	10	NORM	10/30/2009	< 0.0005 U	< 0.00035 U	< 0.00029 U	< 0.00052 U	< 0.00033 U	< 0.00049 U	< 0.00046 U	< 0.00048 U	< 0.00026 U	< 0.00032 U	< 0.0067 U	< 0.0036 UJ
UPC1-BB33	0	NORM	10/29/2009	< 0.00049 U	< 0.00034 U	< 0.00028 U	< 0.00051 U	< 0.00032 U	< 0.00048 U	< 0.00045 U	< 0.00047 U	< 0.00025 U	< 0.00031 U	0.014 J+	< 0.0035 UJ
UPC1-BB33	10	NORM	10/29/2009	< 0.0005 U	< 0.00035 U	< 0.00029 U	< 0.00052 U	< 0.00033 U	< 0.00049 U	< 0.00046 U	< 0.00048 U	< 0.00026 U	< 0.00032 U	< 0.0067 U	< 0.0036 UJ
UPC1-JP11	0	NORM	10/28/2009	< 0.00049 U	< 0.00034 U	< 0.00028 U	< 0.00051 U	< 0.00032 U	< 0.00048 U	< 0.00045 U	< 0.00047 U	< 0.00025 U	< 0.00031 U	0.044	< 0.0035 UJ
UPC1-JP11	10	NORM	10/28/2009	< 0.0005 U	< 0.00035 U	< 0.00029 U	< 0.00052 U	< 0.00033 U	< 0.00049 U	< 0.00046 U	< 0.00048 U	< 0.00026 U	< 0.00032 U	< 0.0067 U	< 0.0036 UJ

All units in mg/kg.

-- = no sample data.

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Volatile Organic Compounds (VOCs)											
Sample ID	**Depth (ft bgs)**	**Sample Type**	**Sample Date**	Benzene	Bromobenzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chlorobromomethane	Chloroethane	Chloroform	Chloromethane
GNC1-BB16	0	NORM	1/27/2009	< 0.000092 U	< 0.00013 UJ	< 0.00022 U	< 0.000062 U	< 0.00014 UJ	< 0.00013 U	< 0.00022 U	< 0.00011 U	< 0.00024 U	< 0.00049 UJ	< 0.00011 U	< 0.00028 U
GNC1-BB16	10	NORM	1/27/2009	< 0.000092 U	< 0.00013 UJ	< 0.00023 U	< 0.000063 U	< 0.00014 UJ	< 0.00013 U	< 0.00022 U	< 0.00011 U	< 0.00024 U	< 0.00049 UJ	< 0.00011 U	< 0.00028 U
GNC1-BC16	0	NORM	1/27/2009	< 0.00009 U	< 0.00013 U	< 0.00022 U	< 0.000061 U	< 0.00013 UJ	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 UJ	< 0.0001 U	< 0.00028 U
GNC1-BC16	10	NORM	1/27/2009	< 0.000095 U	< 0.00013 U	< 0.00023 U	< 0.000064 U	< 0.00014 UJ	< 0.00013 U	< 0.00022 U	< 0.00012 U	< 0.00025 U	< 0.0005 UJ	< 0.00011 U	< 0.00029 U
GNC1-BC18	0	NORM	1/27/2009	< 0.000092 U	< 0.00013 U	< 0.00023 U	< 0.000062 U	< 0.00014 UJ	< 0.00013 U	< 0.00022 U	< 0.00011 U	< 0.00024 U	< 0.00049 UJ	< 0.00011 U	< 0.00028 U
GNC1-BC18	0	FD	1/27/2009	< 0.000091 U	< 0.00013 UJ	< 0.00022 U	< 0.000062 U	< 0.00014 UJ	< 0.00013 U	< 0.00022 U	< 0.00011 U	< 0.00024 U	< 0.00048 UJ	< 0.00011 U	< 0.00028 U
GNC1-BC18	10	NORM	1/27/2009	< 0.000095 U	< 0.00013 U	< 0.00023 U	< 0.000064 U	< 0.00014 UJ	< 0.00013 U	< 0.00022 U	< 0.00012 U	< 0.00025 U	< 0.0005 UJ	< 0.00011 U	< 0.00029 U
GNC1-BC21	0	NORM	1/29/2009	< 0.000088 U	< 0.00012 UJ	< 0.00022 U	< 0.00006 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	< 0.00027 U
GNC1-BC21	10	NORM	1/29/2009	< 0.000092 U	< 0.00013 UJ	< 0.00023 U	< 0.000063 U	< 0.00014 U	< 0.00013 U	< 0.00022 U	< 0.00011 U	< 0.00024 U	< 0.00049 U	< 0.00011 U	< 0.00028 U
GNC1-BC22	0	NORM	3/2/2009	< 0.000089 U	< 0.00012 U	< 0.00022 U	< 0.00006 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	< 0.00027 U
GNC1-BC22	11	NORM	3/2/2009	< 0.000091 U	< 0.00013 U	< 0.00022 U	< 0.000062 U	< 0.00014 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-BC23	0	NORM	2/10/2009	< 0.000092 U	< 0.00013 U	< 0.00023 U	< 0.000062 U	< 0.00014 U	< 0.00013 U	< 0.00022 U	< 0.00011 U	< 0.00024 U	< 0.00049 U	< 0.00011 U	< 0.00028 U
GNC1-BC23	10	NORM	2/10/2009	< 0.000091 U	< 0.00013 U	< 0.00022 U	< 0.000062 U	< 0.00014 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-BC27	0	NORM	2/4/2009	< 0.000089 U	< 0.00012 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	< 0.00028 U
GNC1-BC27	0	FD	2/4/2009	< 0.000088 U	< 0.00012 U	< 0.00022 U	< 0.00006 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	< 0.00027 U
GNC1-BC27	10	NORM	2/4/2009	< 0.00009 U	< 0.00012 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	< 0.00028 U
GNC1-BC28	0	NORM	2/4/2009	< 0.00009 U	< 0.00013 UJ	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-BC28	11	NORM	2/4/2009	< 0.000089 U	< 0.00012 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	< 0.00028 U
GNC1-BC29	0	NORM	2/4/2009	< 0.00009 U	< 0.00013 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-BC29	10	NORM	2/4/2009	< 0.000089 U	< 0.00012 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	< 0.00028 U
GNC1-JB02	0	NORM	2/11/2009	< 0.000091 U	< 0.00013 U	< 0.00022 U	< 0.000062 U	< 0.00014 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00024 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JB02	5	NORM	2/11/2009	< 0.00009 U	< 0.00013 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JB02	15	NORM	2/11/2009	< 0.000091 U	< 0.00013 U	< 0.00022 U	< 0.000062 U	< 0.00014 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00024 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JB03	0	NORM	2/13/2009	< 0.00009 U	< 0.00013 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JB03	0	FD	2/13/2009	< 0.000091 U	< 0.00013 U	< 0.00022 U	< 0.000062 U	< 0.00014 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.00013 U	< 0.00028 U
GNC1-JB03	7	NORM	2/13/2009	< 0.000089 U	< 0.00012 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.00016 U	0.00029 J
GNC1-JB03	17	NORM	2/13/2009	< 0.00009 U	< 0.00013 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JB06	0	NORM	2/13/2009	0.00019 J	< 0.00013 U	< 0.00022 U	< 0.000062 U	< 0.00014 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00024 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JB06	6	NORM	2/17/2009	< 0.000091 U	< 0.00013 U	< 0.00022 U	< 0.000062 U	< 0.00014 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00024 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JB06	16	NORM	2/17/2009	< 0.000093 U	< 0.00013 U	< 0.00023 U	< 0.000063 U	< 0.00014 U	< 0.00013 U	< 0.00022 U	< 0.00011 U	< 0.00024 U	< 0.00049 U	< 0.00011 U	< 0.00029 U
GNC1-JB07	0	NORM	2/13/2009	< 0.000091 U	< 0.00013 U	< 0.00022 U	< 0.000061 U	< 0.00014 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JB07	8	NORM	2/13/2009	0.00019 J	< 0.00012 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	0.00031 J
GNC1-JB07	18	NORM	2/13/2009	< 0.000089 U	< 0.00012 U	< 0.00022 U	< 0.00006 U	< 0.00013 U	< 0.00016 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	0.00028 J
GNC1-JD01	0	NORM	1/27/2009	< 0.000091 UJ	< 0.00013 UJ	< 0.00022 UJ	< 0.000062 UJ	< 0.00014 UJ	< 0.00013 UJ	< 0.00021 UJ	< 0.00011 UJ	< 0.00024 UJ	< 0.00048 UJ	< 0.0001 UJ	< 0.00028 UJ
GNC1-JD01	3	NORM	1/27/2009	< 0.000093 U	< 0.00013 UJ	< 0.00023 U	< 0.000063 U	< 0.00014 UJ	< 0.00013 U	< 0.00022 U	< 0.00011 U	< 0.00024 U	< 0.00049 UJ	< 0.00011 U	< 0.00028 U
GNC1-JD01	13	NORM	1/27/2009	< 0.000092 U	< 0.00013 UJ	< 0.00023 U	< 0.000062 U	< 0.00014 UJ	< 0.00013 U	< 0.00022 U	< 0.00011 U	< 0.00024 U	< 0.00049 UJ	< 0.00011 U	< 0.00028 U

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 8 of 14)

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Volatile Organic Compounds (VOCs)											
				Benzene	Bromobenzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chlorobromomethane	Chloroethane	Chloroform	Chloromethane
GNC1-JD02	0	NORM	1/27/2009	< 0.000095 U	< 0.00013 UJ	< 0.00023 U	< 0.000064 U	< 0.00014 UJ	< 0.00013 U	< 0.00022 U	< 0.00012 U	< 0.00025 U	< 0.0005 UJ	< 0.00011 U	< 0.00029 U
GNC1-JD02	10	NORM	1/27/2009	< 0.000093 U	< 0.00013 UJ	< 0.00023 U	< 0.000063 U	< 0.00014 UJ	< 0.00013 U	< 0.00022 U	< 0.00012 U	< 0.00024 U	< 0.00049 UJ	< 0.00011 U	< 0.00029 U
GNC1-JD06	0	NORM	2/13/2009	< 0.000092 U	< 0.00013 U	< 0.00023 U	< 0.000062 U	< 0.00014 U	< 0.00013 U	< 0.00022 U	< 0.00011 U	< 0.00024 U	< 0.00049 U	< 0.00011 U	< 0.00028 U
GNC1-JD06	10	NORM	2/17/2009	< 0.000092 U	< 0.00013 U	< 0.00023 U	< 0.000062 U	< 0.00014 U	< 0.00013 U	< 0.00022 U	< 0.00011 U	< 0.00024 U	< 0.00049 U	< 0.00011 U	< 0.00028 U
GNC1-JP02	0	NORM	2/12/2009	< 0.00009 U	< 0.00012 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JP02	0	FD	2/12/2009	0.0002 J	0.00023 J	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JP02	10	NORM	2/12/2009	0.00021 J	< 0.00012 U	< 0.00022 U	< 0.00006 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	< 0.00027 U
GNC1-JP04	0	NORM	2/10/2009	< 0.000095 U	< 0.00013 U	< 0.00023 U	< 0.000064 U	< 0.00014 U	< 0.00013 U	< 0.00022 U	< 0.00012 U	< 0.00024 U	< 0.0005 U	< 0.00011 U	< 0.00029 U
GNC1-JP04	0	FD	2/10/2009	< 0.000093 U	< 0.00013 U	< 0.00023 U	< 0.000063 U	< 0.00014 U	< 0.00013 U	< 0.00022 U	< 0.00012 U	< 0.00024 U	< 0.00049 U	< 0.00011 U	< 0.00029 U
GNC1-JP04	10	NORM	2/10/2009	< 0.000091 U	< 0.00013 U	< 0.00022 U	< 0.000061 U	< 0.00014 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JP05	0	NORM	2/4/2009	< 0.000088 U	< 0.00012 U	< 0.00022 U	< 0.00006 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	< 0.00027 U
GNC1-JP05	11	NORM	2/4/2009	< 0.00009 U	< 0.00012 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JP06	0	NORM	2/12/2009	< 0.00009 U	< 0.00013 U	< 0.00022 U	< 0.000061 U	< 0.00014 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JP06	0	FD	2/12/2009	< 0.00009 U	< 0.00013 U	< 0.00022 U	< 0.000061 U	< 0.00013 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JP06	3	NORM	2/12/2009	< 0.000088 U	< 0.00012 U	< 0.00022 U	< 0.00006 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	< 0.00027 U
GNC1-JP06	13	NORM	2/12/2009	< 0.000088 U	< 0.00012 U	< 0.00022 U	< 0.00006 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	< 0.00027 U
GNC1-JS08	0	NORM	1/28/2009	< 0.00009 U	< 0.00012 UJ	< 0.00022 U	< 0.000061 UJ	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 UJ	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JS08	10	NORM	1/28/2009	< 0.000091 U	< 0.00013 U	< 0.00022 U	< 0.000062 U	< 0.00014 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
GNC1-JS17	0	NORM	2/4/2009	< 0.000089 U	< 0.00012 U	< 0.00022 U	< 0.00006 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00047 U	< 0.0001 U	< 0.00027 U
GNC1-JS17	10	NORM	2/4/2009	< 0.000091 U	< 0.00013 U	< 0.00022 U	< 0.000061 U	< 0.00014 U	< 0.00013 U	< 0.00021 U	< 0.00011 U	< 0.00023 U	< 0.00048 U	< 0.0001 U	< 0.00028 U
UPC1-BB28	0	NORM	11/3/2009	< 0.00033 U	< 0.00038 U	< 0.00033 U	< 0.00042 U	< 0.00041 U	< 0.00028 U	< 0.00031 U	< 0.00031 U	< 0.00044 U	< 0.00031 U	< 0.00036 U	< 0.00028 U
UPC1-BB28	0	FD	11/20/2009	< 0.00033 U	< 0.00038 U	< 0.00032 U	< 0.00042 U	< 0.0004 U	< 0.00028 U	< 0.0003 U	0.0007 J	< 0.00044 U	< 0.00031 U	< 0.00036 U	< 0.00027 U
UPC1-BB28	8	NORM	11/3/2009	< 0.00033 U	< 0.00038 U	< 0.00032 U	< 0.00042 U	< 0.0004 U	< 0.00028 U	< 0.00031 U	< 0.00031 U	< 0.00044 U	< 0.00031 U	< 0.00036 U	< 0.00028 U
UPC1-BB28	18	NORM	11/3/2009	< 0.00034 U	< 0.00039 U	< 0.00033 U	< 0.00043 U	< 0.00041 U	< 0.00028 U	< 0.00031 U	< 0.00031 U	< 0.00045 U	< 0.00032 U	< 0.00037 U	< 0.00028 U
UPC1-BB31	0	NORM	10/30/2009	< 0.00033 U	< 0.00038 U	< 0.00032 U	< 0.00042 U	< 0.0004 U	< 0.00028 U	< 0.00031 U	< 0.0003 U	< 0.00044 U	< 0.00031 U	< 0.00036 U	< 0.00028 U
UPC1-BB31	11	NORM	10/30/2009	< 0.00034 U	< 0.00039 U	< 0.00033 U	< 0.00042 U	< 0.00041 U	< 0.00028 U	< 0.00031 U	< 0.00031 U	< 0.00045 U	< 0.00032 U	< 0.00037 U	< 0.00028 U
UPC1-BB32	0	NORM	10/30/2009	< 0.00033 U	< 0.00038 U	< 0.00032 U	< 0.00042 U	< 0.0004 U	< 0.00028 U	< 0.00031 U	< 0.00031 U	< 0.00044 U	< 0.00031 U	< 0.00036 U	< 0.00028 U
UPC1-BB32	0	FD	10/30/2009	< 0.00033 U	< 0.00038 U	< 0.00032 U	< 0.00042 U	< 0.0004 U	< 0.00028 U	< 0.00031 U	< 0.0003 U	< 0.00044 U	< 0.00031 U	< 0.00036 U	< 0.00028 U
UPC1-BB32	10	NORM	10/30/2009	< 0.00034 U	< 0.00038 U	< 0.00033 U	< 0.00042 U	< 0.00041 U	< 0.00028 U	< 0.00031 U	< 0.00031 U	< 0.00045 U	< 0.00032 U	< 0.00037 U	< 0.00028 U
UPC1-BB33	0	NORM	10/29/2009	< 0.00033 U	< 0.00038 U	< 0.00032 U	< 0.00042 U	< 0.0004 U	< 0.00028 U	< 0.00031 U	< 0.0003 U	< 0.00044 U	< 0.00031 U	< 0.00036 U	< 0.00028 U
UPC1-BB33	10	NORM	10/29/2009	< 0.00034 U	< 0.00039 U	< 0.00033 U	< 0.00042 U	< 0.00041 U	< 0.00028 U	< 0.00031 U	< 0.00031 U	< 0.00045 U	< 0.00032 U	< 0.00037 U	< 0.00028 U
UPC1-JP11	0	NORM	10/28/2009	< 0.00033 U	< 0.00038 U	< 0.00032 U	< 0.00041 U	< 0.0004 U	< 0.00028 U	< 0.0003 U	0.0011 J	< 0.00044 U	< 0.00031 U	< 0.00036 U	< 0.00027 U
UPC1-JP11	10	NORM	10/28/2009	< 0.00034 U	< 0.00039 U	< 0.00033 U	< 0.00043 U	< 0.00041 U	< 0.00028 U	< 0.00031 U	< 0.00031 U	< 0.00045 U	< 0.00032 U	< 0.00037 U	< 0.00028 U

All units in mg/kg.
-- = no sample data.

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Volatile Organic Compounds (VOCs)											
Sample ID	Depth (ft bgs)	Sample Type	Sample Date	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene (Isopropyltoluene)	Dibromochloromethane	Dibromochloropropane	Dibromomethane	Dichloromethane (Methylene chloride)	Dimethyldisulfide	Ethanol	Ethylbenzene	Freon-11 (Trichlorofluoromethane)	Freon-113 (1,1,2-Trifluoro-1,2,2-trichloroethane)
GNC1-BB16	0	NORM	1/27/2009	< 0.000057 U	< 0.00011 U	< 0.00013 UJ	< 0.00012 U	< 0.00022 UJ	< 0.00018 U	0.015	< 0.00019 U	< 0.05 UJ	< 0.000061 U	< 0.00023 U	< 0.00015 U
GNC1-BB16	10	NORM	1/27/2009	< 0.000057 U	< 0.00011 U	< 0.00013 UJ	< 0.00013 U	< 0.00022 UJ	< 0.00018 U	0.014	< 0.00019 U	< 0.05 UJ	< 0.000062 U	< 0.00023 U	< 0.00015 U
GNC1-BC16	0	NORM	1/27/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.00071 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00023 U	< 0.00015 U
GNC1-BC16	10	NORM	1/27/2009	< 0.000059 U	< 0.00011 U	< 0.00014 U	< 0.00013 U	< 0.00023 U	< 0.00018 U	0.0087	< 0.00019 U	< 0.052 UJ	< 0.000063 U	< 0.00024 U	< 0.00016 U
GNC1-BC18	0	NORM	1/27/2009	< 0.000057 U	< 0.00011 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00018 U	0.0071	< 0.00019 U	< 0.05 UJ	< 0.000061 U	< 0.00023 U	< 0.00015 U
GNC1-BC18	0	FD	1/27/2009	< 0.000057 U	< 0.00011 U	< 0.00013 UJ	< 0.00012 U	< 0.00022 UJ	< 0.00017 U	0.01	< 0.00018 U	< 0.05 UJ	< 0.000061 U	< 0.00023 U	< 0.00015 U
GNC1-BC18	10	NORM	1/27/2009	< 0.000059 U	< 0.00011 U	< 0.00014 U	< 0.00013 U	< 0.00023 U	< 0.00018 U	< 0.00075 U	< 0.00019 U	< 0.052 UJ	< 0.000063 U	< 0.00024 U	< 0.00016 U
GNC1-BC21	0	NORM	1/29/2009	< 0.000055 U	< 0.0001 U	< 0.00013 UJ	< 0.00012 U	< 0.00021 UJ	< 0.00017 U	< 0.013 U	< 0.00018 U	< 0.048 UJ	< 0.000059 U	< 0.00022 U	< 0.00015 U
GNC1-BC21	10	NORM	1/29/2009	< 0.000057 U	< 0.00011 U	< 0.00013 UJ	< 0.00013 U	< 0.00022 UJ	< 0.00018 U	0.016	< 0.00019 U	< 0.05 UJ	< 0.000062 U	< 0.00023 U	< 0.00015 U
GNC1-BC22	0	NORM	3/2/2009	< 0.000055 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.0099	< 0.00018 U	< 0.048 UJ	< 0.000059 U	< 0.00022 U	< 0.00015 U
GNC1-BC22	11	NORM	3/2/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.011	< 0.00018 U	< 0.049 UJ	< 0.000061 U	< 0.00023 U	< 0.00015 U
GNC1-BC23	0	NORM	2/10/2009	< 0.000057 U	< 0.00011 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00018 U	< 0.00073 U	< 0.00019 U	< 0.05 UJ	< 0.000061 U	< 0.00023 U	< 0.00015 U
GNC1-BC23	10	NORM	2/10/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.00072 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00023 U	< 0.00015 U
GNC1-BC27	0	NORM	2/4/2009	< 0.000055 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.0088 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00022 U	< 0.00015 U
GNC1-BC27	0	FD	2/4/2009	< 0.000055 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00017 U	< 0.0087 U	< 0.00018 U	< 0.048 UJ	< 0.000059 U	< 0.00022 U	< 0.00015 U
GNC1-BC27	10	NORM	2/4/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.0096 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00022 U	< 0.00015 U
GNC1-BC28	0	NORM	2/4/2009	< 0.000056 U	< 0.0001 U	< 0.00013 UJ	< 0.00012 U	< 0.00022 UJ	< 0.00017 U	< 0.0045 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00023 U	< 0.00015 U
GNC1-BC28	11	NORM	2/4/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.0053 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00022 U	< 0.00015 U
GNC1-BC29	0	NORM	2/4/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.0062 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00023 U	< 0.00015 U
GNC1-BC29	10	NORM	2/4/2009	< 0.000055 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.0052 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00022 U	< 0.00015 U
GNC1-JB02	0	NORM	2/11/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.012	< 0.00018 U	< 0.049 UJ	< 0.000061 U	< 0.00023 U	< 0.00015 U
GNC1-JB02	5	NORM	2/11/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.013	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00023 U	< 0.00015 U
GNC1-JB02	15	NORM	2/11/2009	< 0.000057 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.013	< 0.00018 U	< 0.05 UJ	< 0.000061 U	< 0.00023 U	< 0.00015 U
GNC1-JB03	0	NORM	2/13/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.011	< 0.00018 U	< 0.049 UJ	0.00018 J	< 0.00023 U	< 0.00015 U
GNC1-JB03	0	FD	2/13/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.012	< 0.00018 U	< 0.049 UJ	0.00018 J	< 0.00023 U	< 0.00015 U
GNC1-JB03	7	NORM	2/13/2009	< 0.000055 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.011	< 0.00018 U	< 0.049 UJ	0.00019 J	< 0.00022 U	< 0.00015 U
GNC1-JB03	17	NORM	2/13/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.01	< 0.00018 U	< 0.049 UJ	0.00018 J	< 0.00023 U	< 0.00015 U
GNC1-JB06	0	NORM	2/13/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.012	< 0.00018 U	< 0.049 UJ	0.00016 J	< 0.00023 U	< 0.00015 U
GNC1-JB06	6	NORM	2/17/2009	< 0.000057 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.0014 J	< 0.00018 U	< 0.05 UJ	< 0.00019 U	< 0.00023 U	< 0.00015 U
GNC1-JB06	16	NORM	2/17/2009	< 0.000057 U	< 0.00011 U	< 0.00013 U	< 0.00013 U	< 0.00022 U	< 0.00018 U	< 0.00073 U	< 0.00019 U	< 0.05 UJ	< 0.00018 U	< 0.00023 U	< 0.00015 U
GNC1-JB07	0	NORM	2/13/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.013	< 0.00018 U	< 0.049 UJ	0.00018 J	< 0.00023 U	< 0.00015 U
GNC1-JB07	8	NORM	2/13/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.01	< 0.00018 U	< 0.049 UJ	0.00019 J	< 0.00022 U	< 0.00015 U
GNC1-JB07	18	NORM	2/13/2009	< 0.000055 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.0007 U	< 0.00018 U	< 0.048 UJ	< 0.00017 U	< 0.00022 U	< 0.00015 U
GNC1-JD01	0	NORM	1/27/2009	< 0.000057 UJ	< 0.0001 UJ	< 0.00013 UJ	< 0.00012 UJ	< 0.00022 UJ	< 0.00017 UJ	< 0.0021 UJ	< 0.00018 UJ	< 0.05 UJ	< 0.000061 UJ	< 0.00023 UJ	< 0.00015 UJ
GNC1-JD01	3	NORM	1/27/2009	< 0.000057 U	< 0.00011 U	< 0.00013 UJ	< 0.00013 U	< 0.00022 UJ	< 0.00018 U	0.013	< 0.00019 U	< 0.05 UJ	< 0.000062 U	< 0.00023 U	< 0.00015 U
GNC1-JD01	13	NORM	1/27/2009	< 0.000057 U	< 0.00011 U	< 0.00013 UJ	< 0.00012 U	< 0.00022 UJ	< 0.00018 U	0.014	< 0.00019 U	< 0.05 UJ	< 0.000061 U	< 0.00023 U	< 0.00015 U

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Volatile Organic Compounds (VOCs)											
				cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene (Isopropy-ltoluene)	Dibromochloromethane	Dibromochloropropane	Dibromomethane	Dichloromethane (Methylene chloride)	Dimethyldisulfide	Ethanol	Ethylbenzene	Freon-11 (Trichlorofluoromethane)	Freon-113 (1,1,2-Trifluoro-1,2,2-trichloroethane)
GNC1-JD02	0	NORM	1/27/2009	< 0.000059 U	< 0.00011 U	< 0.00014 UJ	< 0.00013 U	< 0.00023 UJ	< 0.00018 U	0.013	< 0.00019 U	< 0.052 UJ	< 0.000063 U	< 0.00024 U	< 0.00016 U
GNC1-JD02	10	NORM	1/27/2009	< 0.000058 U	< 0.00011 U	< 0.00013 UJ	< 0.00013 U	< 0.00023 UJ	< 0.00018 U	0.012	< 0.00019 U	< 0.051 UJ	< 0.000062 U	< 0.00023 U	< 0.00015 U
GNC1-JD06	0	NORM	2/13/2009	< 0.000057 U	< 0.00011 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00018 U	0.012	< 0.00019 U	< 0.05 UJ	0.0002 J	< 0.00023 U	< 0.00015 U
GNC1-JD06	10	NORM	2/17/2009	< 0.000057 U	< 0.00011 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00018 U	< 0.00073 U	< 0.00019 U	< 0.05 UJ	< 0.00015 U	< 0.00023 U	< 0.00015 U
GNC1-JP02	0	NORM	2/12/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.00071 UJ	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00023 U	< 0.00015 U
GNC1-JP02	0	FD	2/12/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.012 J	< 0.00018 U	< 0.049 UJ	0.00018 J	< 0.00023 U	< 0.00015 U
GNC1-JP02	10	NORM	2/12/2009	< 0.000055 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.013	< 0.00018 U	< 0.048 UJ	0.00017 J	< 0.00022 U	< 0.00015 U
GNC1-JP04	0	NORM	2/10/2009	< 0.000059 U	< 0.00011 U	< 0.00013 U	< 0.00013 U	< 0.00023 U	< 0.00018 U	< 0.012 U	< 0.00019 U	< 0.051 UJ	< 0.000063 U	< 0.00024 U	< 0.00016 U
GNC1-JP04	0	FD	2/10/2009	< 0.000058 U	< 0.00011 U	< 0.00013 U	< 0.00013 U	< 0.00022 U	< 0.00018 U	< 0.012 U	< 0.00019 U	< 0.05 UJ	< 0.000062 U	< 0.00023 U	< 0.00015 U
GNC1-JP04	10	NORM	2/10/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.00072 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00023 U	< 0.00015 U
GNC1-JP05	0	NORM	2/4/2009	< 0.000055 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00017 U	< 0.01 U	< 0.00018 U	1.9 J	< 0.000059 U	< 0.00022 U	< 0.00015 U
GNC1-JP05	11	NORM	2/4/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.01 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00023 U	< 0.00015 U
GNC1-JP06	0	NORM	2/12/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.00071 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00023 U	< 0.00015 U
GNC1-JP06	0	FD	2/12/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.00071 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00023 U	< 0.00015 U
GNC1-JP06	3	NORM	2/12/2009	< 0.000055 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00017 U	< 0.0007 U	< 0.00018 U	< 0.048 UJ	< 0.000059 U	< 0.00022 U	< 0.00015 U
GNC1-JP06	13	NORM	2/12/2009	< 0.000055 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00021 U	< 0.00017 U	< 0.0007 U	< 0.00018 U	< 0.048 UJ	< 0.000059 U	< 0.00022 U	< 0.00015 U
GNC1-JS08	0	NORM	1/28/2009	< 0.000056 U	< 0.0001 U	< 0.00013 UJ	< 0.00012 UJ	< 0.00022 UJ	< 0.00017 U	< 0.0039 U	< 0.00018 UJ	< 0.049 UJ	< 0.00006 UJ	< 0.00022 U	< 0.00015 U
GNC1-JS08	10	NORM	1/28/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	0.0098	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00023 U	< 0.00015 U
GNC1-JS17	0	NORM	2/4/2009	< 0.000055 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.0067 U	< 0.00018 U	< 0.048 UJ	< 0.000059 U	< 0.00022 U	< 0.00015 U
GNC1-JS17	10	NORM	2/4/2009	< 0.000056 U	< 0.0001 U	< 0.00013 U	< 0.00012 U	< 0.00022 U	< 0.00017 U	< 0.0049 U	< 0.00018 U	< 0.049 UJ	< 0.00006 U	< 0.00023 U	< 0.00015 U
UPC1-BB28	0	NORM	11/3/2009	< 0.00034 U	< 0.00024 U	< 0.00026 U	< 0.0003 U	< 0.00061 U	< 0.00035 U	< 0.0024 U	< 0.00049 U	< 0.063 UJ	< 0.0003 U	< 0.00031 U	< 0.00025 U
UPC1-BB28	0	FD	11/20/2009	< 0.00033 U	< 0.00024 U	< 0.00026 U	< 0.00029 U	< 0.0006 U	< 0.00035 U	< 0.0038 U	< 0.00048 U	< 0.062 UJ	< 0.00029 U	0.00031 J	< 0.00025 U
UPC1-BB28	8	NORM	11/3/2009	< 0.00034 U	< 0.00024 U	< 0.00026 U	< 0.00029 U	< 0.0006 U	< 0.00035 U	< 0.0024 U	< 0.00048 U	< 0.062 UJ	< 0.00029 U	< 0.00031 U	< 0.00025 U
UPC1-BB28	18	NORM	11/3/2009	< 0.00034 U	< 0.00024 U	< 0.00027 U	< 0.0003 U	< 0.00061 U	< 0.00035 U	< 0.0024 U	< 0.00049 U	< 0.064 UJ	< 0.0003 U	< 0.00031 U	< 0.00025 U
UPC1-BB31	0	NORM	10/30/2009	< 0.00033 U	< 0.00024 U	< 0.00026 U	< 0.00029 U	< 0.0006 U	< 0.00035 U	< 0.0024 U	< 0.00048 U	< 0.062 UJ	< 0.00029 U	< 0.00031 U	< 0.00025 U
UPC1-BB31	11	NORM	10/30/2009	< 0.00034 U	< 0.00024 U	< 0.00027 U	< 0.0003 U	< 0.00061 U	< 0.00035 U	< 0.0024 U	< 0.00049 U	< 0.063 UJ	< 0.0003 U	< 0.00031 U	< 0.00025 U
UPC1-BB32	0	NORM	10/30/2009	< 0.00034 U	< 0.00024 U	< 0.00026 U	< 0.00029 U	< 0.0006 U	< 0.00035 U	< 0.0024 U	< 0.00048 U	< 0.062 UJ	< 0.00029 U	< 0.00031 U	< 0.00025 U
UPC1-BB32	0	FD	10/30/2009	< 0.00033 U	< 0.00024 U	< 0.00026 U	< 0.00029 U	< 0.0006 U	< 0.00035 U	< 0.0024 U	< 0.00048 U	< 0.062 UJ	< 0.00029 U	< 0.00031 U	< 0.00025 U
UPC1-BB32	10	NORM	10/30/2009	< 0.00034 U	< 0.00024 U	< 0.00026 U	< 0.0003 U	< 0.00061 U	< 0.00035 U	< 0.0024 U	< 0.00049 U	< 0.063 UJ	< 0.0003 U	< 0.00031 U	< 0.00025 U
UPC1-BB33	0	NORM	10/29/2009	< 0.00034 U	< 0.00024 U	< 0.00026 U	< 0.00029 U	< 0.0006 U	< 0.00035 U	< 0.0024 U	< 0.00048 U	< 0.062 UJ	< 0.00029 U	< 0.00031 U	< 0.00025 U
UPC1-BB33	10	NORM	10/29/2009	< 0.00034 U	< 0.00024 U	< 0.00027 U	< 0.0003 U	< 0.00061 U	< 0.00035 U	< 0.0024 U	< 0.00049 U	< 0.063 UJ	< 0.0003 U	< 0.00031 U	< 0.00025 U
UPC1-JP11	0	NORM	10/28/2009	< 0.00033 U	< 0.00023 U	< 0.00026 U	< 0.00029 U	< 0.0006 U	< 0.00035 U	< 0.0024 U	< 0.00048 U	< 0.062 UJ	< 0.00029 U	0.00033 J	< 0.00025 U
UPC1-JP11	10	NORM	10/28/2009	< 0.00034 U	< 0.00024 U	< 0.00027 U	< 0.0003 U	< 0.00062 U	< 0.00036 U	< 0.0024 U	< 0.00049 U	< 0.064 UJ	< 0.0003 U	< 0.00031 U	< 0.00026 U

All units in mg/kg.

-- = no sample data.

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Volatile Organic Compounds (VOCs)											
				Freon-12 (Dichloro-difluoromethane)	Heptane	Isopropylbenzene	m,p-Xylene	Methyl ethyl ketone (2-Butanone)	Methyl iodide	MTBE (Methyl tert-butyl ether)	n-Butylbenzene	Nonanal	n-Propylbenzene	o-Xylene	sec-Butylbenzene
GNC1-BB16	0	NORM	1/27/2009	< 0.00031 U	< 0.00017 U	< 0.00011 U	< 0.00018 U	< 0.00092 U	< 0.00013 UJ	< 0.000094 U	< 0.00019 UJ	< 0.00049 UJ	< 0.00012 UJ	< 0.00008 U	< 0.00011 UJ
GNC1-BB16	10	NORM	1/27/2009	< 0.00031 U	< 0.00017 U	< 0.00011 U	< 0.00018 U	< 0.00092 U	< 0.00013 UJ	< 0.000095 U	< 0.00019 UJ	< 0.0005 UJ	< 0.00012 UJ	< 0.000081 U	< 0.00011 UJ
GNC1-BC16	0	NORM	1/27/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 U	< 0.00013 UJ	< 0.000092 U	< 0.00019 U	< 0.00049 U	< 0.00011 U	< 0.000079 U	< 0.00011 U
GNC1-BC16	10	NORM	1/27/2009	< 0.00032 U	< 0.00018 U	< 0.00011 U	< 0.00018 U	< 0.00095 U	< 0.00014 UJ	< 0.000097 U	< 0.0002 U	< 0.00051 U	< 0.00012 U	< 0.000083 U	< 0.00012 U
GNC1-BC18	0	NORM	1/27/2009	< 0.00031 U	< 0.00017 U	< 0.00011 U	< 0.00018 U	< 0.00092 U	< 0.00013 UJ	< 0.000094 U	< 0.00019 U	< 0.0005 U	< 0.00012 U	< 0.00008 U	< 0.00011 U
GNC1-BC18	0	FD	1/27/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.00091 U	< 0.00013 UJ	< 0.000094 U	< 0.00019 UJ	< 0.00049 UJ	< 0.00011 UJ	< 0.00008 U	< 0.00011 UJ
GNC1-BC18	10	NORM	1/27/2009	< 0.00032 U	< 0.00018 U	< 0.00011 U	< 0.00018 U	< 0.00095 U	< 0.00014 UJ	< 0.000097 U	< 0.0002 U	< 0.00051 U	< 0.00012 U	< 0.000083 U	< 0.00012 U
GNC1-BC21	0	NORM	1/29/2009	< 0.00029 U	< 0.00017 U	< 0.0001 U	< 0.00017 U	< 0.00088 U	< 0.00013 UJ	< 0.00009 U	< 0.00018 UJ	< 0.00047 UJ	< 0.00011 UJ	< 0.000077 U	< 0.00011 UJ
GNC1-BC21	10	NORM	1/29/2009	< 0.00031 U	< 0.00017 U	< 0.00011 U	< 0.00018 U	< 0.00092 U	< 0.00013 UJ	< 0.000094 U	< 0.00019 UJ	< 0.0005 UJ	< 0.00012 UJ	< 0.000081 U	< 0.00011 UJ
GNC1-BC22	0	NORM	3/2/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.00089 U	< 0.00013 U	< 0.000091 U	< 0.00018 U	< 0.00048 U	< 0.00011 U	< 0.000078 U	< 0.00011 U
GNC1-BC22	11	NORM	3/2/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 U	< 0.00013 U	< 0.000093 U	< 0.00019 U	0.0061 J	< 0.00011 U	< 0.000079 U	< 0.00011 U
GNC1-BC23	0	NORM	2/10/2009	< 0.00031 U	< 0.00017 U	< 0.00011 U	< 0.00018 U	< 0.00092 U	< 0.00013 U	< 0.000094 U	< 0.00019 U	< 0.0005 U	< 0.00012 U	< 0.00008 U	< 0.00011 U
GNC1-BC23	10	NORM	2/10/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 U	< 0.00013 U	< 0.000093 U	< 0.00019 U	< 0.00049 U	< 0.00011 U	< 0.000079 U	< 0.00011 U
GNC1-BC27	0	NORM	2/4/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.00089 UJ	< 0.00013 U	< 0.000091 U	< 0.00018 U	< 0.00048 U	< 0.00011 U	< 0.000078 U	< 0.00011 U
GNC1-BC27	0	FD	2/4/2009	< 0.00029 U	< 0.00017 U	< 0.0001 U	< 0.00017 U	< 0.00088 UJ	< 0.00013 U	< 0.00009 U	< 0.00018 U	< 0.00047 U	< 0.00011 U	< 0.000077 U	< 0.00011 U
GNC1-BC27	10	NORM	2/4/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.00089 UJ	< 0.00013 U	< 0.000092 U	< 0.00019 U	< 0.00048 U	< 0.00011 U	< 0.000078 U	< 0.00011 U
GNC1-BC28	0	NORM	2/4/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 UJ	< 0.00013 U	< 0.000092 U	< 0.00019 UJ	< 0.00048 UJ	< 0.00011 UJ	< 0.000079 U	< 0.00011 UJ
GNC1-BC28	11	NORM	2/4/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.00089 UJ	< 0.00013 U	< 0.000091 U	< 0.00019 U	< 0.00048 U	< 0.00011 U	< 0.000078 U	< 0.00011 U
GNC1-BC29	0	NORM	2/4/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 UJ	< 0.00013 U	< 0.000092 U	< 0.00019 U	< 0.00048 U	< 0.00011 U	< 0.000079 U	< 0.00011 U
GNC1-BC29	10	NORM	2/4/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.00089 UJ	< 0.00013 U	< 0.000091 U	< 0.00018 U	< 0.00048 U	< 0.00011 U	< 0.000078 U	< 0.00011 U
GNC1-JB02	0	NORM	2/11/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.00091 U	< 0.00013 U	< 0.000093 U	< 0.00019 U	< 0.00049 U	< 0.00011 U	< 0.000079 U	< 0.00011 U
GNC1-JB02	5	NORM	2/11/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 U	< 0.00013 U	< 0.000092 U	< 0.00019 U	< 0.00048 U	< 0.00011 U	< 0.000079 U	< 0.00011 U
GNC1-JB02	15	NORM	2/11/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.00091 U	< 0.00013 U	< 0.000093 U	< 0.00019 U	< 0.00049 U	< 0.00011 U	< 0.00008 U	< 0.00011 U
GNC1-JB03	0	NORM	2/13/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	0.00024 J	< 0.0009 U	< 0.00013 U	< 0.000092 U	< 0.00019 U	< 0.00049 U	0.00016 J	0.00012 J	0.00012 J
GNC1-JB03	0	FD	2/13/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	0.00024 J	< 0.00091 U	< 0.00013 U	< 0.000093 U	< 0.00019 U	< 0.00049 U	< 0.00011 U	< 0.000079 U	< 0.00011 U
GNC1-JB03	7	NORM	2/13/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	0.00028 J	< 0.00089 U	< 0.00013 U	< 0.000091 U	< 0.00018 U	< 0.00048 U	0.00014 J	0.00011 J	< 0.00011 U
GNC1-JB03	17	NORM	2/13/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	0.00025 J	< 0.0009 U	< 0.00013 U	< 0.000092 U	< 0.00019 U	< 0.00048 U	< 0.00011 U	0.000087 J	0.00012 J
GNC1-JB06	0	NORM	2/13/2009	< 0.0003 U	< 0.00017 U	0.00012 J	0.00032 J	< 0.00091 U	< 0.00013 U	< 0.000093 U	< 0.00019 U	< 0.00049 U	0.00017 J	< 0.000079 U	0.00015 J
GNC1-JB06	6	NORM	2/17/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.00091 U	< 0.00013 U	< 0.000093 U	< 0.00019 U	< 0.00049 U	0.00017 J	< 0.00015 U	< 0.00011 U
GNC1-JB06	16	NORM	2/17/2009	< 0.00031 U	< 0.00017 U	0.00012 J	< 0.00026 U	< 0.00092 U	< 0.00013 U	< 0.000095 U	< 0.00019 U	0.0018 J	0.00016 J	< 0.000081 U	< 0.00011 U
GNC1-JB07	0	NORM	2/13/2009	< 0.0003 U	< 0.00017 U	0.00012 J	0.00024 J	< 0.0009 U	< 0.00013 U	< 0.000093 U	< 0.00019 U	< 0.00049 U	0.00015 J	< 0.000079 U	< 0.00011 U
GNC1-JB07	8	NORM	2/13/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	0.00025 J	< 0.00089 U	< 0.00013 U	< 0.000092 U	< 0.00019 U	< 0.00048 U	< 0.00011 U	0.00013 J	< 0.00011 U
GNC1-JB07	18	NORM	2/13/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00022 U	< 0.00089 U	< 0.00013 U	< 0.000091 U	< 0.00018 U	< 0.00048 U	0.00015 J	< 0.000078 U	< 0.00011 U
GNC1-JD01	0	NORM	1/27/2009	< 0.0003 UJ	< 0.00017 UJ	< 0.00011 UJ	< 0.00017 UJ	< 0.00091 UJ	< 0.00013 UJ	< 0.000093 UJ	< 0.00019 UJ	< 0.00049 UJ	< 0.00011 UJ	< 0.00008 UJ	< 0.00011 UJ
GNC1-JD01	3	NORM	1/27/2009	< 0.00031 U	< 0.00017 U	< 0.00011 U	< 0.00018 U	< 0.00092 U	< 0.00013 UJ	< 0.000095 U	< 0.00019 UJ	< 0.0005 UJ	< 0.00012 UJ	< 0.000081 U	< 0.00011 UJ
GNC1-JD01	13	NORM	1/27/2009	< 0.00031 U	< 0.00017 U	< 0.00011 U	< 0.00018 U	< 0.00092 U	< 0.00013 UJ	< 0.000094 U	< 0.00019 UJ	< 0.0005 UJ	< 0.00012 UJ	< 0.000081 U	< 0.00011 UJ

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Volatile Organic Compounds (VOCs)											
				Freon-12 (Dichloro-difluoromethane)	Heptane	Isopropylbenzene	m,p-Xylene	Methyl ethyl ketone (2-Butanone)	Methyl iodide	MTBE (Methyl tert-butyl ether)	n-Butylbenzene	Nonanal	n-Propylbenzene	o-Xylene	sec-Butylbenzene
GNC1-JD02	0	NORM	1/27/2009	< 0.00032 U	< 0.00018 U	< 0.00011 U	< 0.00018 U	< 0.00095 U	< 0.00014 UJ	< 0.000097 U	< 0.0002 UJ	< 0.00051 UJ	< 0.00012 UJ	< 0.000083 U	< 0.00012 UJ
GNC1-JD02	10	NORM	1/27/2009	< 0.00031 U	< 0.00017 U	< 0.00011 U	< 0.00018 U	< 0.00093 U	< 0.00013 UJ	< 0.000095 U	< 0.00019 UJ	< 0.0005 UJ	< 0.00012 UJ	< 0.000081 U	< 0.00011 UJ
GNC1-JD06	0	NORM	2/13/2009	< 0.00031 U	< 0.00017 U	< 0.00011 U	< 0.00018 U	< 0.00092 U	< 0.00013 U	< 0.000094 U	< 0.00019 U	< 0.0005 U	0.00017 J	< 0.00008 U	< 0.00011 U
GNC1-JD06	10	NORM	2/17/2009	< 0.00031 U	< 0.00017 U	< 0.00011 U	< 0.00018 U	< 0.00092 U	< 0.00013 U	< 0.000094 U	< 0.00019 U	< 0.0005 U	< 0.00012 U	< 0.00008 U	< 0.00011 U
GNC1-JP02	0	NORM	2/12/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 U	< 0.00013 U	< 0.000092 U	< 0.00019 U	< 0.00048 U	< 0.00011 U	< 0.000078 U	< 0.00011 U
GNC1-JP02	0	FD	2/12/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	0.00028 J	< 0.0009 U	< 0.00013 U	< 0.000092 U	< 0.00019 U	< 0.00048 U	0.00015 J	0.00012 J	< 0.00011 U
GNC1-JP02	10	NORM	2/12/2009	< 0.00029 U	< 0.00017 U	< 0.00011 U	0.00026 J	< 0.00088 U	< 0.00013 U	< 0.000091 U	< 0.00018 U	0.00049 J	0.00014 J	< 0.000078 U	0.00013 J
GNC1-JP04	0	NORM	2/10/2009	< 0.00031 U	< 0.00018 U	< 0.00011 U	< 0.00018 U	< 0.00094 U	< 0.00013 U	< 0.000097 U	< 0.0002 U	< 0.00051 U	< 0.00012 U	< 0.000083 U	< 0.00012 U
GNC1-JP04	0	FD	2/10/2009	< 0.00031 U	< 0.00017 U	< 0.00011 U	< 0.00018 U	< 0.00092 U	< 0.00013 U	< 0.000095 U	< 0.00019 U	< 0.0005 U	< 0.00012 U	< 0.000081 U	< 0.00011 U
GNC1-JP04	10	NORM	2/10/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 U	< 0.00013 U	< 0.000093 U	< 0.00019 U	< 0.00049 U	< 0.00011 U	< 0.000079 U	< 0.00011 U
GNC1-JP05	0	NORM	2/4/2009	< 0.00029 U	< 0.00017 U	< 0.0001 U	< 0.00017 U	< 0.00088 UJ	< 0.00013 U	< 0.00009 U	< 0.00018 U	< 0.00048 U	< 0.00011 U	< 0.000077 U	< 0.00011 U
GNC1-JP05	11	NORM	2/4/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 UJ	< 0.00013 U	< 0.000092 U	< 0.00019 U	< 0.00048 U	< 0.00011 U	< 0.000078 U	< 0.00011 U
GNC1-JP06	0	NORM	2/12/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 U	< 0.00013 U	< 0.000092 U	< 0.00019 U	< 0.00049 U	< 0.00011 U	< 0.000079 U	< 0.00011 U
GNC1-JP06	0	FD	2/12/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 U	< 0.00013 U	< 0.000092 U	< 0.00019 U	< 0.00048 U	< 0.00011 U	< 0.000079 U	< 0.00011 U
GNC1-JP06	3	NORM	2/12/2009	< 0.00029 U	< 0.00017 U	< 0.0001 U	< 0.00017 U	< 0.00088 U	< 0.00013 U	< 0.00009 U	< 0.00018 U	< 0.00047 U	< 0.00011 U	< 0.000077 U	< 0.00011 U
GNC1-JP06	13	NORM	2/12/2009	< 0.00029 U	< 0.00017 U	< 0.0001 U	< 0.00017 U	< 0.00088 U	< 0.00013 U	< 0.00009 U	< 0.00018 U	< 0.00047 U	< 0.00011 U	< 0.000077 U	< 0.00011 U
GNC1-JS08	0	NORM	1/28/2009	< 0.0003 U	< 0.00017 U	< 0.00011 UJ	< 0.00017 UJ	< 0.00089 U	< 0.00013 UJ	< 0.000092 U	< 0.00019 UJ	< 0.00048 UJ	< 0.00011 UJ	< 0.000078 UJ	< 0.00011 UJ
GNC1-JS08	10	NORM	1/28/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 U	< 0.00013 UJ	< 0.000093 U	< 0.00019 U	< 0.00049 U	< 0.00011 U	< 0.000079 U	< 0.00011 U
GNC1-JS17	0	NORM	2/4/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.00089 UJ	< 0.00013 U	< 0.000091 U	< 0.00018 U	< 0.00048 U	< 0.00011 U	< 0.000078 U	< 0.00011 U
GNC1-JS17	10	NORM	2/4/2009	< 0.0003 U	< 0.00017 U	< 0.00011 U	< 0.00017 U	< 0.0009 UJ	< 0.00013 U	< 0.000093 U	< 0.00019 U	< 0.00049 U	< 0.00011 U	< 0.000079 U	< 0.00011 U
UPC1-BB28	0	NORM	11/3/2009	< 0.00025 U	< 0.00038 U	< 0.00029 U	< 0.00046 U	< 0.00058 U	< 0.00039 U	< 0.00047 U	< 0.0003 U	< 0.00037 U	< 0.00028 U	< 0.00024 U	< 0.00033 U
UPC1-BB28	0	FD	11/20/2009	< 0.00025 U	< 0.00037 U	< 0.00028 U	0.0011 J	0.0099 J	< 0.00039 U	< 0.00047 U	< 0.00029 U	< 0.00036 U	< 0.00027 U	0.00038 J	< 0.00033 U
UPC1-BB28	8	NORM	11/3/2009	< 0.00025 U	< 0.00038 U	< 0.00029 U	< 0.00046 U	< 0.00058 U	< 0.00039 U	< 0.00047 U	< 0.0003 U	< 0.00037 U	< 0.00028 U	< 0.00024 U	< 0.00033 U
UPC1-BB28	18	NORM	11/3/2009	< 0.00025 U	< 0.00038 U	< 0.00029 U	< 0.00047 U	< 0.00059 U	< 0.0004 U	< 0.00048 U	< 0.0003 U	< 0.00037 U	< 0.00028 U	< 0.00024 U	< 0.00033 U
UPC1-BB31	0	NORM	10/30/2009	< 0.00025 U	< 0.00038 U	< 0.00029 U	< 0.00046 U	< 0.00058 U	< 0.00039 U	< 0.00047 U	< 0.0003 U	< 0.00037 U	< 0.00028 U	< 0.00024 U	< 0.00033 U
UPC1-BB31	11	NORM	10/30/2009	< 0.00025 U	< 0.00038 U	< 0.00029 U	< 0.00046 U	< 0.00059 U	< 0.0004 U	< 0.00048 U	< 0.0003 U	< 0.00037 U	< 0.00028 U	< 0.00024 U	< 0.00033 U
UPC1-BB32	0	NORM	10/30/2009	< 0.00025 U	< 0.00038 U	< 0.00029 U	< 0.00046 U	< 0.00058 U	< 0.00039 U	< 0.00047 U	< 0.0003 U	< 0.00037 U	< 0.00028 U	< 0.00024 U	< 0.00033 U
UPC1-BB32	0	FD	10/30/2009	< 0.00025 U	< 0.00038 U	< 0.00029 U	< 0.00046 U	< 0.00058 U	< 0.00039 U	< 0.00047 U	< 0.0003 U	< 0.00037 U	< 0.00028 U	< 0.00024 U	< 0.00033 U
UPC1-BB32	10	NORM	10/30/2009	< 0.00025 U	< 0.00038 U	< 0.00029 U	< 0.00046 U	< 0.00059 U	< 0.0004 U	< 0.00048 U	< 0.0003 U	< 0.00037 U	< 0.00028 U	< 0.00024 U	< 0.00033 U
UPC1-BB33	0	NORM	10/29/2009	< 0.00025 U	< 0.00038 U	< 0.00029 U	< 0.00046 U	0.0045 J+	< 0.00039 U	< 0.00047 U	< 0.0003 U	< 0.00037 U	< 0.00028 U	< 0.00024 U	< 0.00033 U
UPC1-BB33	10	NORM	10/29/2009	< 0.00025 U	< 0.00038 U	< 0.00029 U	< 0.00046 U	< 0.00059 U	< 0.0004 U	< 0.00048 U	< 0.0003 U	< 0.00037 U	< 0.00028 U	< 0.00024 U	< 0.00033 U
UPC1-JP11	0	NORM	10/28/2009	< 0.00025 U	< 0.00037 U	< 0.00028 U	0.00082 J	0.0095 J	< 0.00039 U	< 0.00047 U	< 0.00029 U	< 0.00036 U	< 0.00027 U	0.00024 J	< 0.00032 U
UPC1-JP11	10	NORM	10/28/2009	< 0.00026 U	< 0.00039 U	< 0.00029 U	< 0.00047 U	< 0.00059 U	< 0.0004 U	< 0.00048 U	< 0.0003 U	< 0.00037 U	< 0.00028 U	< 0.00024 U	< 0.00033 U

All units in mg/kg.
-- = no sample data.

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 13 of 14)

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Volatile Organic Compounds (VOCs)									
				Styrene	tert-Butylbenzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloro-propene	Trichloroethene	Vinyl acetate	Vinyl chloride	Xylenes (total)
GNC1-BB16	0	NORM	1/27/2009	< 0.00018 U	< 0.00011 UJ	< 0.000092 U	< 0.00034 U	< 0.000095 U	< 0.00011 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-BB16	10	NORM	1/27/2009	< 0.00018 U	< 0.00011 UJ	< 0.000092 U	< 0.00034 U	< 0.000096 U	< 0.00011 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00025 U
GNC1-BC16	0	NORM	1/27/2009	< 0.00018 U	< 0.0001 U	< 0.00009 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-BC16	10	NORM	1/27/2009	< 0.00019 U	< 0.00011 U	< 0.000095 U	< 0.00035 U	< 0.000098 U	< 0.00011 U	< 0.00011 U	< 0.00026 U	< 0.00012 U	< 0.00025 U
GNC1-BC18	0	NORM	1/27/2009	< 0.00018 U	< 0.00011 U	< 0.000092 U	< 0.00034 U	< 0.000095 U	< 0.00011 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-BC18	0	FD	1/27/2009	< 0.00018 U	< 0.00011 UJ	< 0.000091 U	< 0.00034 U	< 0.000095 U	< 0.00011 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-BC18	10	NORM	1/27/2009	< 0.00019 U	< 0.00011 U	< 0.000095 U	< 0.00035 U	< 0.000098 U	< 0.00011 U	< 0.00011 U	< 0.00026 U	< 0.00012 U	< 0.00025 U
GNC1-BC21	0	NORM	1/29/2009	< 0.00018 U	< 0.0001 UJ	< 0.000088 U	< 0.00033 U	< 0.000091 U	< 0.0001 U	< 0.00011 U	< 0.00024 U	< 0.00011 U	< 0.00023 U
GNC1-BC21	10	NORM	1/29/2009	< 0.00018 U	< 0.00011 UJ	< 0.000092 U	< 0.00034 U	< 0.000096 U	< 0.00011 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00025 U
GNC1-BC22	0	NORM	3/2/2009	< 0.00018 U	< 0.0001 U	< 0.000089 U	< 0.00033 U	< 0.000092 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00011 U	< 0.00024 U
GNC1-BC22	11	NORM	3/2/2009	< 0.00018 U	< 0.0001 U	< 0.000091 U	< 0.00034 U	< 0.000094 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-BC23	0	NORM	2/10/2009	< 0.00018 U	< 0.00011 U	< 0.000092 U	< 0.00034 U	< 0.000095 U	< 0.00011 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-BC23	10	NORM	2/10/2009	< 0.00018 U	< 0.0001 U	< 0.000091 U	< 0.00034 U	< 0.000094 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-BC27	0	NORM	2/4/2009	< 0.00018 U	< 0.0001 U	< 0.000089 U	< 0.00033 U	< 0.000092 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-BC27	0	FD	2/4/2009	< 0.00018 U	< 0.0001 U	< 0.000088 U	< 0.00033 U	< 0.000091 U	< 0.0001 U	< 0.00011 U	< 0.00024 U	< 0.00011 U	< 0.00023 U
GNC1-BC27	10	NORM	2/4/2009	< 0.00018 U	< 0.0001 U	< 0.00009 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-BC28	0	NORM	2/4/2009	< 0.00018 U	< 0.0001 UJ	< 0.00009 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-BC28	11	NORM	2/4/2009	< 0.00018 U	< 0.0001 U	< 0.000089 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-BC29	0	NORM	2/4/2009	< 0.00018 U	< 0.0001 U	< 0.00009 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-BC29	10	NORM	2/4/2009	< 0.00018 U	< 0.0001 U	< 0.000089 U	< 0.00033 U	< 0.000092 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00011 U	< 0.00024 U
GNC1-JB02	0	NORM	2/11/2009	< 0.00024 U	< 0.0001 U	< 0.000091 U	< 0.00034 U	< 0.000094 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JB02	5	NORM	2/11/2009	< 0.00018 U	< 0.0001 U	< 0.00009 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JB02	15	NORM	2/11/2009	< 0.00023 U	< 0.0001 U	< 0.000091 U	< 0.00034 U	< 0.000094 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JB03	0	NORM	2/13/2009	< 0.00018 U	< 0.0001 U	< 0.00009 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	0.00036 J
GNC1-JB03	0	FD	2/13/2009	< 0.00019 U	< 0.0001 U	< 0.000091 U	< 0.00034 U	< 0.000094 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JB03	7	NORM	2/13/2009	< 0.00023 U	< 0.0001 U	< 0.000089 U	< 0.00033 U	< 0.000092 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00011 U	0.00038 J
GNC1-JB03	17	NORM	2/13/2009	< 0.00027 U	< 0.0001 U	< 0.00009 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	0.00034 J
GNC1-JB06	0	NORM	2/13/2009	< 0.00023 U	0.00013 J	< 0.000091 U	< 0.00034 U	< 0.000094 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	0.00032 J
GNC1-JB06	6	NORM	2/17/2009	< 0.00021 U	< 0.0001 U	< 0.000091 U	< 0.00044 U	< 0.000094 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JB06	16	NORM	2/17/2009	< 0.00023 U	0.00012 J	< 0.000093 U	< 0.00034 U	< 0.000096 U	< 0.00011 U	< 0.00011 U	< 0.00026 U	< 0.00012 U	< 0.00026 U
GNC1-JB07	0	NORM	2/13/2009	< 0.00023 U	< 0.0001 U	< 0.000091 U	< 0.00033 U	< 0.000094 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JB07	8	NORM	2/13/2009	< 0.00026 U	< 0.0001 U	< 0.00009 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	0.00038 J
GNC1-JB07	18	NORM	2/13/2009	< 0.0002 U	< 0.0001 U	< 0.000089 U	< 0.00033 U	< 0.000092 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00011 U	< 0.00024 U
GNC1-JD01	0	NORM	1/27/2009	0.00053 J-	< 0.0001 UJ	< 0.000091 UJ	< 0.00034 UJ	< 0.000094 UJ	< 0.0001 UJ	< 0.00011 UJ	< 0.00025 UJ	< 0.00012 UJ	< 0.00024 UJ
GNC1-JD01	3	NORM	1/27/2009	< 0.00018 U	< 0.00011 UJ	< 0.000093 U	< 0.00034 U	< 0.000096 U	< 0.00011 U	< 0.00011 U	< 0.00026 U	< 0.00012 U	< 0.00025 U
GNC1-JD01	13	NORM	1/27/2009	< 0.00018 U	< 0.00011 UJ	< 0.000092 U	< 0.00034 U	< 0.000095 U	< 0.00011 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U

TABLE B-10
SOIL VOLATILE ORGANIC COMPOUNDS (VOCS) DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Sample ID	Depth (ft bgs)	Sample Type	Sample Date	Volatile Organic Compounds (VOCs)									
				Styrene	tert-Butylbenzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloro-propene	Trichloroethene	Vinyl acetate	Vinyl chloride	Xylenes (total)
GNC1-JD02	0	NORM	1/27/2009	< 0.00019 U	< 0.00011 UJ	< 0.000095 U	< 0.00035 U	< 0.000098 U	< 0.00011 U	< 0.00011 U	< 0.00026 U	< 0.00012 U	< 0.00025 U
GNC1-JD02	10	NORM	1/27/2009	< 0.00018 U	< 0.00011 UJ	< 0.000093 U	< 0.00034 U	< 0.000096 U	< 0.00011 U	< 0.00011 U	< 0.00026 U	< 0.00012 U	< 0.00025 U
GNC1-JD06	0	NORM	2/13/2009	< 0.00027 U	< 0.00011 U	< 0.000092 U	< 0.00034 U	< 0.000095 U	< 0.00011 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JD06	10	NORM	2/17/2009	< 0.00022 U	< 0.00011 U	< 0.000092 U	< 0.00034 U	< 0.000095 U	< 0.00011 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JP02	0	NORM	2/12/2009	< 0.00018 U	< 0.0001 U	< 0.00009 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JP02	0	FD	2/12/2009	< 0.00024 U	0.00012 J	< 0.00009 U	< 0.00033 U	< 0.000093 U	0.00015 J	< 0.00011 U	< 0.00025 U	< 0.00012 U	0.0004 J
GNC1-JP02	10	NORM	2/12/2009	< 0.00026 U	0.00012 J	< 0.000089 U	< 0.00033 U	< 0.000092 U	< 0.0001 U	< 0.00011 U	< 0.00024 U	< 0.00011 U	0.00026 J
GNC1-JP04	0	NORM	2/10/2009	< 0.00023 U	< 0.00011 U	< 0.000095 U	< 0.00035 U	< 0.000098 U	< 0.00011 U	< 0.00011 U	< 0.00026 U	< 0.00012 U	< 0.00025 U
GNC1-JP04	0	FD	2/10/2009	< 0.00023 U	< 0.00011 U	< 0.000093 U	< 0.00034 U	< 0.000096 U	< 0.00011 U	< 0.00011 U	< 0.00026 U	< 0.00012 U	< 0.00025 U
GNC1-JP04	10	NORM	2/10/2009	< 0.00018 U	< 0.0001 U	< 0.000091 U	< 0.00034 U	< 0.000094 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JP05	0	NORM	2/4/2009	< 0.00018 U	< 0.0001 U	< 0.000088 U	< 0.00033 U	< 0.000091 U	< 0.0001 U	< 0.00011 U	< 0.00024 U	< 0.00011 U	< 0.00023 U
GNC1-JP05	11	NORM	2/4/2009	< 0.00018 U	< 0.0001 U	< 0.00009 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JP06	0	NORM	2/12/2009	< 0.00018 U	< 0.0001 U	< 0.00009 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JP06	0	FD	2/12/2009	< 0.00018 U	< 0.0001 U	< 0.00009 U	< 0.00033 U	< 0.000093 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JP06	3	NORM	2/12/2009	< 0.00018 U	< 0.0001 U	< 0.000088 U	< 0.00033 U	< 0.000091 U	< 0.0001 U	< 0.00011 U	< 0.00024 U	< 0.00011 U	< 0.00023 U
GNC1-JP06	13	NORM	2/12/2009	< 0.00018 U	< 0.0001 U	< 0.000088 U	< 0.00033 U	< 0.000091 U	< 0.0001 U	< 0.00011 U	< 0.00024 U	< 0.00011 U	< 0.00023 U
GNC1-JS08	0	NORM	1/28/2009	< 0.00018 UJ	< 0.0001 UJ	< 0.00009 UJ	< 0.00033 UJ	< 0.000093 U	< 0.0001 UJ	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 UJ
GNC1-JS08	10	NORM	1/28/2009	< 0.00018 U	< 0.0001 U	< 0.000091 U	< 0.00034 U	< 0.000094 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
GNC1-JS17	0	NORM	2/4/2009	< 0.00018 U	< 0.0001 U	< 0.000089 U	< 0.00033 U	< 0.000092 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00011 U	< 0.00024 U
GNC1-JS17	10	NORM	2/4/2009	< 0.00018 U	< 0.0001 U	< 0.000091 U	< 0.00033 U	< 0.000094 U	< 0.0001 U	< 0.00011 U	< 0.00025 U	< 0.00012 U	< 0.00024 U
UPC1-BB28	0	NORM	11/3/2009	< 0.00021 U	< 0.00023 U	< 0.00047 U	< 0.00024 U	< 0.00035 U	< 0.00018 U	< 0.00027 U	< 0.00039 U	< 0.00033 U	< 0.00065 U
UPC1-BB28	0	FD	11/20/2009	< 0.00021 U	< 0.00023 U	< 0.00047 U	0.00056 J	< 0.00034 U	< 0.00018 U	< 0.00026 U	< 0.00038 U	< 0.00032 U	0.0015 J
UPC1-BB28	8	NORM	11/3/2009	< 0.00021 U	< 0.00023 U	< 0.00047 U	< 0.00024 U	< 0.00034 U	< 0.00018 U	< 0.00027 U	< 0.00039 U	< 0.00033 U	< 0.00065 U
UPC1-BB28	18	NORM	11/3/2009	< 0.00021 U	< 0.00023 U	< 0.00048 U	< 0.00025 U	< 0.00035 U	< 0.00018 U	< 0.00027 U	< 0.00039 U	< 0.00033 U	< 0.00066 U
UPC1-BB31	0	NORM	10/30/2009	< 0.00021 U	< 0.00023 U	< 0.00047 U	< 0.00024 U	< 0.00034 U	< 0.00018 U	< 0.00027 U	< 0.00038 U	< 0.00033 U	< 0.00065 U
UPC1-BB31	11	NORM	10/30/2009	< 0.00021 U	< 0.00023 U	< 0.00048 U	< 0.00025 U	< 0.00035 U	< 0.00018 U	< 0.00027 U	< 0.00039 U	< 0.00033 U	< 0.00066 U
UPC1-BB32	0	NORM	10/30/2009	< 0.00021 U	< 0.00023 U	< 0.00047 U	< 0.00024 U	< 0.00034 U	< 0.00018 U	< 0.00027 U	< 0.00039 U	< 0.00033 U	< 0.00065 U
UPC1-BB32	0	FD	10/30/2009	< 0.00021 U	< 0.00023 U	< 0.00047 U	< 0.00024 U	< 0.00034 U	< 0.00018 U	< 0.00027 U	< 0.00038 U	< 0.00033 U	< 0.00065 U
UPC1-BB32	10	NORM	10/30/2009	< 0.00021 U	< 0.00023 U	< 0.00048 U	< 0.00025 U	< 0.00035 U	< 0.00018 U	< 0.00027 U	< 0.00039 U	< 0.00033 U	< 0.00066 U
UPC1-BB33	0	NORM	10/29/2009	< 0.00021 U	< 0.00023 U	< 0.00047 U	< 0.00024 U	< 0.00034 U	< 0.00018 U	< 0.00027 U	< 0.00038 U	< 0.00033 U	< 0.00065 U
UPC1-BB33	10	NORM	10/29/2009	< 0.00021 U	< 0.00023 U	< 0.00048 U	< 0.00025 U	< 0.00035 U	< 0.00018 U	< 0.00027 U	< 0.00039 U	< 0.00033 U	< 0.00066 U
UPC1-JP11	0	NORM	10/28/2009	< 0.00021 U	< 0.00023 U	< 0.00046 U	< 0.00024 U	< 0.00034 U	< 0.00018 U	< 0.00026 U	< 0.00038 U	< 0.00032 U	0.0011 J
UPC1-JP11	10	NORM	10/28/2009	< 0.00021 U	< 0.00023 U	< 0.00048 U	< 0.00025 U	< 0.00035 U	< 0.00018 U	< 0.00027 U	< 0.00039 U	< 0.00033 U	< 0.00066 U

All units in mg/kg.
-- = no sample data.

TABLE B-11
SURFACE FLUX DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 1 of 7)

				Surface Flux									
Sample ID	**Sample Type**	**Sample Date**	**Analytical Method**	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene
GNC1-BB16	NORM	2/12/2009	TO-15	< 0.0158 U	< 0.0142 U	< 0.0181 UJ	< 0.0142 U	< 0.0104 U	< 0.0104 U	< 0.00963 U	< 0.0135 UJ	< 0.0393 UJ	< 0.0258 U
GNC1-BB16	NORM	2/12/2009	TO-15 SIM	--	--	< 0.00181 UJ	< 0.00142 UJ	--	--	--	< 0.00123 UJ	--	--
GNC1-BC16	NORM	2/12/2009	TO-15	< 0.0154 U	< 0.0142 U	< 0.0177 UJ	< 0.0142 U	< 0.0104 U	< 0.01 UJ	< 0.00963 U	< 0.0131 U	0.0597 J	0.0835 J
GNC1-BC16	NORM	2/12/2009	TO-15 SIM	--	--	< 0.00177 UJ	< 0.00142 U	--	--	--	< 0.00123 UJ	--	--
GNC1-BC29	NORM	2/12/2009	TO-15	< 0.0158 U	< 0.0142 U	< 0.0181 UJ	< 0.0142 U	< 0.0104 U	< 0.0104 U	< 0.00963 U	< 0.0135 UJ	< 0.0393 UJ	< 0.0258 U
GNC1-BC29	NORM	2/12/2009	TO-15 SIM	--	--	< 0.00181 UJ	< 0.00142 U	--	--	--	< 0.00123 UJ	--	--
GNC1-JB07	NORM	2/12/2009	TO-15	< 0.0158 U	< 0.0146 U	< 0.0181 UJ	< 0.0146 U	< 0.0108 U	< 0.0104 U	< 0.01 U	< 0.0135 U	< 0.0397 UJ	< 0.0262 UJ
GNC1-JB07	NORM	2/12/2009	TO-15 SIM	--	--	< 0.00181 UJ	< 0.00146 UJ	--	--	--	< 0.00127 UJ	--	--
GNC1-JP02	NORM	2/12/2009	TO-15	< 0.0162 U	< 0.0146 U	< 0.0185 UJ	< 0.0146 U	< 0.0108 U	< 0.0104 U	< 0.01 U	< 0.0135 U	< 0.04 UJ	< 0.0262 UJ
GNC1-JP02	NORM	2/12/2009	TO-15 SIM	--	--	< 0.00185 UJ	< 0.00146 U	--	--	--	< 0.00127 UJ	--	--
GNC1-JP02	FD	2/12/2009	TO-15	< 0.0158 U	< 0.0142 U	< 0.0181 UJ	< 0.0142 U	< 0.0104 U	< 0.0104 U	< 0.00963 U	< 0.0135 U	< 0.0393 UJ	< 0.0258 UJ
GNC1-JP02	FD	2/12/2009	TO-15 SIM	--	--	< 0.00181 UJ	< 0.00142 U	--	--	--	< 0.00123 UJ	--	--
GNC1-JP04	NORM	2/12/2009	TO-15	< 0.0158 U	< 0.0146 U	< 0.0181 UJ	< 0.0146 U	< 0.0108 U	< 0.0104 U	< 0.01 U	< 0.0135 UJ	1.86 J	0.571 J+
GNC1-JP04	NORM	2/12/2009	TO-15 SIM	--	--	< 0.00181 UJ	< 0.00146 U	--	--	--	< 0.00127 UJ	--	--
GNC1-JP06	NORM	2/12/2009	TO-15	< 0.0158 U	< 0.0142 U	< 0.0181 UJ	< 0.0142 U	< 0.0104 U	< 0.0104 U	< 0.01 U	< 0.0135 U	< 0.0397 UJ	< 0.0258 UJ
GNC1-JP06	NORM	2/12/2009	TO-15 SIM	--	--	< 0.00181 UJ	< 0.00142 U	--	--	--	< 0.00123 UJ	--	--
GNC1-JS08	NORM	2/12/2009	TO-15	< 0.0223 U	< 0.0204 U	< 0.0258 UJ	< 0.0204 U	< 0.015 U	< 0.0146 U	< 0.0139 U	< 0.0189 U	< 0.0558 UJ	< 0.0366 U
GNC1-JS08	NORM	2/12/2009	TO-15 SIM	--	--	< 0.00181 UJ	< 0.00142 UJ	--	--	--	< 0.00123 UJ	--	--
UPC1-BB31	NORM	7/29/2010	TO-15	< 0.0108 U	< 0.0227 U	--	< 0.0227 U	< 0.0166 U	< 0.0166 U	< 0.0112 U	< 0.0112 U	< 0.125 UJ	< 0.082 U
UPC1-BB31	NORM	7/29/2010	TO-15 SIM	--	--	< 0.00285 UJ	--	--	--	--	--	--	--
UPC1-BB32	NORM	7/29/2010	TO-15	< 0.01 U	< 0.0216 U	--	< 0.0216 U	< 0.0158 U	< 0.0154 U	< 0.0108 U	< 0.0108 U	< 0.119 UJ	< 0.0782 U
UPC1-BB32	NORM	7/29/2010	TO-15 SIM	--	--	< 0.00273 UJ	--	--	--	--	--	--	--
UPC1-JP11	NORM	7/28/2010	TO-15	< 0.0123 U	< 0.0258 U	--	< 0.0258 U	< 0.0189 U	< 0.0185 U	< 0.0127 U	< 0.0127 UJ	< 0.142 UJ	< 0.0936 U
UPC1-JP11	NORM	7/28/2010	TO-15 SIM	--	--	< 0.00458 U	--	--	--	--	--	--	--

All units in $\mu g/m^2$, min^{-1}.
-- = no analysis data.

TABLE B-11
SURFACE FLUX DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

				Surface Flux									
Sample ID	**Sample Type**	**Sample Date**	**Analytical Method**	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	1,4-Dioxane	2,2-Dichloropropane
GNC1-BB16	NORM	2/12/2009	TO-15	< 0.0204 U	< 0.0308 UJ	< 0.0108 U	< 0.0123 U	< 0.0266 U	< 0.0316 U	< 0.01 U	< 0.0316 U	< 0.00809 U	< 0.0108 U
GNC1-BB16	NORM	2/12/2009	TO-15 SIM	< 0.00254 UJ	< 0.00154 UJ	0.00196 J	< 0.00123 UJ	--	< 0.00158 UJ	--	< 0.00158 UJ	--	--
GNC1-BC16	NORM	2/12/2009	TO-15	< 0.0204 U	< 0.0304 UJ	< 0.0108 U	< 0.0119 U	< 0.0266 U	< 0.0312 UJ	< 0.00963 U	< 0.0312 UJ	< 0.00809 U	< 0.0108 U
GNC1-BC16	NORM	2/12/2009	TO-15 SIM	< 0.00204 U	< 0.00154 UJ	< 0.00108 U	< 0.00123 U	--	< 0.00158 UJ	--	< 0.00158 UJ	--	--
GNC1-BC29	NORM	2/12/2009	TO-15	< 0.0204 U	< 0.0308 UJ	< 0.0108 U	< 0.0123 U	< 0.0266 U	< 0.0316 U	< 0.01 U	< 0.0316 UJ	< 0.00809 U	< 0.0108 U
GNC1-BC29	NORM	2/12/2009	TO-15 SIM	< 0.00204 U	< 0.00154 UJ	< 0.00108 U	< 0.00123 U	--	< 0.00158 UJ	--	< 0.00158 UJ	--	--
GNC1-JB07	NORM	2/12/2009	TO-15	< 0.0208 U	< 0.0312 UJ	< 0.0108 U	< 0.0123 U	< 0.027 U	< 0.032 UJ	< 0.01 U	< 0.032 UJ	< 0.00809 U	< 0.0108 U
GNC1-JB07	NORM	2/12/2009	TO-15 SIM	< 0.00347 UJ	< 0.00158 UJ	< 0.00108 UJ	< 0.00127 UJ	--	< 0.00158 UJ	--	< 0.00158 UJ	--	--
GNC1-JP02	NORM	2/12/2009	TO-15	< 0.0208 U	< 0.0316 UJ	< 0.0108 U	< 0.0123 U	< 0.0273 U	< 0.0323 UJ	< 0.01 U	< 0.0323 UJ	< 0.00847 U	< 0.0112 U
GNC1-JP02	NORM	2/12/2009	TO-15 SIM	< 0.00208 U	< 0.00158 UJ	< 0.00112 U	< 0.00127 U	--	< 0.00162 UJ	--	< 0.00162 UJ	--	--
GNC1-JP02	FD	2/12/2009	TO-15	< 0.0204 U	< 0.0308 UJ	< 0.0108 U	< 0.0123 U	< 0.0266 U	< 0.0316 UJ	< 0.01 U	< 0.0316 UJ	< 0.00809 U	< 0.0108 U
GNC1-JP02	FD	2/12/2009	TO-15 SIM	< 0.00204 U	< 0.00158 UJ	< 0.00108 U	< 0.00123 U	--	< 0.00185 UJ	--	< 0.0027 UJ	--	--
GNC1-JP04	NORM	2/12/2009	TO-15	< 0.0208 U	0.0416 J	< 0.0108 U	< 0.0123 U	0.415 J+	0.037 J+	< 0.01 U	0.0628 J	< 0.00809 U	< 0.0108 U
GNC1-JP04	NORM	2/12/2009	TO-15 SIM	< 0.00208 U	0.0115 J	< 0.00108 U	< 0.00127 U	--	0.0104 J	--	0.018 J	--	--
GNC1-JP06	NORM	2/12/2009	TO-15	< 0.0208 U	< 0.0312 UJ	< 0.0108 U	< 0.0123 U	< 0.027 U	< 0.0316 UJ	< 0.01 U	< 0.0316 UJ	< 0.00809 U	< 0.0108 U
GNC1-JP06	NORM	2/12/2009	TO-15 SIM	< 0.00208 U	< 0.00154 UJ	< 0.00108 U	< 0.00123 U	--	< 0.00158 UJ	--	< 0.00158 UJ	--	--
GNC1-JS08	NORM	2/12/2009	TO-15	< 0.0293 U	< 0.0439 U	< 0.0154 U	< 0.0173 U	< 0.0381 U	< 0.045 U	< 0.0139 U	< 0.045 U	< 0.0116 U	< 0.0154 U
GNC1-JS08	NORM	2/12/2009	TO-15 SIM	< 0.00204 UJ	< 0.00154 UJ	< 0.00108 UJ	< 0.00123 UJ	--	< 0.00158 UJ	--	< 0.00158 UJ	--	--
UPC1-BB31	NORM	7/29/2010	TO-15	--	< 0.0982 UJ	--	< 0.0196 U	< 0.0212 U	< 0.1 U	< 0.0116 U	--	< 0.0277 U	< 0.0154 U
UPC1-BB31	NORM	7/29/2010	TO-15 SIM	--	--	< 0.00169 U	--	--	--	--	< 0.0025 U	--	--
UPC1-BB32	NORM	7/29/2010	TO-15	--	< 0.0936 U	--	< 0.0185 U	< 0.0204 U	< 0.0955 U	< 0.0108 U	--	< 0.0262 U	< 0.0146 U
UPC1-BB32	NORM	7/29/2010	TO-15 SIM	--	--	< 0.00162 U	--	--	--	--	< 0.00239 U	--	--
UPC1-JP11	NORM	7/28/2010	TO-15	--	< 0.112 UJ	--	< 0.0223 U	< 0.0243 U	< 0.114 UJ	< 0.0131 U	--	< 0.0316 U	< 0.0177 U
UPC1-JP11	NORM	7/28/2010	TO-15 SIM	--	--	< 0.00273 UJ	--	--	--	--	< 0.004 U	--	--

All units in µg/m^2, min^{-1}.
-- = no analysis data.

TABLE B-11
SURFACE FLUX DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 3 of 7)

Sample ID	Sample Type	Sample Date	Analytical Method	Surface Flux									
				2-Hexanone	2-Methyl-1-propanol	4-Methyl-2-pentanone (MIBK)	Acetone	Acetonitrile	Benzene	Benzyl chloride	Bromodichloromethane	Bromoform	Bromomethane
GNC1-BB16	NORM	2/12/2009	TO-15	< 0.00924 U	< 0.0193 UJ	< 0.00963 U	0.159 J	< 0.0154 U	< 0.027 U	< 0.0239 UJ	< 0.0139 U	< 0.0246 UJ	< 0.0104 U
GNC1-BB16	NORM	2/12/2009	TO-15 SIM	--	--	--	--	--	< 0.00501 UJ	< 0.001 UJ	< 0.00116 UJ	--	--
GNC1-BC16	NORM	2/12/2009	TO-15	< 0.00924 U	< 0.0189 UJ	< 0.00963 U	< 0.00539 UJ	< 0.0104 UJ	< 0.0939 U	< 0.0239 UJ	< 0.0135 U	< 0.0246 U	< 0.0104 U
GNC1-BC16	NORM	2/12/2009	TO-15 SIM	--	--	--	--	--	0.00343 J	< 0.001 UJ	< 0.00116 U	--	--
GNC1-BC29	NORM	2/12/2009	TO-15	< 0.00924 UJ	< 0.0193 UJ	< 0.00963 U	0.164 J	0.11	< 0.0331 U	< 0.0239 UJ	< 0.0139 U	< 0.0246 UJ	< 0.0104 U
GNC1-BC29	NORM	2/12/2009	TO-15 SIM	--	--	--	--	--	< 0.00936 UJ	< 0.001 UJ	< 0.00116 U	--	--
GNC1-JB07	NORM	2/12/2009	TO-15	< 0.00924 U	< 0.0193 UJ	< 0.00963 U	< 0.0535 UJ	< 0.0108 U	< 0.0196 U	< 0.0243 UJ	< 0.0139 U	< 0.025 U	< 0.0104 U
GNC1-JB07	NORM	2/12/2009	TO-15 SIM	--	--	--	--	--	< 0.00585 UJ	< 0.00104 UJ	< 0.00119 UJ	--	--
GNC1-JP02	NORM	2/12/2009	TO-15	0.0131 J+	< 0.0196 UJ	< 0.01 U	< 0.00578 UJ	< 0.0108 U	< 0.0212 UJ	< 0.0246 UJ	< 0.0142 U	< 0.0254 U	< 0.0108 U
GNC1-JP02	NORM	2/12/2009	TO-15 SIM	--	--	--	--	--	0.0037 J	< 0.00104 UJ	< 0.00119 U	--	--
GNC1-JP02	FD	2/12/2009	TO-15	0.0116 J	< 0.0193 UJ	< 0.00963 U	< 0.00539 UJ	< 0.0104 U	< 0.0223 U	< 0.0239 UJ	< 0.0139 U	< 0.0246 U	< 0.0104 U
GNC1-JP02	FD	2/12/2009	TO-15 SIM	--	--	--	--	--	0.0128 J	< 0.001 UJ	< 0.00116 U	--	--
GNC1-JP04	NORM	2/12/2009	TO-15	0.062 J	< 0.0193 UJ	< 0.00963 U	< 0.00539 UJ	< 0.0108 U	< 0.047 UJ	0.0866 J	< 0.0139 U	< 0.025 UJ	< 0.0104 U
GNC1-JP04	NORM	2/12/2009	TO-15 SIM	--	--	--	--	--	< 0.0142 UJ	< 0.00104 UJ	< 0.00119 U	--	--
GNC1-JP06	NORM	2/12/2009	TO-15	0.01 J	< 0.0193 UJ	< 0.00963 U	0.167 J	< 0.0108 U	< 0.032 U	< 0.0243 UJ	< 0.0139 U	< 0.025 U	< 0.0104 U
GNC1-JP06	NORM	2/12/2009	TO-15 SIM	--	--	--	--	--	0.0165	< 0.001 UJ	< 0.00119 U	--	--
GNC1-JS08	NORM	2/12/2009	TO-15	< 0.0131 U	< 0.0273 UJ	< 0.0139 U	0.695 J	0.296	0.0531 J	< 0.0343 UJ	< 0.0196 U	< 0.035 U	< 0.0146 U
GNC1-JS08	NORM	2/12/2009	TO-15 SIM	--	--	--	--	--	0.0257 J	< 0.001 UJ	< 0.00116 UJ	--	--
UPC1-BB31	NORM	7/29/2010	TO-15	< 0.0108 U	--	< 0.0116 U	0.269	< 0.0139 UJ	0.0181 J	--	< 0.01 U	< 0.0104 U	< 0.0166 U
UPC1-BB31	NORM	7/29/2010	TO-15 SIM	--	--	--	--	--	--	--	--	--	--
UPC1-BB32	NORM	7/29/2010	TO-15	< 0.0104 U	--	< 0.0112 U	0.34	< 0.0135 UJ	0.032 J	--	< 0.00963 U	< 0.01 U	< 0.0158 U
UPC1-BB32	NORM	7/29/2010	TO-15 SIM	--	--	--	--	--	--	--	--	--	--
UPC1-JP11	NORM	7/28/2010	TO-15	< 0.0123 U	--	< 0.0131 U	< 0.349 U	< 0.0158 UJ	< 0.0335 U	--	< 0.0116 U	< 0.0119 U	< 0.0189 U
UPC1-JP11	NORM	7/28/2010	TO-15 SIM	--	--	--	--	--	--	--	--	--	--

All units in $\mu g/m^2$, min^{-1}.
-- = no analysis data.

TABLE B-11
SURFACE FLUX DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 4 of 7)

Sample ID	Sample Type	Sample Date	Analytical Method	Surface Flux									
				Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chlorobromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene (Isopropyltoluene)
GNC1-BB16	NORM	2/12/2009	TO-15	< 0.0362 UJ	< 0.0166 U	< 0.0119 U	< 0.0116 U	< 0.00693 U	< 0.0127 U	< 0.00539 U	< 0.0104 U	< 0.0123 U	< 0.0258 UJ
GNC1-BB16	NORM	2/12/2009	TO-15 SIM	--	0.00516 J	--	--	--	0.013 J	--	--	--	--
GNC1-BC16	NORM	2/12/2009	TO-15	< 0.00693 UJ	< 0.0162 U	< 0.0119 U	< 0.0116 U	< 0.00693 U	< 0.0127 U	< 0.00539 U	< 0.0104 U	< 0.0123 U	< 0.0254 U
GNC1-BC16	NORM	2/12/2009	TO-15 SIM	--	0.00308 J	--	--	--	0.00824	--	--	--	--
GNC1-BC29	NORM	2/12/2009	TO-15	0.114 J	< 0.0166 U	< 0.0119 U	< 0.0116 U	0.0758	0.0227 J	< 0.00539 U	< 0.0104 U	< 0.0123 U	< 0.0258 UJ
GNC1-BC29	NORM	2/12/2009	TO-15 SIM	--	0.00912	--	--	--	0.0255	--	--	--	--
GNC1-JB07	NORM	2/12/2009	TO-15	0.248 J	< 0.0166 U	< 0.0123 U	< 0.0119 U	< 0.00732 U	0.0208 J	< 0.00539 U	< 0.0108 U	< 0.0127 U	< 0.0262 U
GNC1-JB07	NORM	2/12/2009	TO-15 SIM	--	0.00381 J	--	--	--	0.0333 J	--	--	--	--
GNC1-JP02	NORM	2/12/2009	TO-15	< 0.00732 UJ	< 0.0169 U	< 0.0123 U	< 0.0119 U	< 0.00732 U	< 0.0131 U	< 0.00539 U	< 0.0108 U	< 0.0127 U	< 0.0262 U
GNC1-JP02	NORM	2/12/2009	TO-15 SIM	--	0.00566 J	--	--	--	0.0415 J	--	--	--	--
GNC1-JP02	FD	2/12/2009	TO-15	< 0.00693 UJ	< 0.0166 U	< 0.0119 U	< 0.0116 U	< 0.00693 U	< 0.0127 U	< 0.00539 U	< 0.0104 U	< 0.0123 U	< 0.0258 U
GNC1-JP02	FD	2/12/2009	TO-15 SIM	--	0.0193 J	--	--	--	0.0714 J	--	--	--	--
GNC1-JP04	NORM	2/12/2009	TO-15	< 0.00732 UJ	< 0.0166 U	0.0196 J+	< 0.0119 U	< 0.00732 U	0.0516 J+	< 0.00539 U	< 0.0108 U	< 0.0127 U	0.268 J
GNC1-JP04	NORM	2/12/2009	TO-15 SIM	--	0.0077 J	--	--	--	0.0872	--	--	--	--
GNC1-JP06	NORM	2/12/2009	TO-15	< 0.00732 UJ	0.166	0.0139 J	< 0.0119 U	< 0.00693 U	0.181	< 0.00539 U	< 0.0104 U	< 0.0123 U	< 0.0258 U
GNC1-JP06	NORM	2/12/2009	TO-15 SIM	--	0.433	--	--	--	0.317	--	--	--	--
GNC1-JS08	NORM	2/12/2009	TO-15	0.147 J	< 0.0235 U	< 0.0173 U	< 0.0166 U	0.0481 J	< 0.0181 U	< 0.0077 U	< 0.015 U	< 0.0177 U	< 0.0366 U
GNC1-JS08	NORM	2/12/2009	TO-15 SIM	--	0.00628 J	--	--	--	0.0129 J	--	--	--	--
UPC1-BB31	NORM	7/29/2010	TO-15	0.0162 J	--	< 0.0193 U	< 0.0108 U	< 0.0112 U	--	0.0296 J	< 0.0166 U	< 0.0196 U	< 0.0142 U
UPC1-BB31	NORM	7/29/2010	TO-15 SIM	--	0.00728 J	--	--	--	0.0133	--	--	--	--
UPC1-BB32	NORM	7/29/2010	TO-15	< 0.0104 U	--	< 0.0181 U	< 0.01 U	< 0.0108 U	--	< 0.0112 U	< 0.0158 U	< 0.0189 U	< 0.0135 U
UPC1-BB32	NORM	7/29/2010	TO-15 SIM	--	0.00296 J	--	--	--	0.00458 J	--	--	--	--
UPC1-JP11	NORM	7/28/2010	TO-15	< 0.0123 U	--	< 0.0219 U	< 0.0119 U	< 0.0127 U	--	< 0.0304 U	< 0.0189 U	< 0.0223 U	< 0.0162 UJ
UPC1-JP11	NORM	7/28/2010	TO-15 SIM	--	0.0129 J	--	--	--	0.0124 J	--	--	--	--

All units in $\mu g/m^2$, min^{-1}.
-- = no analysis data.

TABLE B-11
SURFACE FLUX DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 5 of 7)

Sample ID	Sample Type	Sample Date	Analytical Method	Surface Flux									
				Dibromochloromethane	Dibromochloropropane	Dibromomethane	Dichloromethane (Methylene chloride)	Ethanol	Ethylbenzene	Freon-11 (Trichlorofluoromethane)	Freon-113 (1,1,2-Trifluoro-1,2,2-trichloroethane)	Freon-12 (Dichloro-difluoromethane)	Heptane
GNC1-BB16	NORM	2/12/2009	TO-15	< 0.0193 U	< 0.119 UJ	< 0.0162 U	< 0.00924 U	0.111 J	< 0.0116 U	< 0.015 U	< 0.02 U	0.0196 J	< 0.00886 U
GNC1-BB16	NORM	2/12/2009	TO-15 SIM	< 0.00162 UJ	< 0.00531 UJ	--	0.0025 J	--	--	--	--	--	--
GNC1-BC16	NORM	2/12/2009	TO-15	< 0.0193 U	< 0.118 UJ	< 0.0158 U	< 0.00924 UJ	0.567 J	0.0212 J	< 0.015 U	< 0.02 U	< 0.0131 U	< 0.0154 U
GNC1-BC16	NORM	2/12/2009	TO-15 SIM	< 0.00162 U	< 0.00527 UJ	--	< 0.000924 U	--	--	--	--	--	--
GNC1-BC29	NORM	2/12/2009	TO-15	< 0.0193 U	< 0.119 UJ	< 0.0162 U	0.0227 J	0.114 J	< 0.0116 U	0.0173 J	< 0.02 U	0.0508 J	0.015 J
GNC1-BC29	NORM	2/12/2009	TO-15 SIM	< 0.00162 U	< 0.00531 UJ	--	0.00412 J	--	--	--	--	--	--
GNC1-JB07	NORM	2/12/2009	TO-15	< 0.0196 U	< 0.121 UJ	< 0.0162 U	< 0.00924 U	< 0.0119 UJ	< 0.0119 U	< 0.0154 U	< 0.0204 U	< 0.0135 U	< 0.00886 U
GNC1-JB07	NORM	2/12/2009	TO-15 SIM	< 0.00166 UJ	< 0.00539 UJ	--	< 0.000924 UJ	--	--	--	--	--	--
GNC1-JP02	NORM	2/12/2009	TO-15	< 0.02 U	< 0.122 UJ	< 0.0166 U	< 0.00963 U	< 0.0119 UJ	< 0.0119 U	< 0.0154 U	< 0.0204 U	< 0.0135 U	< 0.00886 U
GNC1-JP02	NORM	2/12/2009	TO-15 SIM	< 0.00166 U	< 0.00543 UJ	--	< 0.000963 U	--	--	--	--	--	--
GNC1-JP02	FD	2/12/2009	TO-15	< 0.0193 U	< 0.119 UJ	< 0.0162 U	< 0.00924 U	< 0.0119 UJ	< 0.0116 U	< 0.015 U	< 0.02 U	< 0.0135 U	< 0.00886 U
GNC1-JP02	FD	2/12/2009	TO-15 SIM	< 0.00162 U	< 0.00531 UJ	--	< 0.000924 U	--	--	--	--	--	--
GNC1-JP04	NORM	2/12/2009	TO-15	< 0.0196 U	< 0.121 UJ	< 0.0162 U	< 0.00924 U	< 0.0119 UJ	0.0212 J+	< 0.0154 U	< 0.0204 U	< 0.0135 U	< 0.00886 U
GNC1-JP04	NORM	2/12/2009	TO-15 SIM	< 0.00166 U	< 0.00539 UJ	--	0.0149	--	--	--	--	--	--
GNC1-JP06	NORM	2/12/2009	TO-15	< 0.0196 U	< 0.12 UJ	< 0.0162 U	< 0.00924 U	< 0.0119 UJ	< 0.0116 U	< 0.015 U	< 0.02 U	< 0.0135 U	< 0.00886 U
GNC1-JP06	NORM	2/12/2009	TO-15 SIM	0.0215 J+	< 0.00535 UJ	--	0.0376	--	--	--	--	--	--
GNC1-JS08	NORM	2/12/2009	TO-15	< 0.0277 U	< 0.17 UJ	< 0.0231 U	< 0.0131 U	0.444 J	0.0285 J	< 0.0216 U	< 0.0285 U	< 0.0189 U	0.0531 J+
GNC1-JS08	NORM	2/12/2009	TO-15 SIM	< 0.00162 UJ	< 0.00531 UJ	--	0.0121 J	--	--	--	--	--	--
UPC1-BB31	NORM	7/29/2010	TO-15	--	--	< 0.01 U	< 0.0146 U	< 0.106 UJ	< 0.0185 U	< 0.0239 U	< 0.032 U	0.0431 J	< 0.00924 U
UPC1-BB31	NORM	7/29/2010	TO-15 SIM	< 0.00127 U	< 0.0161 UJ	--	--	--	--	--	--	--	--
UPC1-BB32	NORM	7/29/2010	TO-15	--	--	< 0.00963 U	< 0.0139 U	< 0.101 UJ	< 0.0177 U	< 0.0227 U	< 0.0304 U	< 0.02 U	< 0.00886 U
UPC1-BB32	NORM	7/29/2010	TO-15 SIM	< 0.00123 U	< 0.0278 UJ	--	--	--	--	--	--	--	--
UPC1-JP11	NORM	7/28/2010	TO-15	--	--	< 0.0116 U	< 0.0169 U	< 0.121 UJ	< 0.0212 U	0.0289 J	< 0.0366 U	0.0639 J	< 0.0108 U
UPC1-JP11	NORM	7/28/2010	TO-15 SIM	< 0.00204 U	< 0.0134 UJ	--	--	--	--	--	--	--	--

All units in $\mu g/m^2$, min^{-1}.
-- = no analysis data.

TABLE B-11
SURFACE FLUX DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 6 of 7)

Sample ID	Sample Type	Sample Date	Analytical Method	Surface Flux									
				Hexachlorobutadiene	Isopropylbenzene	m & p-Xylenes	Methyl ethyl ketone (2-Butanone)	Methyl iodide	MTBE (Methyl tert-butyl ether)	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene
GNC1-BB16	NORM	2/12/2009	TO-15	< 0.0562 UJ	< 0.0119 UJ	< 0.0231 U	0.0447	< 0.0304 U	< 0.00732 U	--	< 0.0258 UJ	< 0.0108 UJ	< 0.0116 U
GNC1-BB16	NORM	2/12/2009	TO-15 SIM	< 0.00285 UJ	--	--	--	--	--	< 0.00289 UJ	--	--	--
GNC1-BC16	NORM	2/12/2009	TO-15	< 0.0558 UJ	0.0708	0.0597 J	< 0.00655 U	< 0.0304 U	< 0.00732 U	--	< 0.0258 U	0.0196 J	0.032 J
GNC1-BC16	NORM	2/12/2009	TO-15 SIM	< 0.00281 UJ	--	--	--	--	--	< 0.00285 UJ	--	--	--
GNC1-BC29	NORM	2/12/2009	TO-15	< 0.0562 UJ	< 0.0119 UJ	0.0235 J	0.104	< 0.0304 U	< 0.00732 U	--	< 0.0258 UJ	< 0.0108 UJ	< 0.0116 U
GNC1-BC29	NORM	2/12/2009	TO-15 SIM	< 0.00285 UJ	--	--	--	--	--	< 0.00289 UJ	--	--	--
GNC1-JB07	NORM	2/12/2009	TO-15	< 0.0574 UJ	< 0.0123 U	< 0.0235 U	< 0.0204 U	< 0.0312 U	< 0.00732 U	--	< 0.0262 UJ	< 0.0108 U	< 0.0116 U
GNC1-JB07	NORM	2/12/2009	TO-15 SIM	< 0.00289 UJ	--	--	--	--	--	< 0.00293 UJ	--	--	--
GNC1-JP02	NORM	2/12/2009	TO-15	< 0.0578 UJ	< 0.0123 U	< 0.0235 U	< 0.00655 U	< 0.0312 U	< 0.00732 U	--	< 0.0266 UJ	< 0.0108 U	< 0.0116 U
GNC1-JP02	NORM	2/12/2009	TO-15 SIM	< 0.00293 UJ	--	--	--	--	--	< 0.00293 UJ	--	--	--
GNC1-JP02	FD	2/12/2009	TO-15	< 0.0562 UJ	< 0.0119 U	< 0.0231 U	< 0.00655 U	< 0.0304 U	< 0.00732 U	--	< 0.0258 UJ	< 0.0108 U	< 0.0116 U
GNC1-JP02	FD	2/12/2009	TO-15 SIM	< 0.00285 UJ	--	--	--	--	--	< 0.00289 UJ	--	--	--
GNC1-JP04	NORM	2/12/2009	TO-15	1.37 J	0.425 J	0.0666 J+	1.07 J+	< 0.0312 U	< 0.00732 U	--	0.295 J	0.0809 J	0.0293 J+
GNC1-JP04	NORM	2/12/2009	TO-15 SIM	0.234 J	--	--	--	--	--	0.0298 J	--	--	--
GNC1-JP06	NORM	2/12/2009	TO-15	< 0.0566 UJ	< 0.0119 U	< 0.0231 U	< 0.00655 U	< 0.0308 U	< 0.00732 U	--	< 0.0262 UJ	< 0.0108 U	< 0.0116 U
GNC1-JP06	NORM	2/12/2009	TO-15 SIM	< 0.00285 UJ	--	--	--	--	--	< 0.00289 UJ	--	--	--
GNC1-JS08	NORM	2/12/2009	TO-15	< 0.0805 U	0.0285 J	0.0855 J	0.105	< 0.0435 U	< 0.0104 U	--	< 0.037 U	< 0.015 U	0.0296 J
GNC1-JS08	NORM	2/12/2009	TO-15 SIM	< 0.00285 UJ	--	--	--	--	--	< 0.00289 UJ	--	--	--
UPC1-BB31	NORM	7/29/2010	TO-15	--	< 0.0142 U	--	0.0466 J	< 0.00732 U	< 0.01 U	< 0.0189 UJ	< 0.0135 U	< 0.0139 U	< 0.0181 U
UPC1-BB31	NORM	7/29/2010	TO-15 SIM	< 0.0045 UJ	--	--	--	--	--	--	--	--	--
UPC1-BB32	NORM	7/29/2010	TO-15	--	< 0.0135 U	--	0.057	< 0.00693 U	< 0.00963 U	< 0.0181 UJ	< 0.0127 U	< 0.0131 U	< 0.0173 U
UPC1-BB32	NORM	7/29/2010	TO-15 SIM	< 0.00427 UJ	--	--	--	--	--	--	--	--	--
UPC1-JP11	NORM	7/28/2010	TO-15	--	< 0.0162 UJ	--	< 0.0304 U	< 0.00809 U	< 0.0116 U	< 0.0216 UJ	< 0.0154 UJ	< 0.0158 UJ	< 0.0208 U
UPC1-JP11	NORM	7/28/2010	TO-15 SIM	< 0.00716 UJ	--	--	--	--	--	--	--	--	--

All units in µg/m^2, min^{-1}.
-- = no analysis data.

TABLE B-11
SURFACE FLUX DATA
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA
(Page 7 of 7)

				Surface Flux									
Sample ID	**Sample Type**	**Sample Date**	**Analytical Method**	sec-Butylbenzene	Styrene	tert-Butylbenzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloro-propene	Trichloroethene	Vinyl acetate	Vinyl chloride
GNC1-BB16	NORM	2/12/2009	TO-15	< 0.0258 UJ	< 0.0112 U	< 0.0254 UJ	< 0.0177 U	< 0.01 U	< 0.00886 U	< 0.0119 U	< 0.0142 U	< 0.0077 U	< 0.00693 U
GNC1-BB16	NORM	2/12/2009	TO-15 SIM	--	--	--	< 0.004 UJ	--	--	--	< 0.00389 UJ	--	< 0.000693 UJ
GNC1-BC16	NORM	2/12/2009	TO-15	0.0327 J	< 0.0112 U	< 0.025 U	< 0.0177 U	< 0.0424 U	< 0.00886 U	< 0.0119 U	< 0.0142 U	< 0.0077 U	< 0.00693 U
GNC1-BC16	NORM	2/12/2009	TO-15 SIM	--	--	--	< 0.00177 U	--	--	--	0.00212 J-	--	< 0.000693 U
GNC1-BC29	NORM	2/12/2009	TO-15	< 0.0258 UJ	< 0.0112 U	< 0.0254 UJ	< 0.0177 U	0.12	< 0.00886 U	< 0.0119 U	< 0.0142 U	< 0.0077 U	< 0.00693 U
GNC1-BC29	NORM	2/12/2009	TO-15 SIM	--	--	--	< 0.00177 U	--	--	--	< 0.00146 U	--	< 0.000693 U
GNC1-JB07	NORM	2/12/2009	TO-15	< 0.0262 U	< 0.0116 U	< 0.0258 UJ	< 0.0181 U	< 0.01 U	< 0.00886 U	< 0.0123 U	< 0.0142 U	< 0.0077 U	< 0.00693 U
GNC1-JB07	NORM	2/12/2009	TO-15 SIM	--	--	--	< 0.00243 UJ	--	--	--	< 0.00146 UJ	--	< 0.000693 UJ
GNC1-JP02	NORM	2/12/2009	TO-15	< 0.0262 U	< 0.0116 U	< 0.0258 UJ	< 0.0181 U	< 0.01 U	< 0.00886 U	< 0.0123 U	< 0.0146 U	< 0.00809 U	< 0.00693 U
GNC1-JP02	NORM	2/12/2009	TO-15 SIM	--	--	--	< 0.00219 U	--	--	--	< 0.00189 UJ	--	< 0.000693 U
GNC1-JP02	FD	2/12/2009	TO-15	< 0.0258 U	< 0.0112 U	< 0.0254 UJ	< 0.0177 U	< 0.01 U	< 0.00886 U	< 0.0119 U	< 0.0142 U	< 0.0077 U	< 0.00693 U
GNC1-JP02	FD	2/12/2009	TO-15 SIM	--	--	--	< 0.00354 U	--	--	--	< 0.00142 UJ	--	< 0.000693 U
GNC1-JP04	NORM	2/12/2009	TO-15	0.149 J	< 0.0116 U	0.157 J	< 0.0181 U	0.248 J+	< 0.00886 U	< 0.0123 U	< 0.0142 U	< 0.0077 U	< 0.00693 U
GNC1-JP04	NORM	2/12/2009	TO-15 SIM	--	--	--	< 0.00285 U	--	--	--	< 0.00335 UJ	--	< 0.000693 U
GNC1-JP06	NORM	2/12/2009	TO-15	< 0.0258 U	< 0.0112 U	< 0.0254 UJ	< 0.0177 U	0.025 J	< 0.00886 U	< 0.0123 U	< 0.0142 U	< 0.0077 U	< 0.00693 U
GNC1-JP06	NORM	2/12/2009	TO-15 SIM	--	--	--	0.00766 J	--	--	--	< 0.00589 UJ	--	< 0.000693 U
GNC1-JS08	NORM	2/12/2009	TO-15	< 0.0366 U	< 0.0162 U	< 0.0362 U	0.212	0.356	< 0.0127 U	< 0.0173 U	< 0.0204 U	< 0.0112 U	< 0.00963 U
GNC1-JS08	NORM	2/12/2009	TO-15 SIM	--	--	--	0.177 J	--	--	--	< 0.00327 UJ	--	< 0.000693 UJ
UPC1-BB31	NORM	7/29/2010	TO-15	< 0.0146 U	< 0.0181 U	< 0.0139 U	< 0.0281 U	< 0.0158 U	< 0.0108 U	< 0.0193 U	< 0.0227 U	< 0.0466 UJ	< 0.0108 U
UPC1-BB31	NORM	7/29/2010	TO-15 SIM	--	--	--	--	--	--	--	--	--	--
UPC1-BB32	NORM	7/29/2010	TO-15	< 0.0139 U	< 0.0169 U	< 0.0131 U	< 0.027 U	0.0227 J	< 0.0104 U	< 0.0185 U	< 0.0216 U	< 0.0443 UJ	< 0.0104 U
UPC1-BB32	NORM	7/29/2010	TO-15 SIM	--	--	--	--	--	--	--	--	--	--
UPC1-JP11	NORM	7/28/2010	TO-15	< 0.0166 UJ	< 0.0204 U	< 0.0154 UJ	< 0.0323 U	< 0.0181 U	< 0.0123 U	< 0.0219 U	< 0.0258 U	< 0.0531 UJ	< 0.0123 U
UPC1-JP11	NORM	7/28/2010	TO-15 SIM	--	--	--	--	--	--	--	--	--	--

All units in µg/m^2, min^{-1}.
-- = no analysis data.

TABLE B-12
SPLP DATA SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	GNC1-BC17 Result	GNC1-JP03 Result	Residential Water BCL	Count of Detects > BCL	MCL	Count of Detects > MCL
Aldehydes	Acetaldehyde	mg/L	2	< 0.0082 U	< 0.0082 U	0.00221	--	--	--
	Formaldehyde	mg/L	2	< 0.021 U	< 0.021 U	0.00146	--	--	--
General Chemistry	Ammonia (as N)	mg/L	0	--	--	0.209	--	--	--
	Bromide	mg/L	2	< 0.026 U	< 0.026 U	--	--	--	--
	Chlorate	mg/L	2	0.86	0.79	--	--	--	--
	Chloride	mg/L	2	29.1	33.9	--	--	--	--
	Fluoride	mg/L	2	0.15	0.22	4	0	4	0
	Nitrate	mg/L	0	--	--	10	--	10	--
	Nitrite	mg/L	2	< 0.003 U	< 0.003 U	1	--	1	--
	Orthophosphate as P	mg/L	2	< 0.05 U	< 0.5 U	--	--	--	--
	Perchlorate	mg/L	2	0.134	0.00185 J	0.018	1	0.018/0.0245 (1)	1
	Total Kjeldahl Nitrogen (TKN)	mg/L	2	< 0.25 U	< 0.25 U	--	--	--	--
Metals	Aluminum	mg/L	2	0.0331	< 0.0099 U	0.05	0	--	--
	Antimony	mg/L	2	< 0.00068 U	< 0.00068 U	0.006	--	0.006	--
	Arsenic	mg/L	2	0.0065	0.0024 J	0.01	0	0.01	0
	Barium	mg/L	2	0.0685	0.0605	2	0	2	0
	Beryllium	mg/L	2	< 0.00013 U	< 0.00013 U	0.004	--	0.004	--
	Boron	mg/L	2	0.0712	0.176	7.3	0	--	--
	Cadmium	mg/L	2	< 0.000042 U	< 0.0005 U	0.005	--	0.005	--
	Calcium	mg/L	2	4.63	50.2	--	--	--	--
	Chromium	mg/L	2	< 0.003 U	< 0.003 U	0.1	--	0.1	--
	Chromium (VI)	mg/L	2	< 0.002 U	< 0.002 U	0.1	--	0.1	--
	Cobalt	mg/L	2	< 0.00024 U	< 0.00024 U	0.011	--	--	--
	Copper	mg/L	2	< 0.00081 U	0.0095	1.3	0	1.3	0
	Iron	mg/L	2	< 0.016 U	0.0609 J	0.3	0	--	--
	Lead	mg/L	2	< 0.00049 U	< 0.00049 U	0.015	--	0.015	--
	Lithium	mg/L	2	0.0069	0.0098	0.073	0	--	--
	Magnesium	mg/L	2	5.53	14.4	207	0	--	--
	Manganese	mg/L	2	0.00088	0.00067 J	0.02	0	--	--
	Mercury	mg/L	2	< 0.000044 U	< 0.000044 U	0.002	--	0.002	--
	Molybdenum	mg/L	2	0.0081	0.0287	0.183	0	--	--
	Nickel	mg/L	2	< 0.00049 U	0.001 J	0.73	0	--	--
	Potassium	mg/L	2	0.563	2.57	--	--	--	--
	Selenium	mg/L	2	0.0013	0.0016 J	0.05	0	0.05	0
	Silver	mg/L	2	< 0.0002 U	< 0.0002 U	0.1	--	--	--
	Sodium	mg/L	2	25.2	35.7	--	--	--	--
	Strontium	mg/L	2	1.22	3.35	21.9	0	--	--
	Thallium	mg/L	2	< 0.00006 U	< 0.00006 U	0.002	--	0.002	--
	Tin	mg/L	2	< 0.00068 U	< 0.002 U	21.9	--	--	--
	Titanium	mg/L	2	< 0.0015 U	< 0.003 U	146	--	--	--
	Tungsten	mg/L	2	< 0.0015 U	0.0027 J	0.274	0	--	--
	Uranium	mg/L	2	< 0.00042 U	0.00022 J	0.03	0	0.03	0
	Vanadium	mg/L	2	0.0129	0.0083 J	0.183	0	--	--
	Zinc	mg/L	2	< 0.0009 U	< 0.0009 U	11	--	--	--

TABLE B-12
SPLP DATA SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	GNC1-BC17 Result	GNC1-JP03 Result	Residential Water BCL	Count of Detects > BCL	MCL	Count of Detects > MCL
OCPs	2,4-DDD	mg/L	2	< 0.000011 U	< 0.000022 U	--	--	--	--
	2,4-DDE	mg/L	2	< 0.000009 U	< 0.000018 U	--	--	--	--
	4,4-DDD	mg/L	2	< 0.0000038 U	< 0.0000076 U	0.00028	--	--	--
	4,4-DDE	mg/L	2	< 0.0000027 U	< 0.0000054 U	0.000198	--	--	--
	4,4-DDT	mg/L	2	< 0.0000056 U	< 0.000011 U	0.000198	--	--	--
	Aldrin	mg/L	2	< 0.000004 U	< 0.000008 U	0.00000395	--	--	--
	alpha-BHC	mg/L	2	< 0.0000025 U	< 0.000005 U	0.011	--	--	--
	alpha-Chlordane	mg/L	2	< 0.000003 U	< 0.000006 U	--	--	--	--
	beta-BHC	mg/L	2	< 0.000013 U	< 0.000025 U	0.00219	--	--	--
	Chlordane	mg/L	2	< 0.00018 U	< 0.00036 U	0.002	--	0.002	--
	delta-BHC	mg/L	2	< 0.000006 U	< 0.000012 U	--	--	--	--
	Dieldrin	mg/L	2	< 0.0000023 U	< 0.0000046 U	0.0000042	--	--	--
	Endosulfan I	mg/L	2	< 0.0000025 U	< 0.000005 U	0.219	--	--	--
	Endosulfan II	mg/L	2	< 0.00001 U	< 0.00002 U	0.219	--	--	--
	Endosulfan sulfate	mg/L	2	< 0.000017 U	< 0.000034 U	--	--	--	--
	Endrin	mg/L	2	< 0.0000028 U	< 0.0000056 U	0.002	--	0.002	--
	Endrin aldehyde	mg/L	2	< 0.0000032 U	< 0.0000064 U	--	--	--	--
	Endrin ketone	mg/L	2	< 0.000016 U	< 0.000033 U	--	--	--	--
	gamma-BHC (Lindane)	mg/L	2	< 0.0000025 U	< 0.000005 U	0.0002	--	0.0002	--
	gamma-Chlordane	mg/L	2	< 0.0000027 U	< 0.0000054 U	--	--	--	--
	Heptachlor	mg/L	2	< 0.0000025 U	< 0.000005 U	0.0004	--	0.0004	--
	Heptachlor epoxide	mg/L	2	< 0.0000032 U	< 0.0000064 U	0.0002	--	0.0002	--
	Methoxychlor	mg/L	2	< 0.000005 U	< 0.00001 U	0.04	--	0.04	--
	Toxaphene	mg/L	2	< 0.00033 U	< 0.00066 U	0.003	--	0.003	--
PAHs	Acenaphthene	mg/L	2	< 0.00025 U	< 0.00025 U	0.00624	--	--	--
	Acenaphthylene	mg/L	2	< 0.00025 U	< 0.00025 U	0.00622	--	--	--
	Anthracene	mg/L	2	< 0.00025 U	< 0.00025 U	0.00625	--	--	--
	Benzo(a)anthracene	mg/L	2	< 0.00025 U	< 0.00025 U	0.0000921	--	--	--
	Benzo(a)pyrene	mg/L	2	< 0.00025 U	< 0.00025 U	0.0002	--	0.0002	--
	Benzo(b)fluoranthene	mg/L	2	< 0.00025 U	< 0.00025 U	0.0000921	--	--	--
	Benzo(g,h,i)perylene	mg/L	2	< 0.00025 U	< 0.00025 U	1.1	--	--	--
	Benzo(k)fluoranthene	mg/L	2	< 0.00025 U	< 0.00025 U	0.000921	--	--	--
	Chrysene	mg/L	2	< 0.00025 U	< 0.00025 U	0.00921	--	--	--
	Dibenzo(a,h)anthracene	mg/L	2	< 0.00025 U	< 0.00025 U	0.00000921	--	--	--
	Indeno(1,2,3-cd)pyrene	mg/L	2	< 0.00025 U	< 0.00025 U	0.0000921	--	--	--
	Phenanthrene	mg/L	2	0.00118	< 0.00025 U	0.00622	0	--	--
	Pyrene	mg/L	2	0.000314 J	< 0.00025 U	0.00622	0	--	--
Radionuclides	Radium-226	pCi/L	2	0.35 U	0.0889 U	5	0	--	--
	Radium-228	pCi/L	2	1.24	1.55 J+	5	0	--	--
	Thorium-228	pCi/L	1	--	0.127 U	0.11	0	--	--
	Thorium-230	pCi/L	1	--	-0.0747 U	0.42	0	--	--
	Thorium-232	pCi/L	1	--	-0.0166 U	0.14	0	--	--
	Uranium-233/234	pCi/L	2	1 UJ	-0.0896 U	--	--	--	--
	Uranium-235/236	pCi/L	2	0 UJ	-0.0261 U	--	--	--	--
	Uranium-238	pCi/L	2	0.241 J-	0.0669 U	--	--	--	--

TABLE B-12
SPLP DATA SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	GNC1-BC17 Result	GNC1-JP03 Result	Residential Water BCL	Count of Detects > BCL	MCL	Count of Detects > MCL
SVOCs	1,2,4,5-Tetrachlorobenzene	mg/L	2	< 0.01 U	< 0.01 U	0.011	--	--	--
	1,2-Diphenylhydrazine	mg/L	2	< 0.01 U	< 0.01 U	0.000084	--	--	--
	1,4-Dioxane	mg/L	2	< 0.005 UJ	< 0.005 U	0.000672	--	--	--
	2,2'-Dichlorobenzil	mg/L	2	< 0.017 U	< 0.017 U	0.011	--	--	--
	2,4,5-Trichlorophenol	mg/L	2	< 0.005 U	< 0.005 U	3.65	--	--	--
	2,4,6-Trichlorophenol	mg/L	2	< 0.01 U	< 0.01 U	0.00611	--	--	--
	2,4-Dichlorophenol	mg/L	2	< 0.01 U	< 0.01 U	0.11	--	--	--
	2,4-Dimethylphenol	mg/L	2	< 0.01 U	< 0.01 U	0.73	--	--	--
	2,4-Dinitrophenol	mg/L	2	< 0.05 U	< 0.05 U	0.073	--	--	--
	2,4-Dinitrotoluene	mg/L	2	< 0.01 U	< 0.01 U	0.000217	--	--	--
	2,6-Dinitrotoluene	mg/L	2	< 0.01 U	< 0.01 U	0.0365	--	--	--
	2-Chloronaphthalene	mg/L	2	< 0.0018 U	< 0.0018 U	0.00208	--	--	--
	2-Chlorophenol	mg/L	2	< 0.01 U	< 0.01 U	0.0664	--	--	--
	2-Methylnaphthalene	mg/L	2	< 0.0015 U	< 0.0015 U	--	--	--	--
	2-Nitroaniline	mg/L	2	< 0.01 U	< 0.01 U	0.11	--	--	--
	2-Nitrophenol	mg/L	2	< 0.01 U	< 0.01 U	--	--	--	--
	3,3-Dichlorobenzidine	mg/L	2	< 0.005 U	< 0.005 U	0.000149	--	--	--
	3-Nitroaniline	mg/L	2	< 0.01 U	< 0.01 U	--	--	--	--
	4-Bromophenyl phenyl ether	mg/L	2	< 0.01 U	< 0.01 U	--	--	--	--
	4-Chloro-3-methylphenol	mg/L	2	< 0.01 U	< 0.01 U	--	--	--	--
	4-Chlorophenyl phenyl ether	mg/L	2	< 0.01 U	< 0.01 U	--	--	--	--
	4-Chlorothioanisole	mg/L	2	< 0.017 U	< 0.017 U	--	--	--	--
	4-Nitroaniline	mg/L	2	< 0.015 U	< 0.015 U	--	--	--	--
	4-Nitrophenol	mg/L	2	< 0.01 U	< 0.01 UJ	0.292	--	--	--
	Acetophenone	mg/L	2	< 0.01 U	< 0.01 U	0.679	--	--	--
	Aniline	mg/L	2	< 0.013 U	< 0.013 U	0.0118	--	--	--
	Benzenethiol	mg/L	2	< 0.033 U	< 0.033 U	--	--	--	--
	Benzoic acid	mg/L	2	< 0.03 U	< 0.03 U	146	--	--	--
	Benzyl alcohol	mg/L	2	< 0.01 U	< 0.01 U	18.3	--	--	--
	bis(2-Chloroethoxy)methane	mg/L	2	< 0.015 U	< 0.015 U	--	--	--	--
	bis(2-Chloroethyl) ether	mg/L	2	< 0.01 U	< 0.01 U	0.0000119	--	--	--
	bis(2-Chloroisopropyl) ether	mg/L	2	< 0.01 U	< 0.01 U	0.000323	--	--	--
	bis(2-Ethylhexyl) phthalate	mg/L	2	< 0.01 U	< 0.01 U	0.006	--	0.006	--
	bis(p-Chlorophenyl) sulfone	mg/L	2	< 0.017 U	< 0.017 U	--	--	--	--
	bis(p-Chlorophenyl)disulfide	mg/L	2	< 0.017 U	< 0.017 U	--	--	--	--
	Butylbenzyl phthalate	mg/L	2	< 0.01 U	< 0.01 U	0.0354	--	--	--
	Carbazole	mg/L	2	< 0.001 U	< 0.001 U	0.00336	--	--	--
	Dibenzofuran	mg/L	2	< 0.01 U	< 0.01 U	0.073	--	--	--
	Diethyl phthalate	mg/L	2	< 0.01 U	< 0.01 U	29.2	--	--	--
	Dimethyl phthalate	mg/L	2	< 0.01 U	< 0.01 U	365	--	--	--
	Di-n-butyl phthalate	mg/L	2	< 0.01 U	< 0.01 U	3.65	--	--	--
	Di-n-octyl phthalate	mg/L	2	< 0.015 U	< 0.015 U	--	--	--	--
	Diphenyl disulfide	mg/L	2	< 0.017 U	< 0.017 U	--	--	--	--
	Diphenyl sulfide	mg/L	2	< 0.017 U	< 0.017 U	--	--	--	--
	Diphenyl sulfone	mg/L	2	< 0.017 U	< 0.017 U	0.11	--	--	--

TABLE B-12
SPLP DATA SUMMARY
HUMAN HEALTH RISK ASSESSMENT AND CLOSURE REPORT FOR GALLERIA DR. RIGHT-OF-WAY
BMI COMMON AREAS (EASTSIDE), CLARK COUNTY, NEVADA

Parameter of Interest	Compound List	Units	Total Count	GNC1-BC17 Result	GNC1-JP03 Result	Residential Water BCL	Count of Detects > BCL	MCL	Count of Detects > MCL
SVOCs	Diphenylamine	mg/L	2	< 0.015 U	< 0.015 U	0.913	--	--	--
	Fluoranthene	mg/L	2	< 0.001 U	< 0.001 U	1.46	--	--	--
	Fluorene	mg/L	2	< 0.001 U	< 0.001 U	0.00623	--	--	--
	Hexachlorobenzene	mg/L	2	< 0.01 U	< 0.01 U	0.001	--	0.001	--
	Hexachlorobutadiene	mg/L	2	< 0.01 U	< 0.01 UJ	0.000862	--	--	--
	Hexachlorocyclopentadiene	mg/L	2	< 0.01 UJ	< 0.01 U	0.05	--	0.05	--
	Hexachloroethane	mg/L	2	< 0.01 U	< 0.01 U	0.0048	--	--	--
	Hydroxymethyl phthalimide	mg/L	2	< 0.017 U	< 0.017 U	--	--	--	--
	Isophorone	mg/L	2	< 0.01 U	< 0.01 U	0.0708	--	--	--
	m,p-Cresols	mg/L	2	< 0.015 U	< 0.015 U	0.183	--	--	--
	Naphthalene	mg/L	2	< 0.0015 U	< 0.0015 U	0.000143	--	--	--
	Nitrobenzene	mg/L	2	< 0.015 U	< 0.015 U	0.000122	--	--	--
	N-nitrosodi-n-propylamine	mg/L	2	< 0.01 U	< 0.01 U	0.0000096	--	--	--
	o-Cresol	mg/L	2	< 0.01 U	< 0.01 U	1.83	--	--	--
	Octachlorostyrene	mg/L	2	< 0.017 U	< 0.017 U	--	--	--	--
	p-Chloroaniline	mg/L	2	< 0.01 U	< 0.01 U	0.000336	--	--	--
	p-Chlorobenzenethiol	mg/L	2	< 0.017 U	< 0.017 U	--	--	--	--
	Pentachlorobenzene	mg/L	2	< 0.01 U	< 0.01 U	0.0292	--	--	--
	Pentachlorophenol	mg/L	2	< 0.01 U	< 0.01 U	0.001	--	0.001	--
	Phenol	mg/L	2	< 0.005 U	< 0.005 U	11	--	--	--
	Pyridine	mg/L	2	< 0.005 U	< 0.005 U	0.0319	--	--	--

BCL = Basic Comparison Levels (BCLs) from NDEP 2012. Values used are residential water BCLs.
MCL = USEPA Maximum Contaminant Level.
(1)A MCL for perchlorate has not been promulgated. The USEPA Drinking Water Equivalent Level of 24.5 µg/L was used.

APPENDIX C

GES FIELD REPORTS
(on the report CD in Appendix B)

APPENDIX D

SURFACE FLUX CHAMBER TESTING INVESTIGATOR'S REPORT
(on the report CD in Appendix B)

APPENDIX E

DATA USABILITY TABLES
(on the report CD in Appendix B)

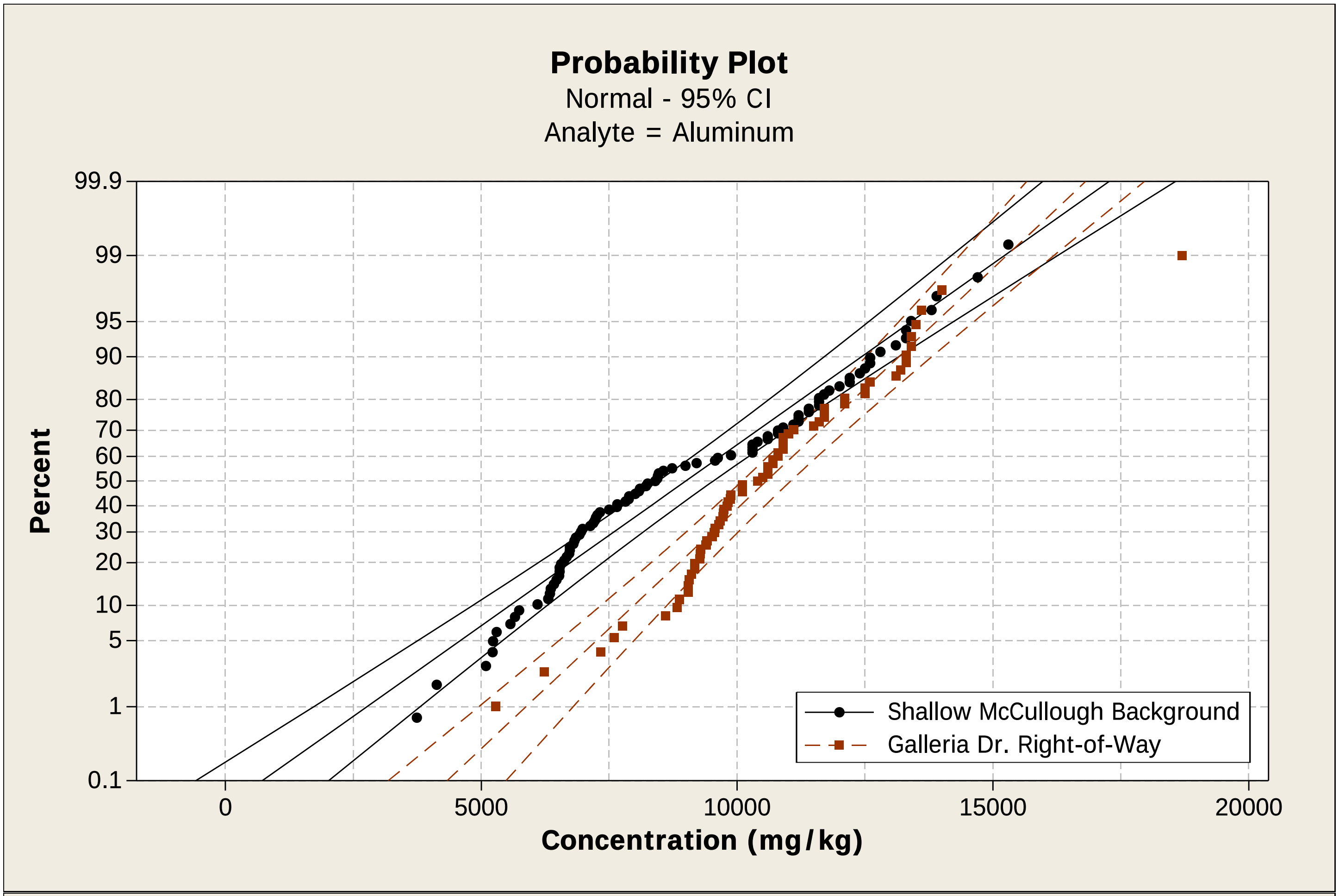
LIST OF TABLES (APPENDIX E)

APPENDIX F

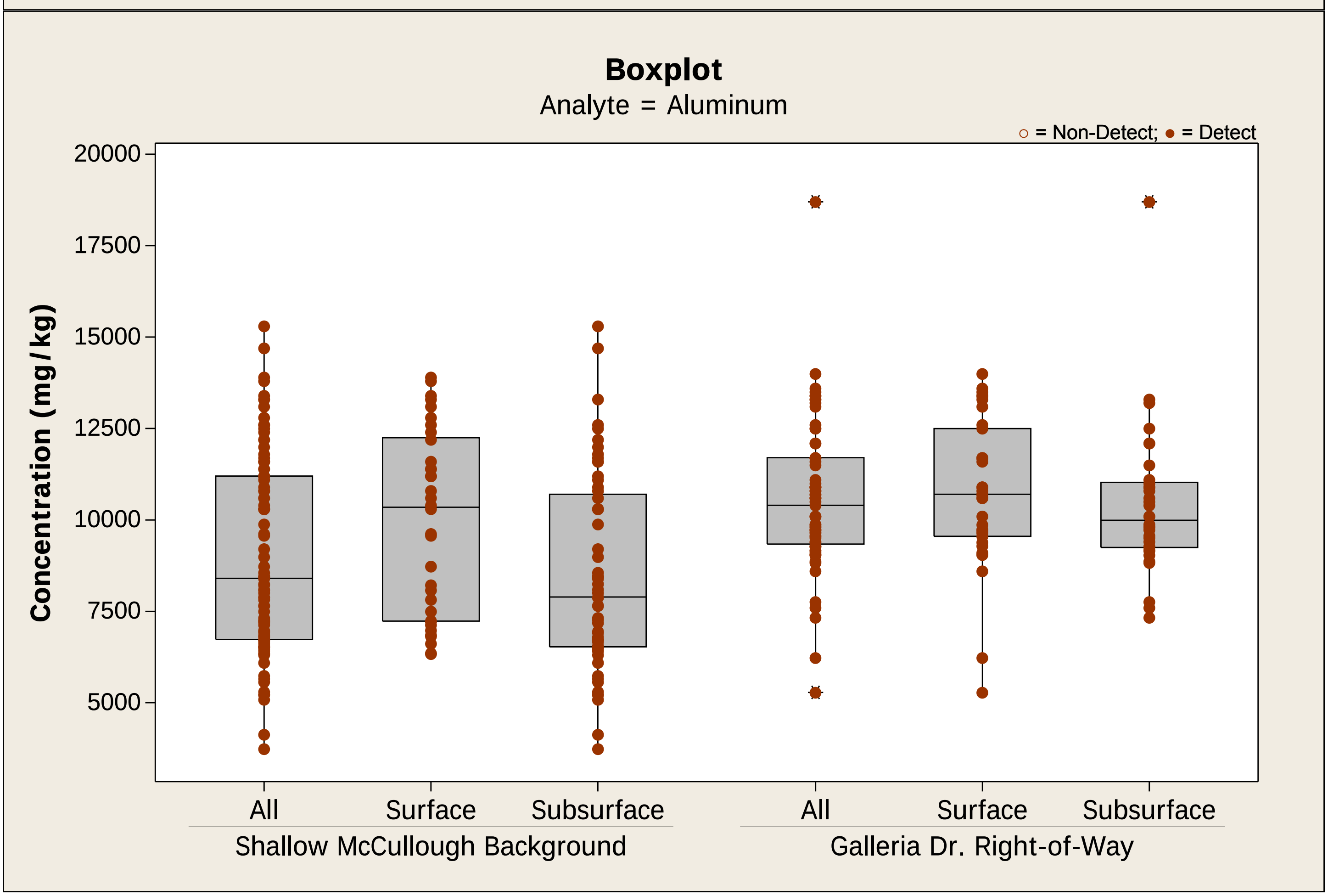
DATA VALIDATION SUMMARY REPORTS

APPENDIX G

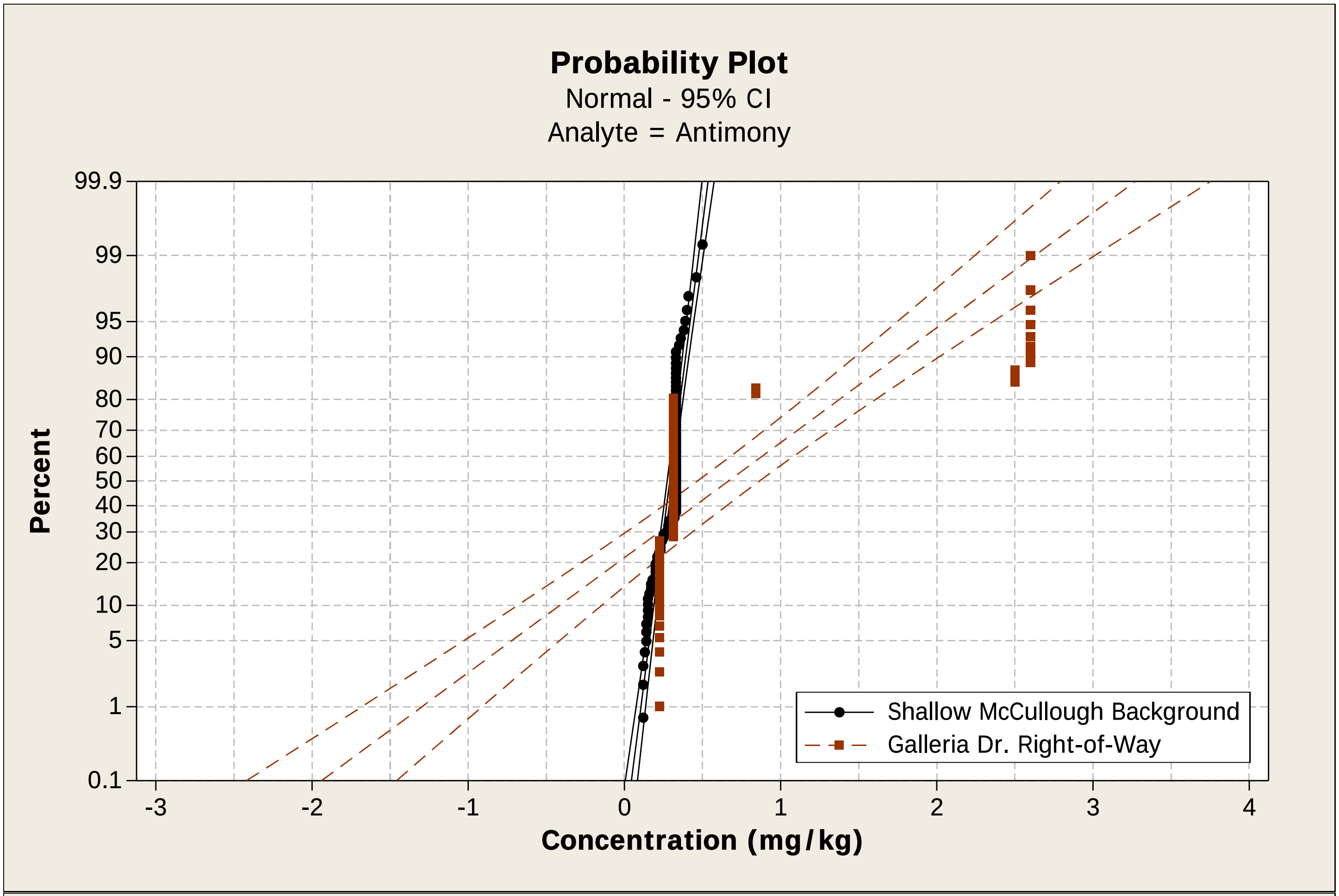
CUMULATIVE PROBABILITY PLOTS AND BOXPLOTS FOR METALS AND RADIONUCLIDES

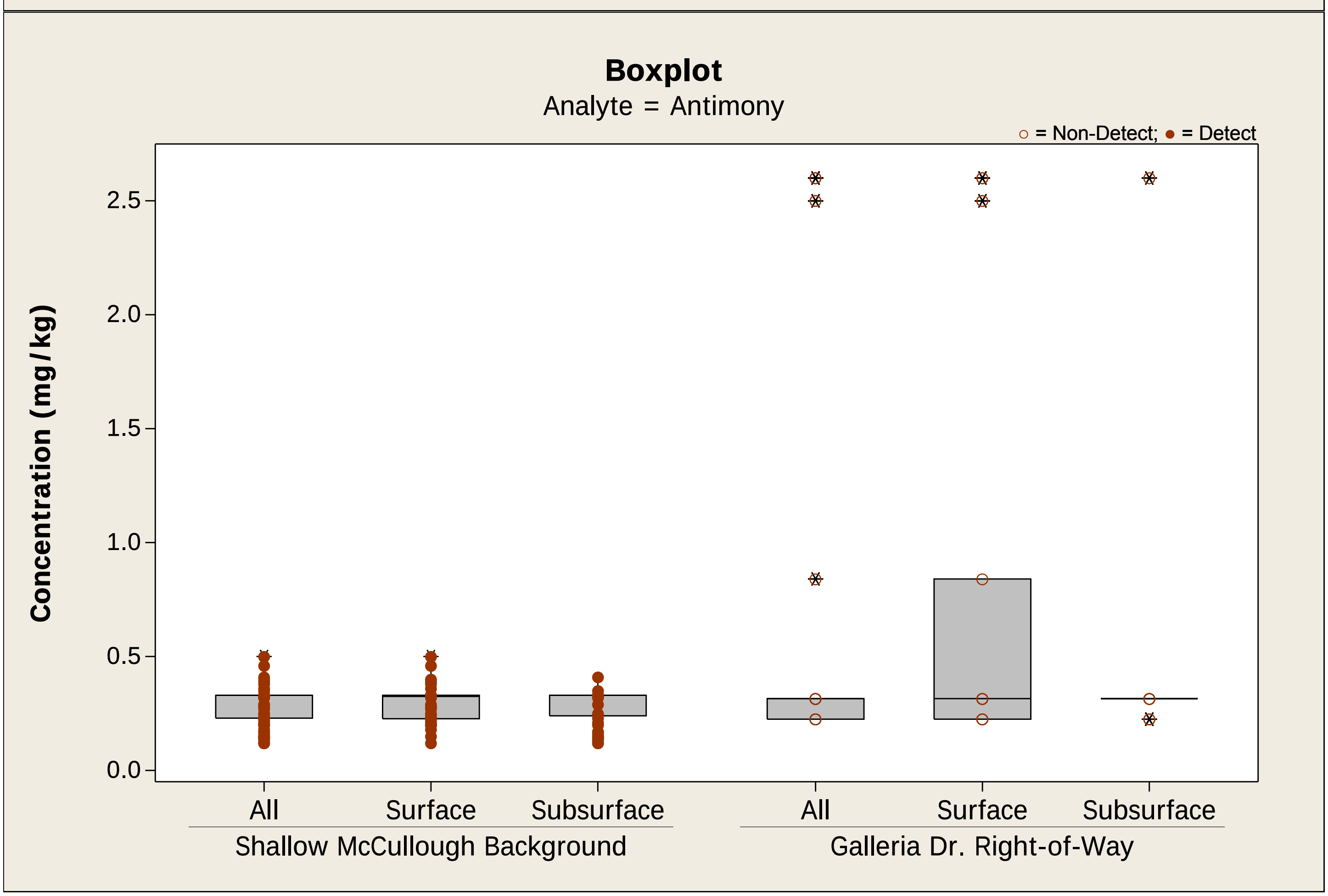


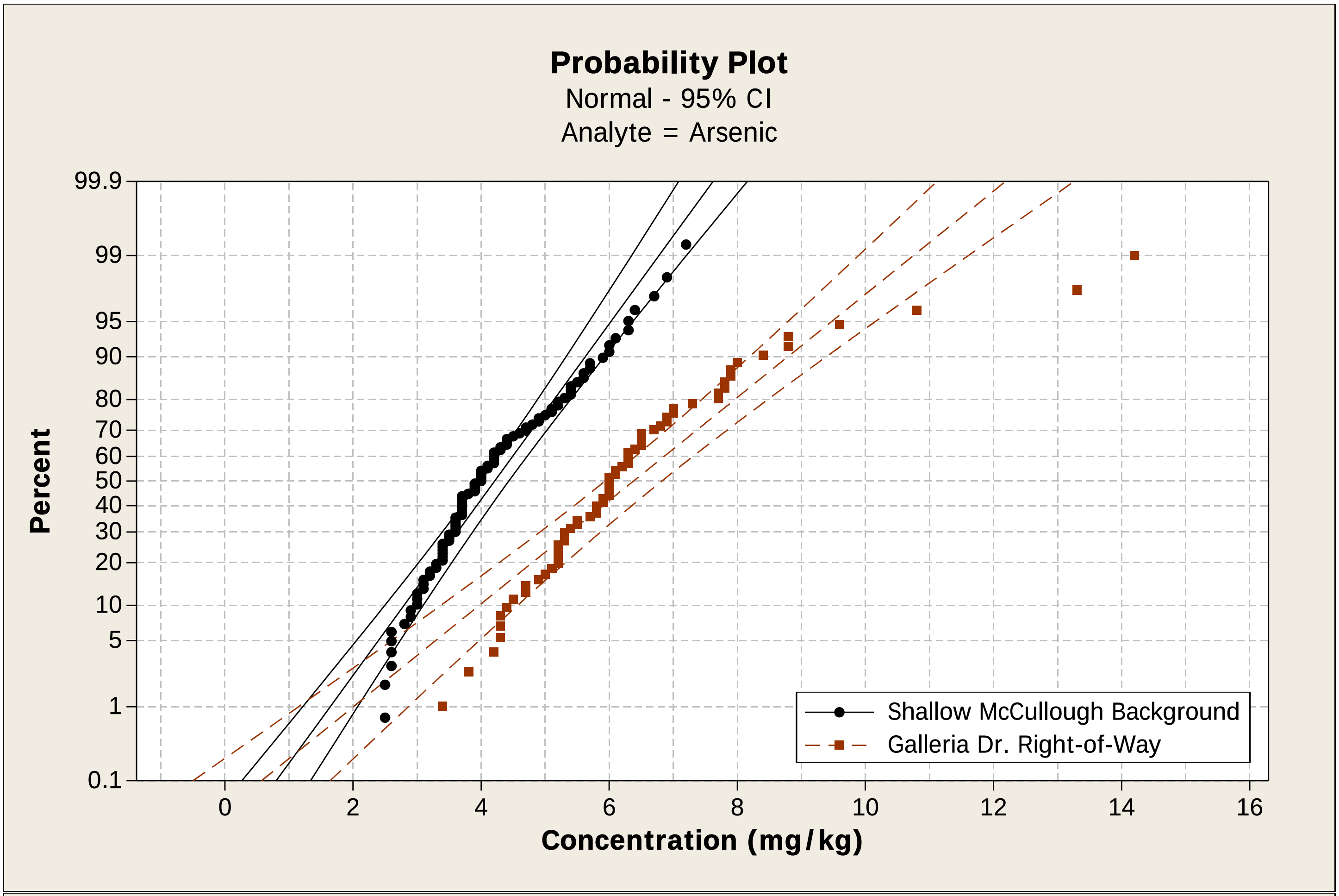
Probability Plot
Normal - 95% CI
Analyte = Aluminum
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
5000
10000
15000
20000
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



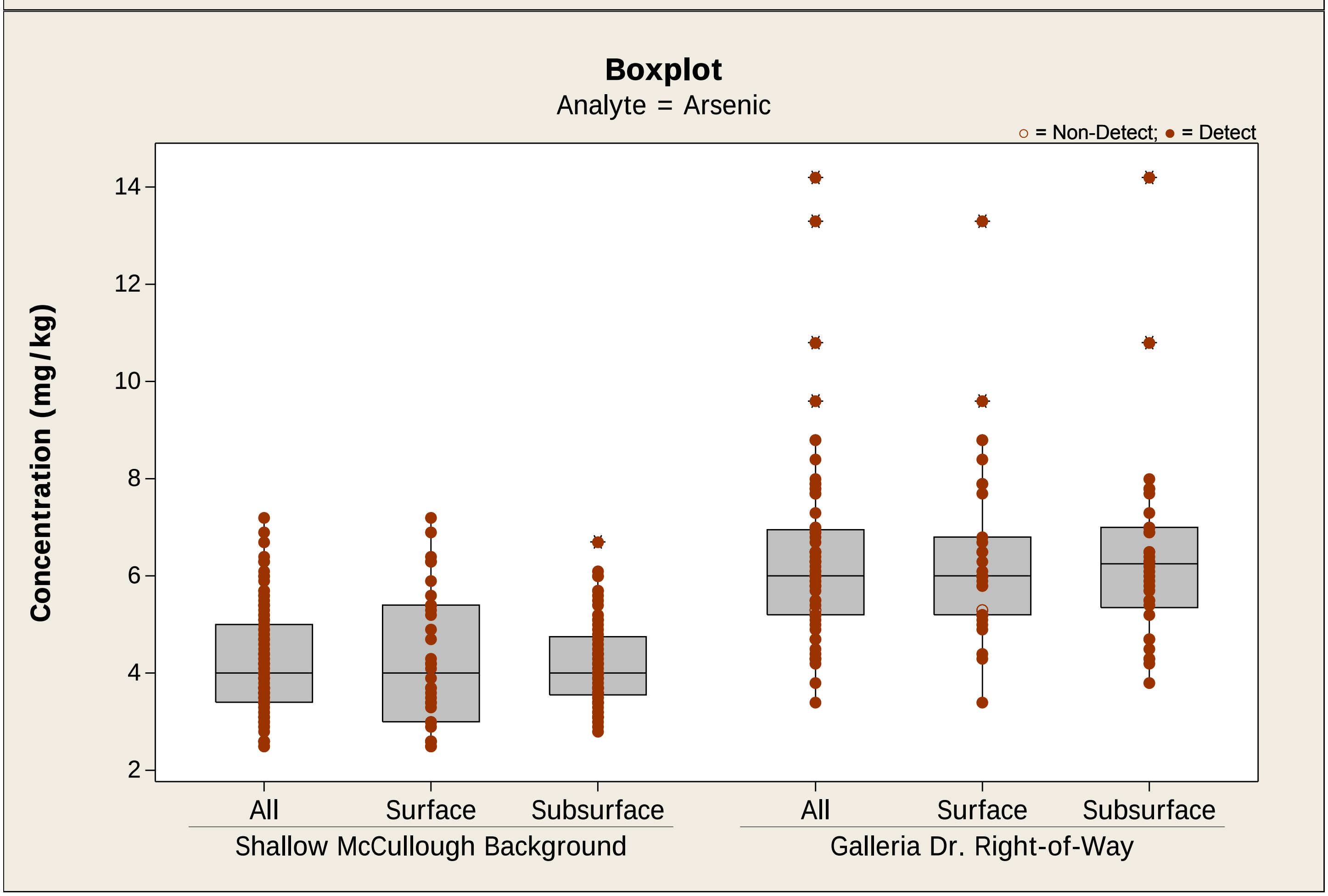
Boxplot
Analyte = Aluminum
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
20000
17500
15000
12500
10000
7500
5000
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Antimony
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-3
-2
-1
0
1
2
3
4
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

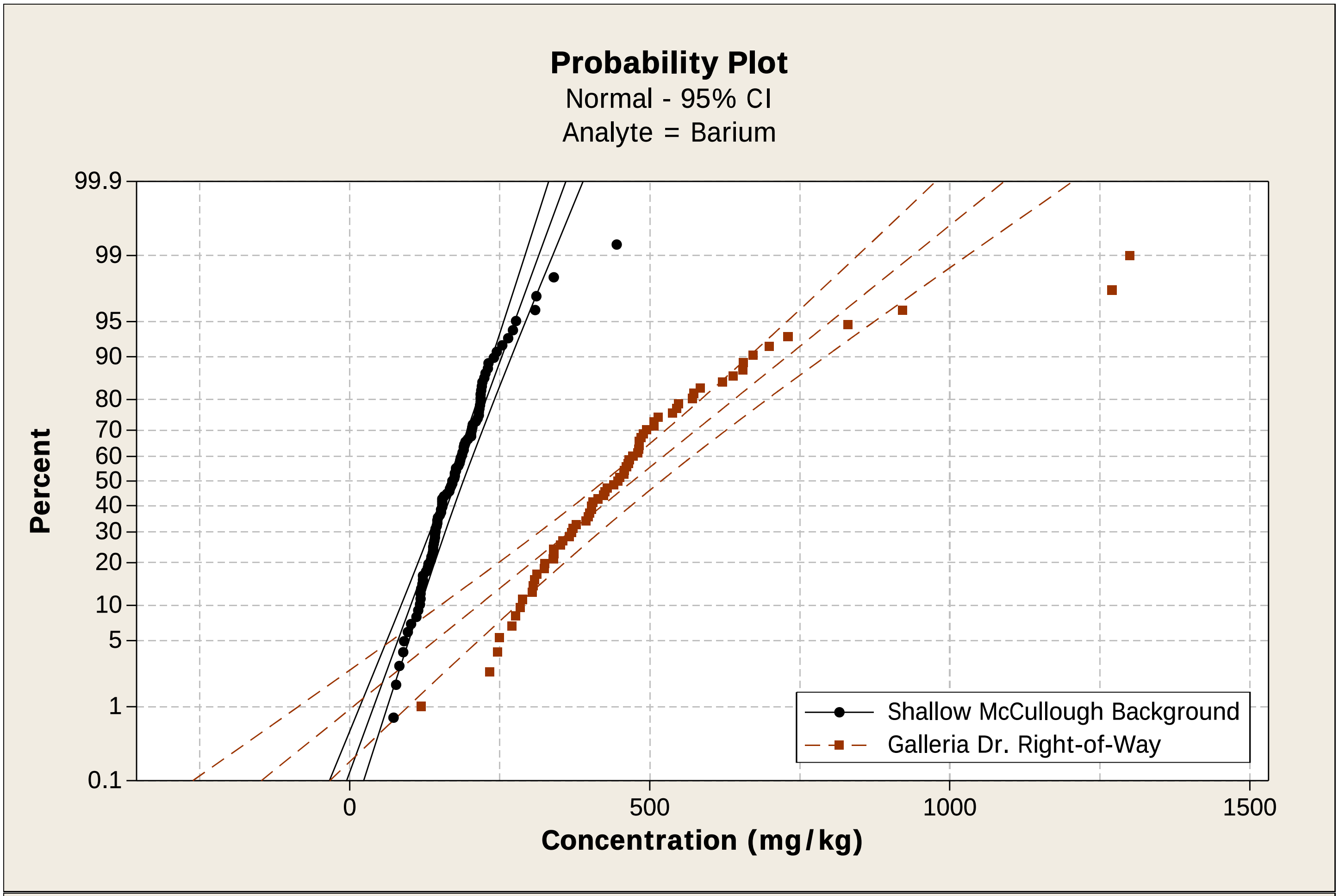

Boxplot
Analyte = Antimony
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
2.5
2.0
1.5
1.0
0.5
0.0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



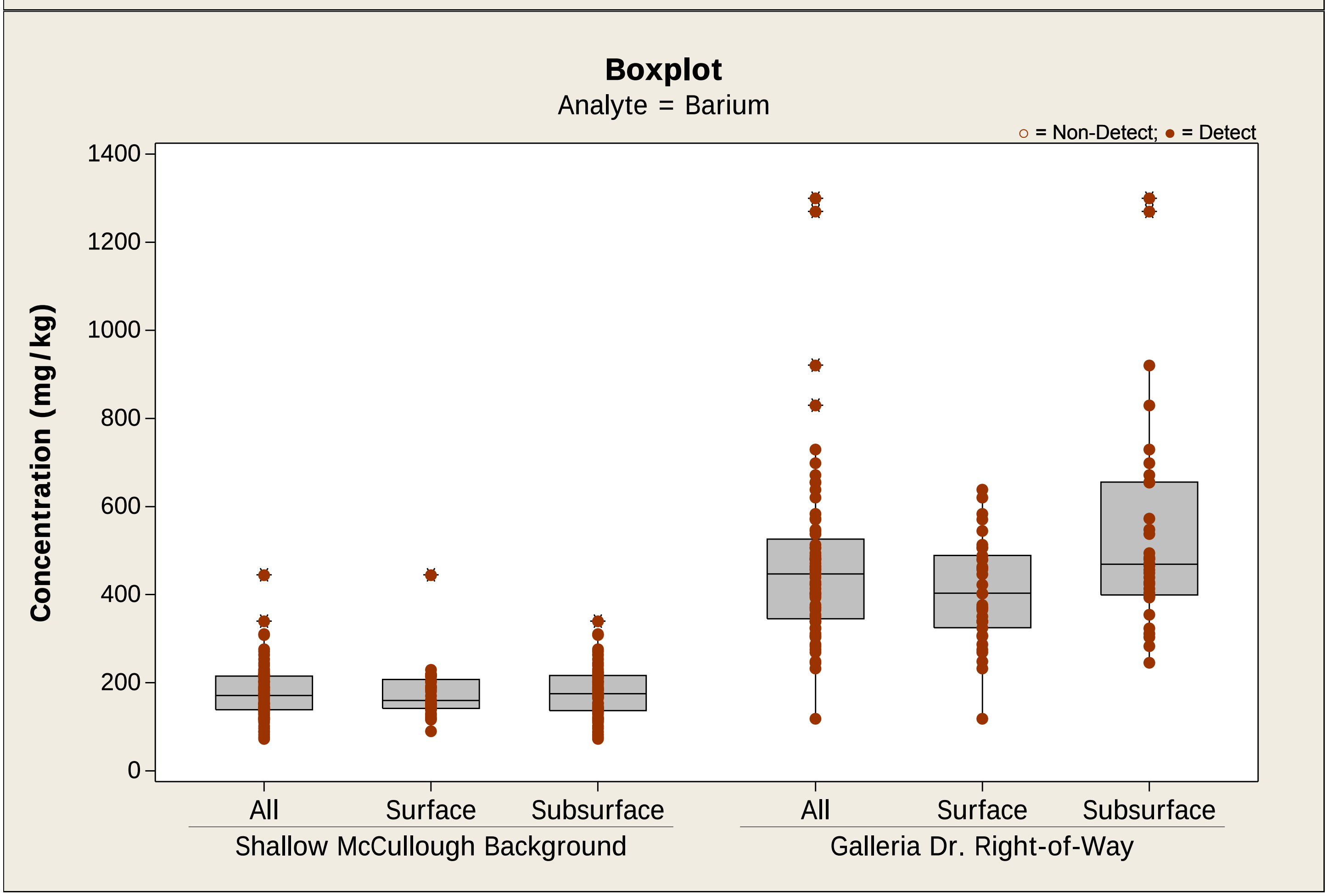
Probability Plot
Normal - 95% CI
Analyte = Arsenic
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
2
4
6
8
10
12
14
16
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



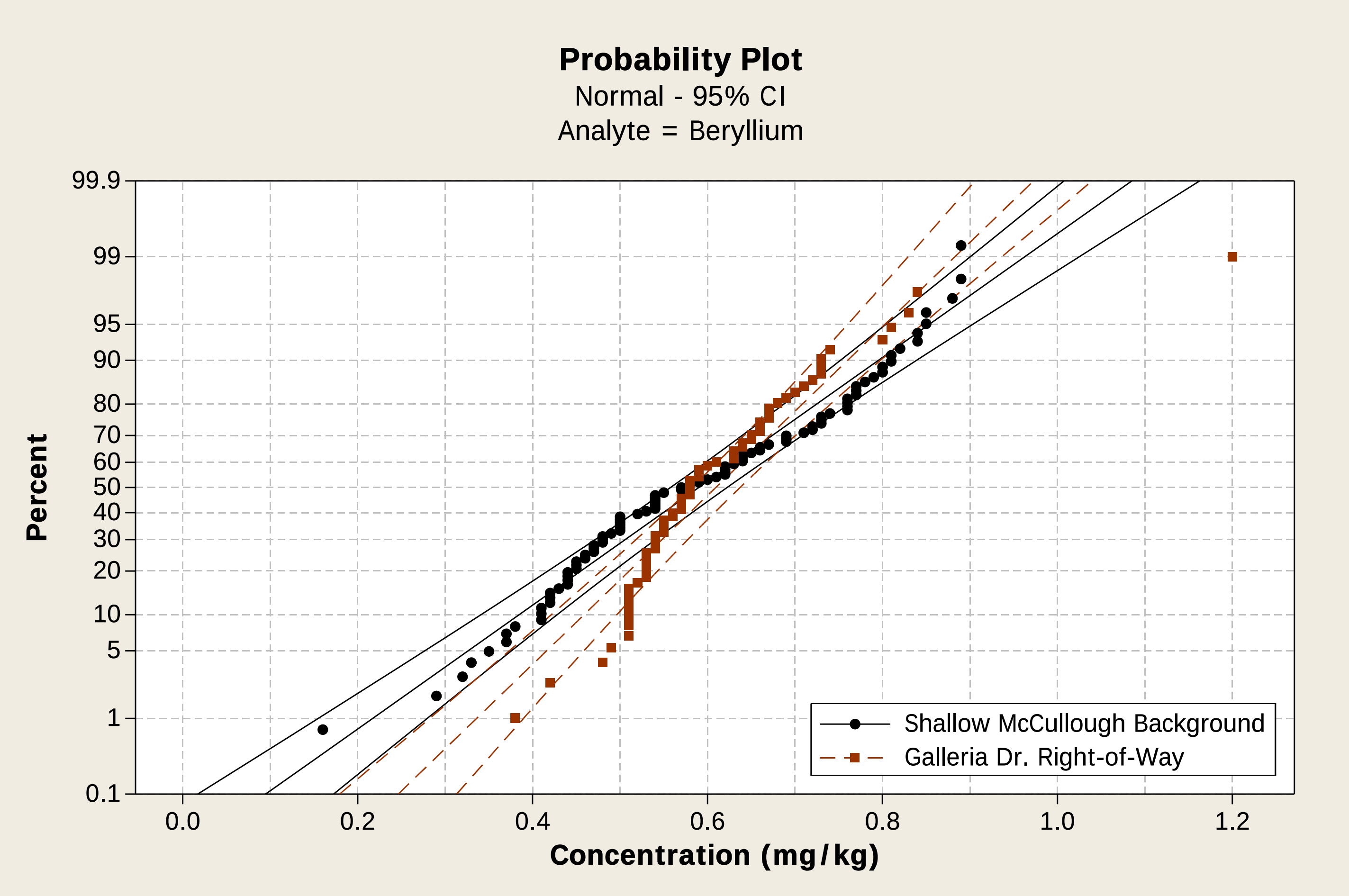
Boxplot
Analyte = Arsenic
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
14
12
10
8
6
4
2
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



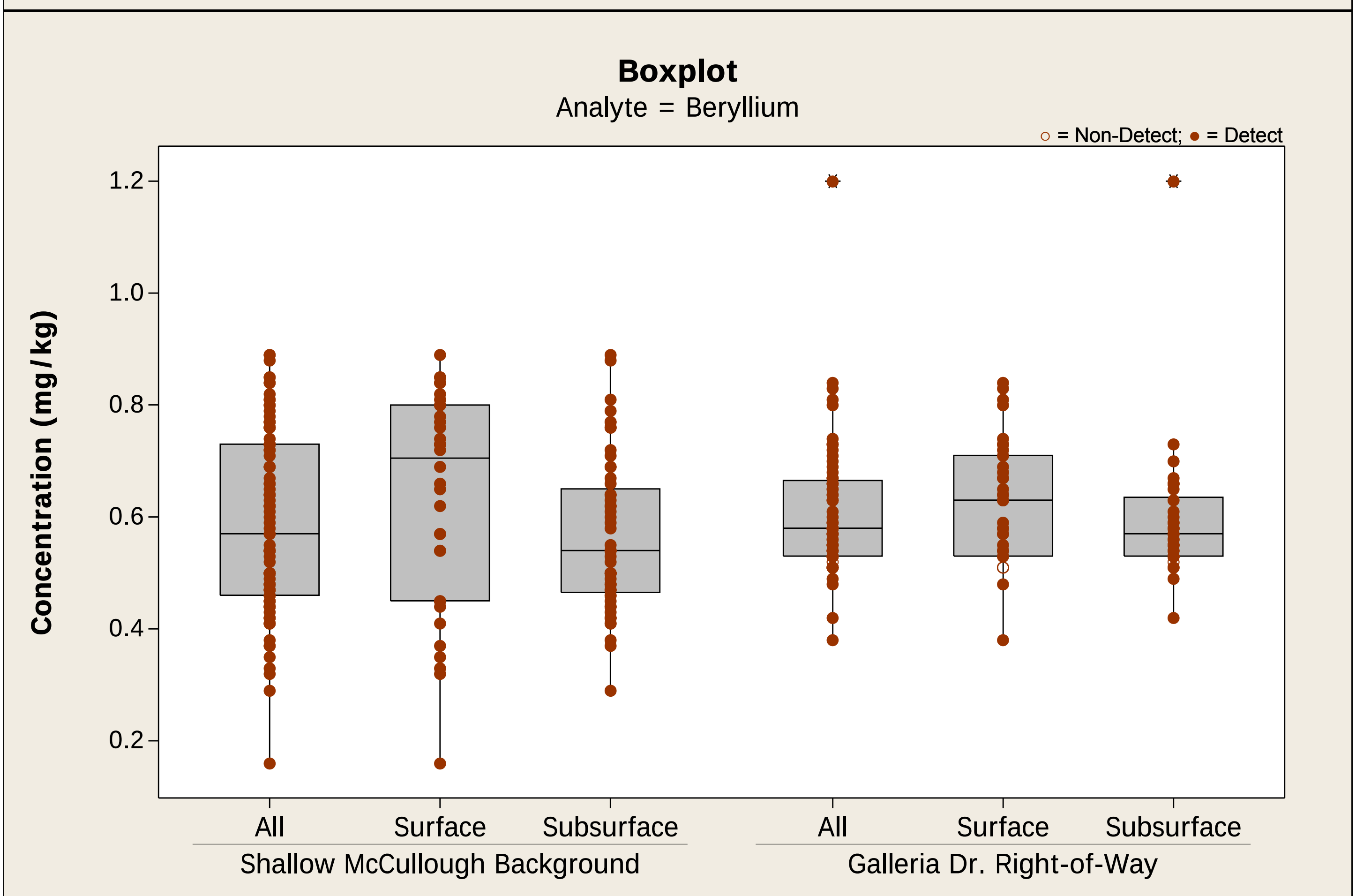
Probability Plot
Normal - 95% CI
Analyte = Barium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
500
1000
1500
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



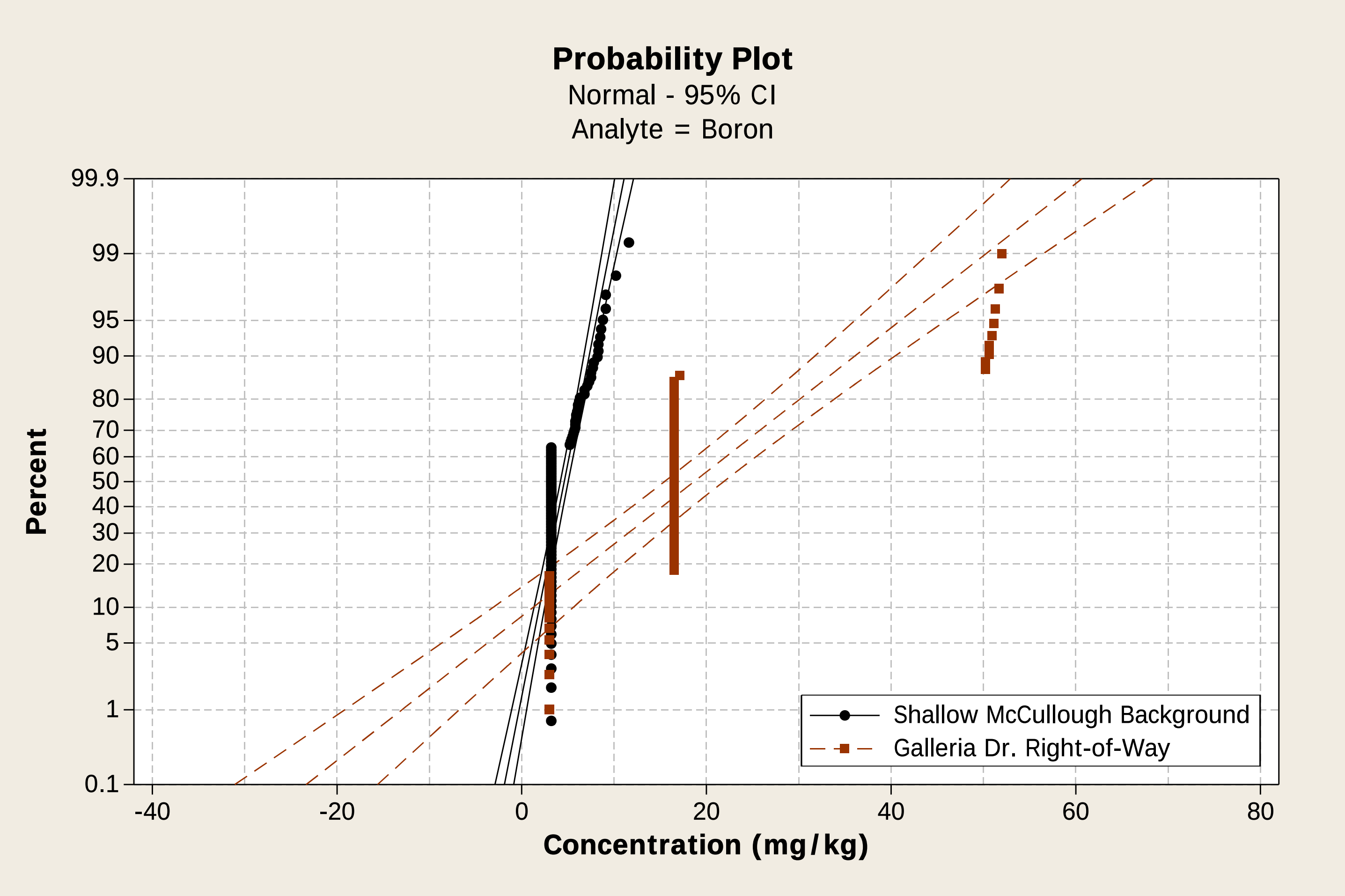
Boxplot
Analyte = Barium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
1400
1200
1000
800
600
400
200
0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



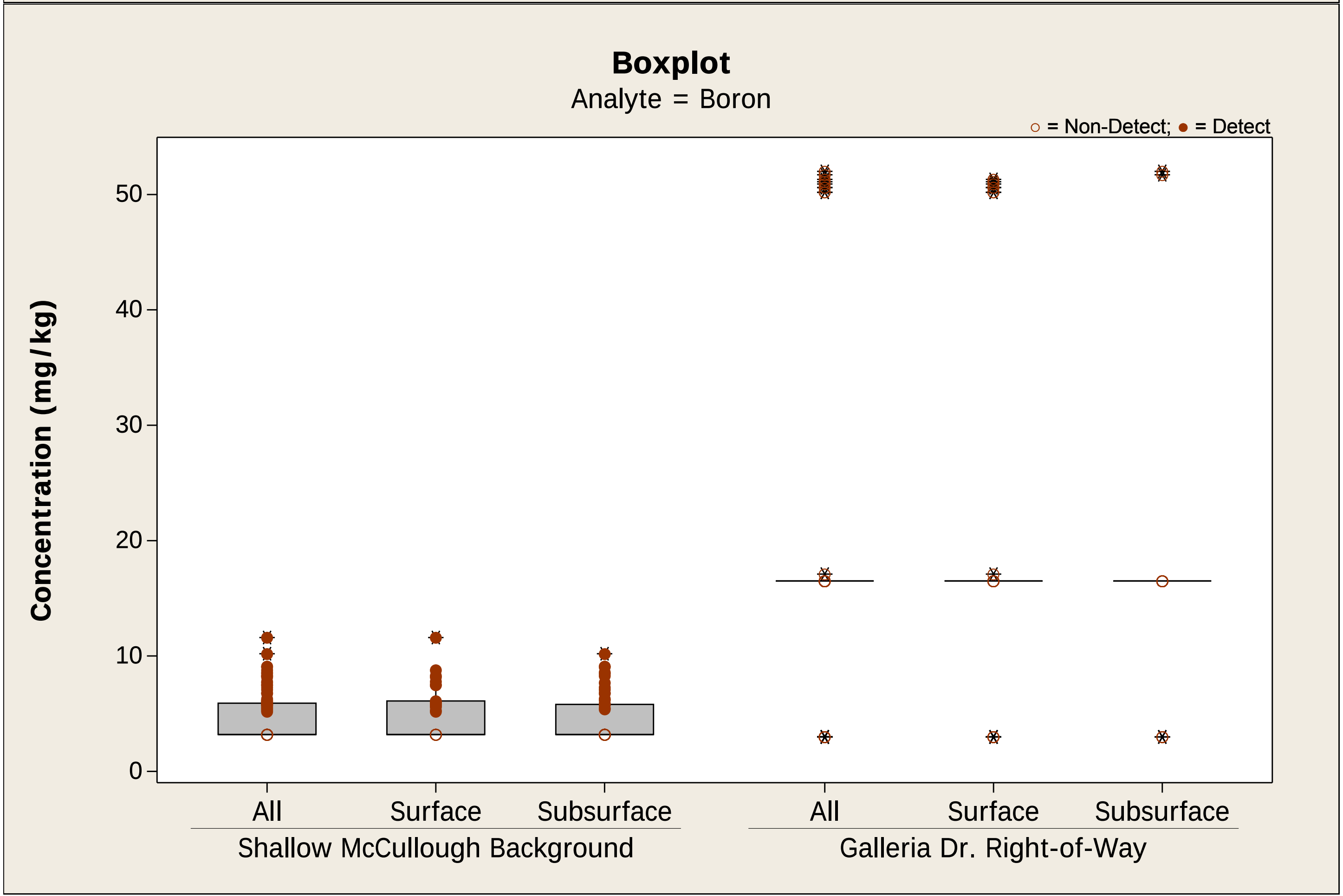
Probability Plot
Normal - 95% CI
Analyte = Beryllium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



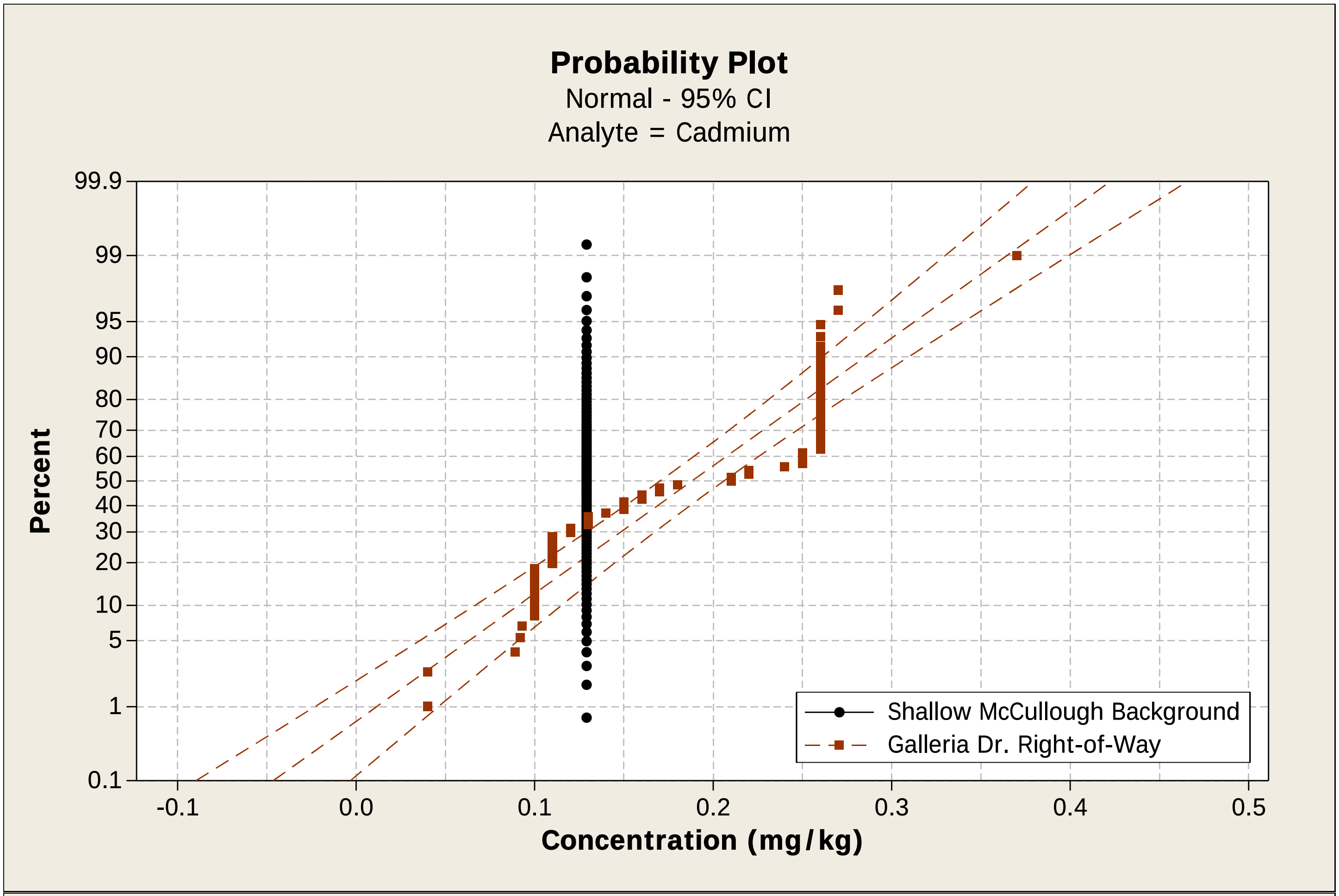
Boxplot
Analyte = Beryllium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
1.2
1.0
0.8
0.6
0.4
0.2
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



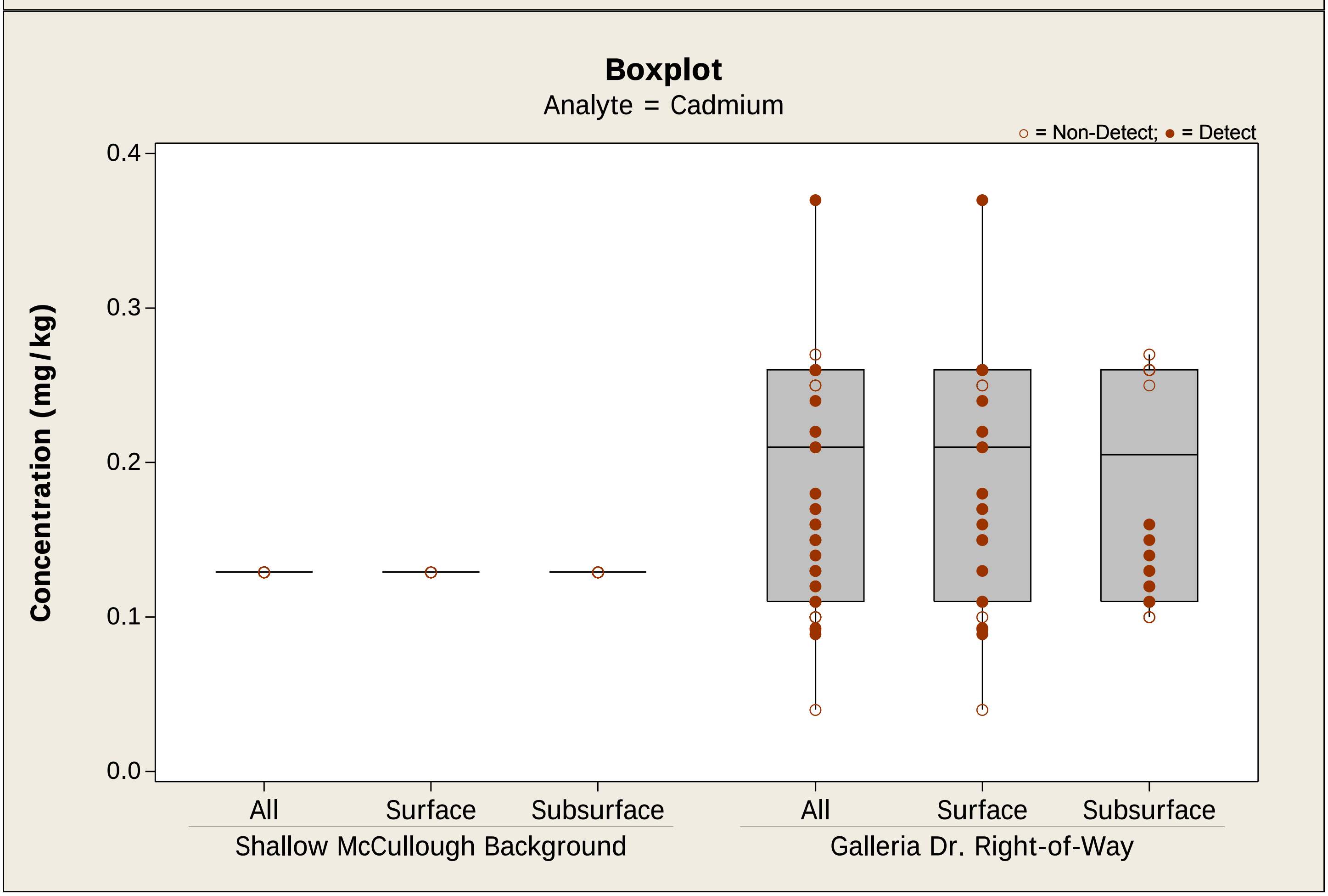
Probability Plot
Normal - 95% CI
Analyte = Boron
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-40
-20
0
20
40
60
80
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



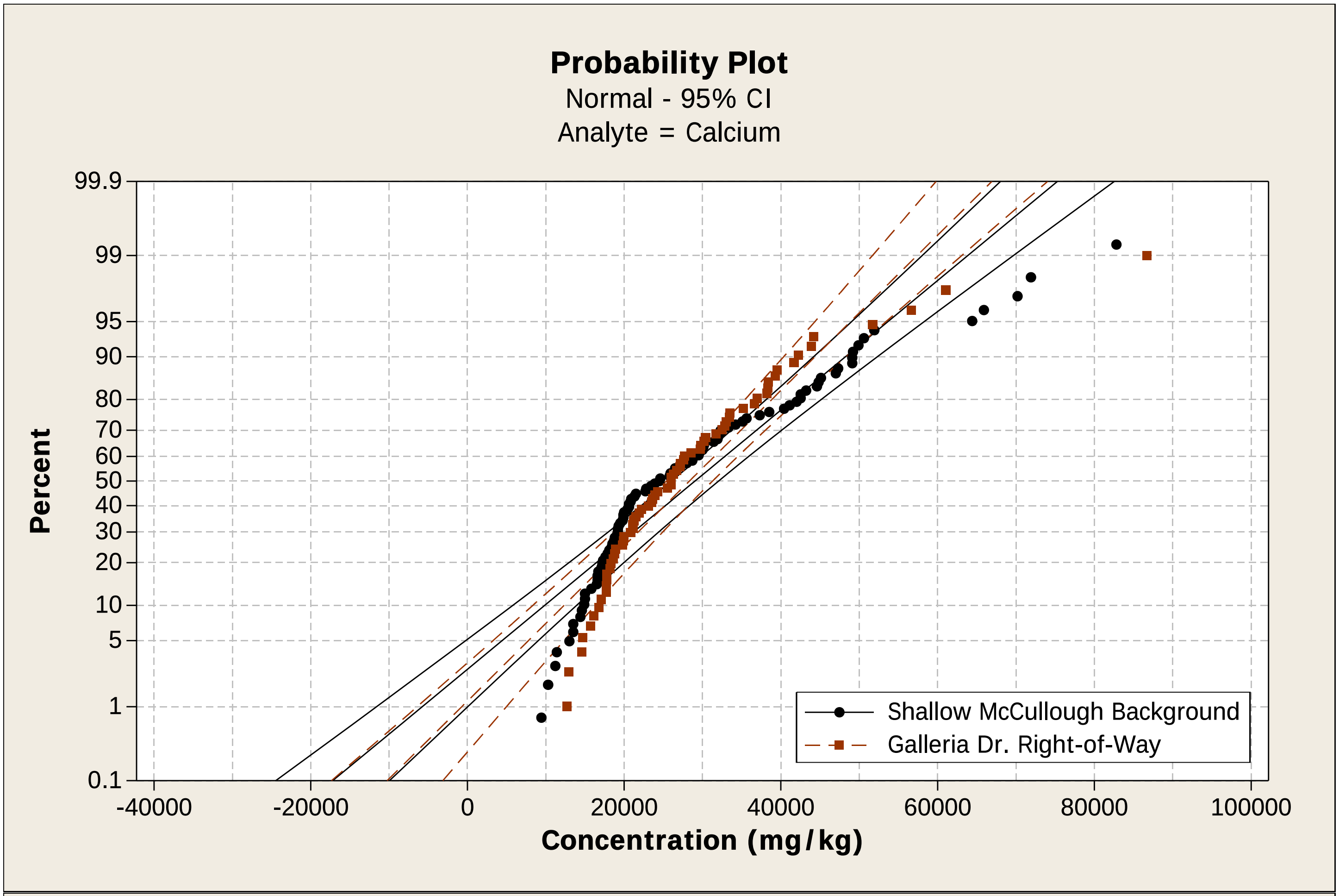
Boxplot
Analyte = Boron
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
50
40
30
20
10
0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



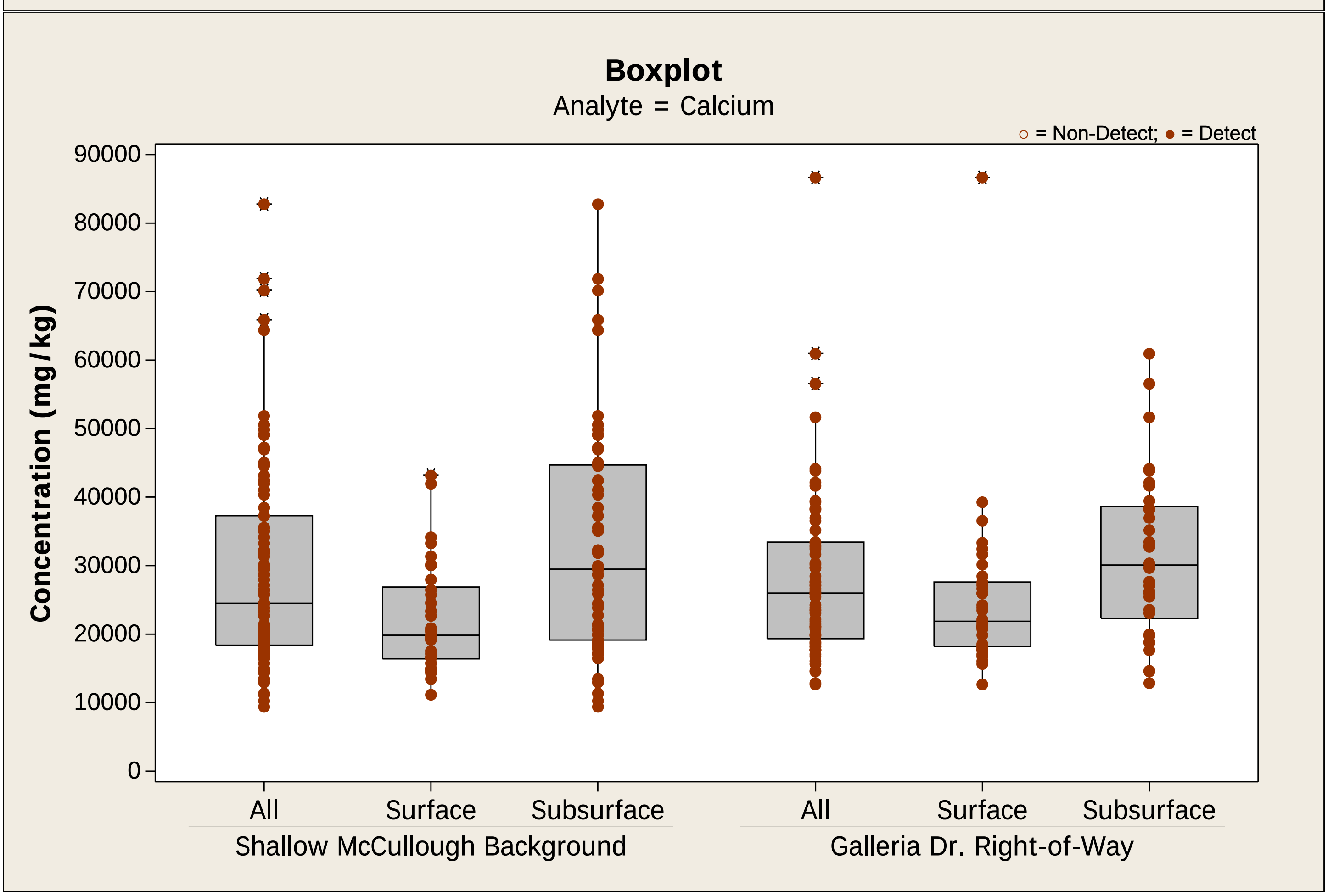
Probability Plot
Normal - 95% CI
Analyte = Cadmium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-0.1
0.0
0.1
0.2
0.3
0.4
0.5
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



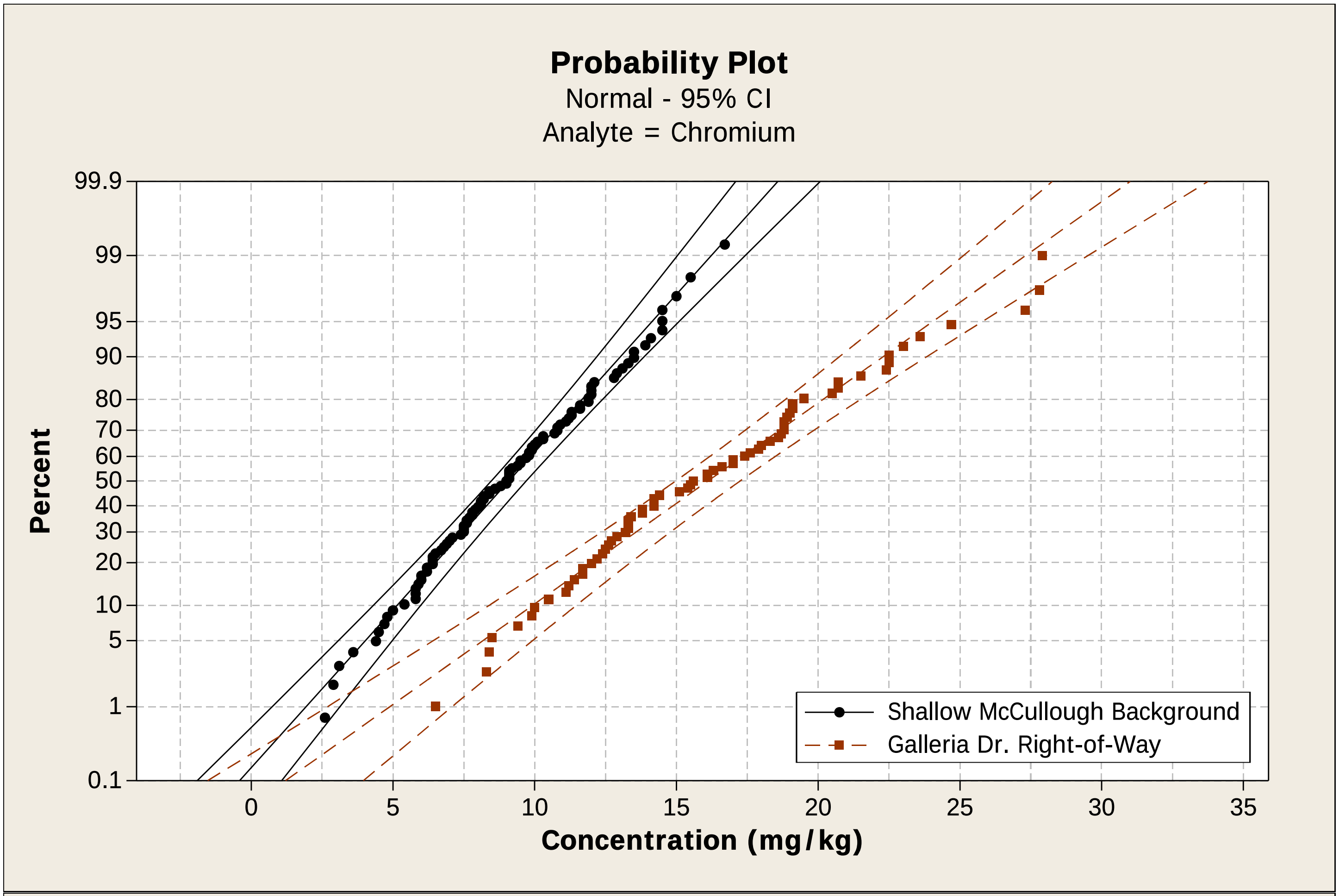
Boxplot
Analyte = Cadmium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
0.4
0.3
0.2
0.1
0.0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way

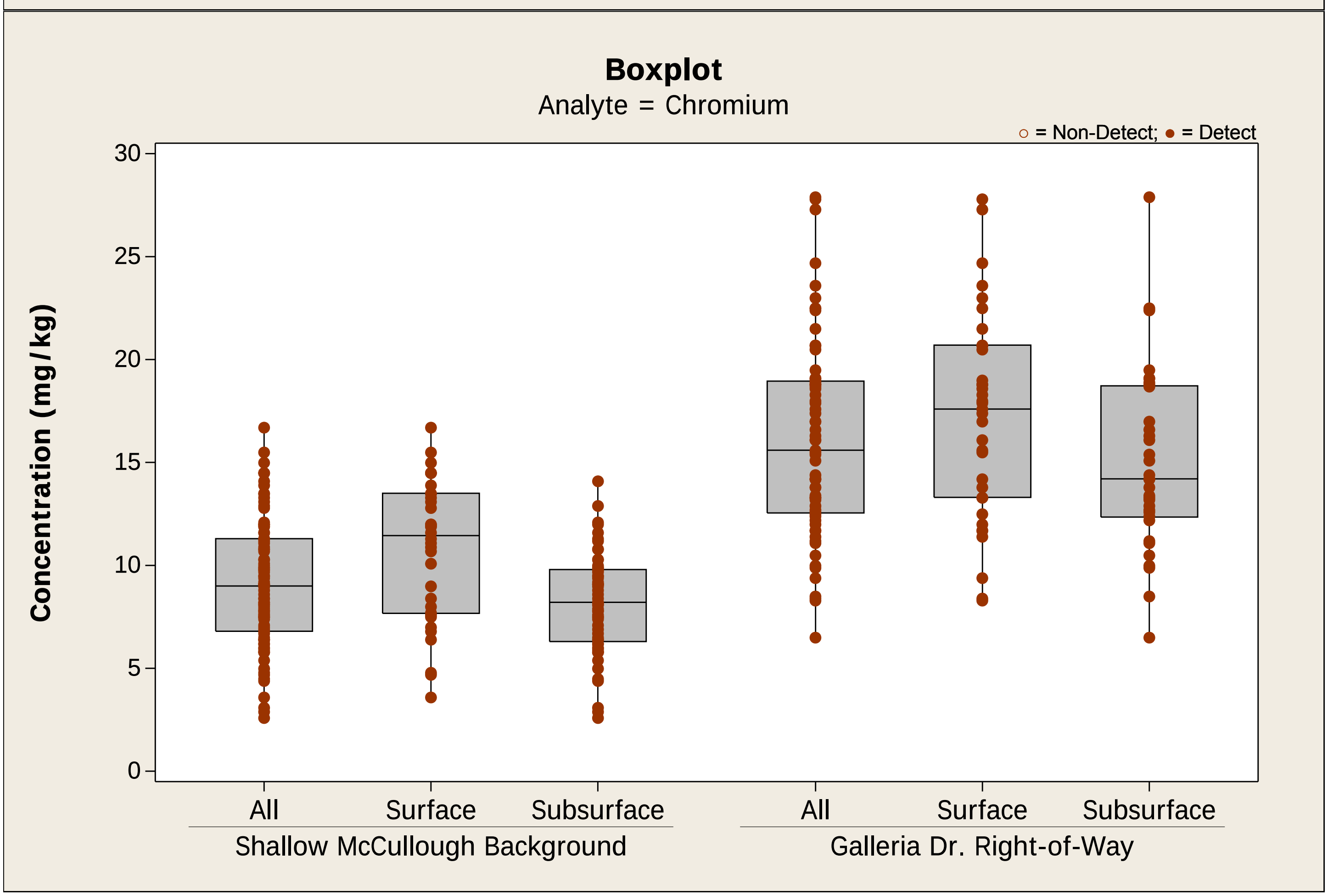


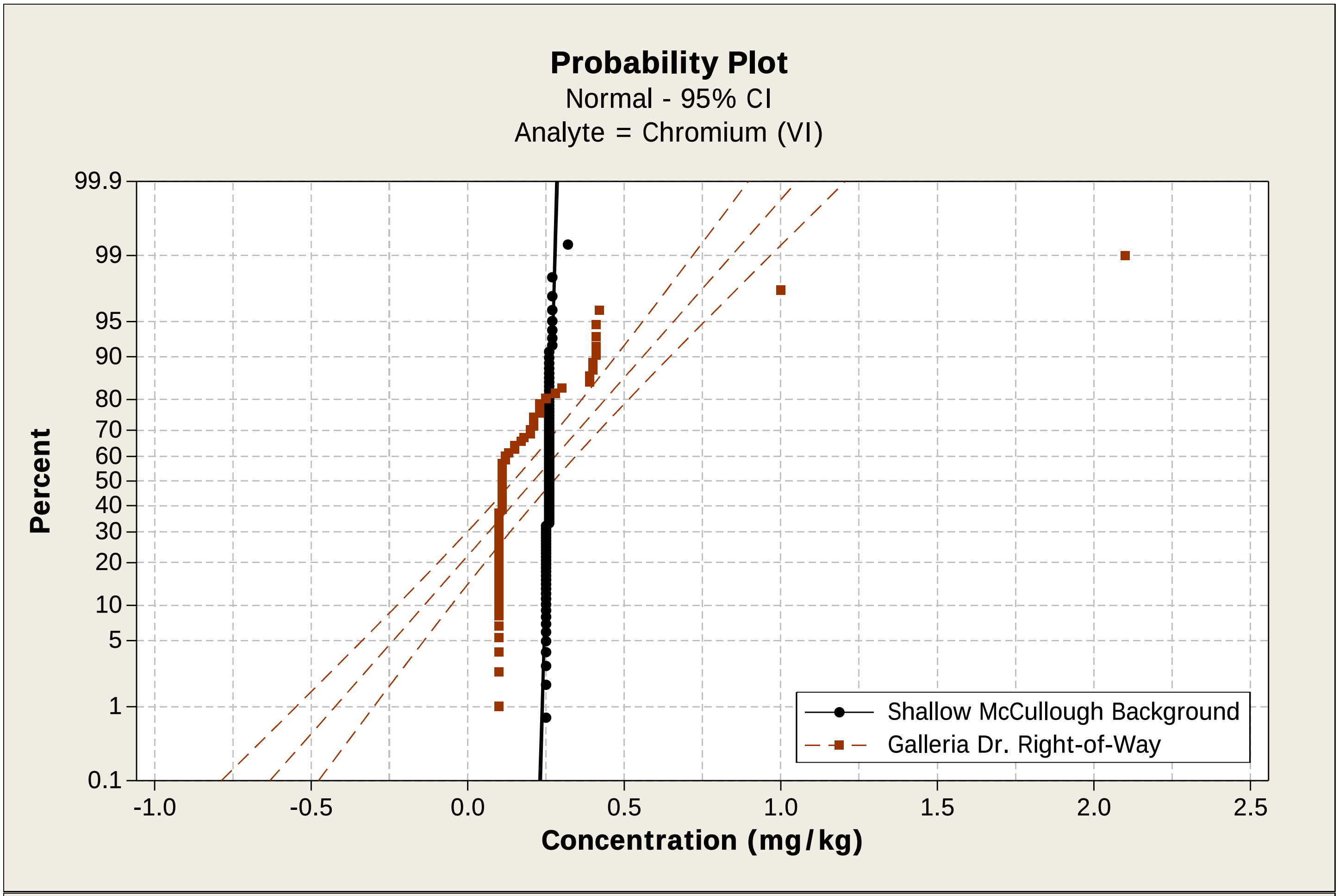
Probability Plot
Normal - 95% CI
Analyte = Calcium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-40000
-20000
0
20000
40000
60000
80000
100000
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



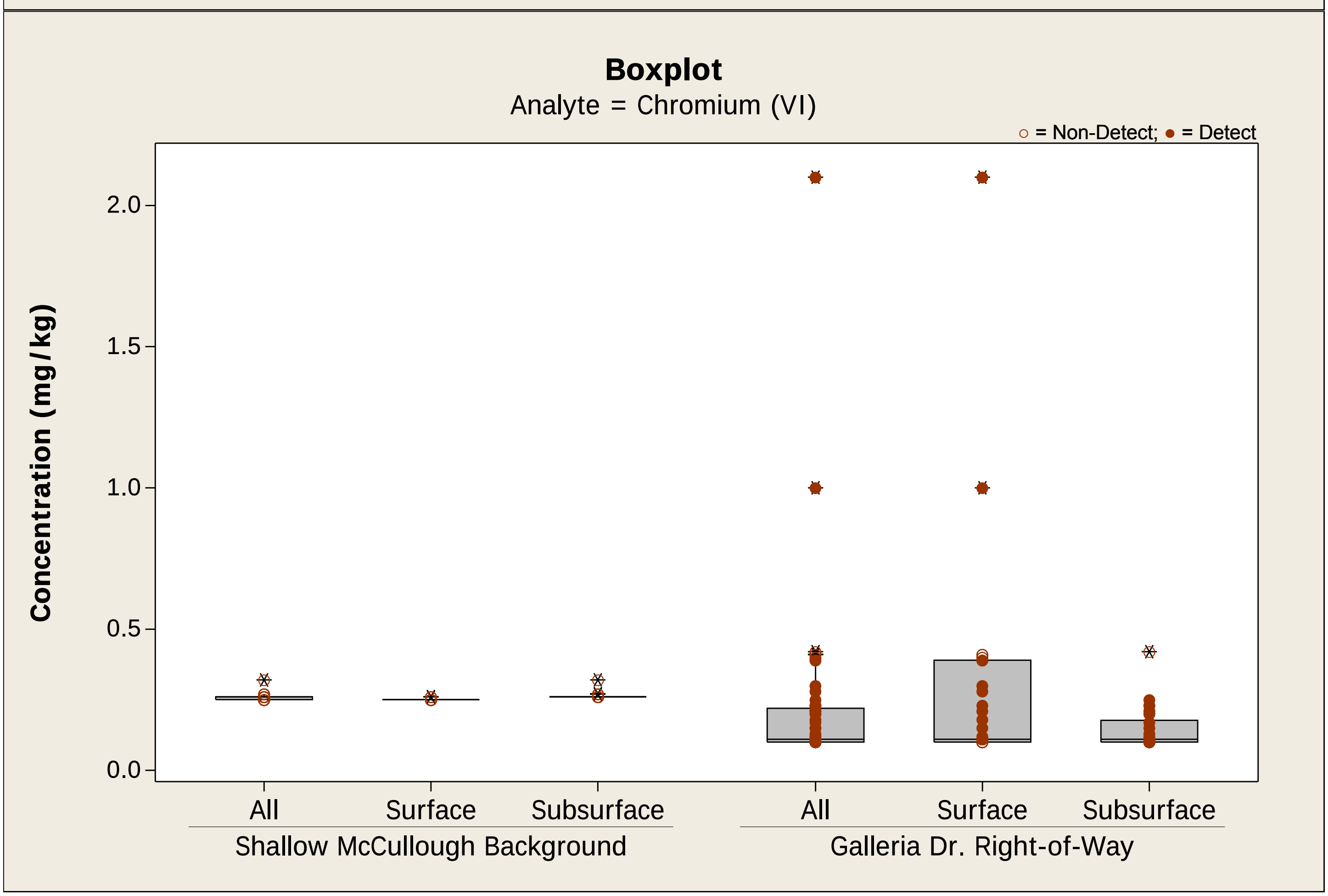
Boxplot
Analyte = Calcium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Chromium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
5
10
15
20
25
30
35
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

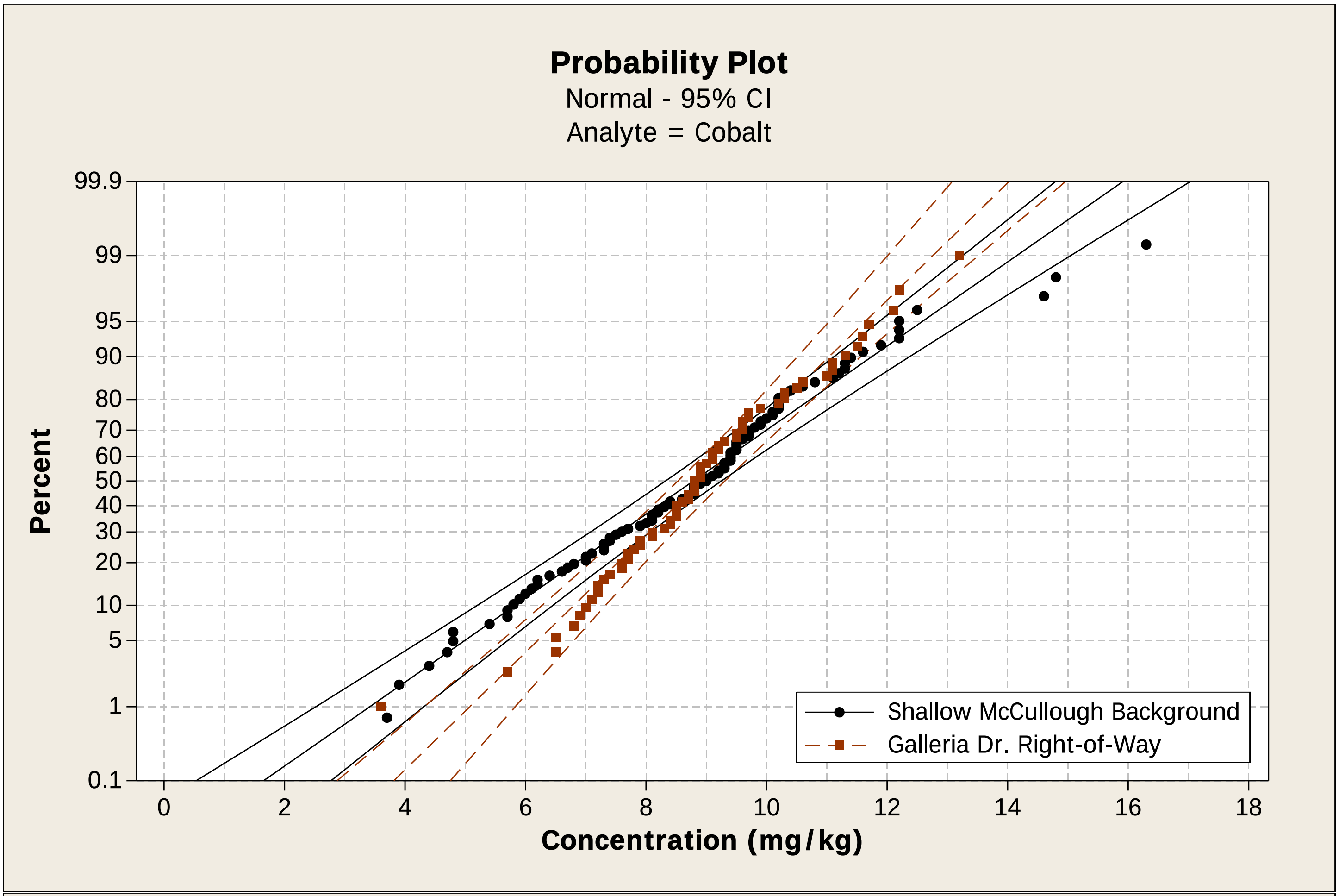

Boxplot
Analyte = Chromium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
30
25
20
15
10
5
0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



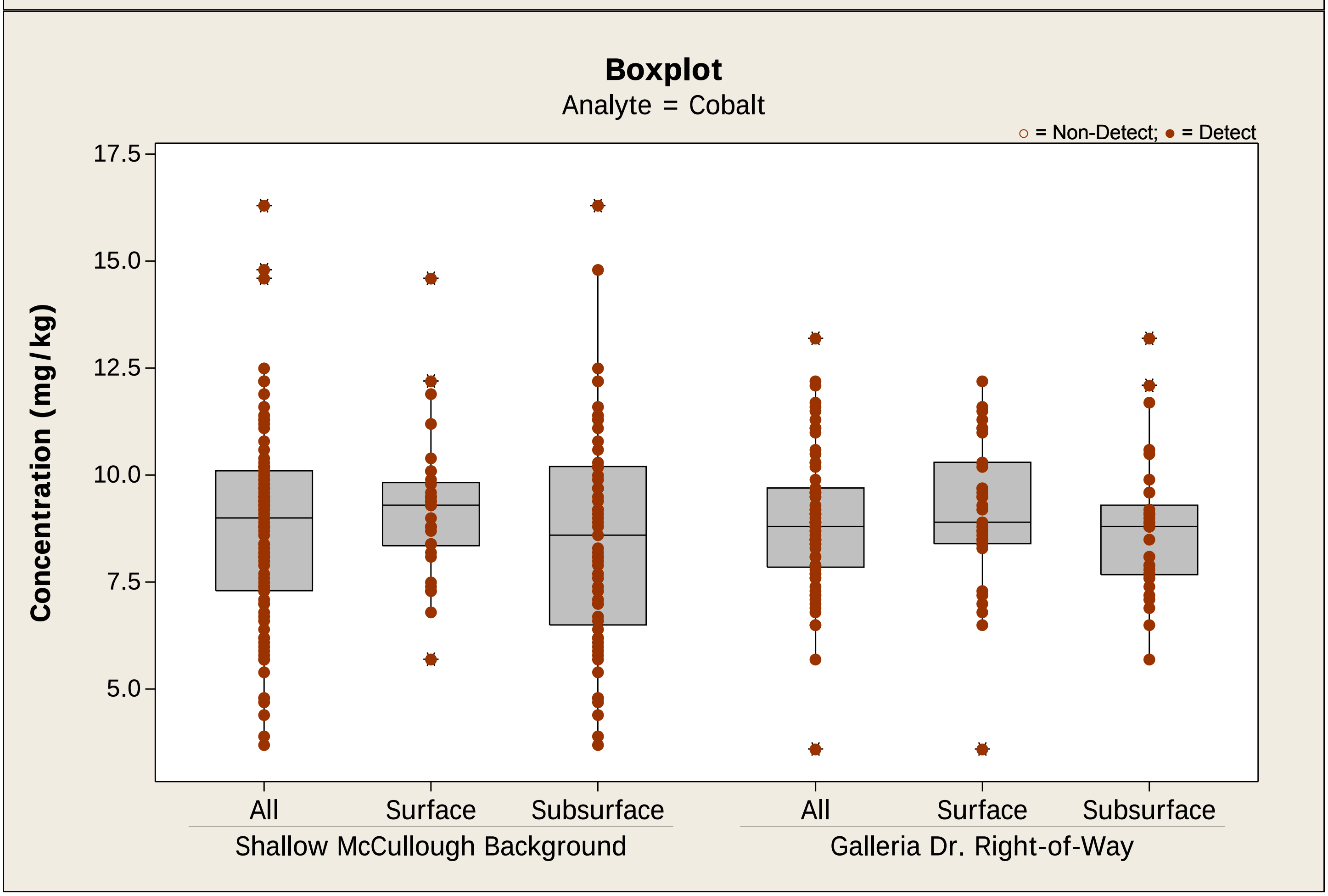
Probability Plot
Normal - 95% CI
Analyte = Chromium (VI)
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
2.5
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



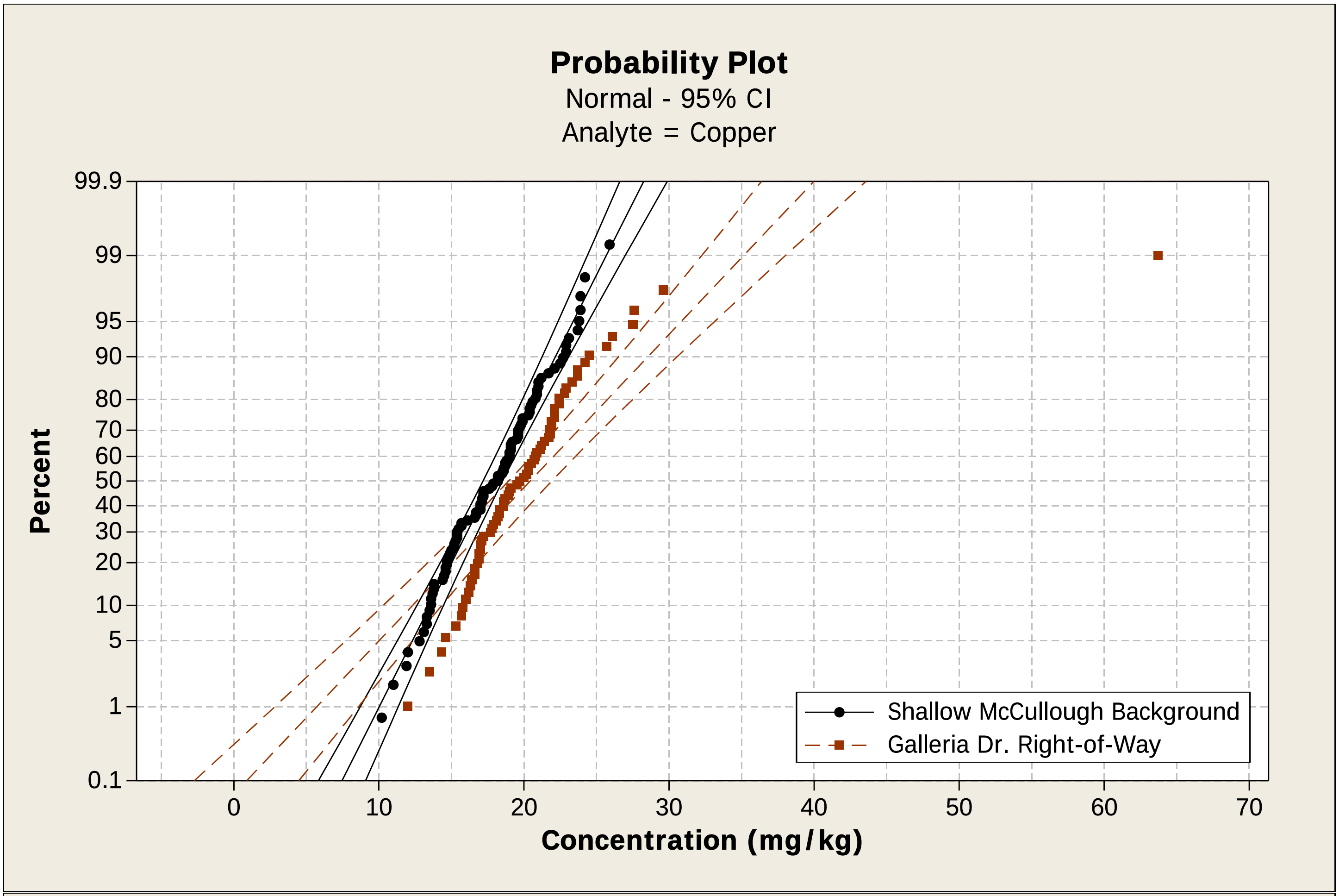
Boxplot
Analyte = Chromium (VI)
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
2.0
1.5
1.0
0.5
0.0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



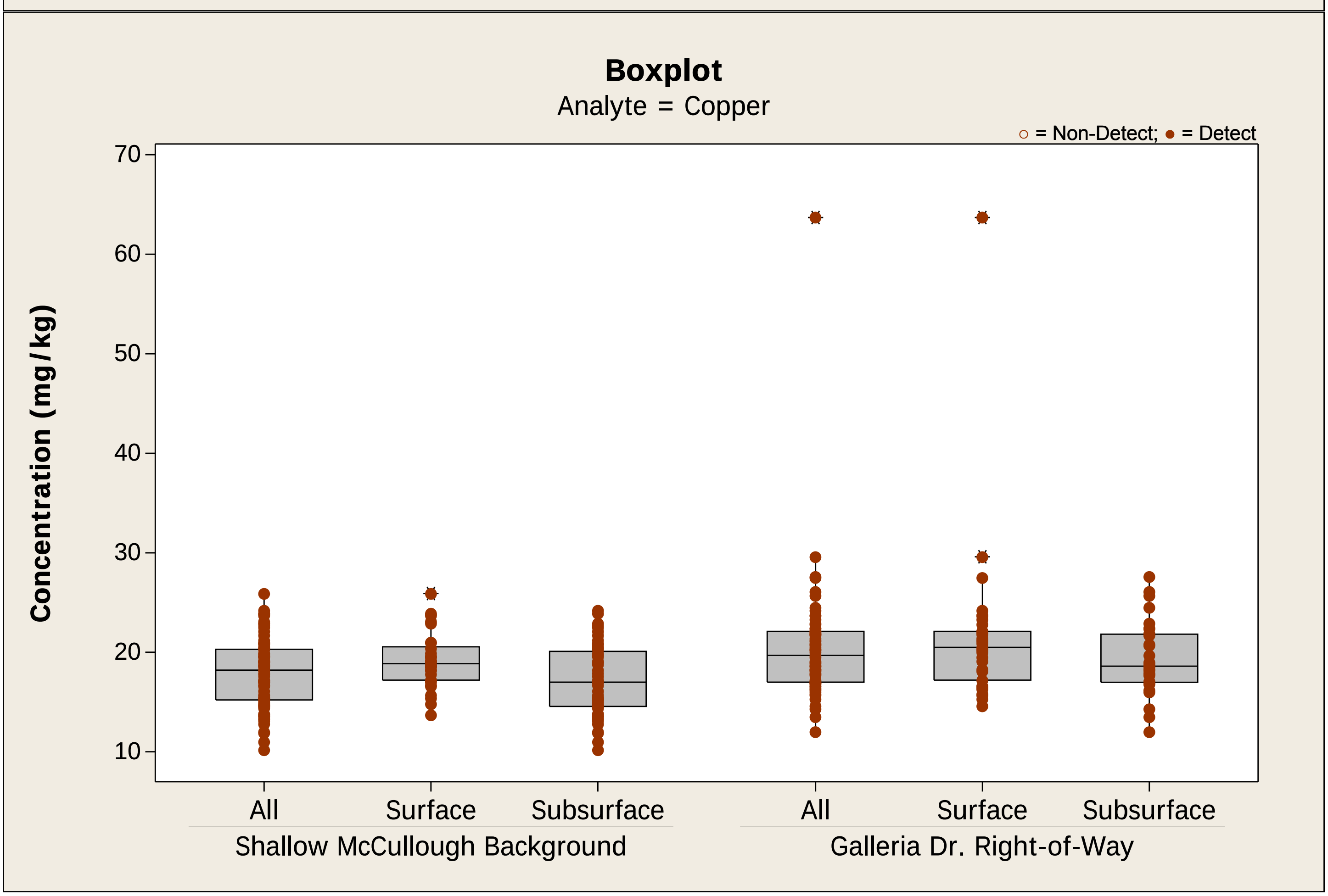
Probability Plot
Normal - 95% CI
Analyte = Cobalt
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
2
4
6
8
10
12
14
16
18
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



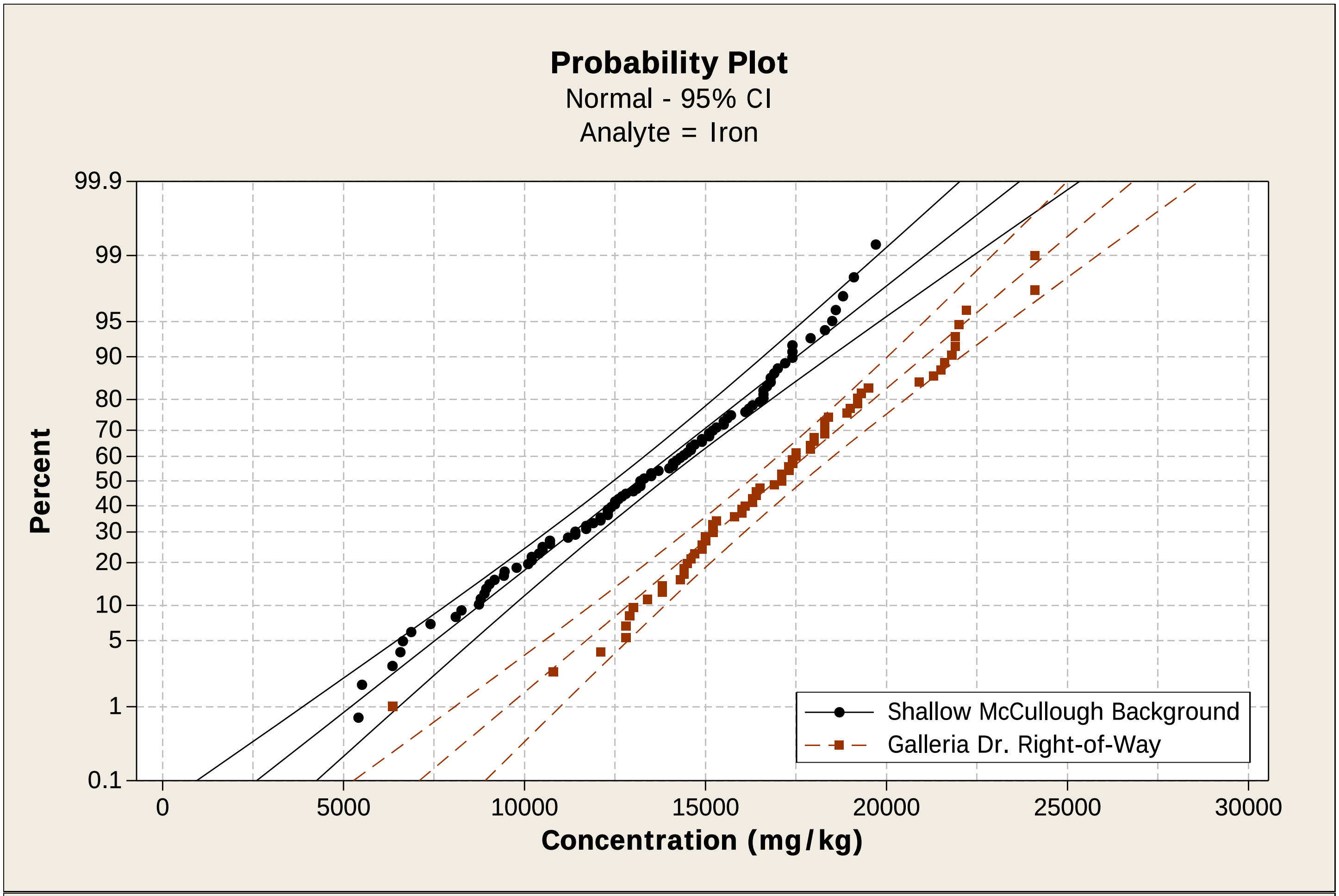
Boxplot
Analyte = Cobalt
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
17.5
15.0
12.5
10.0
7.5
5.0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way

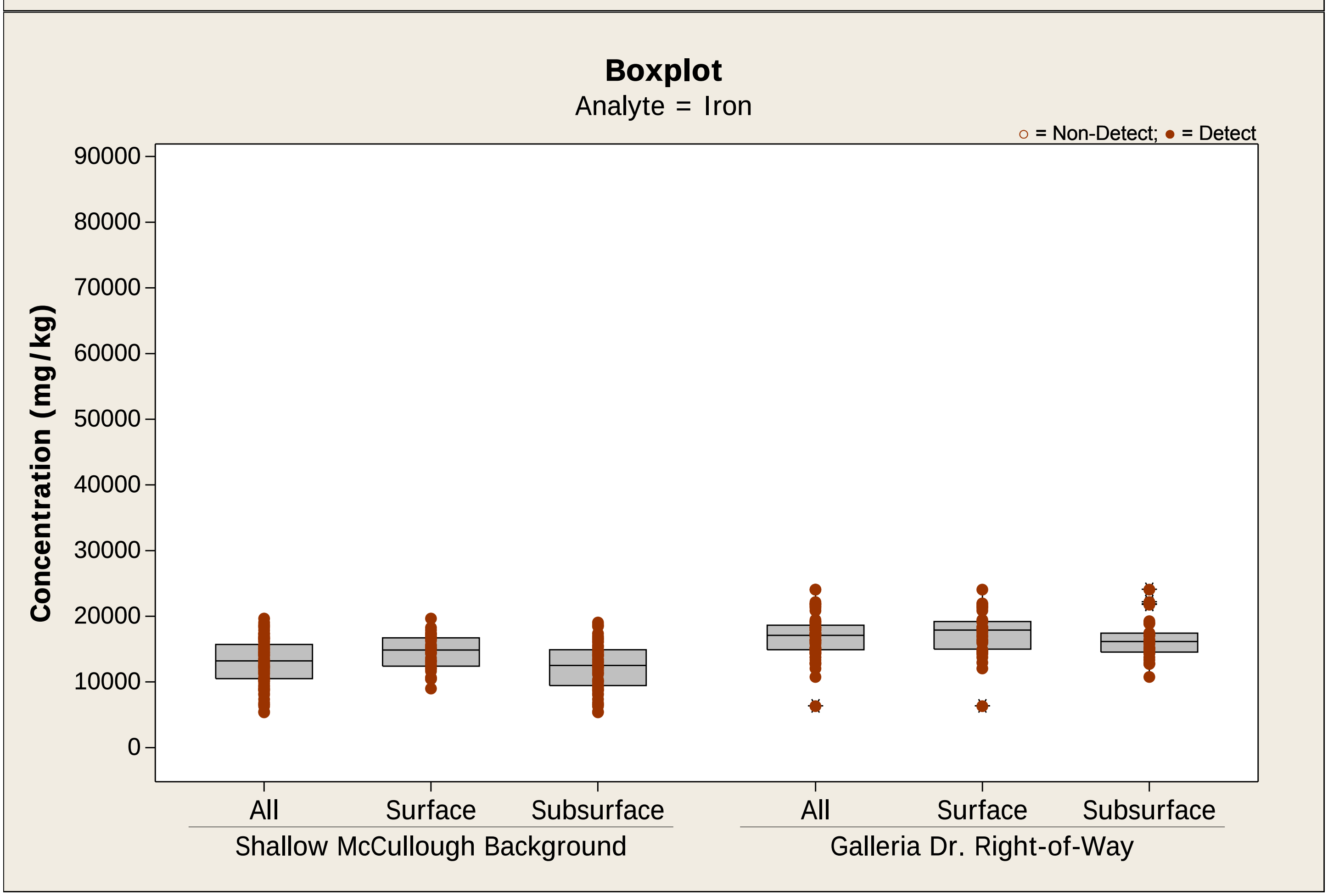


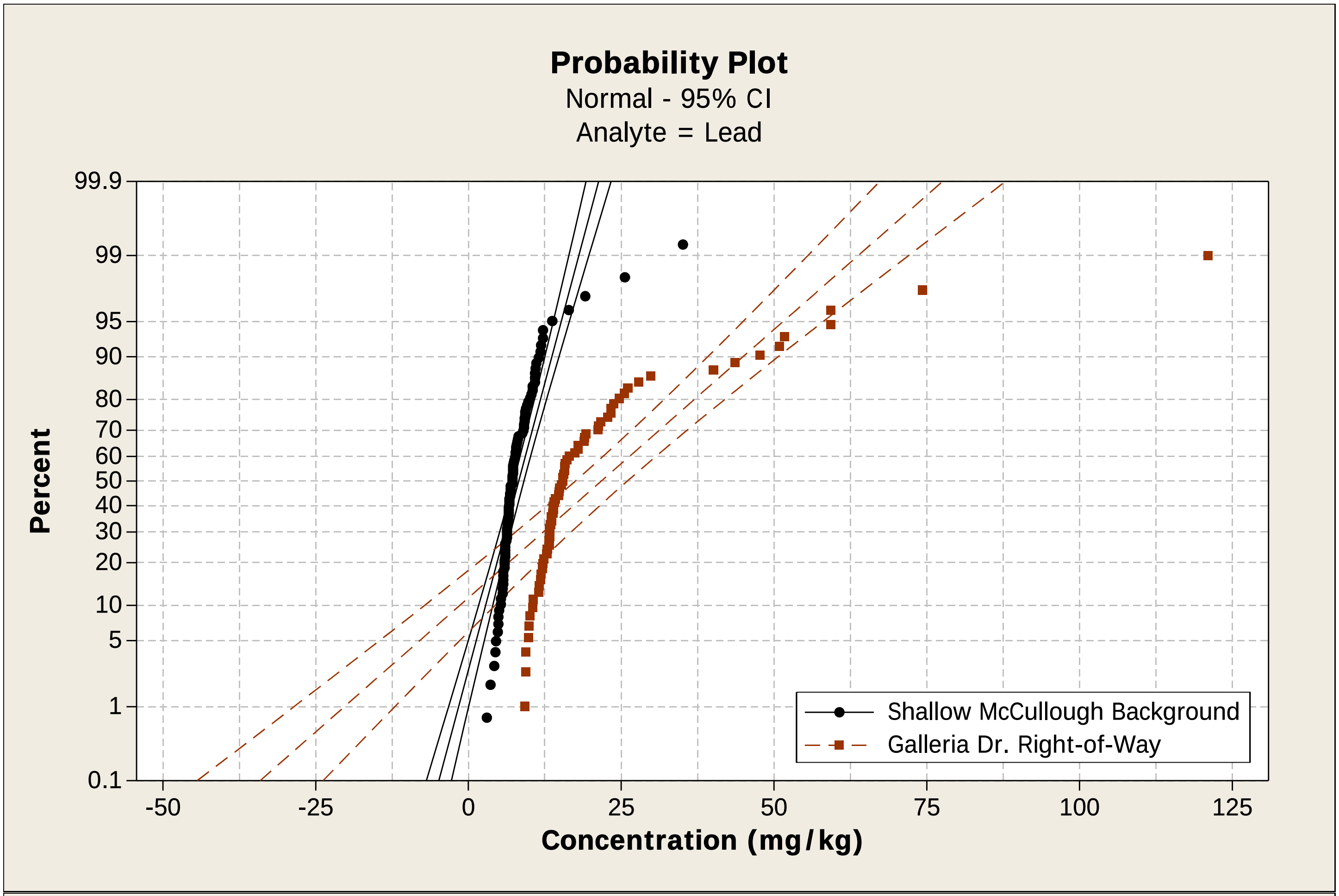
Probability Plot
Normal - 95% CI
Analyte = Copper
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
10
20
30
40
50
60
70
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



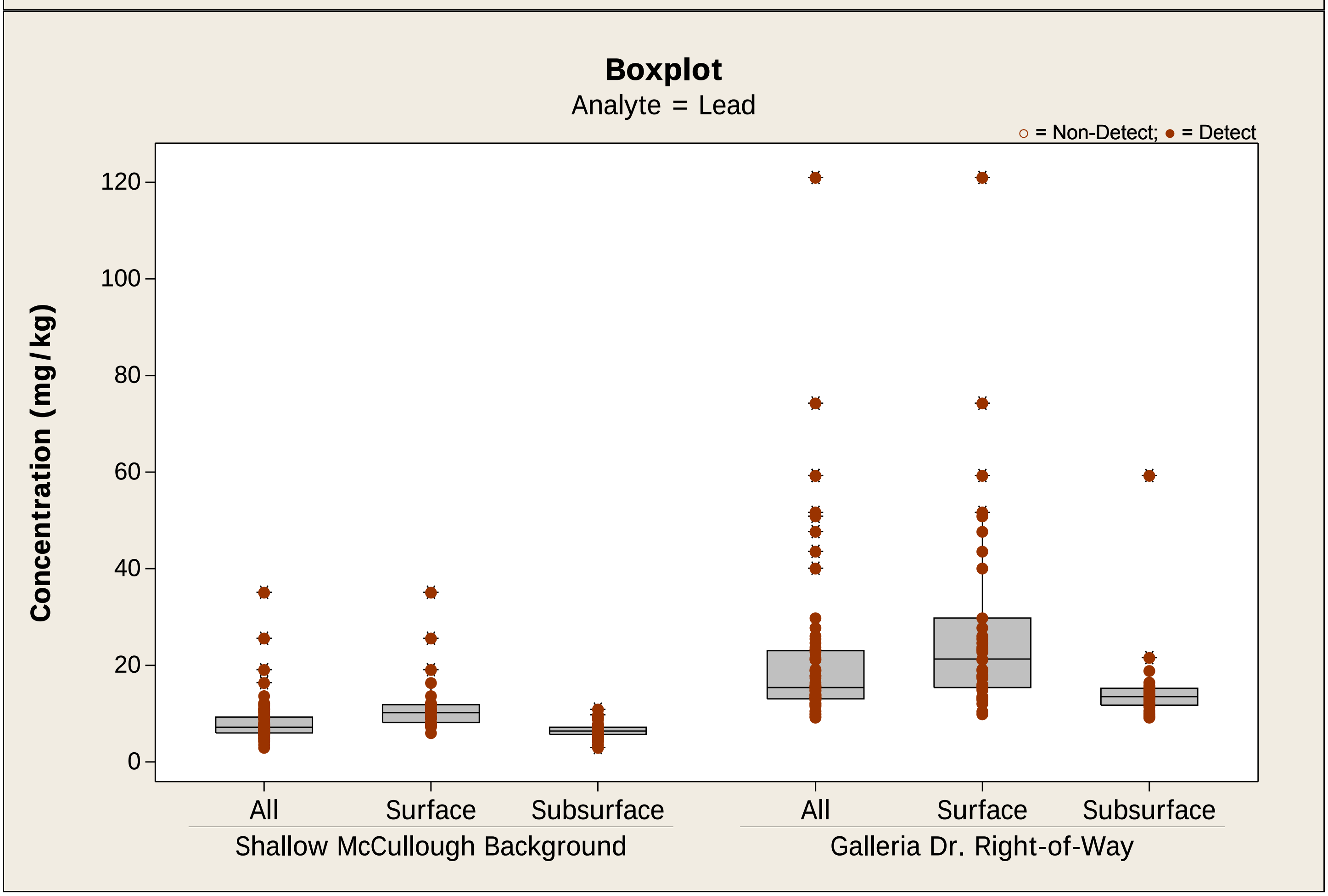
Boxplot
Analyte = Copper
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
70
60
50
40
30
20
10
All
Surface
Subsurface
Shallow McCullough Background
All
Surface
Subsurface
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Iron
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
5000
10000
15000
20000
25000
30000
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

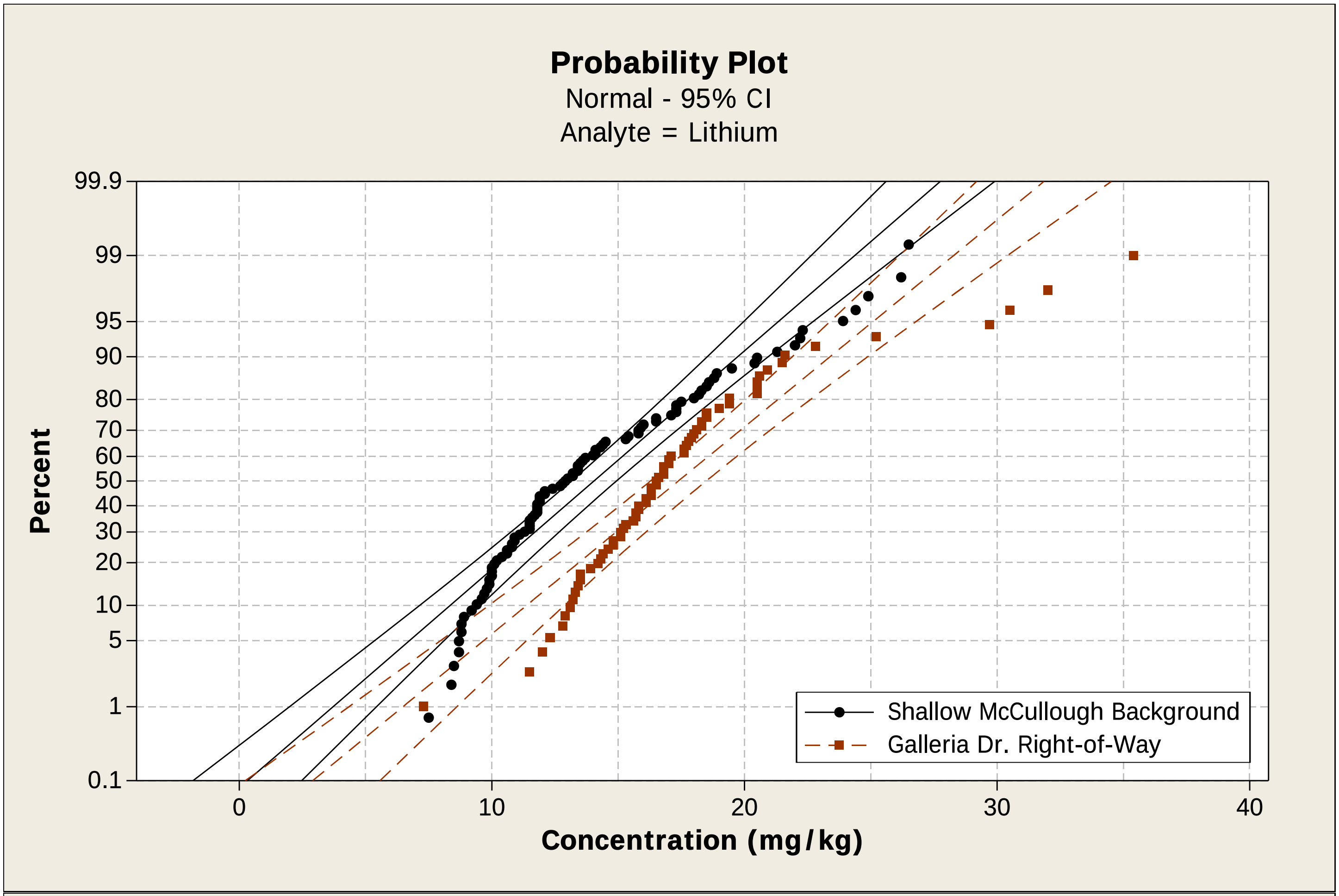

Boxplot
Analyte = Iron
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way

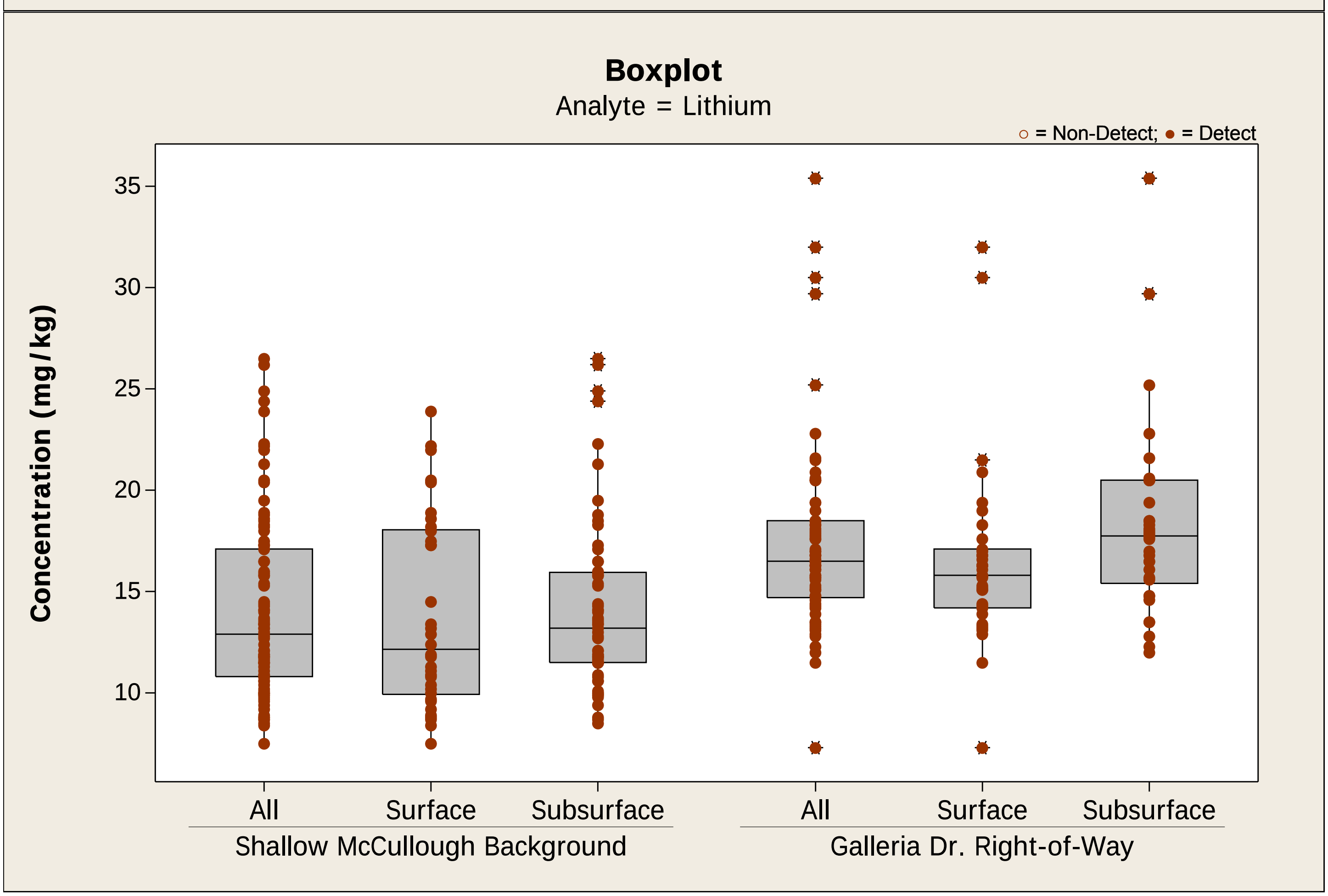


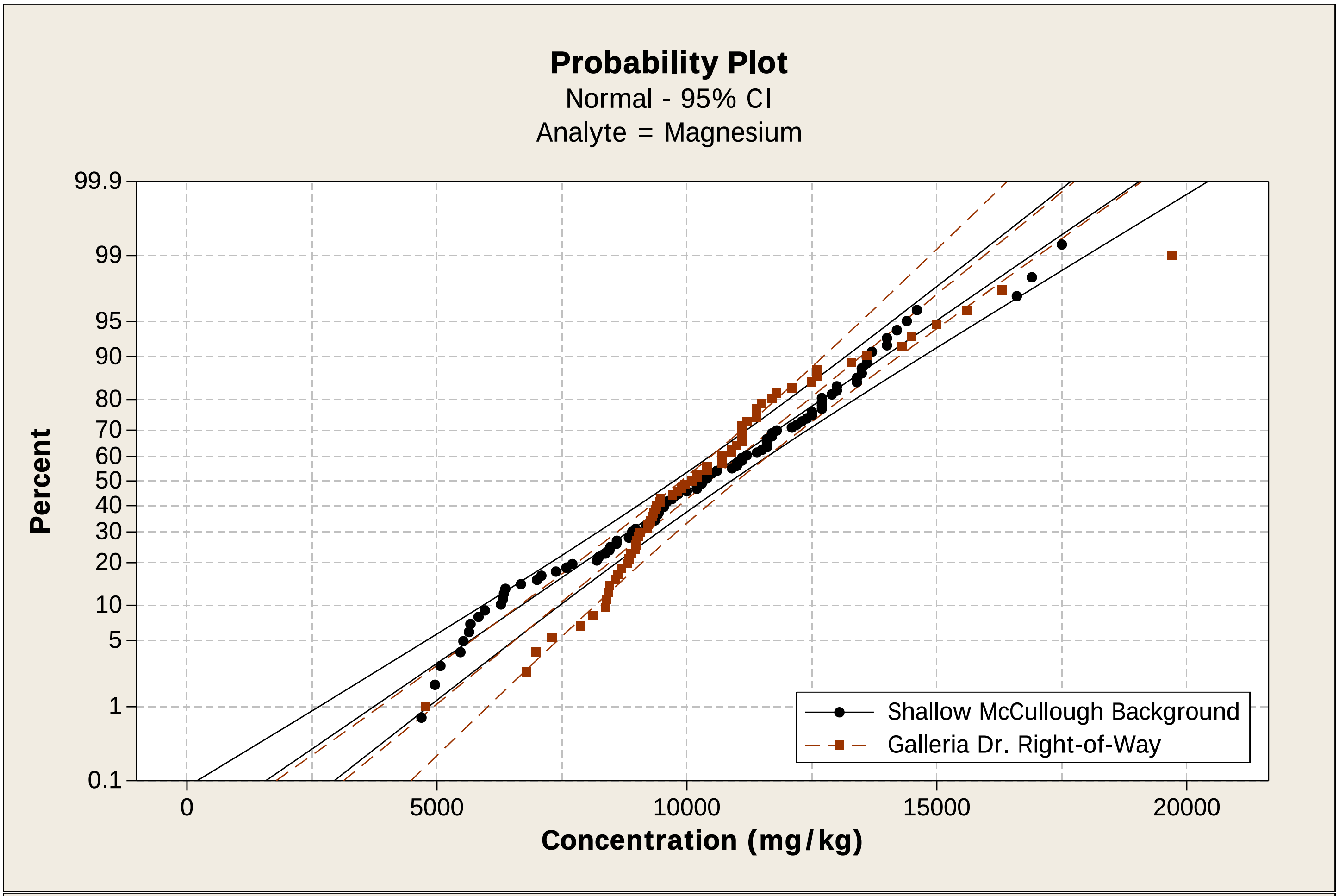
Probability Plot
Normal - 95% CI
Analyte = Lead
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-50
-25
0
25
50
75
100
125
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

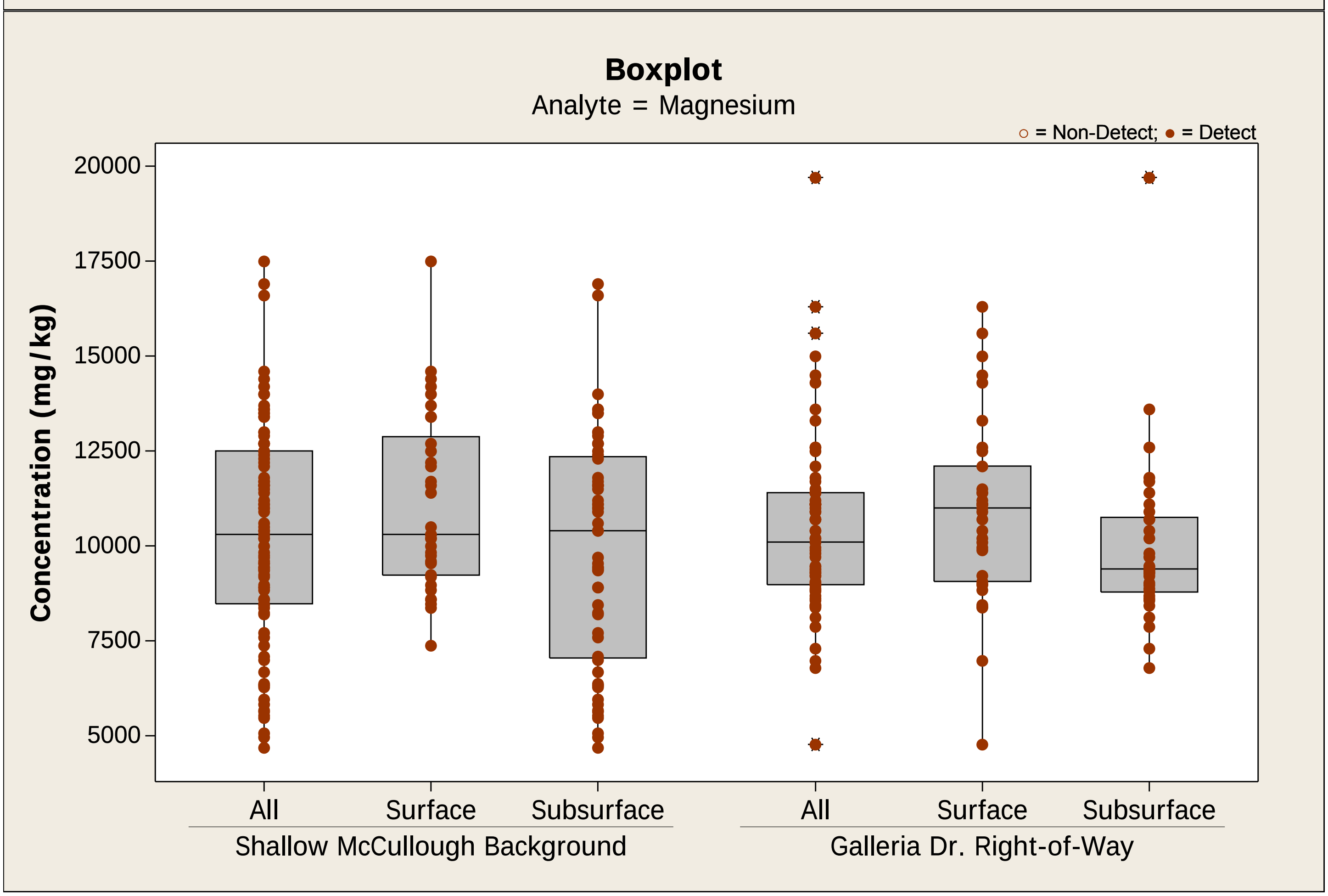


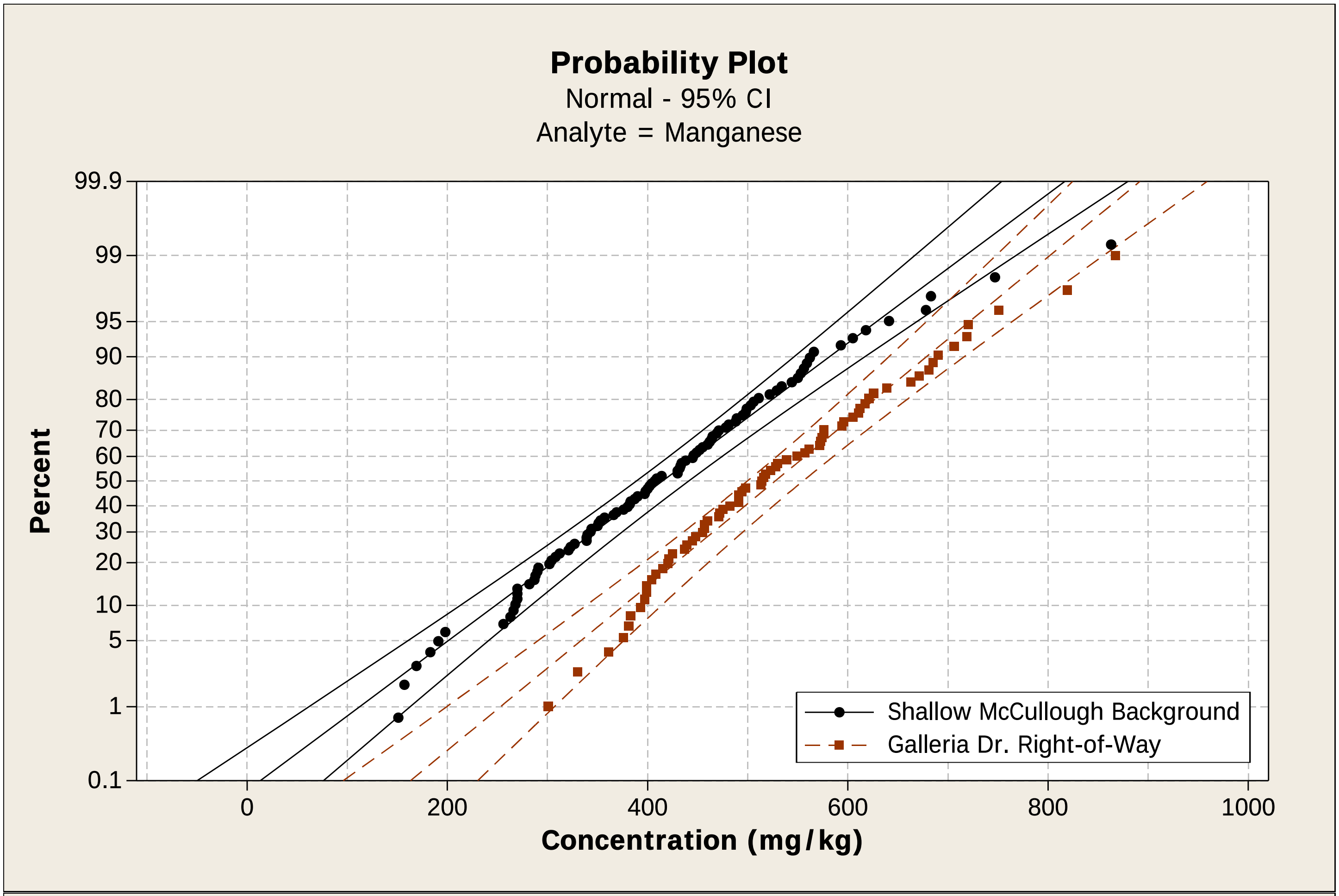
Boxplot
Analyte = Lead
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
120
100
80
60
40
20
0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way

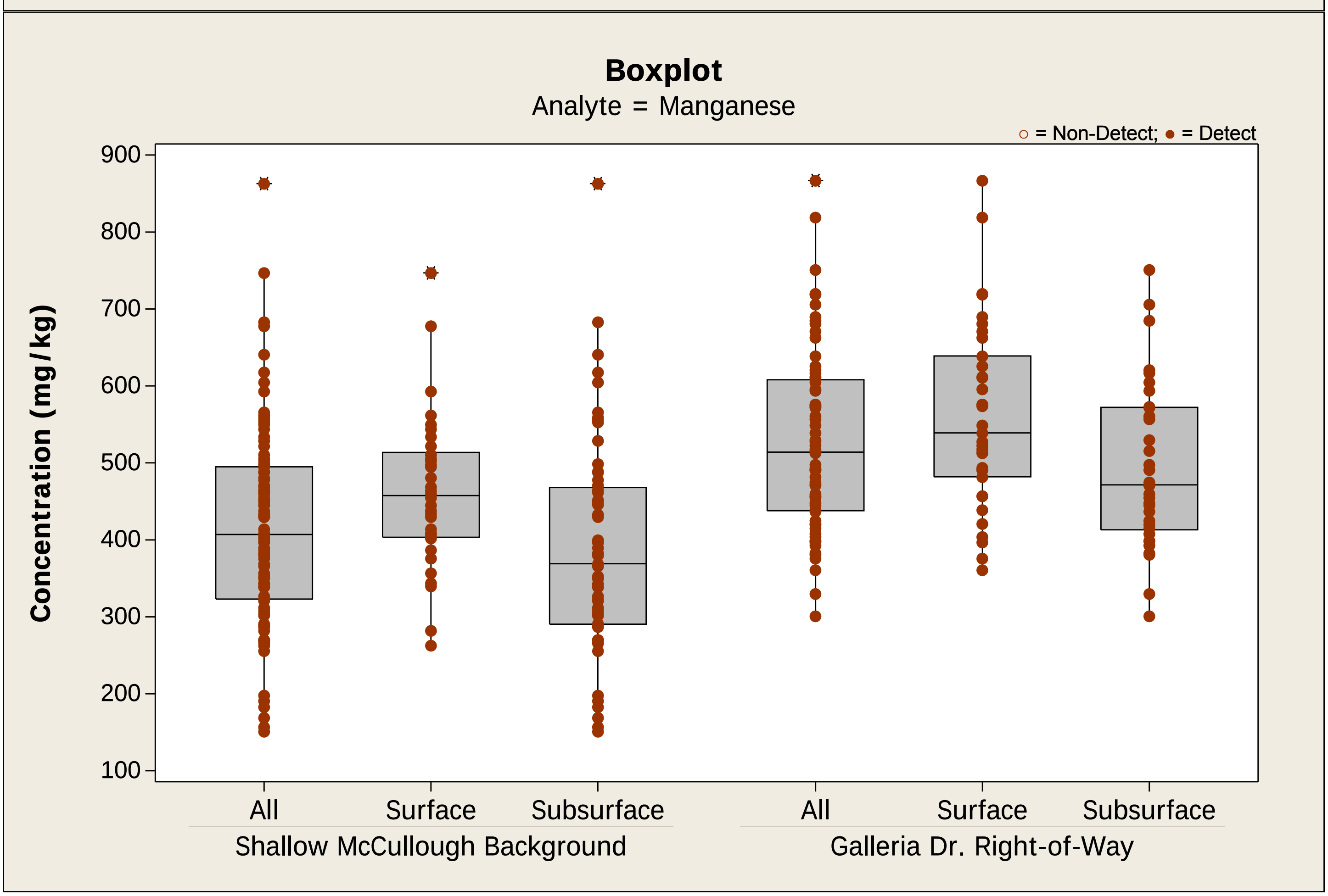

Probability Plot
Normal - 95% CI
Analyte = Lithium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
10
20
30
40
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

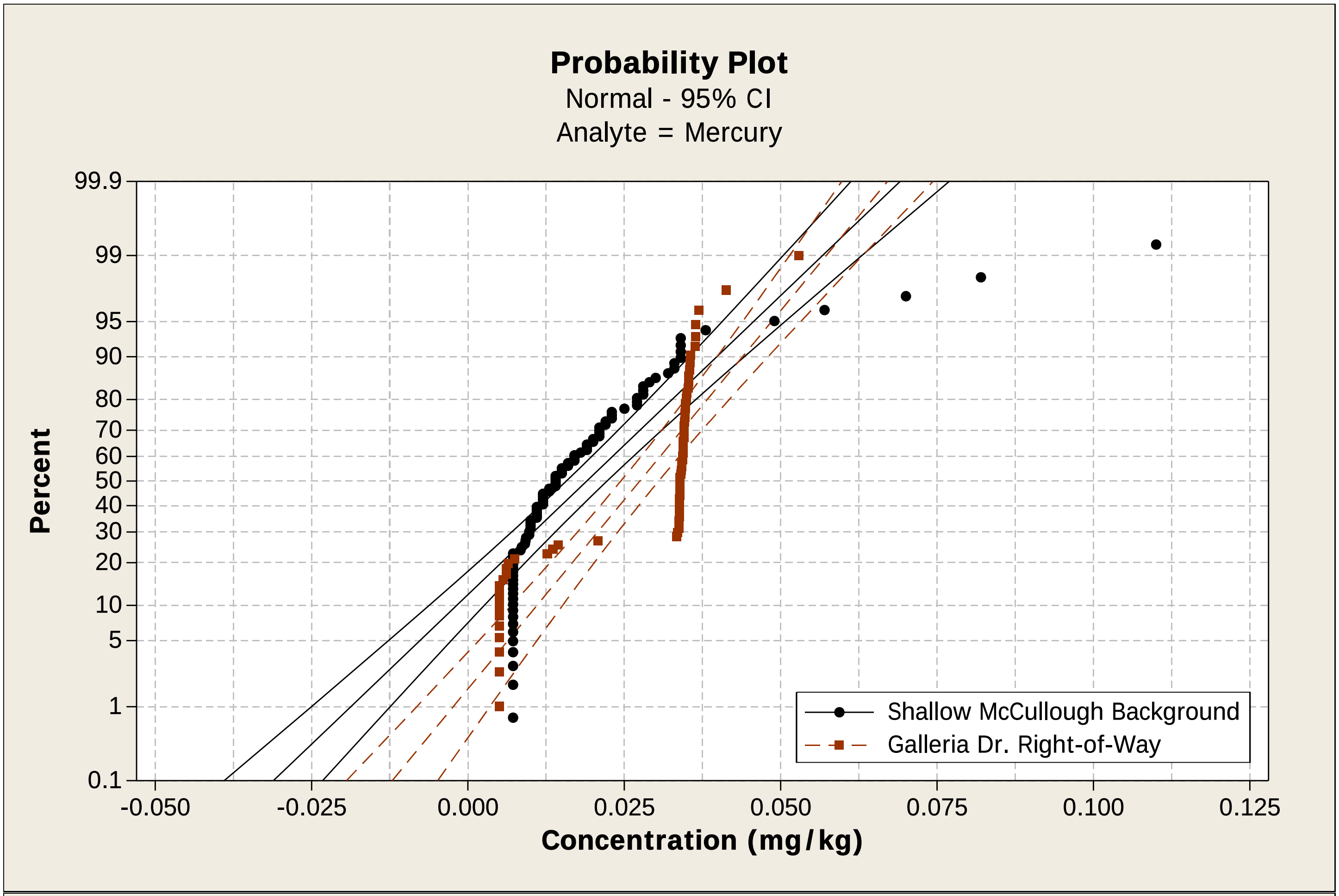

Boxplot
Analyte = Lithium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
35
30
25
20
15
10
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Magnesium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
5000
10000
15000
20000
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

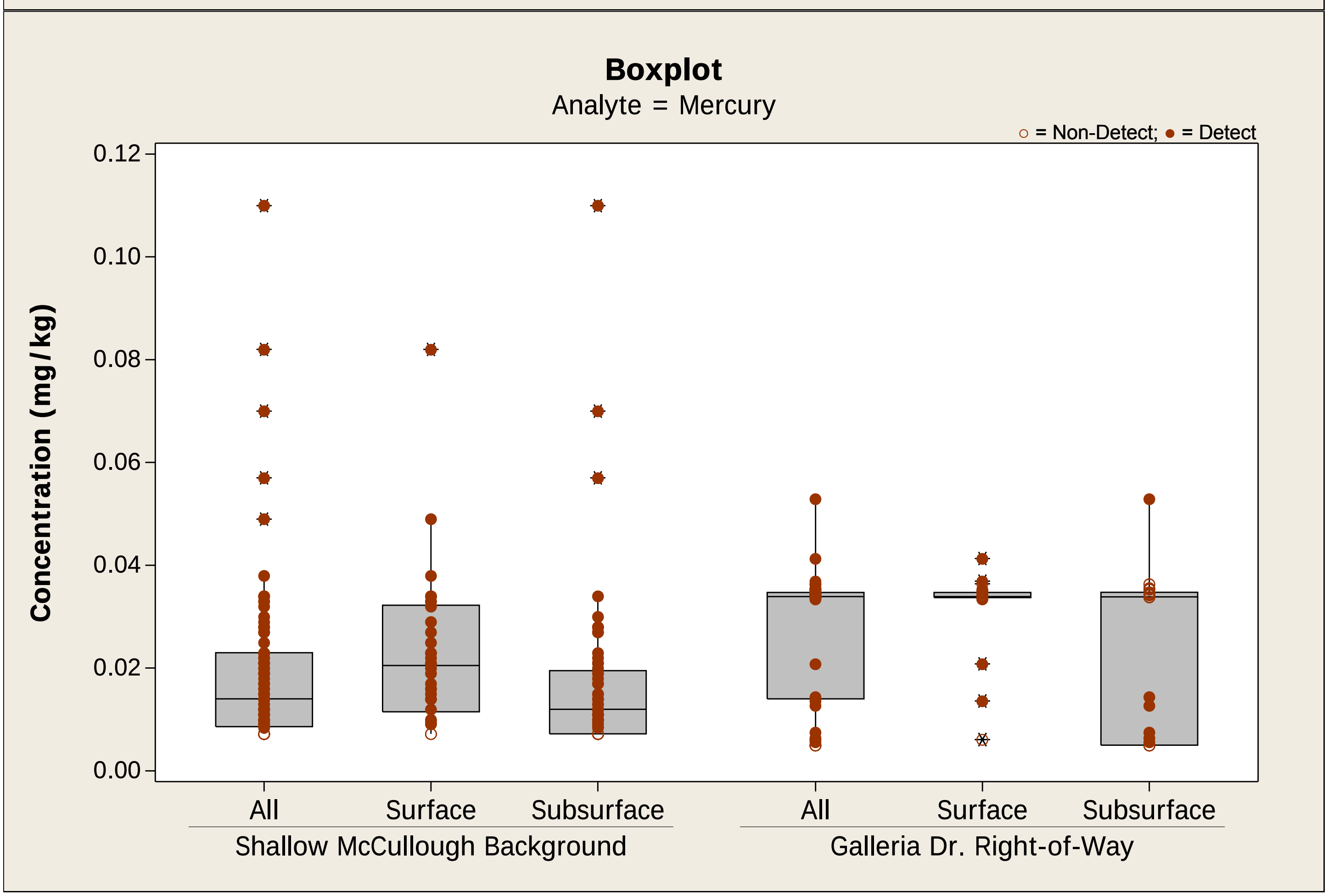

Boxplot
Analyte = Magnesium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
20000
17500
15000
12500
10000
7500
5000
All
Surface
Subsurface
Shallow McCullough Background
All
Surface
Subsurface
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Manganese
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
200
400
600
800
1000
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

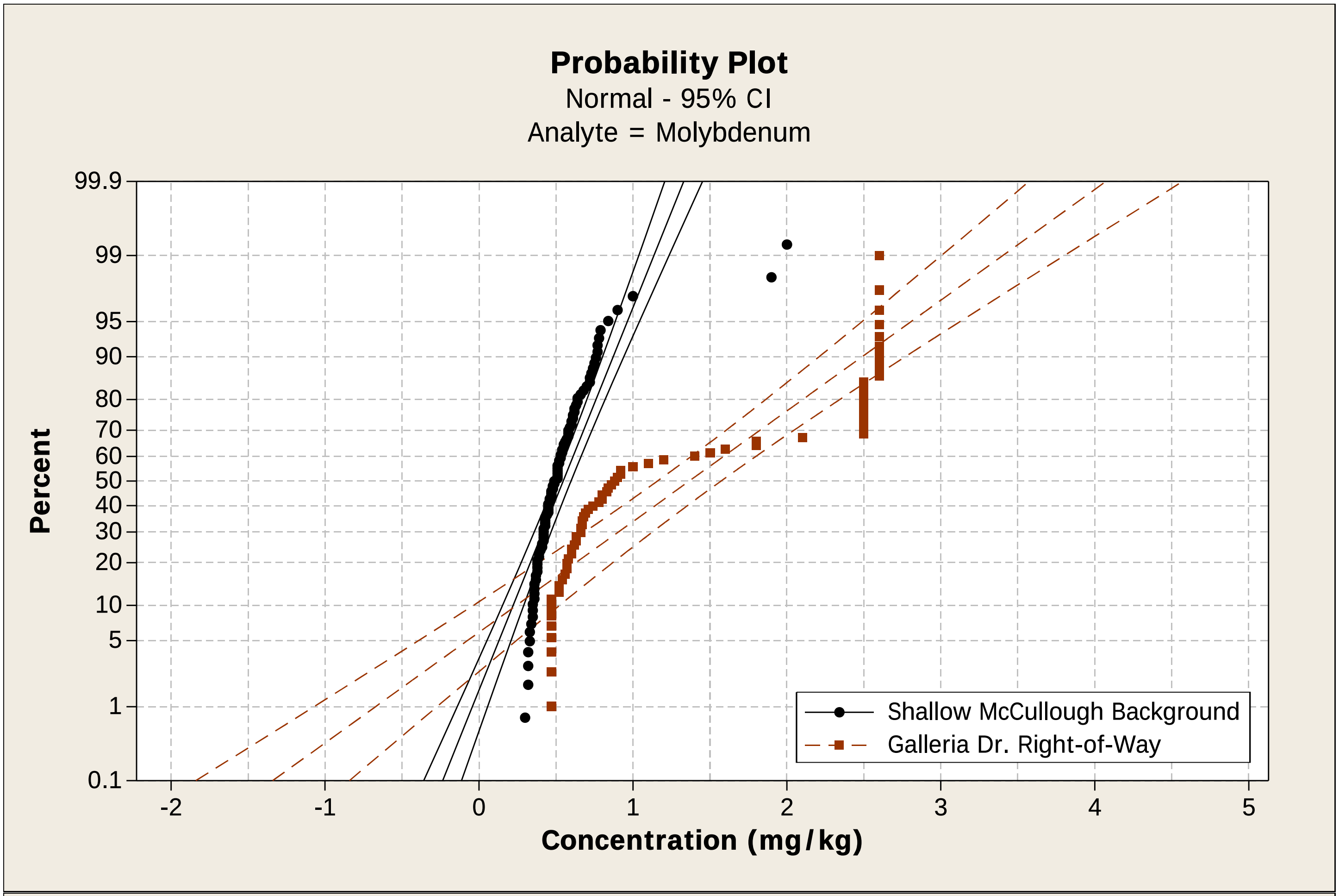

Boxplot
Analyte = Manganese
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
900
800
700
600
500
400
300
200
100
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



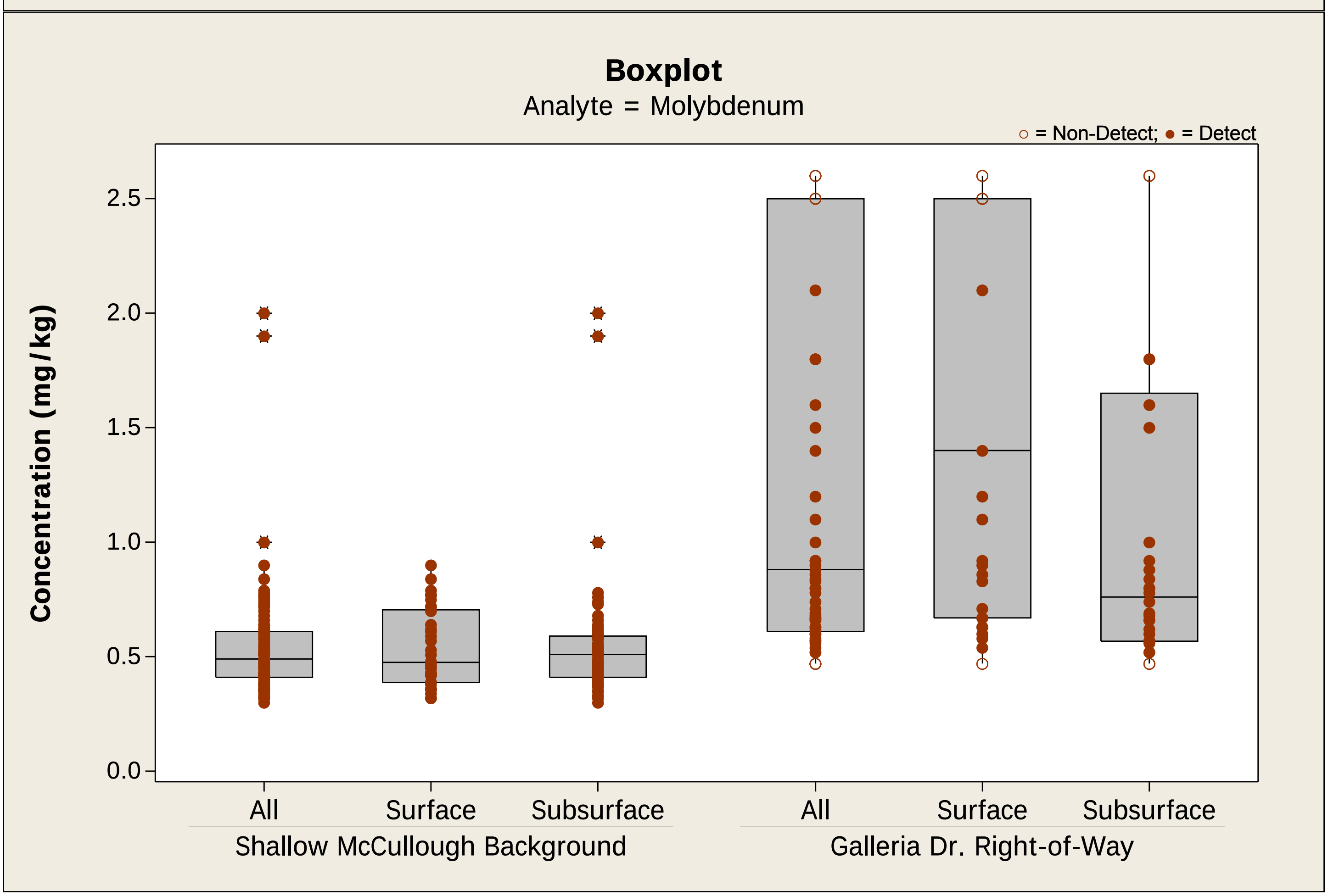
Probability Plot
Normal - 95% CI
Analyte = Mercury
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-0.050
-0.025
0.000
0.025
0.050
0.075
0.100
0.125
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



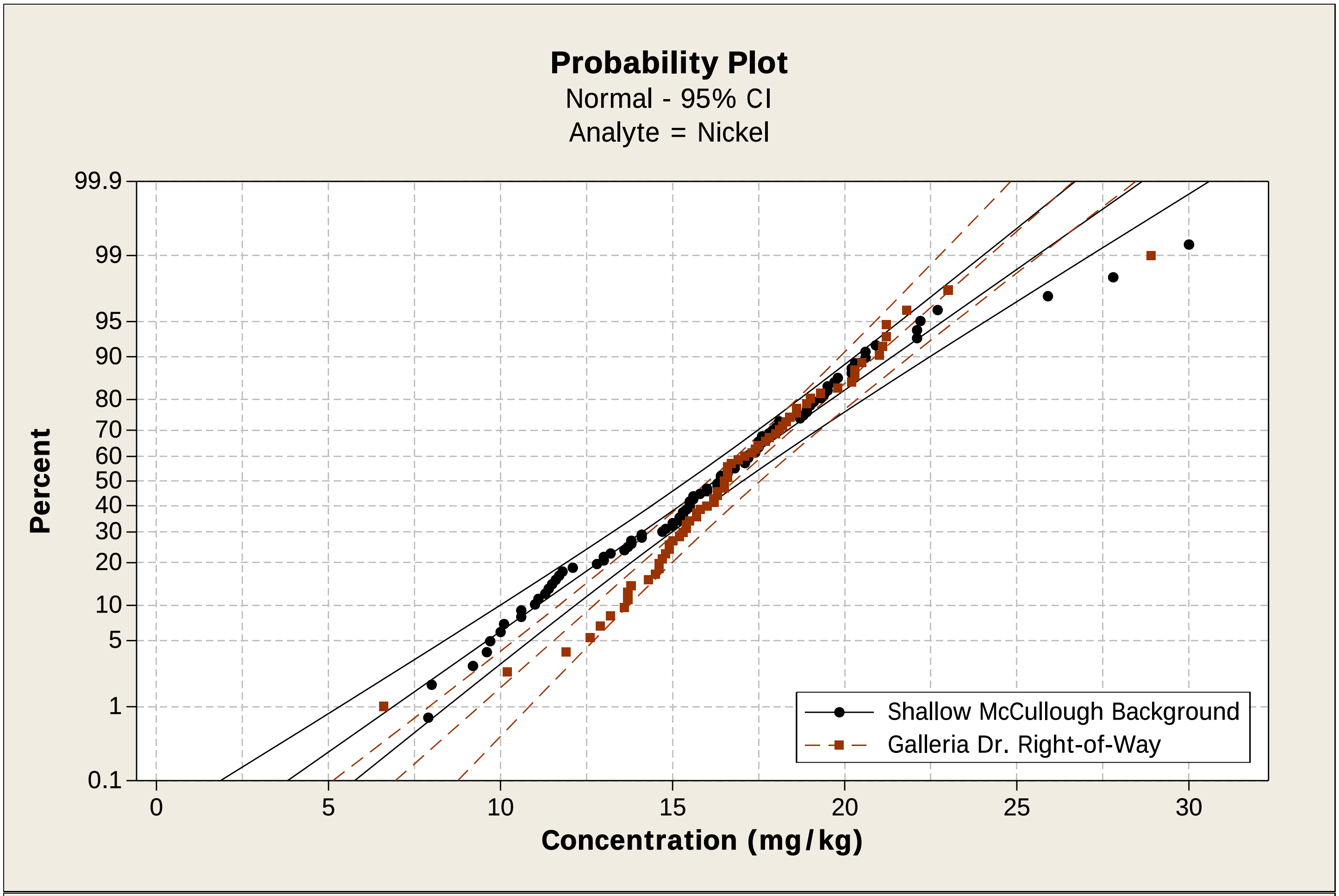
Boxplot
Analyte = Mercury
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
0.12
0.10
0.08
0.06
0.04
0.02
0.00
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



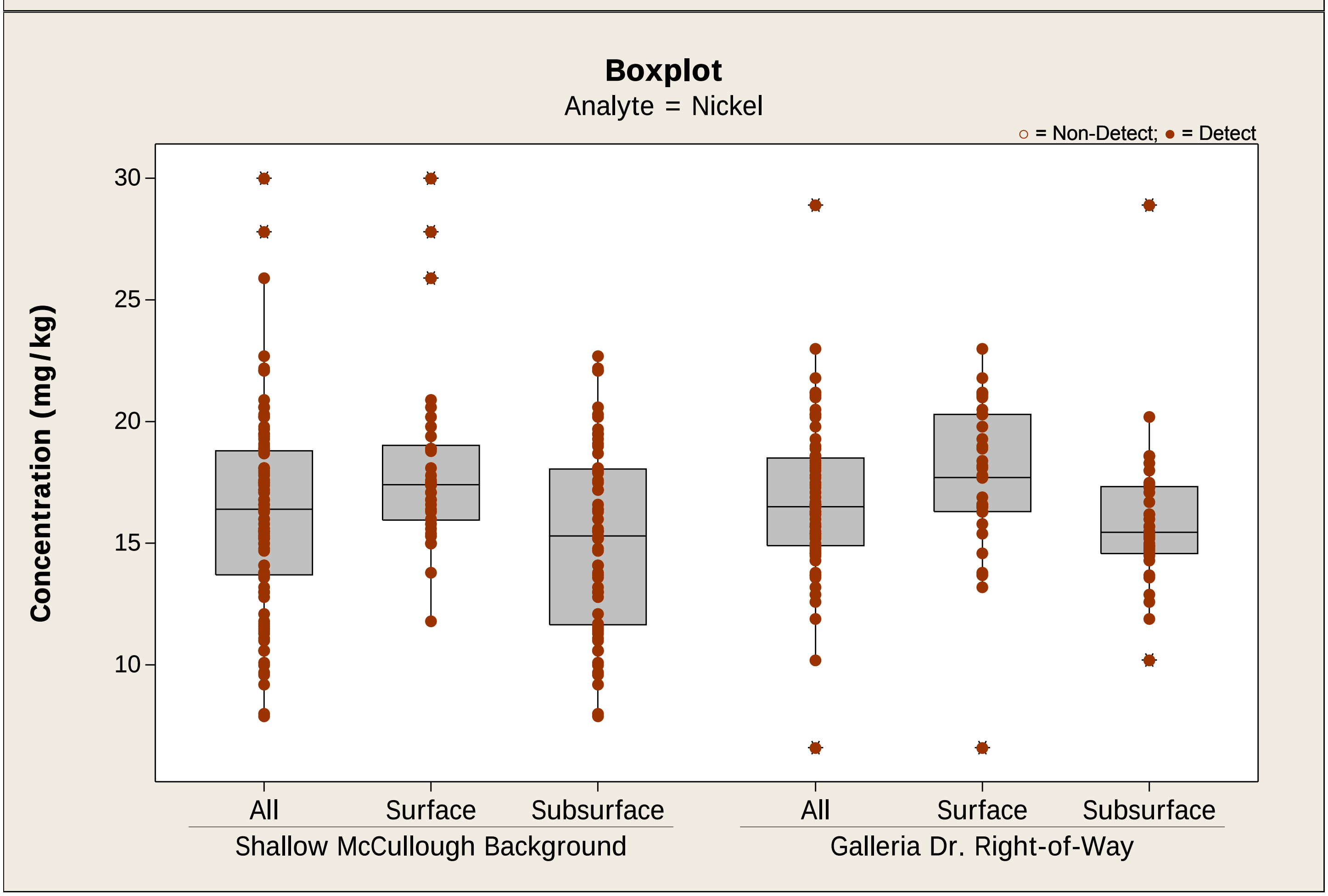
Probability Plot
Normal - 95% CI
Analyte = Molybdenum
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-2
-1
0
1
2
3
4
5
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



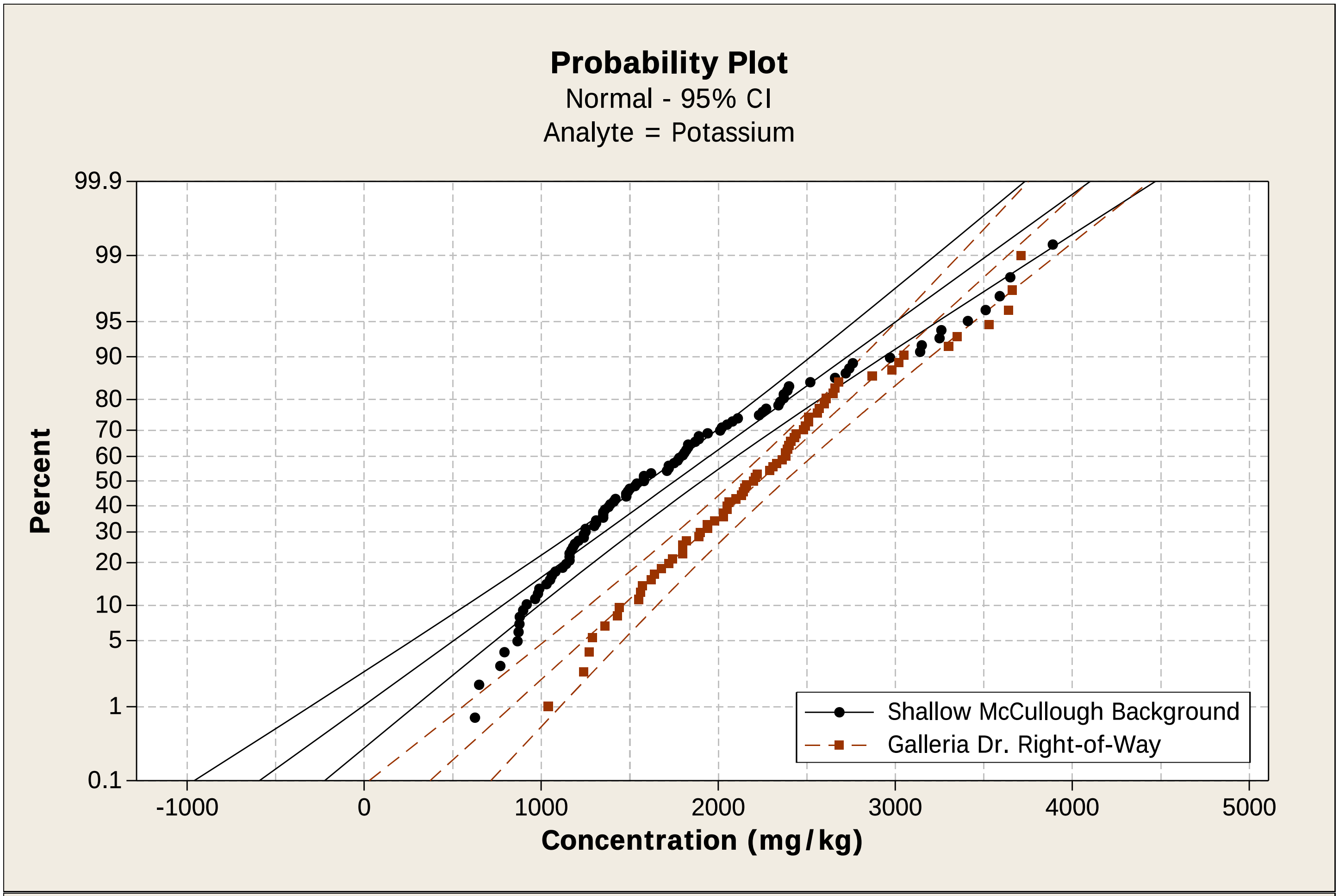
Boxplot
Analyte = Molybdenum
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
2.5
2.0
1.5
1.0
0.5
0.0
All
Surface
Subsurface
Shallow McCullough Background
All
Surface
Subsurface
Galleria Dr. Right-of-Way

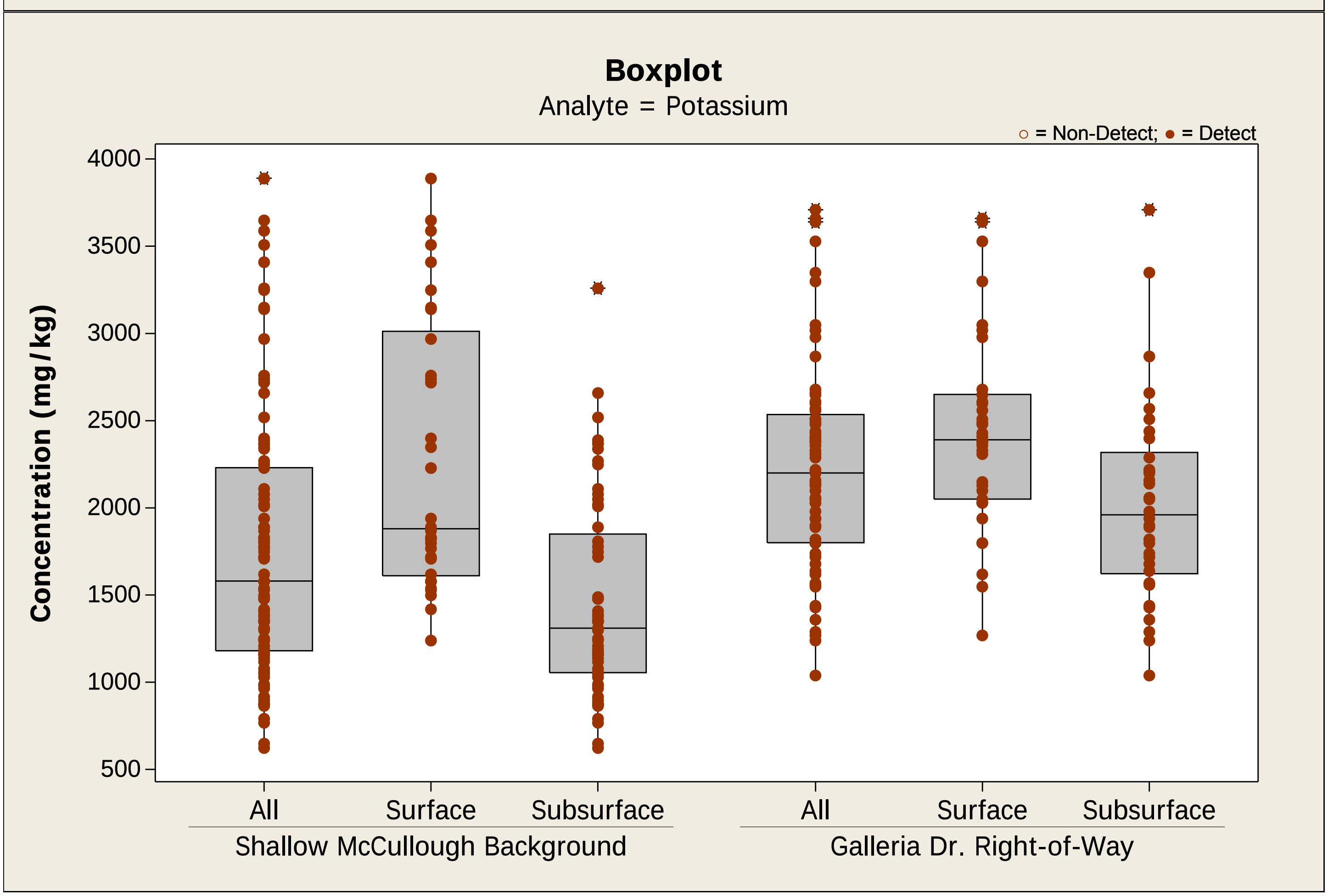


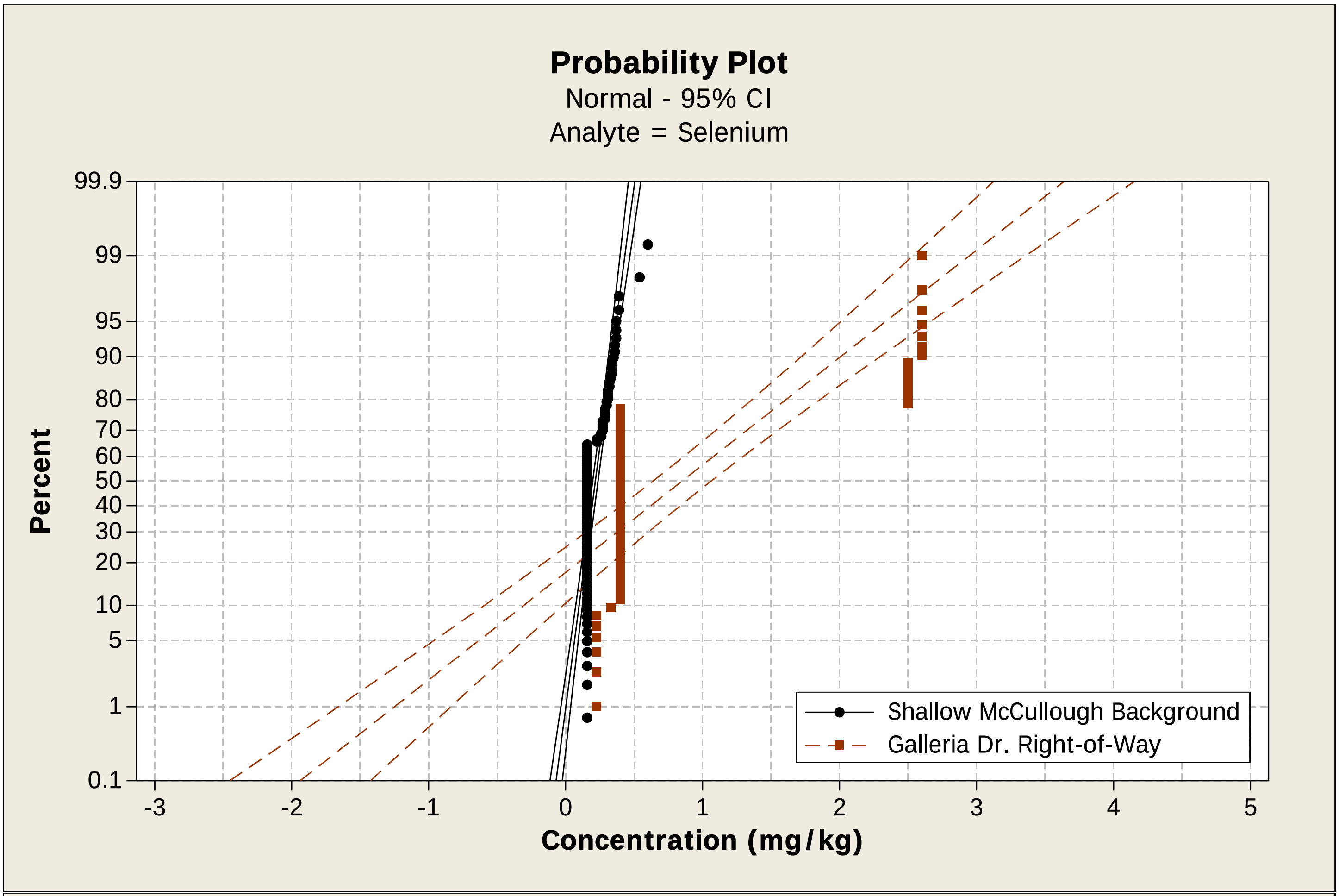
Probability Plot
Normal - 95% CI
Analyte = Nickel
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
5
10
15
20
25
30
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

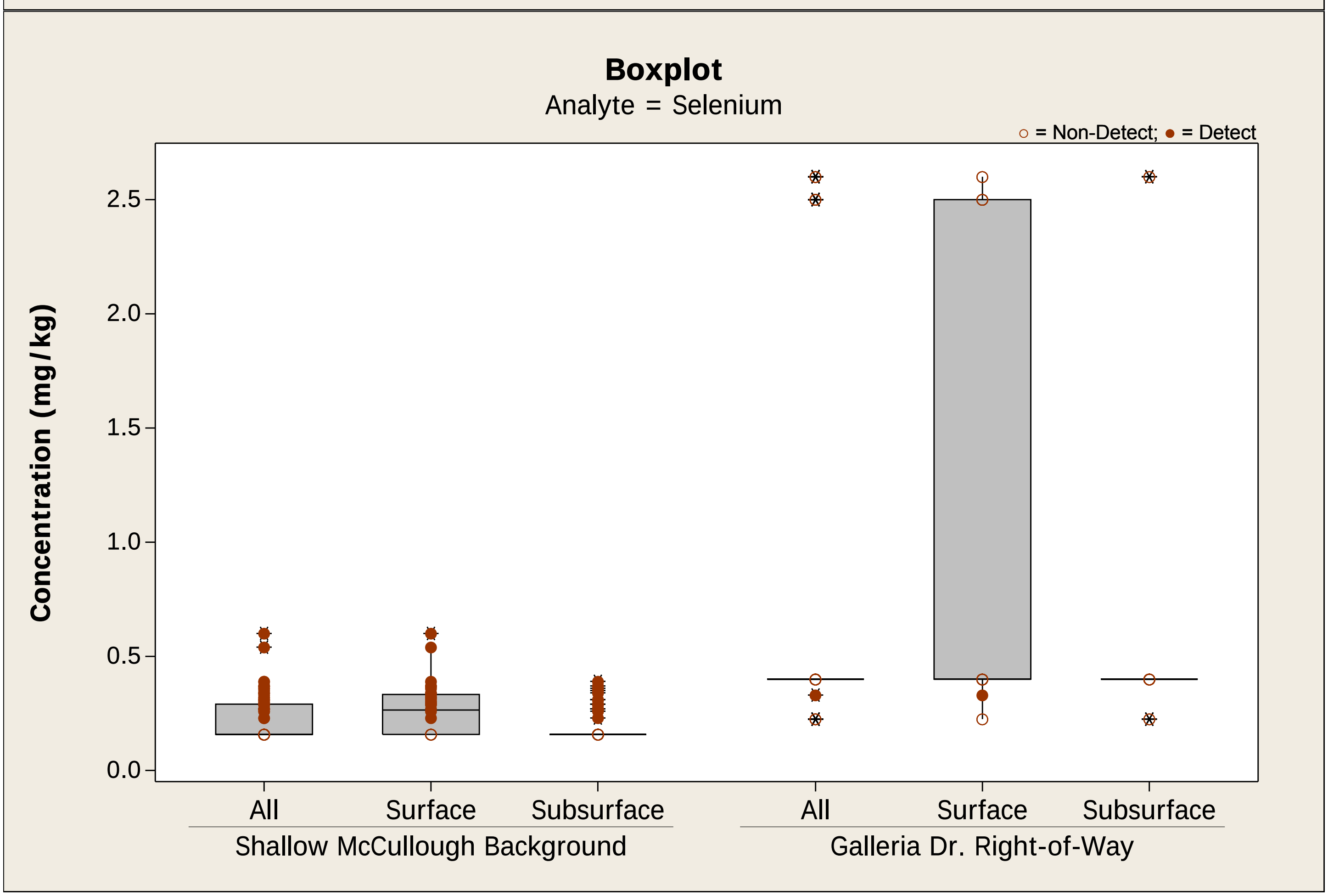


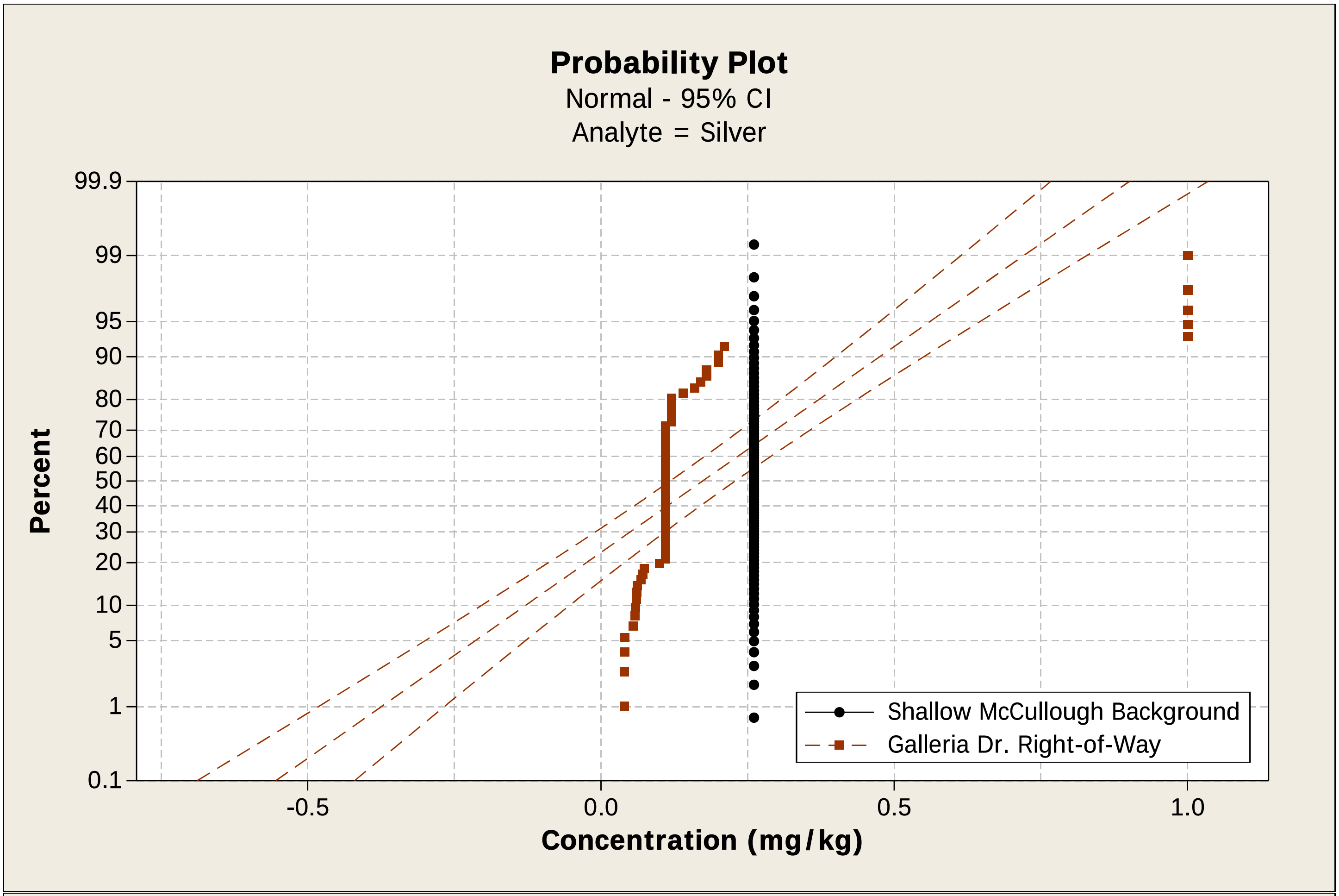
Boxplot
Analyte = Nickel
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
30
25
20
15
10
All
Surface
Subsurface
Shallow McCullough Background
All
Surface
Subsurface
Galleria Dr. Right-of-Way

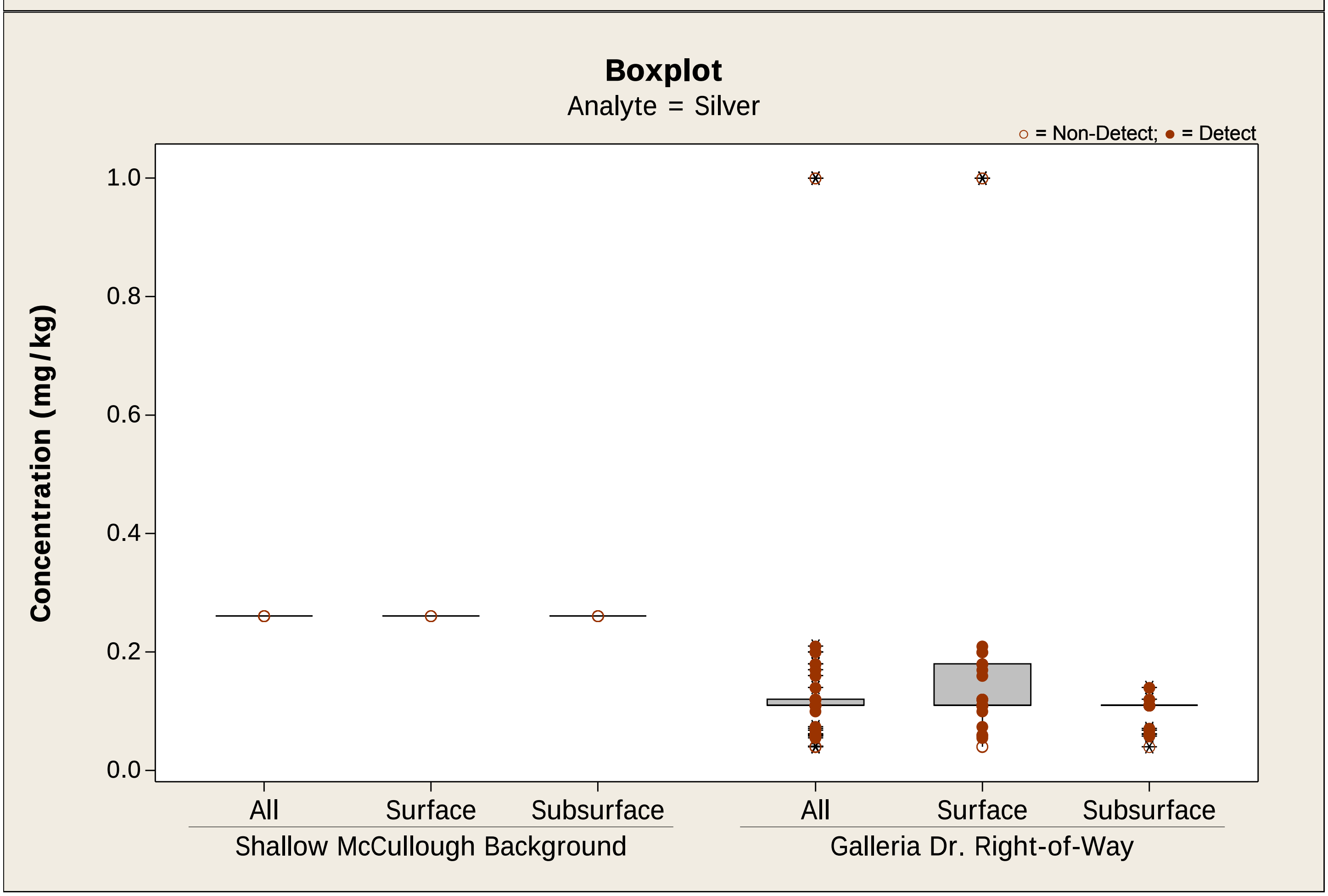

Probability Plot
Normal - 95% CI
Analyte = Potassium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-1000
0
1000
2000
3000
4000
5000
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

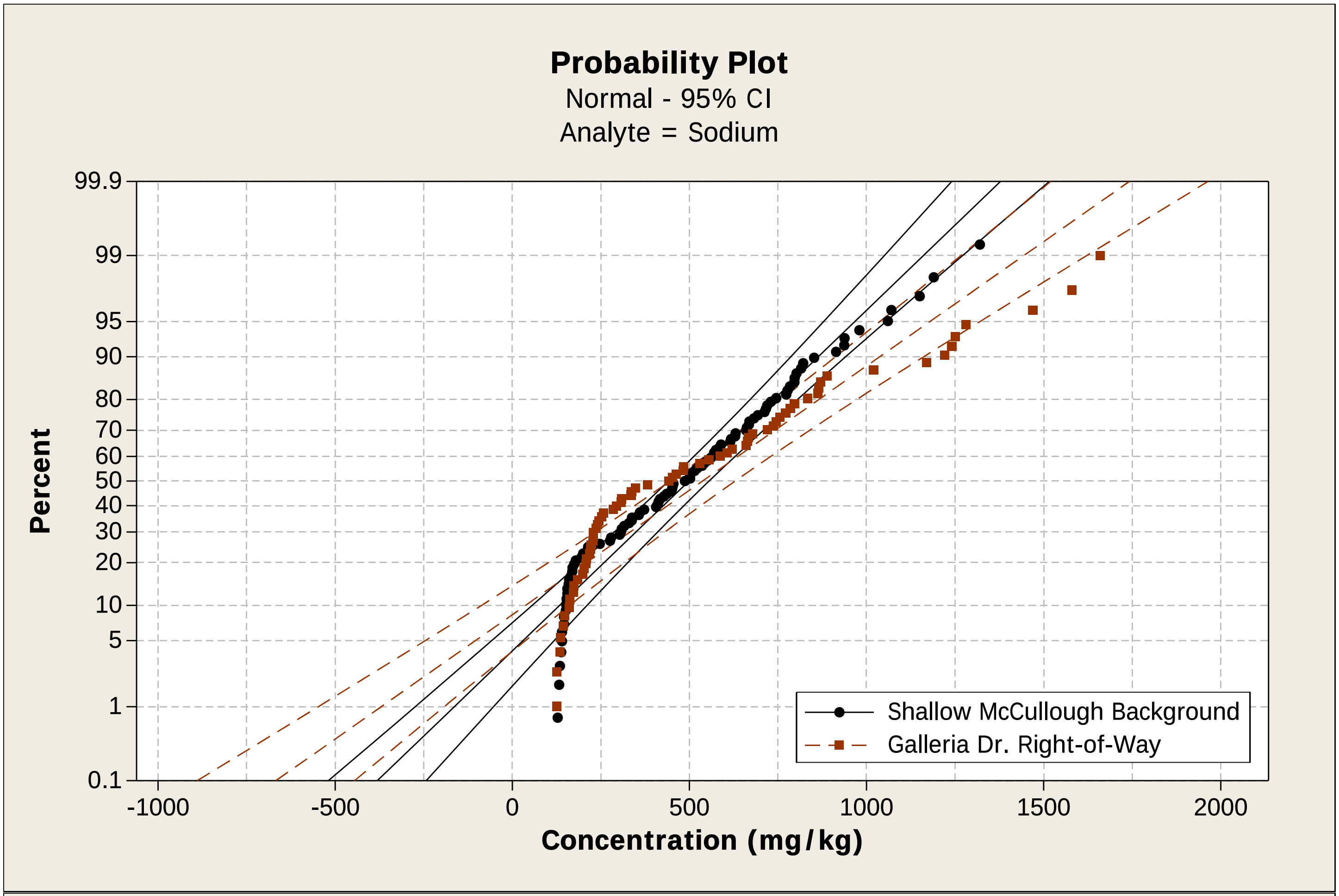

Boxplot
Analyte = Potassium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
4000
3500
3000
2500
2000
1500
1000
500
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Selenium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-3
-2
-1
0
1
2
3
4
5
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

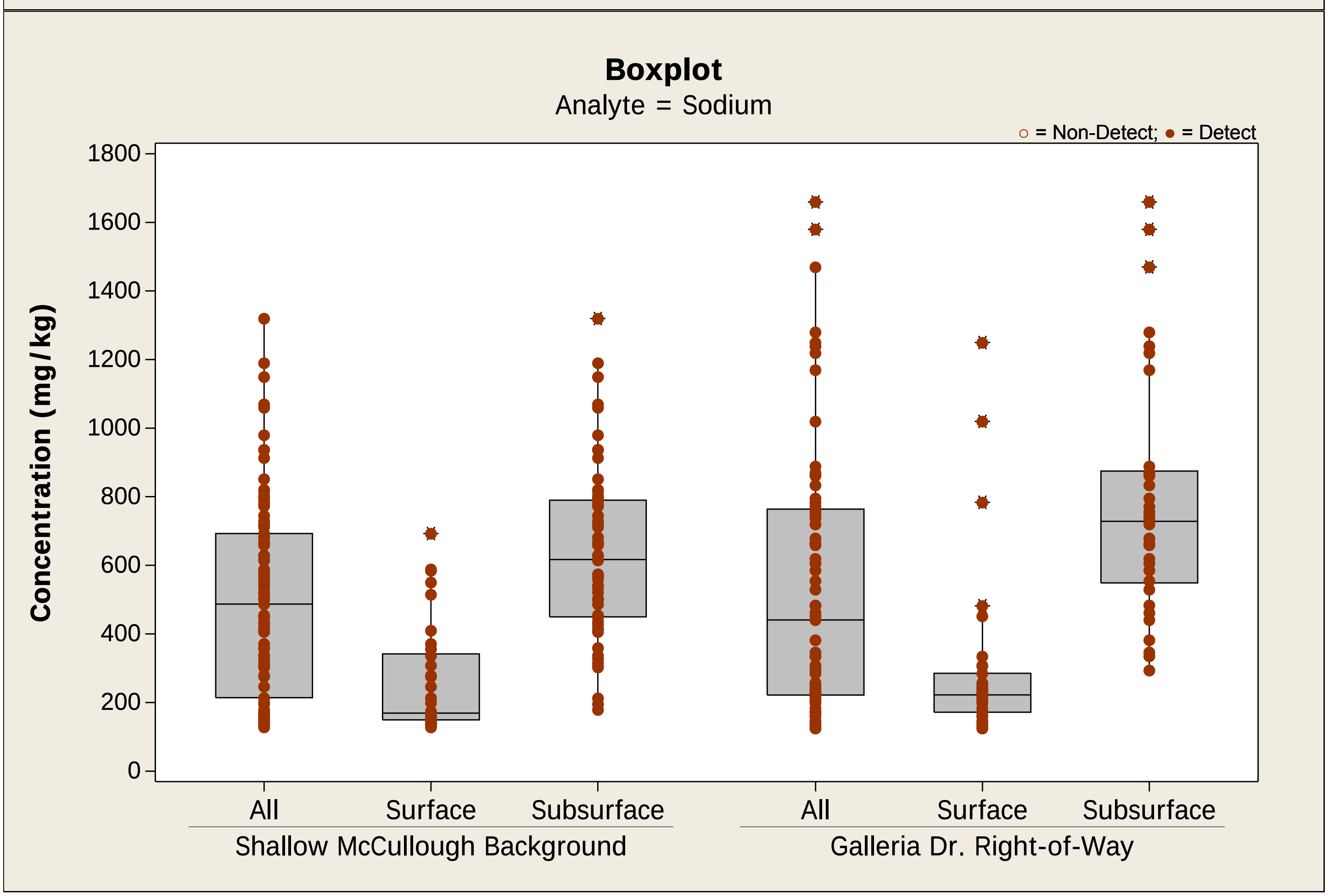

Boxplot
Analyte = Selenium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
2.5
2.0
1.5
1.0
0.5
0.0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Silver
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-0.5
0.0
0.5
1.0
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

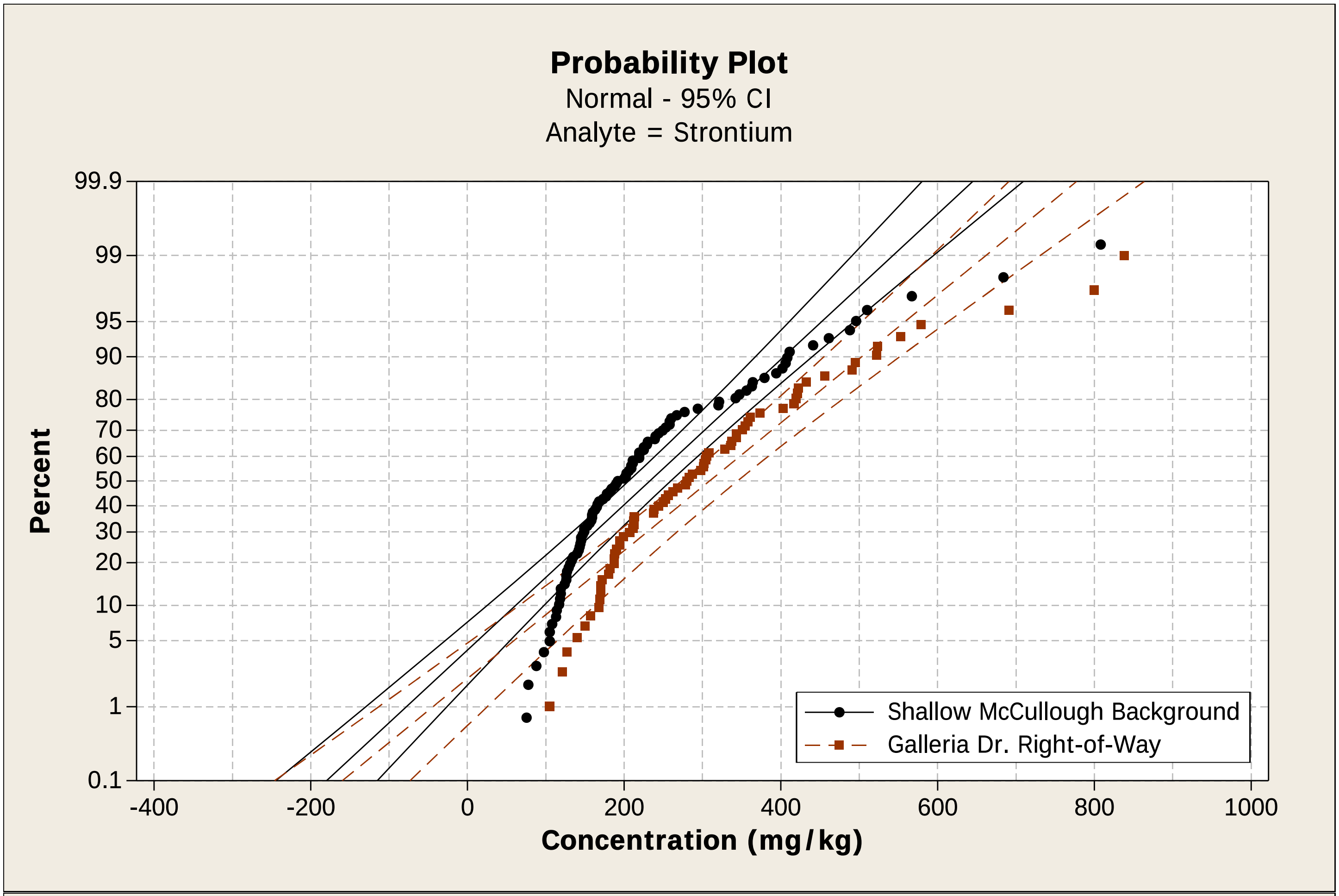

Boxplot
Analyte = Silver
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
1.0
0.8
0.6
0.4
0.2
0.0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way

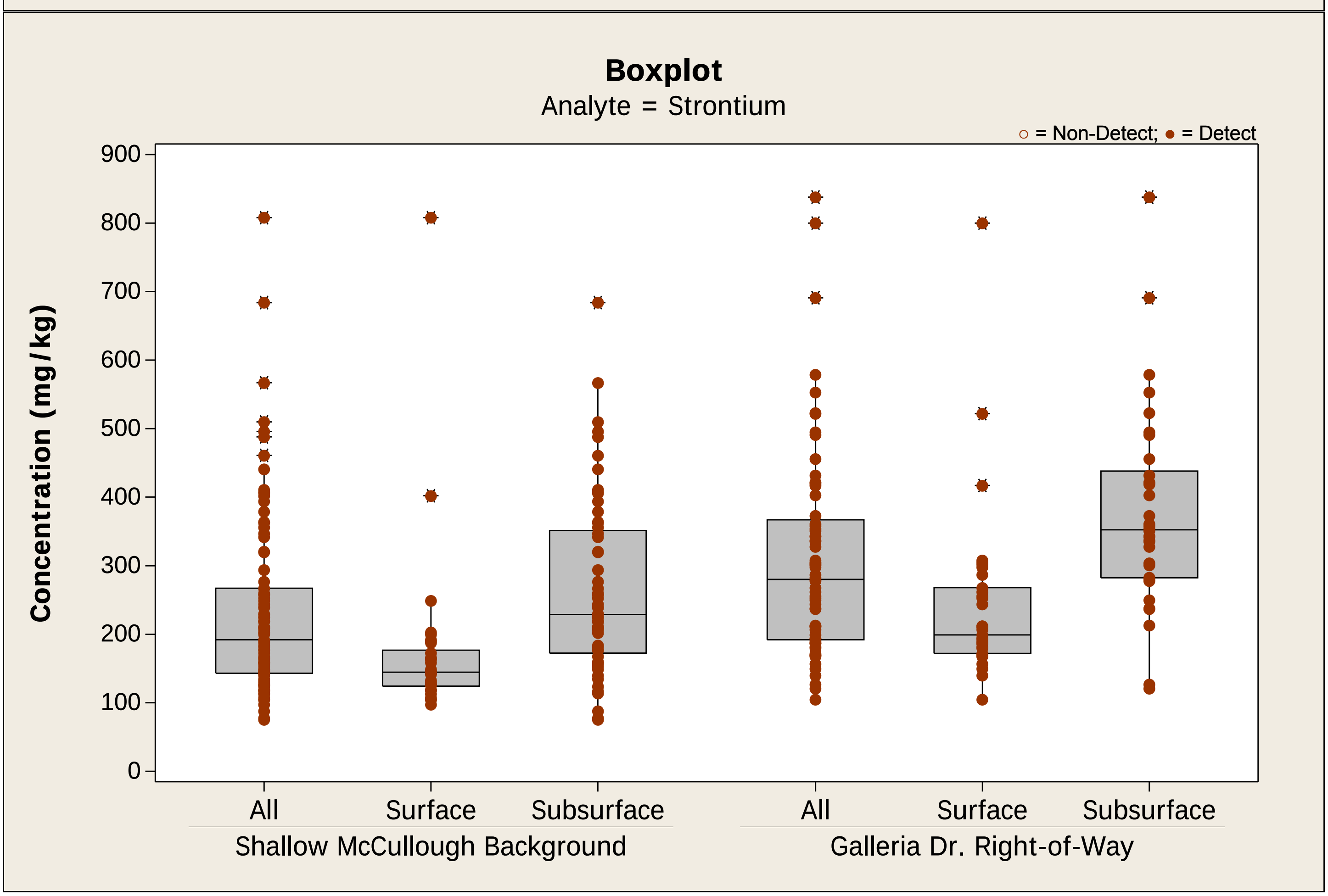


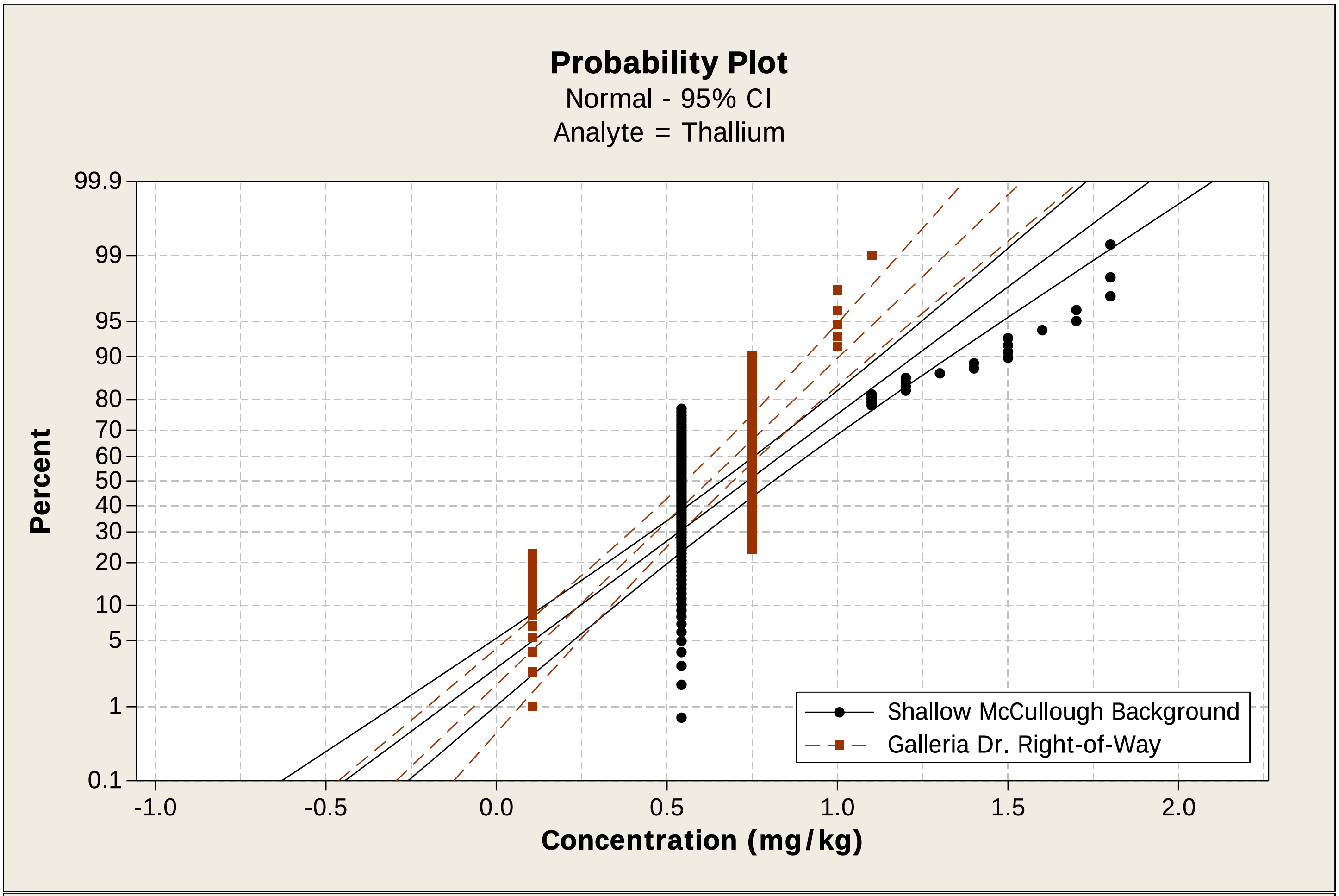
Probability Plot
Normal - 95% CI
Analyte = Sodium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-1000
-500
0
500
1000
1500
2000
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



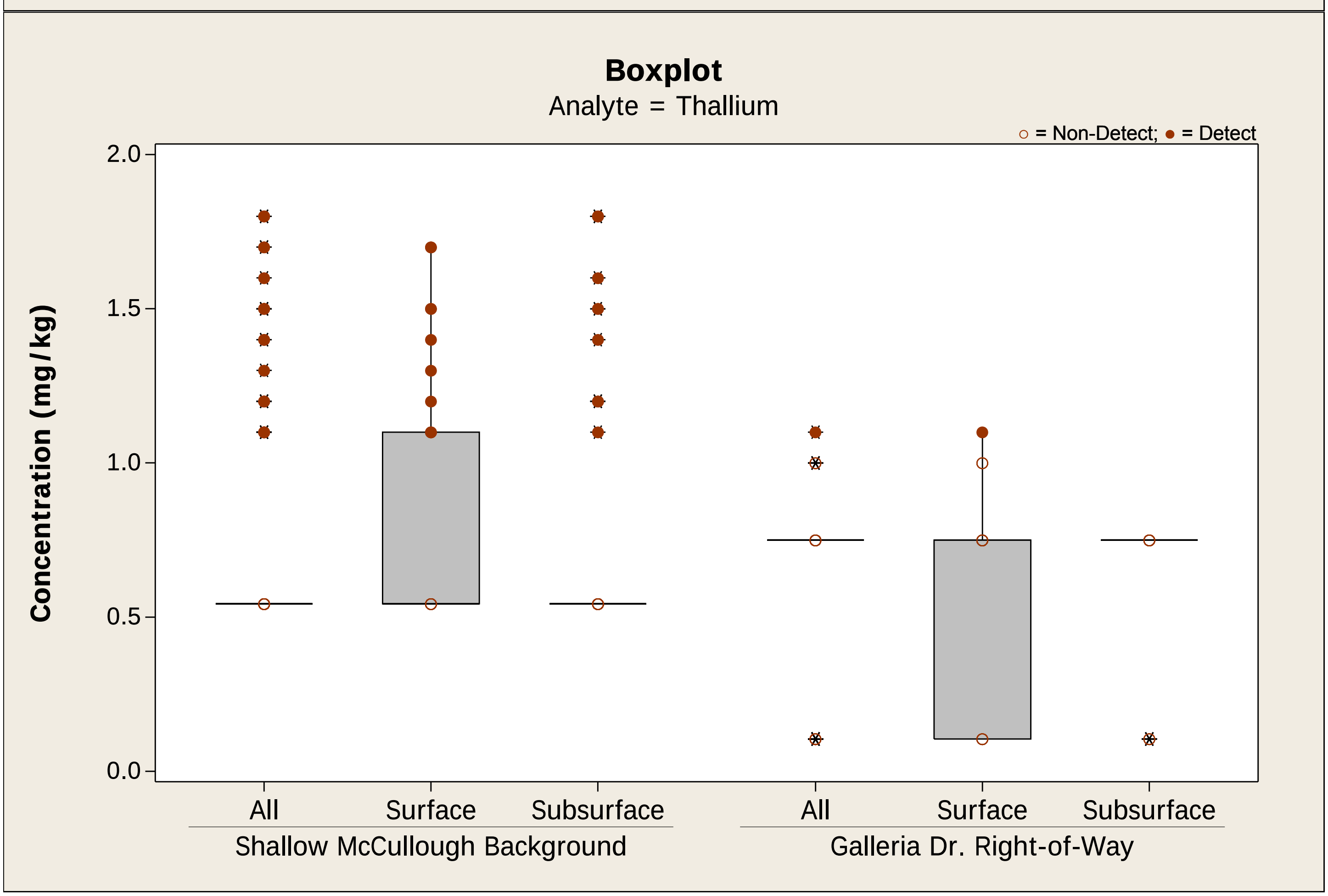
Boxplot
Analyte = Sodium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
1800
1600
1400
1200
1000
800
600
400
200
0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Strontium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-400
-200
0
200
400
600
800
1000
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

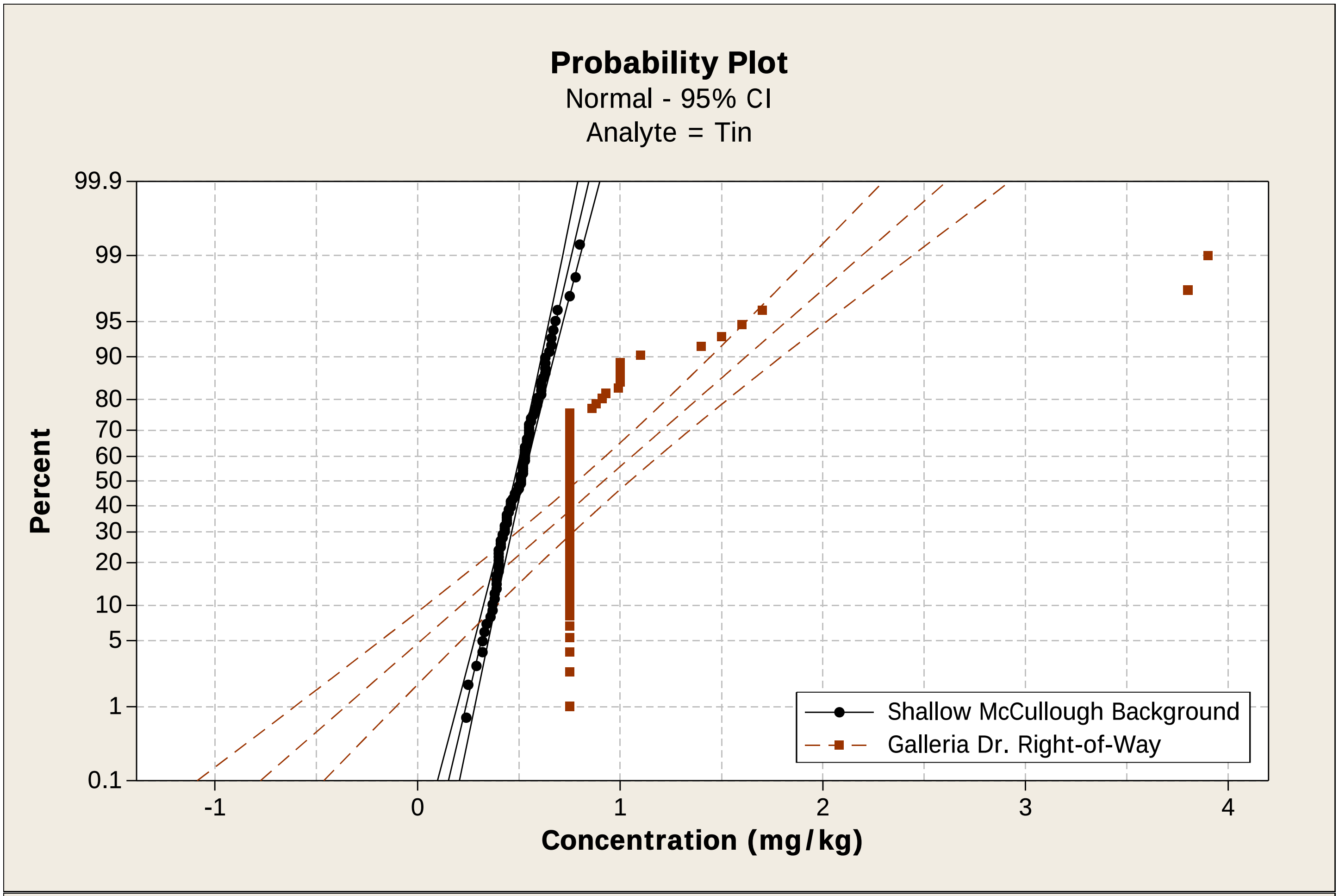

Boxplot
Analyte = Strontium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
900
800
700
600
500
400
300
200
100
0
All
Surface
Subsurface
Shallow McCullough Background
All
Surface
Subsurface
Galleria Dr. Right-of-Way

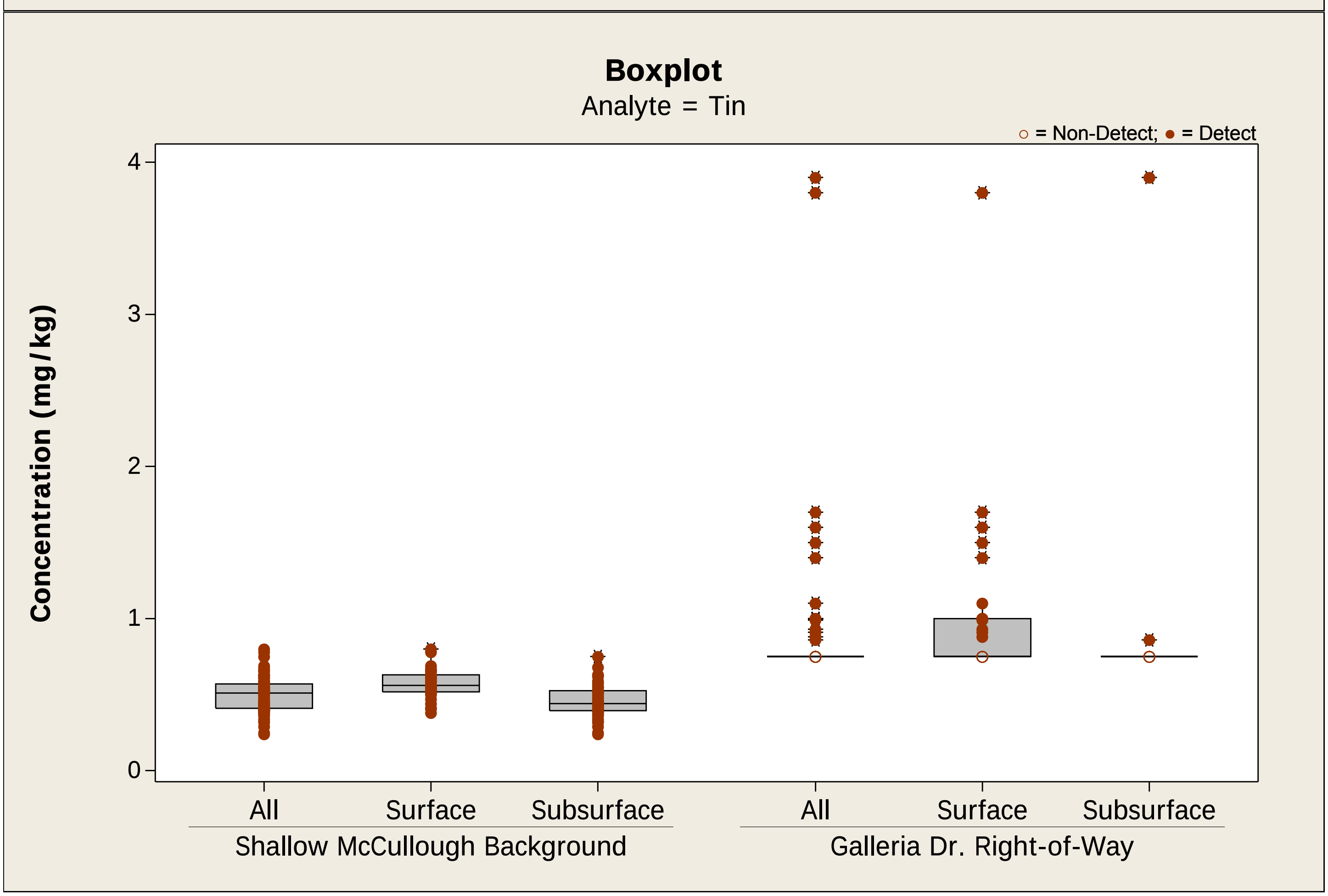


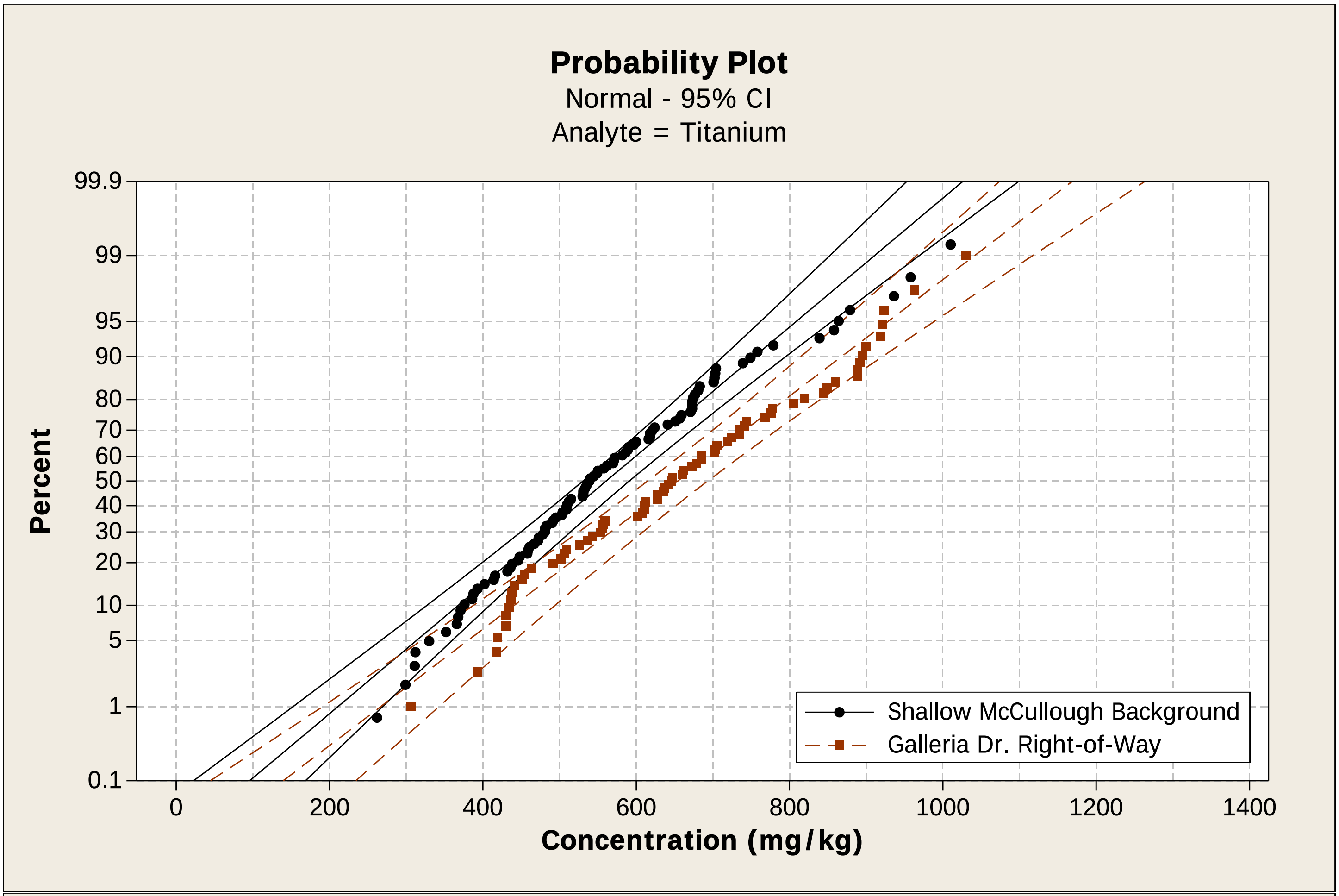
Probability Plot
Normal - 95% CI
Analyte = Thallium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



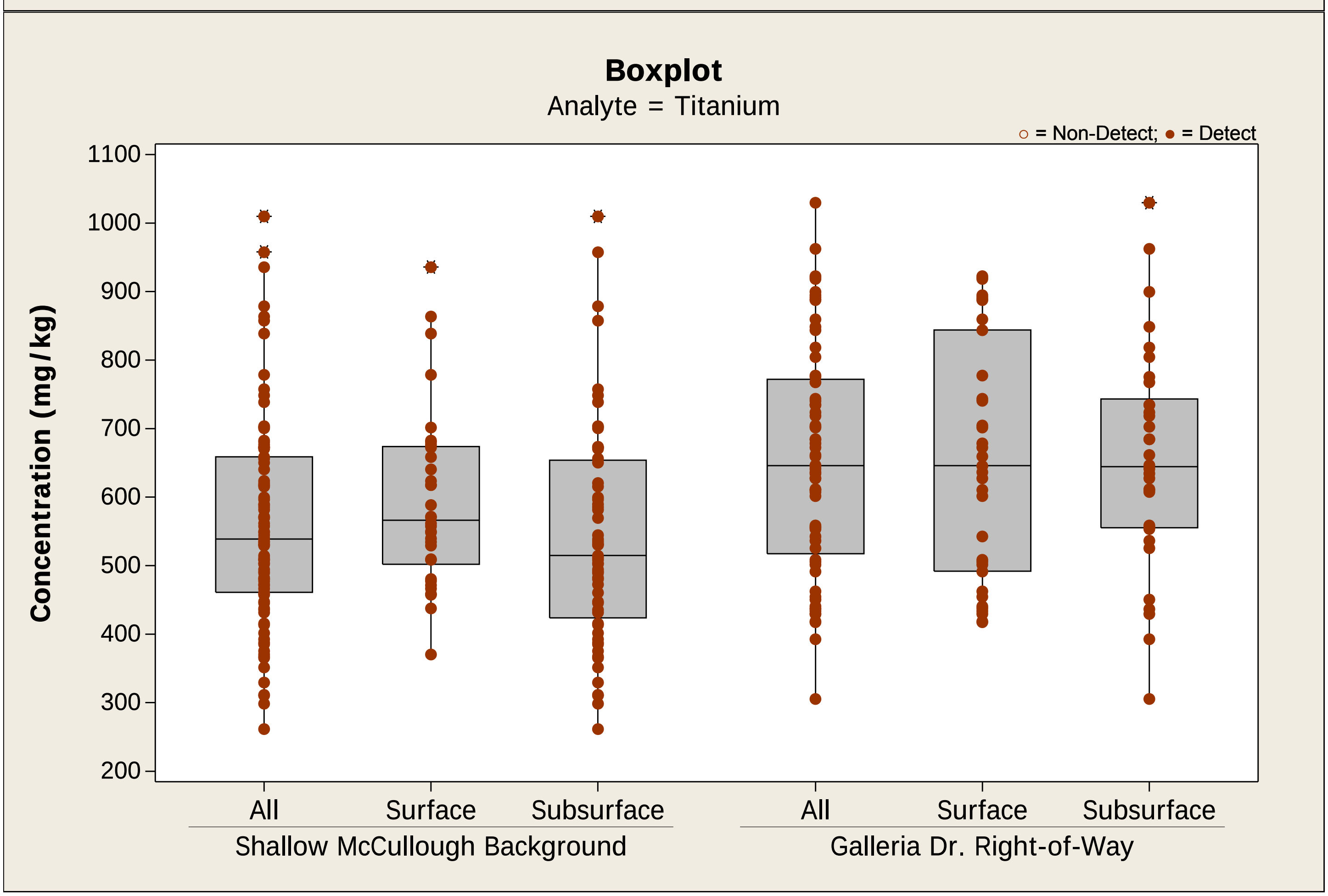
Boxplot
Analyte = Thallium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
2.0
1.5
1.0
0.5
0.0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Tin
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-1
0
1
2
3
4
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

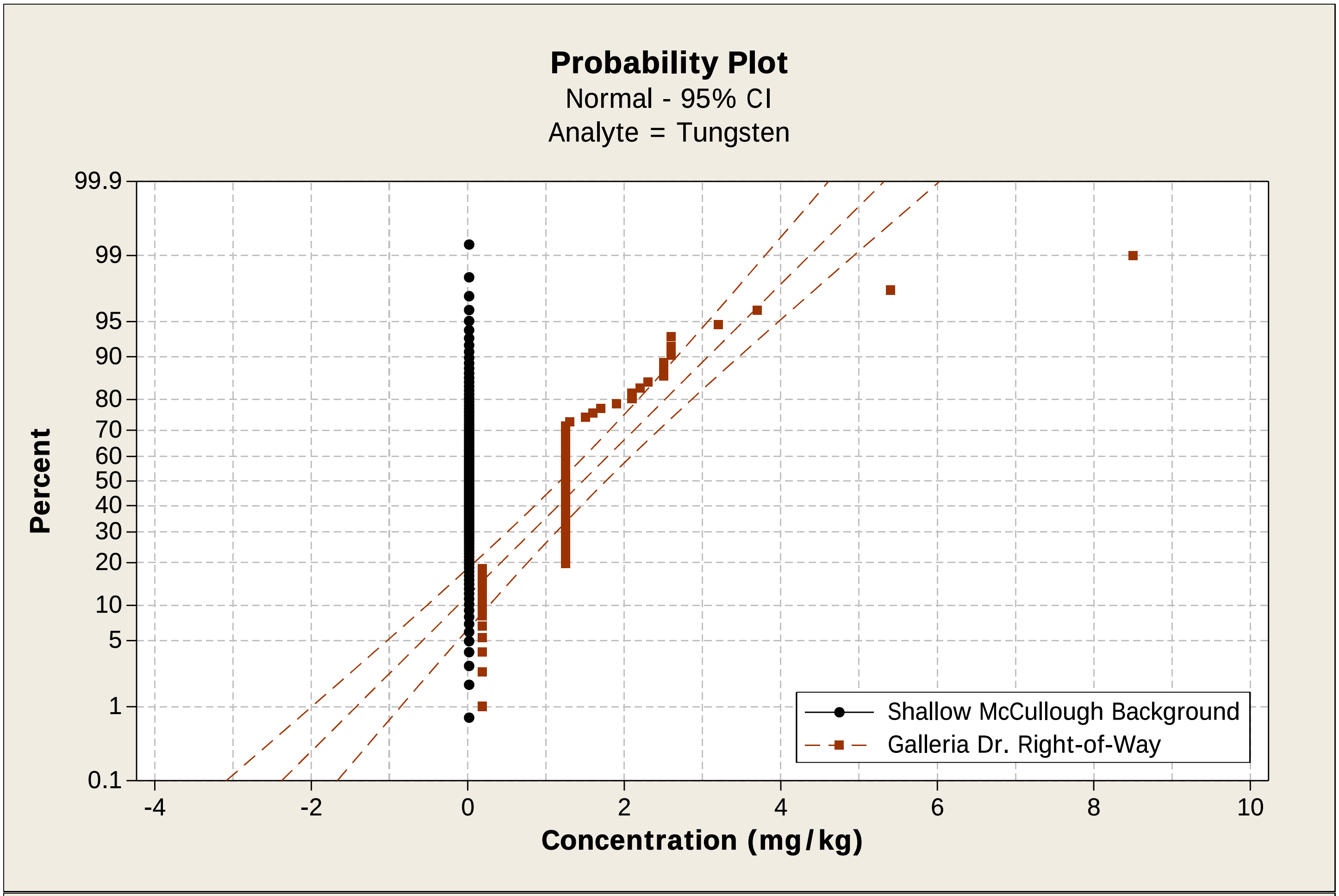

Boxplot
Analyte = Tin
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
4
3
2
1
0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



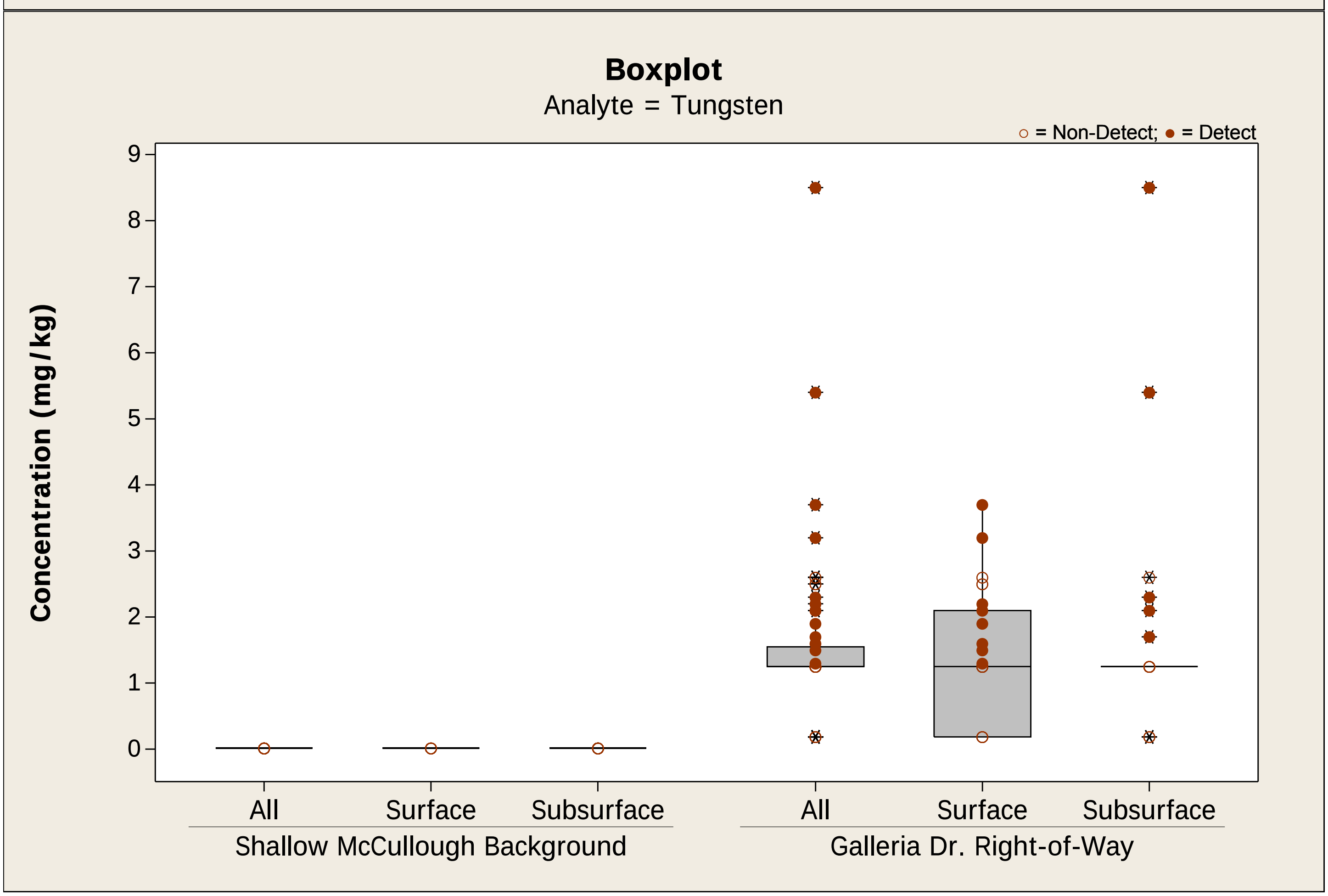
Probability Plot
Normal - 95% CI
Analyte = Titanium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
200
400
600
800
1000
1200
1400
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



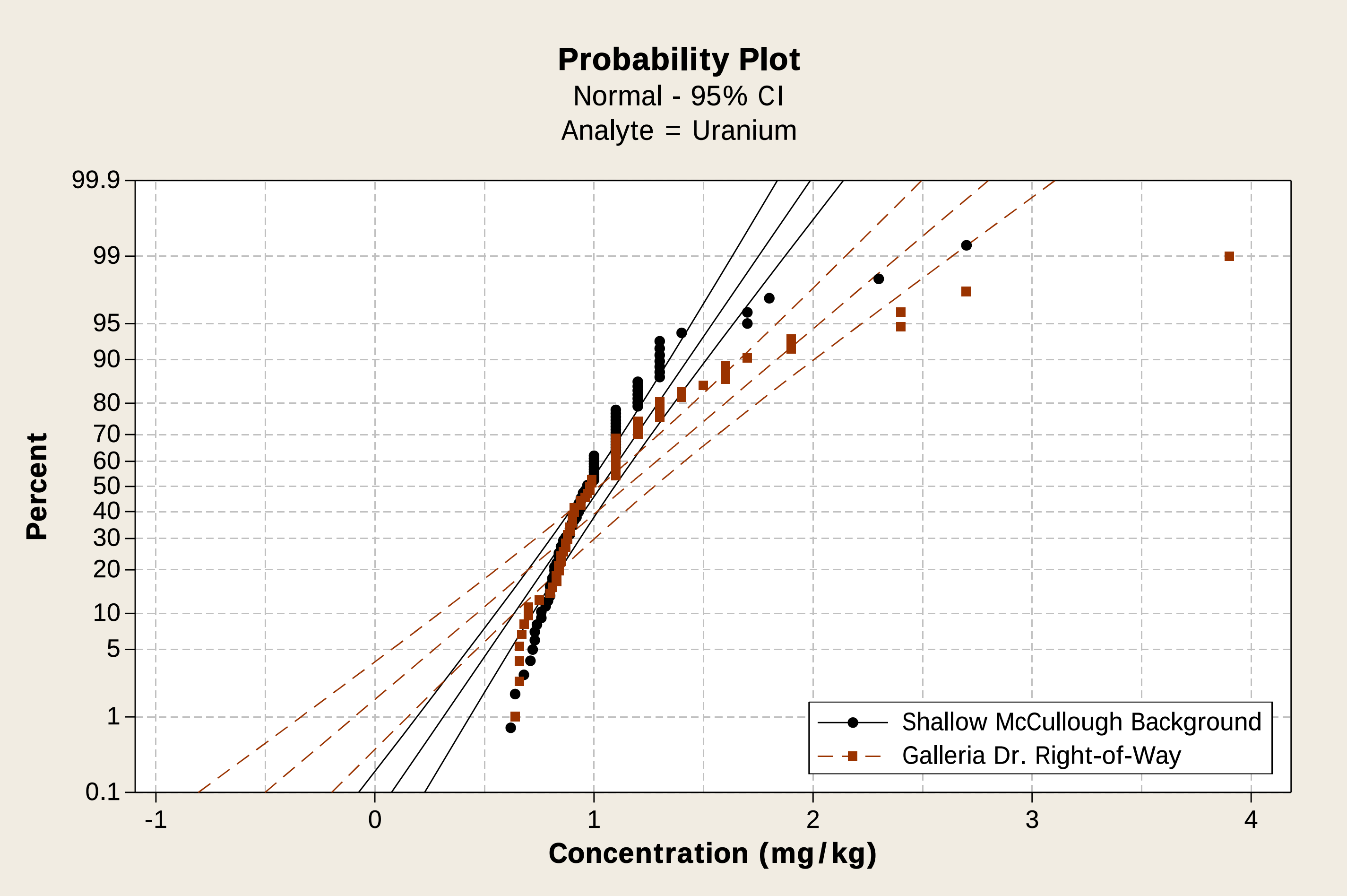
Boxplot
Analyte = Titanium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
1100
1000
900
800
700
600
500
400
300
200
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



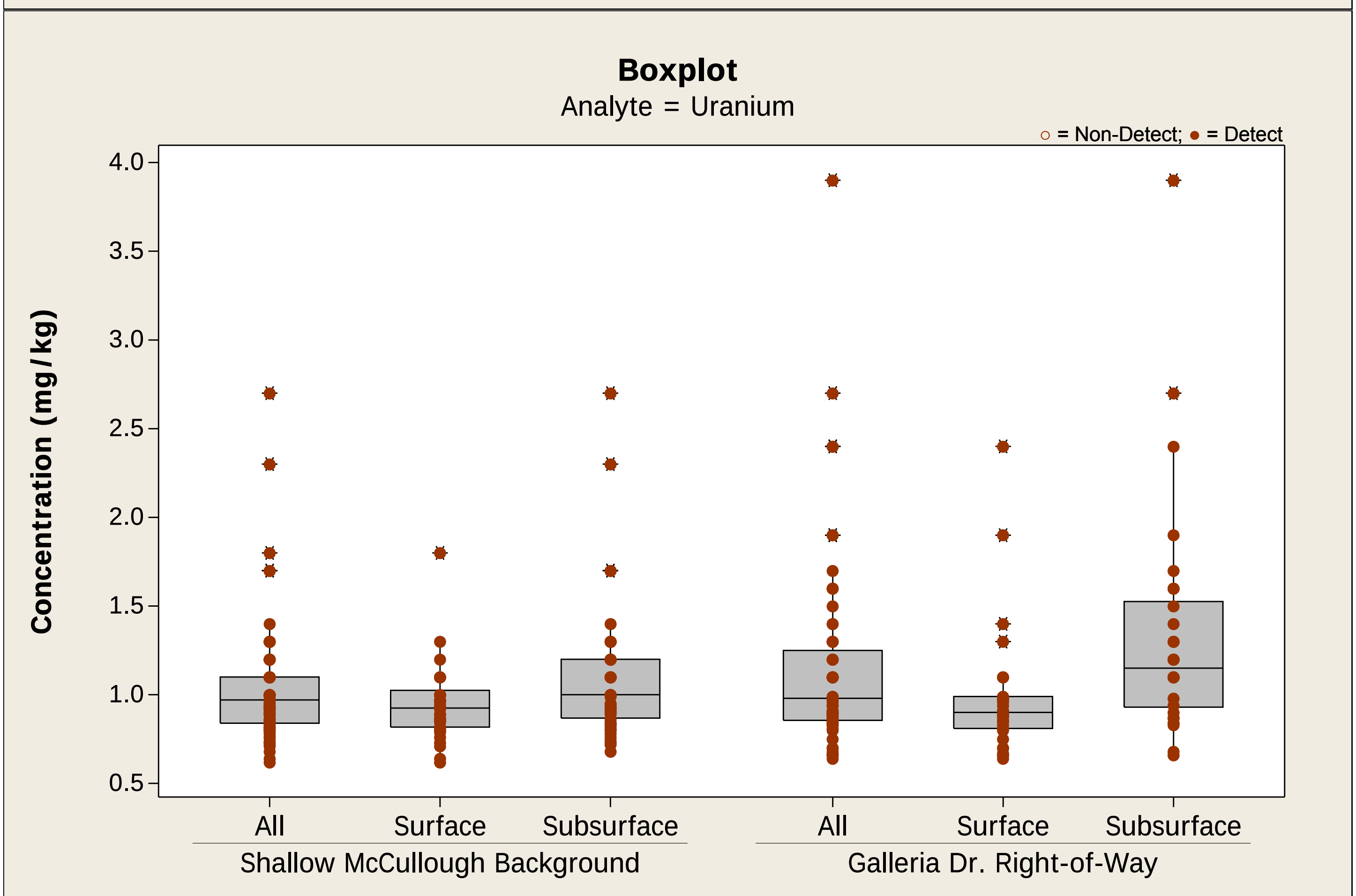
Probability Plot
Normal - 95% CI
Analyte = Tungsten
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-4
-2
0
2
4
6
8
10
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



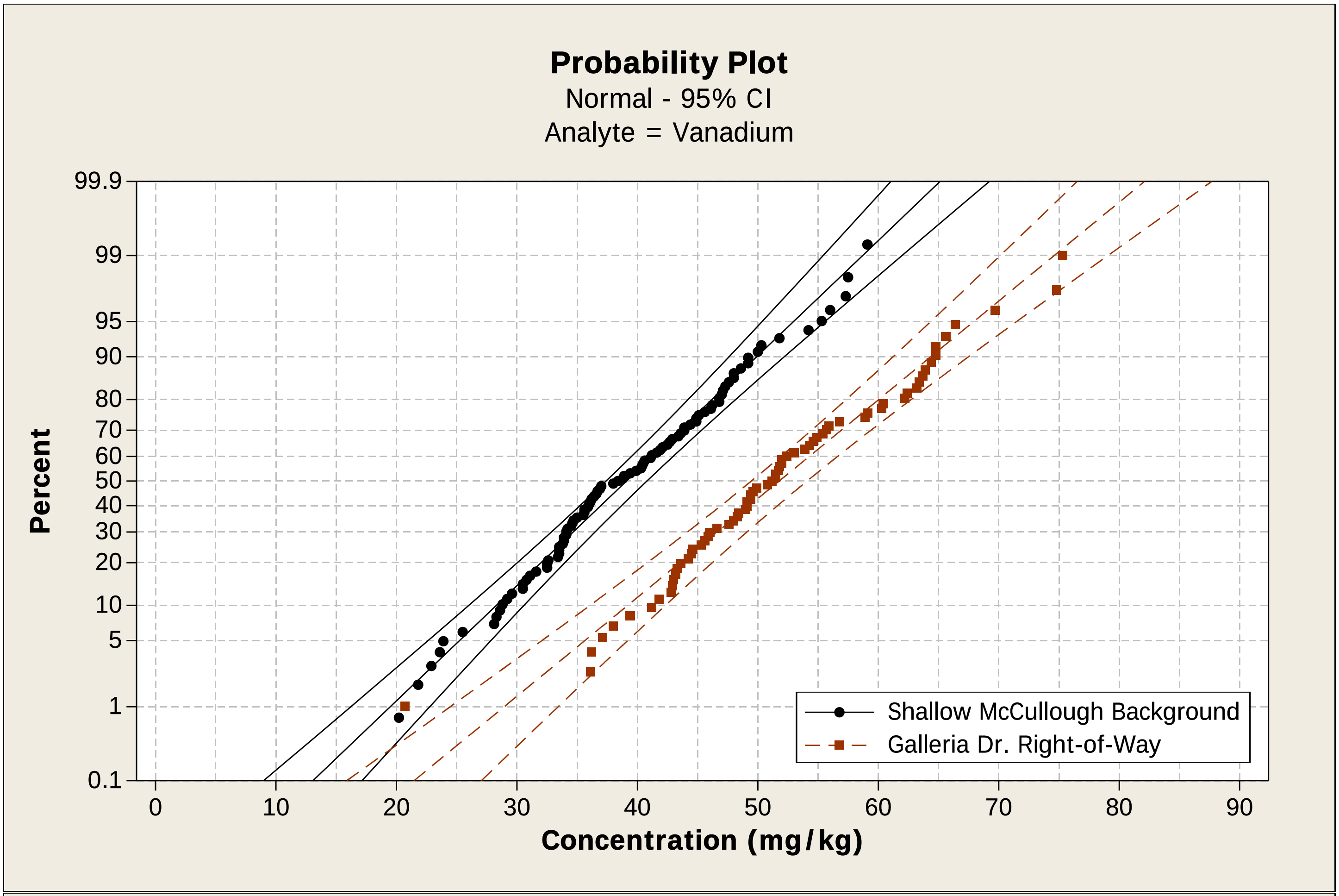
Boxplot
Analyte = Tungsten
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
9
8
7
6
5
4
3
2
1
0
All
Surface
Subsurface
Shallow McCullough Background
All
Surface
Subsurface
Galleria Dr. Right-of-Way

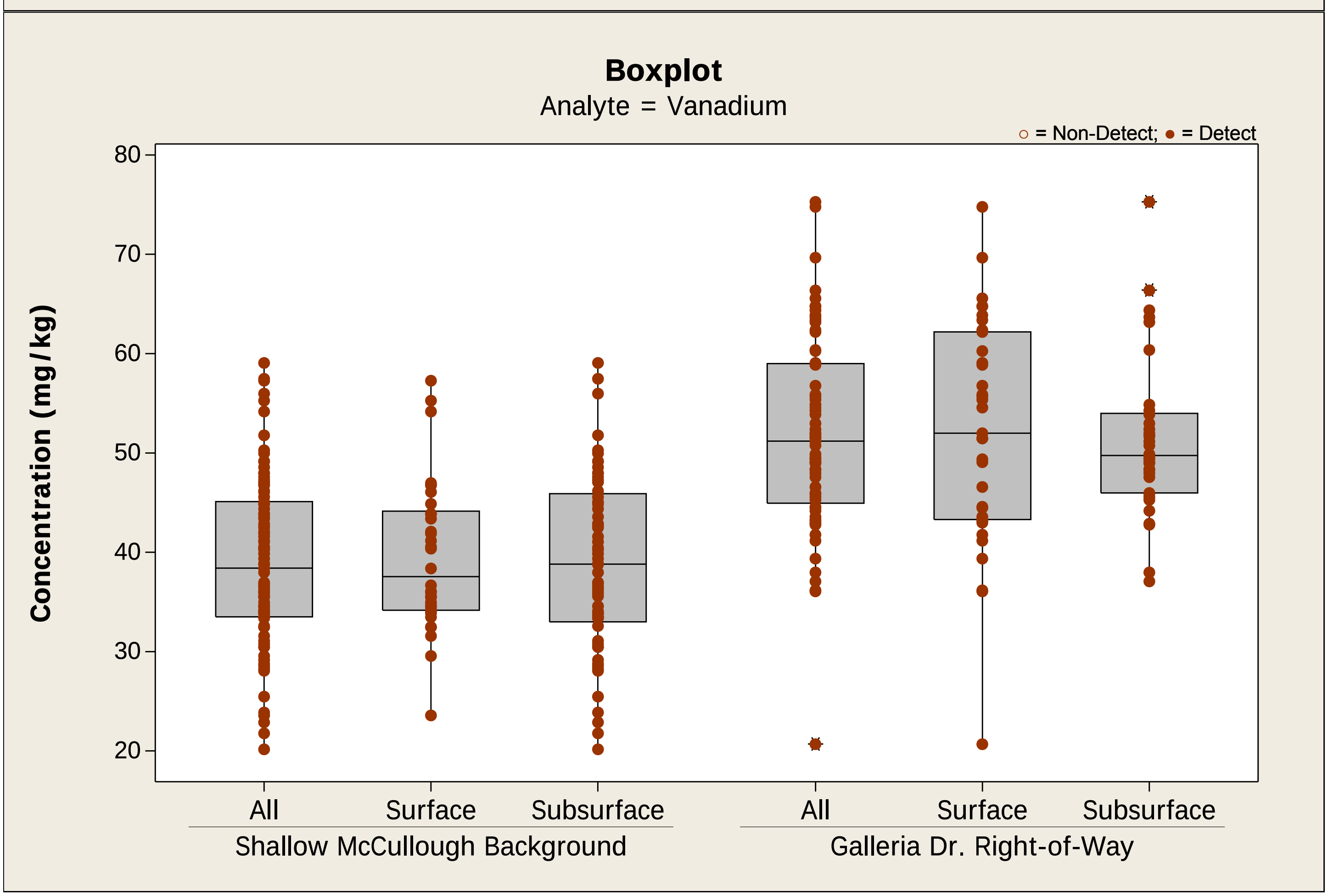


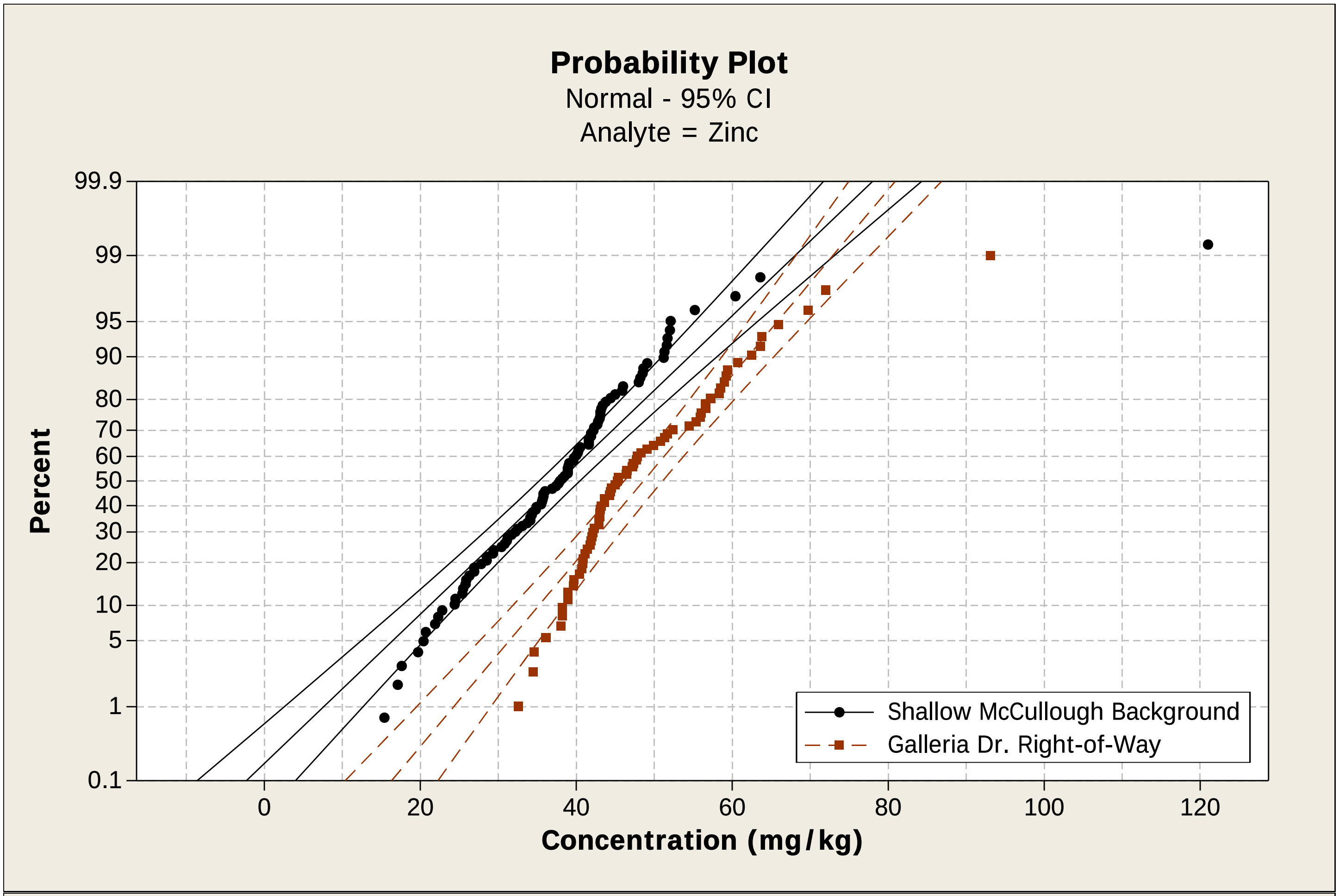
Probability Plot
Normal - 95% CI
Analyte = Uranium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-1
0
1
2
3
4
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way



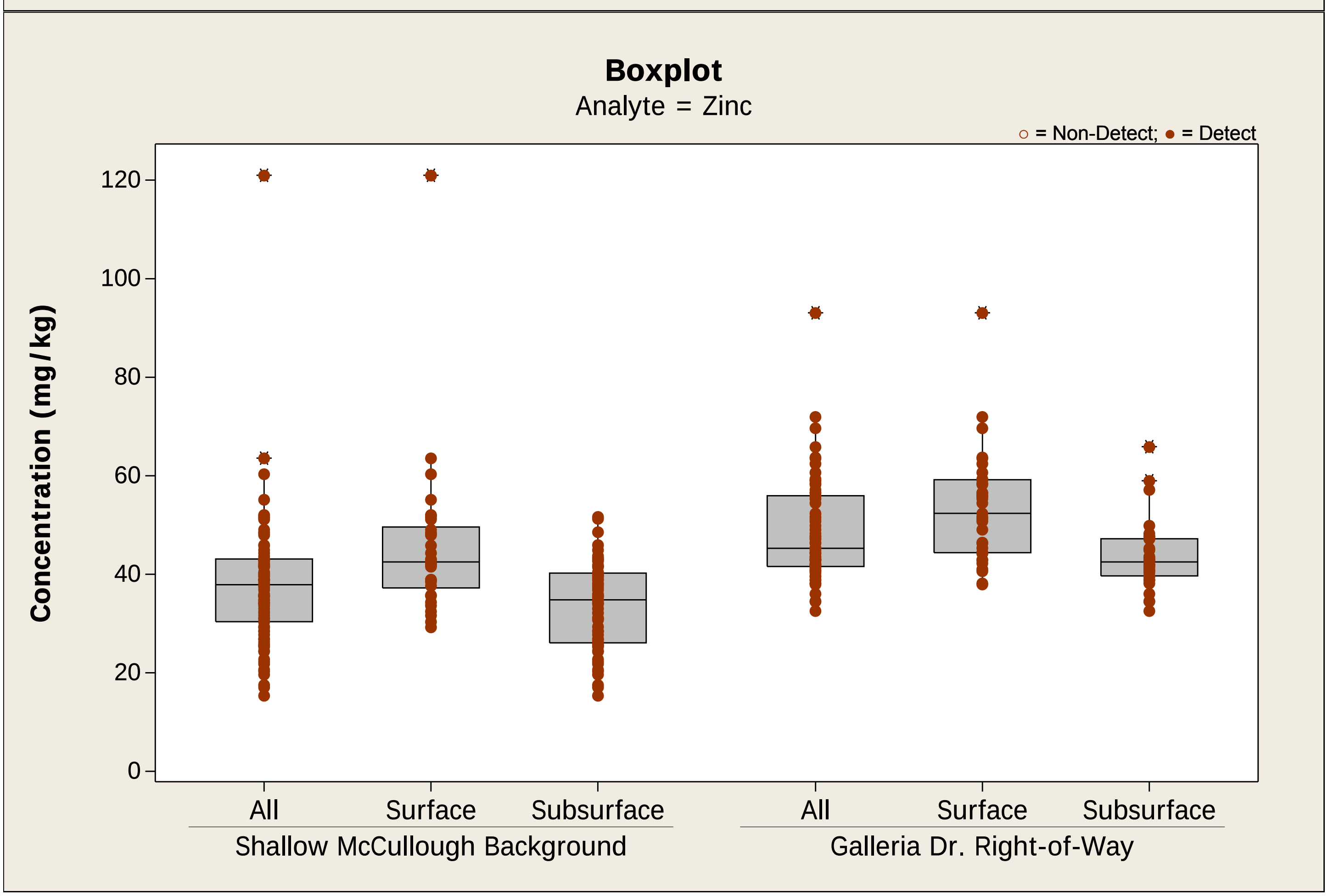
Boxplot
Analyte = Uranium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
All
Surface
Subsurface
Shallow McCullough Background
All
Surface
Subsurface
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Vanadium
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
10
20
30
40
50
60
70
80
90
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

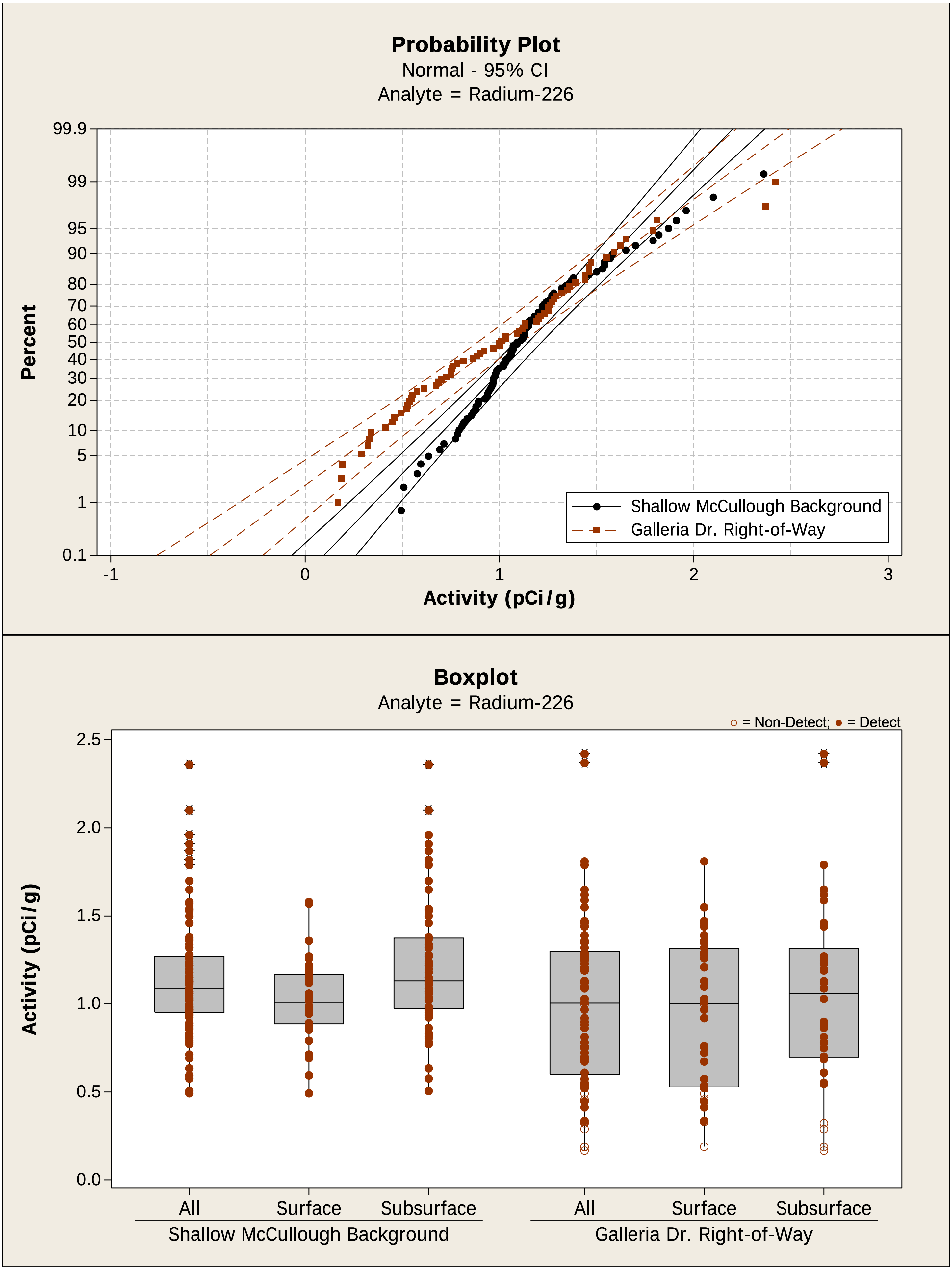

Boxplot
Analyte = Vanadium
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
80
70
60
50
40
30
20
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



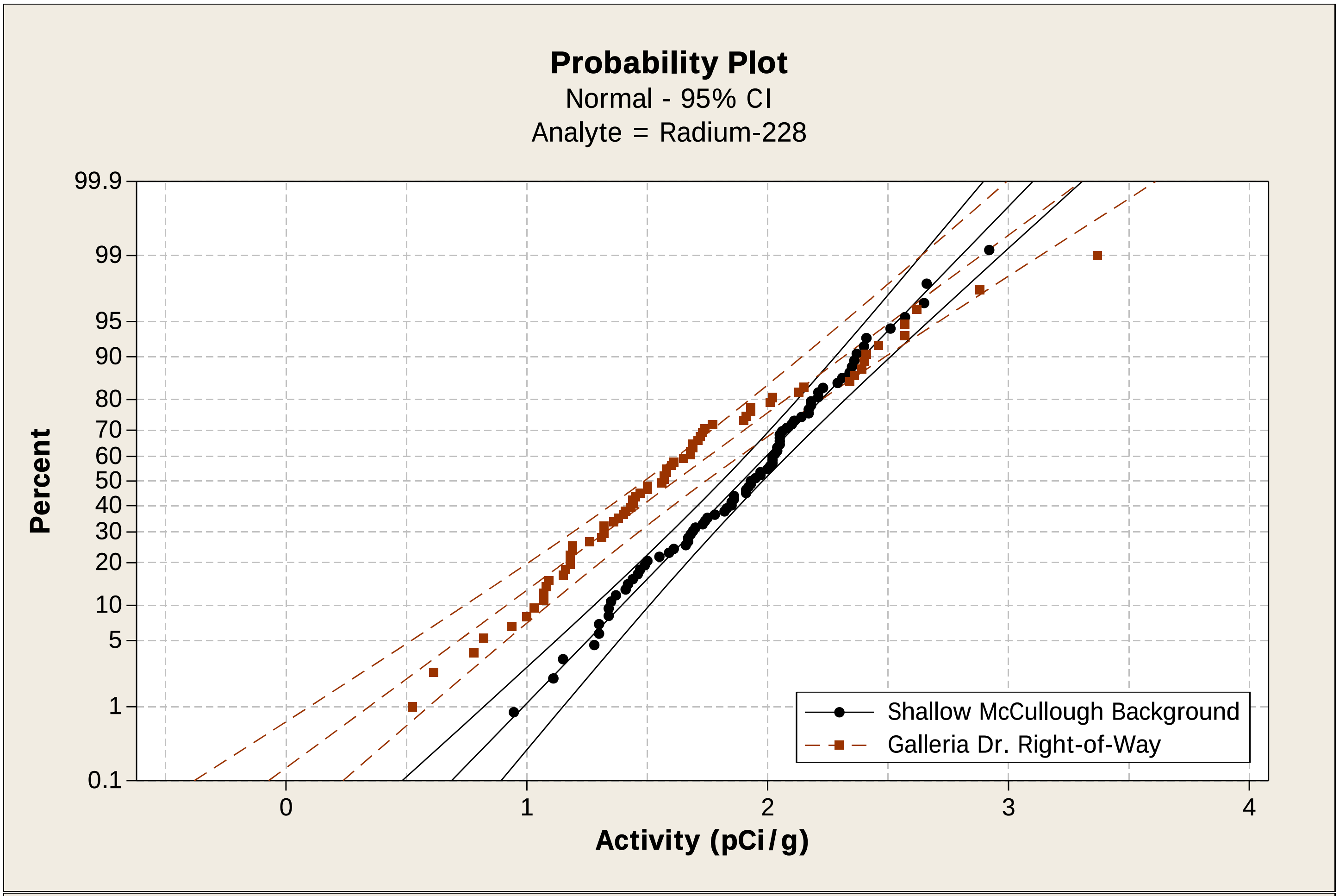
Probability Plot
Normal - 95% CI
Analyte = Zinc
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
20
40
60
80
100
120
Concentration (mg/kg)
Shallow McCullough Background
Galleria Dr. Right-of-Way

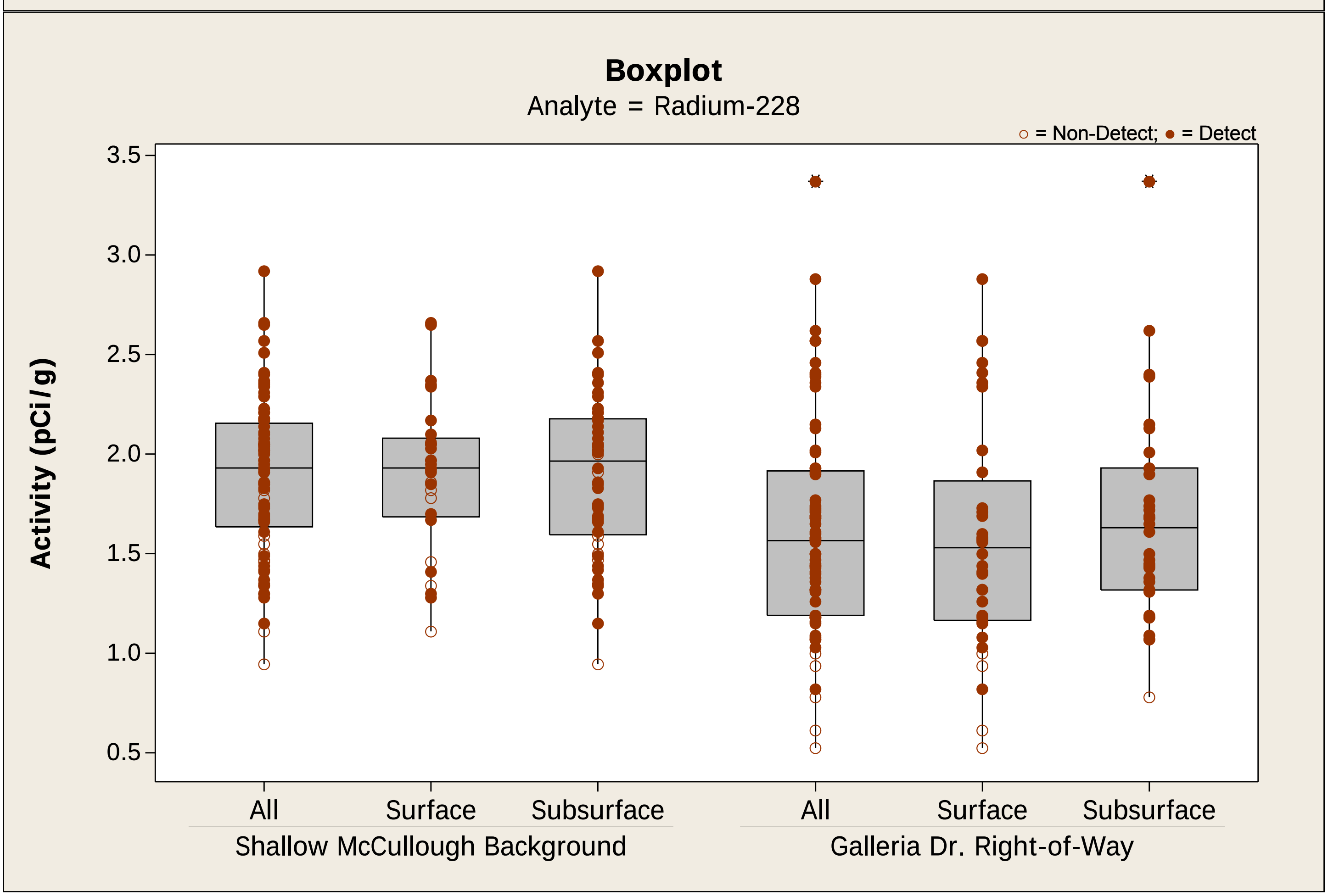


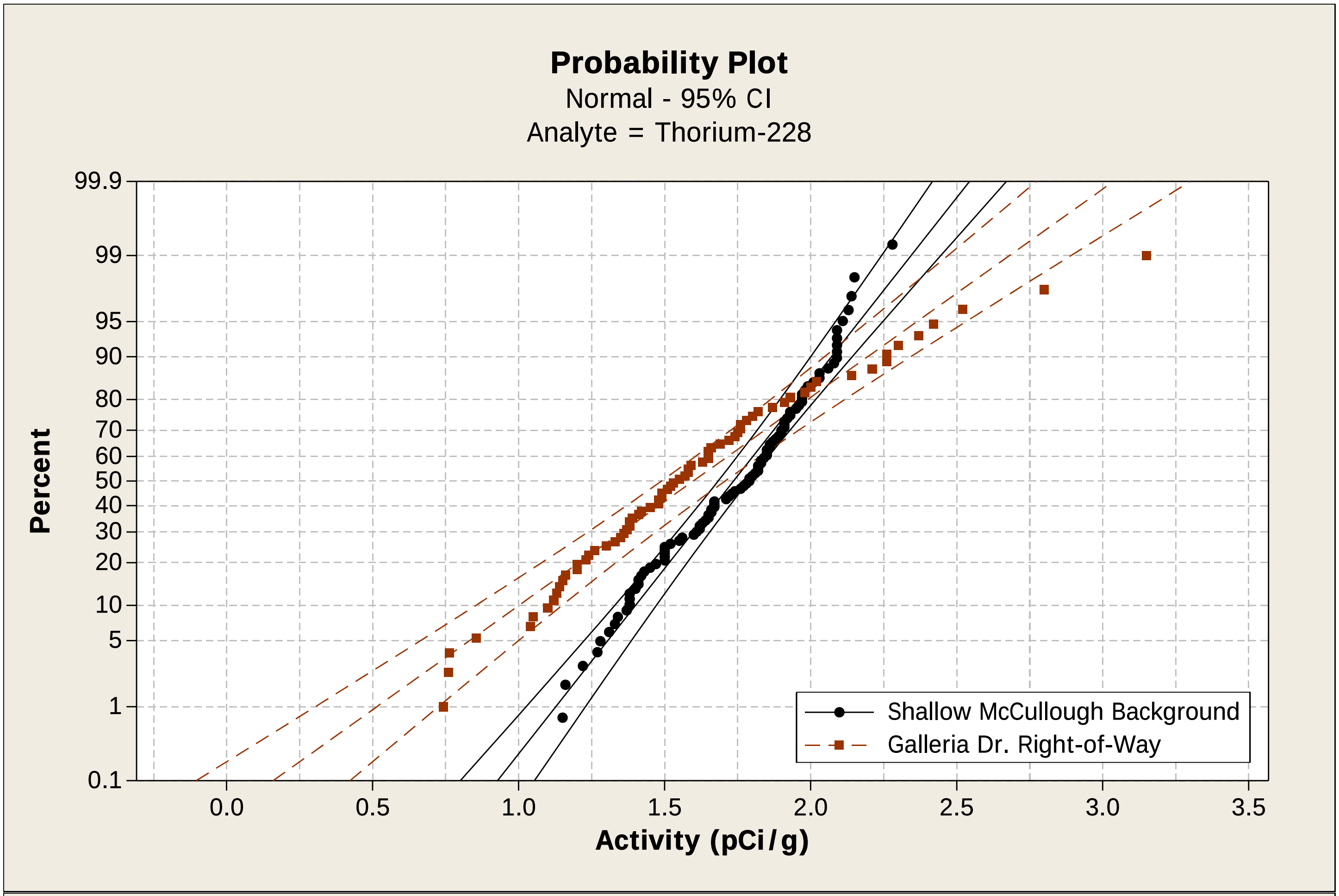
Boxplot
Analyte = Zinc
○ = Non-Detect; ● = Detect
Concentration (mg/kg)
120
100
80
60
40
20
0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



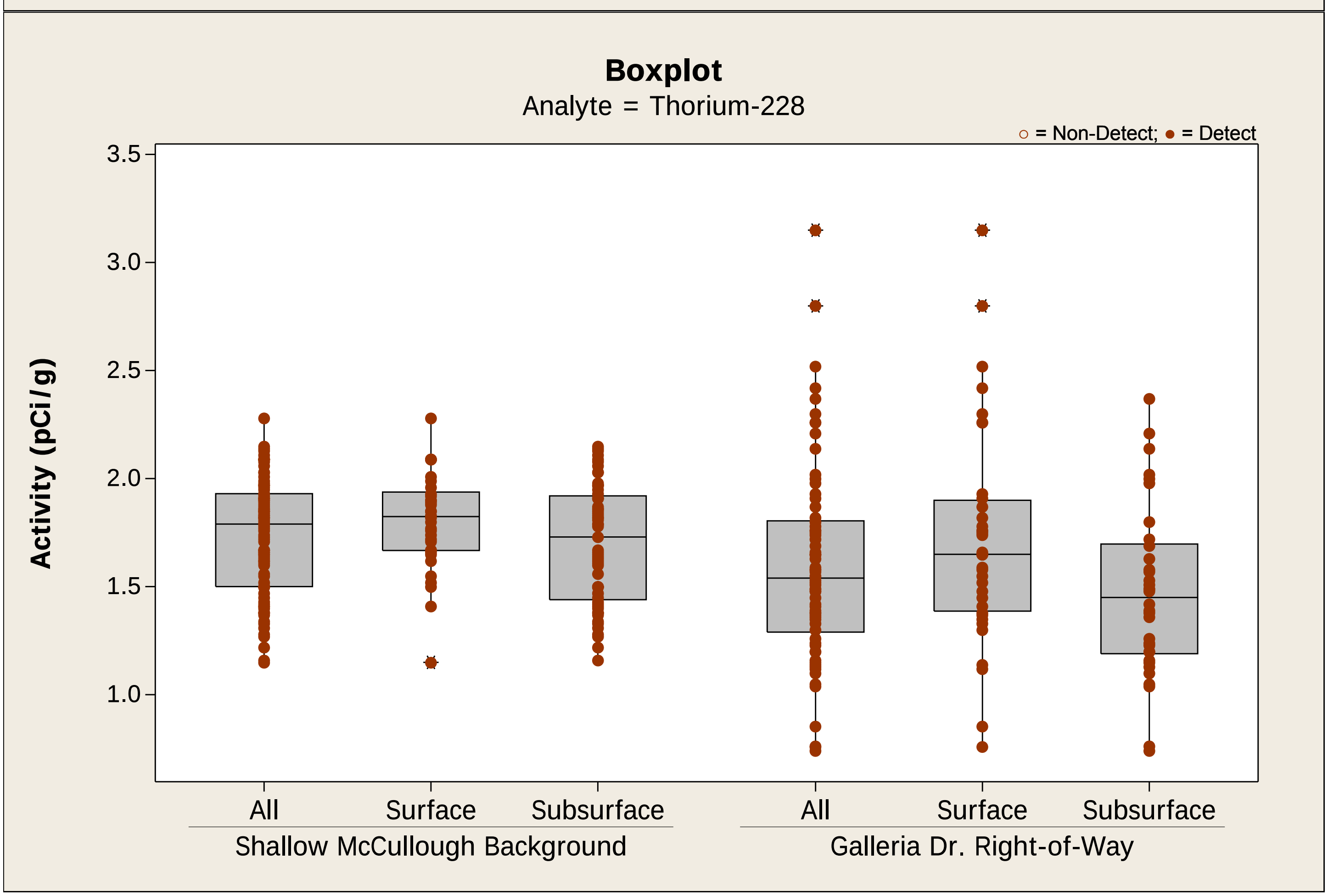
Probability Plot
Normal - 95% CI
Analyte = Radium-226
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-1
0
1
2
3
Activity (pCi/g)
Shallow McCullough Background
Galleria Dr. Right-of-Way
Boxplot
Analyte = Radium-226
○ = Non-Detect; ● = Detect
Activity (pCi/g)
2.5
2.0
1.5
1.0
0.5
0.0
All
Surface
Subsurface
Shallow McCullough Background
All
Surface
Subsurface
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Radium-228
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0
1
2
3
4
Activity (pCi/g)
Shallow McCullough Background
Galleria Dr. Right-of-Way

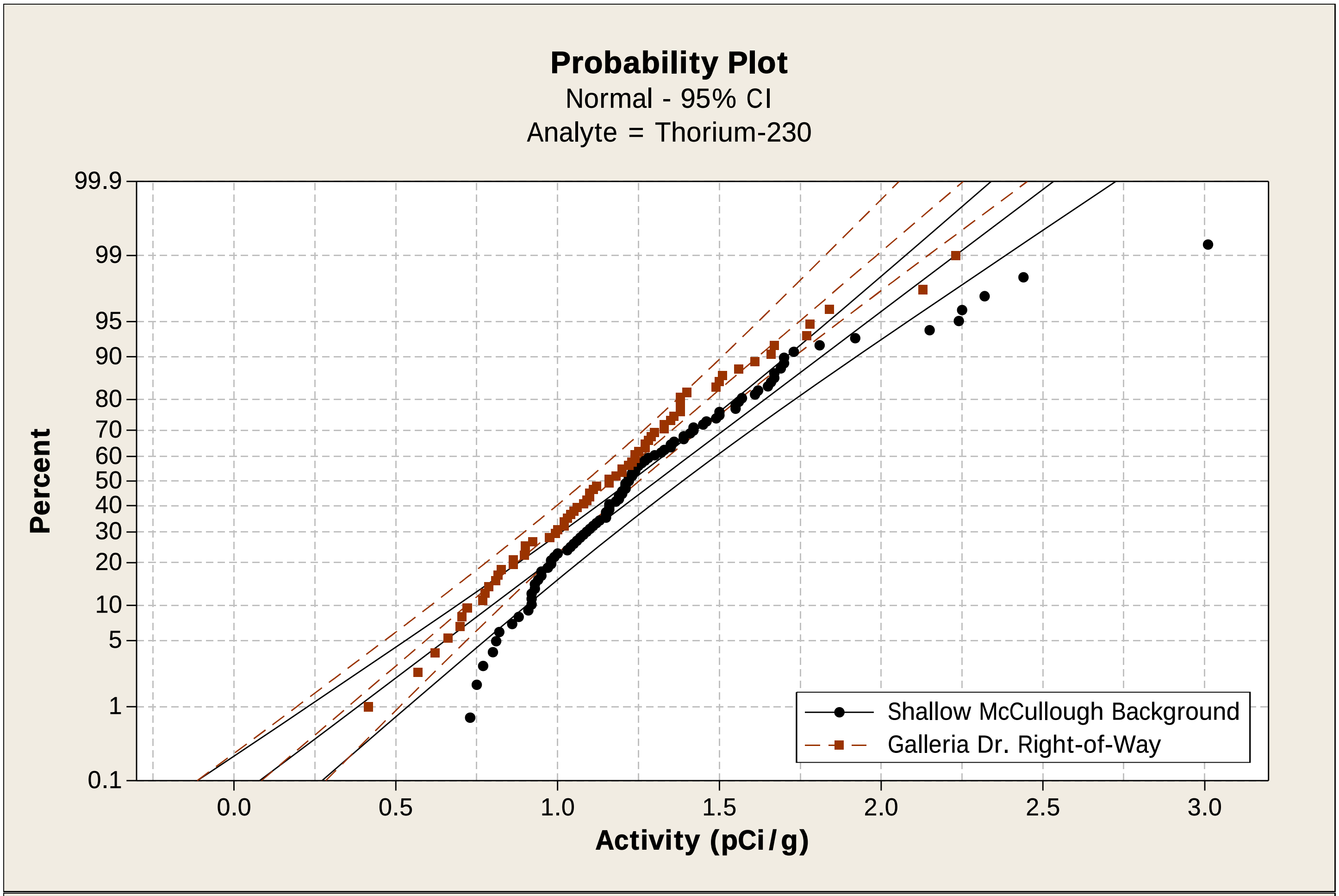

Boxplot
Analyte = Radium-228
○ = Non-Detect; ● = Detect
Activity (pCi/g)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



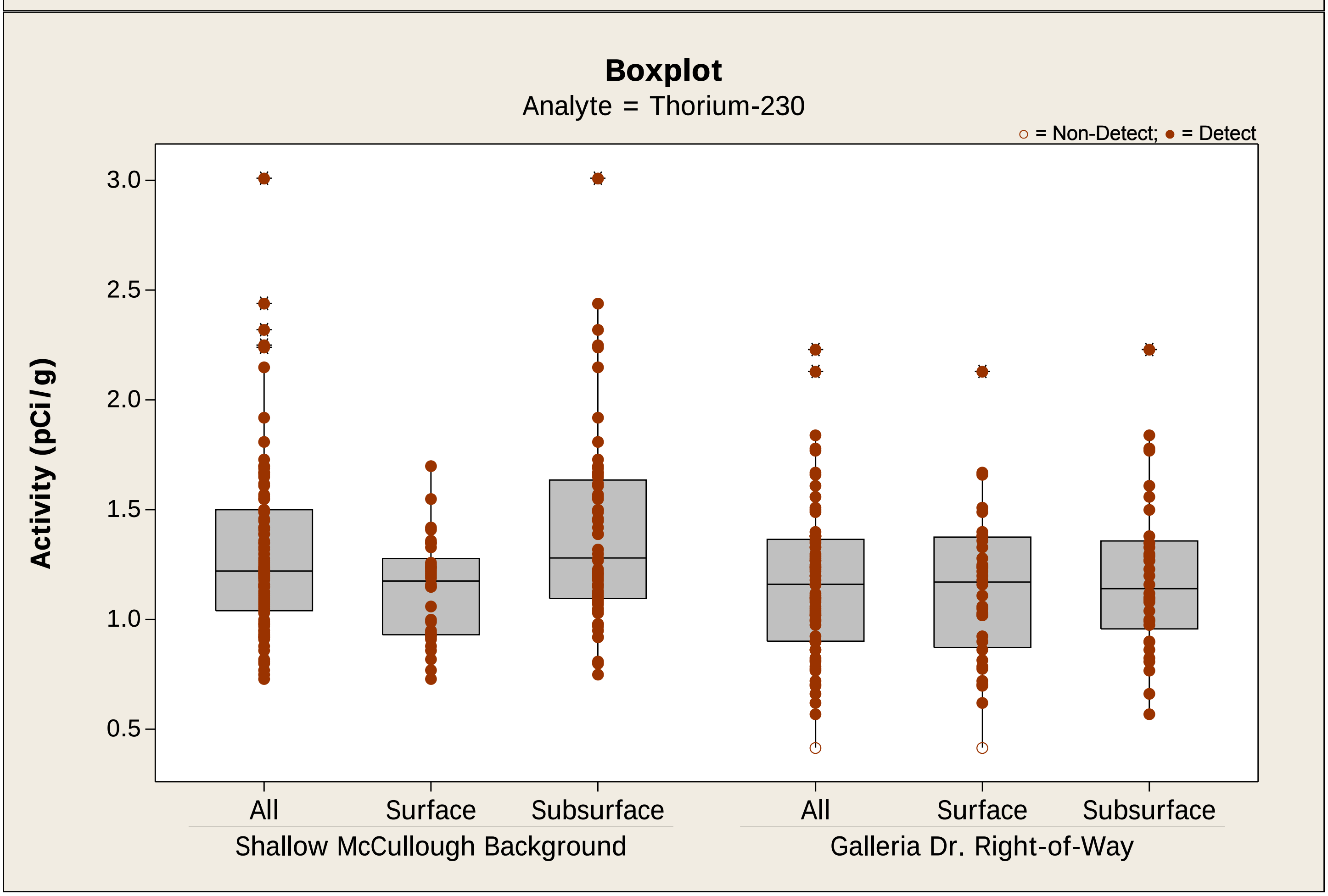
Probability Plot
Normal - 95% CI
Analyte = Thorium-228
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Activity (pCi/g)
Shallow McCullough Background
Galleria Dr. Right-of-Way



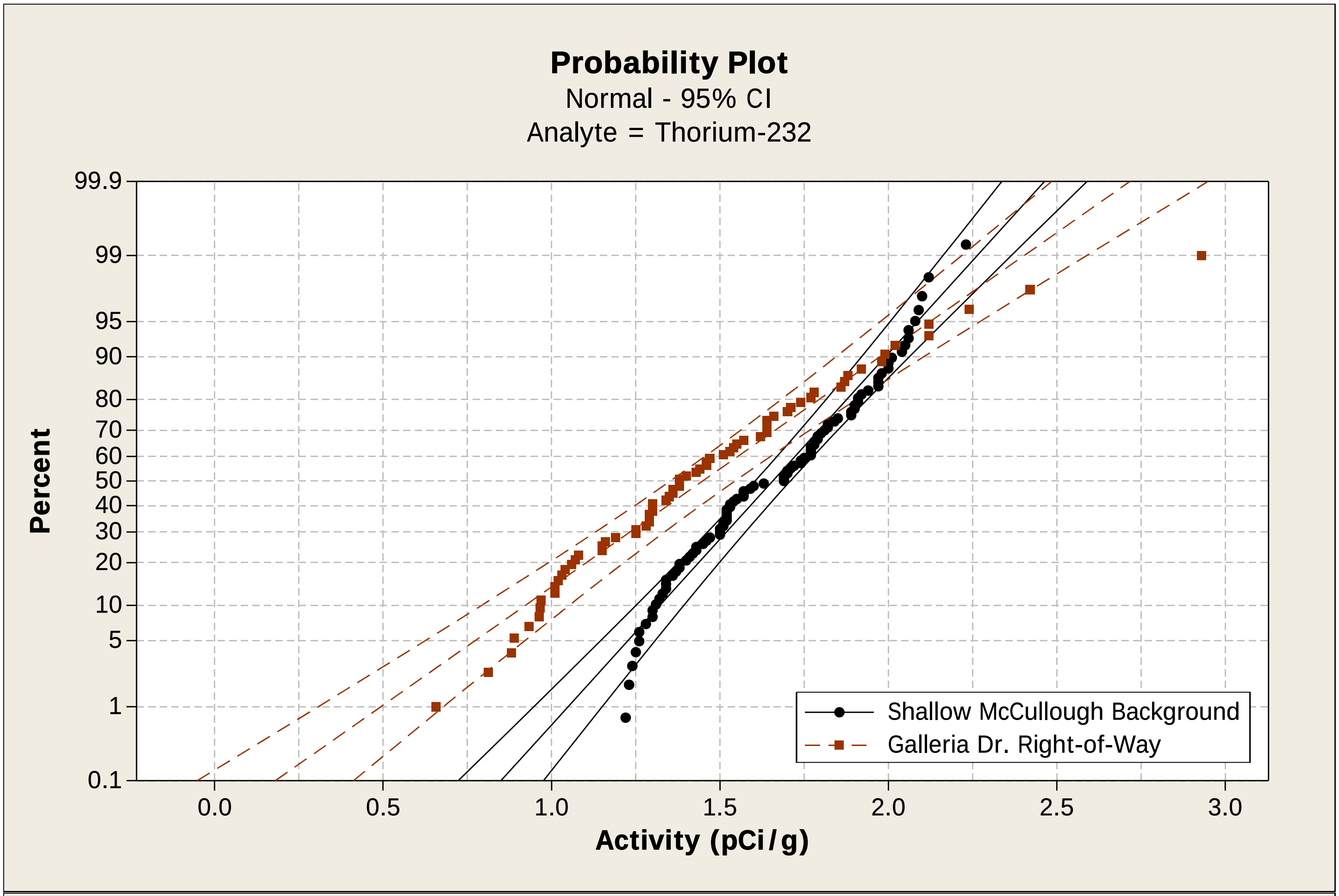
Boxplot
Analyte = Thorium-228
○ = Non-Detect; ● = Detect
Activity (pCi/g)
3.5
3.0
2.5
2.0
1.5
1.0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



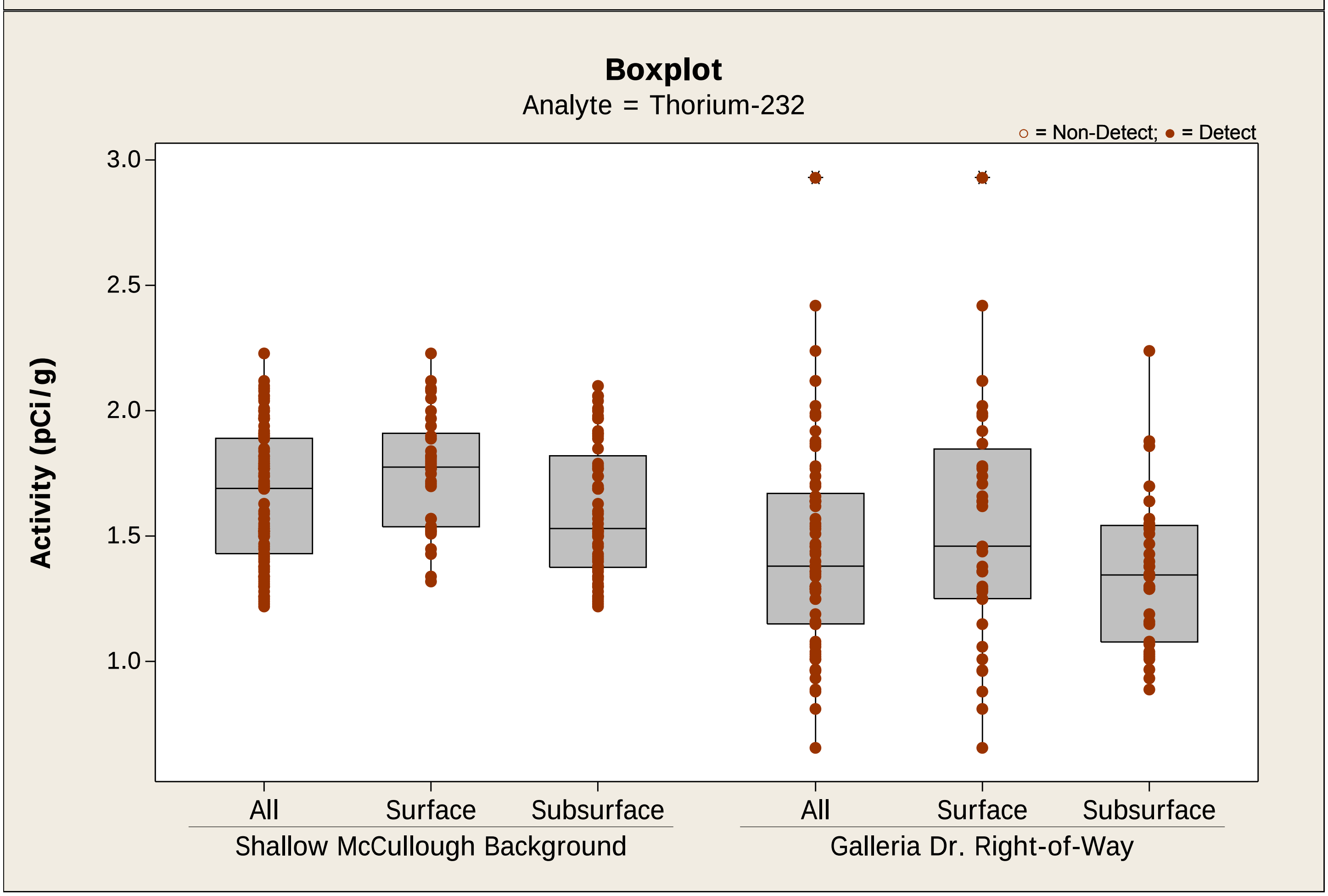
Probability Plot
Normal - 95% CI
Analyte = Thorium-230
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Activity (pCi/g)
Shallow McCullough Background
Galleria Dr. Right-of-Way



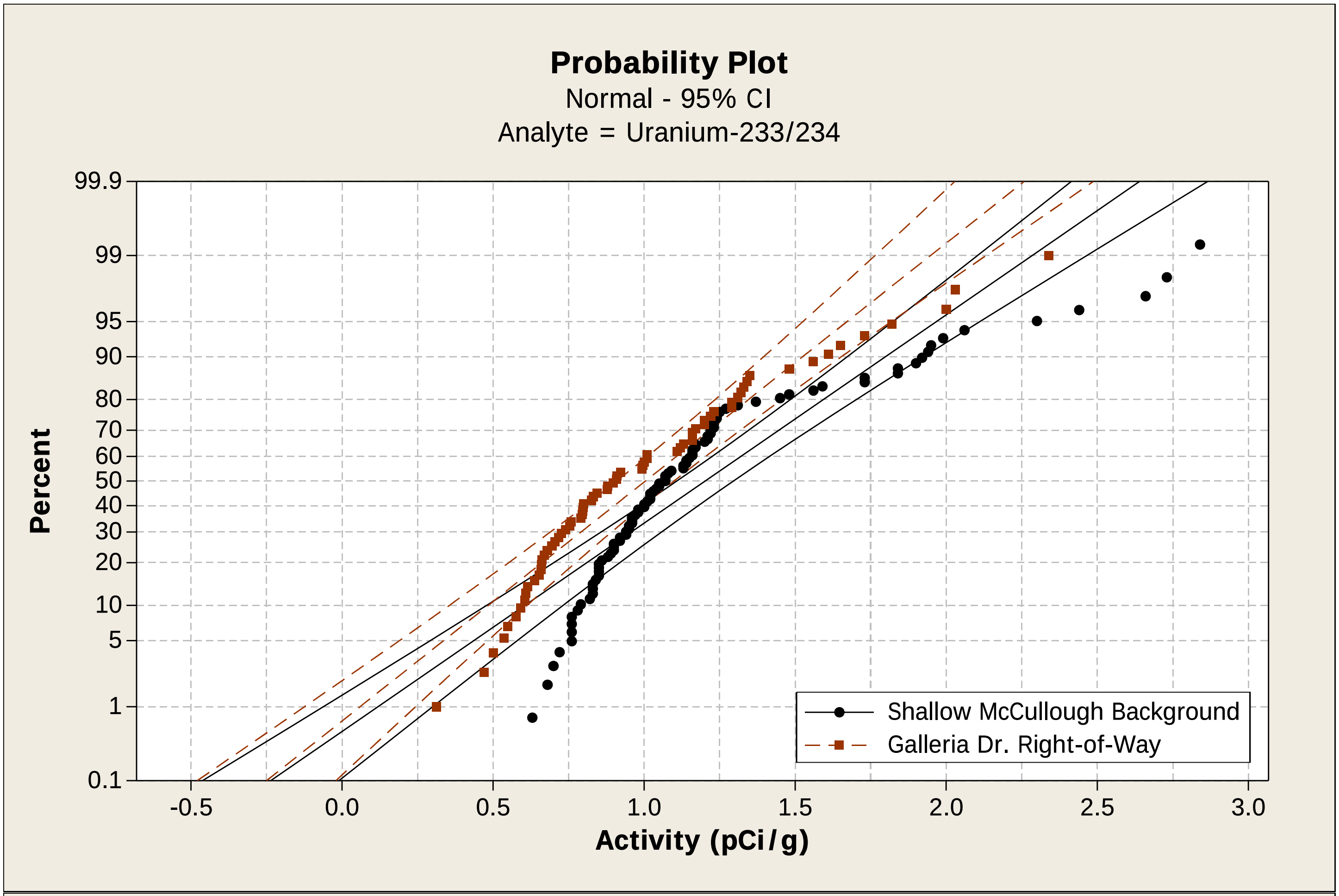
Boxplot
Analyte = Thorium-230
○ = Non-Detect; ● = Detect
Activity (pCi/g)
3.0
2.5
2.0
1.5
1.0
0.5
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way

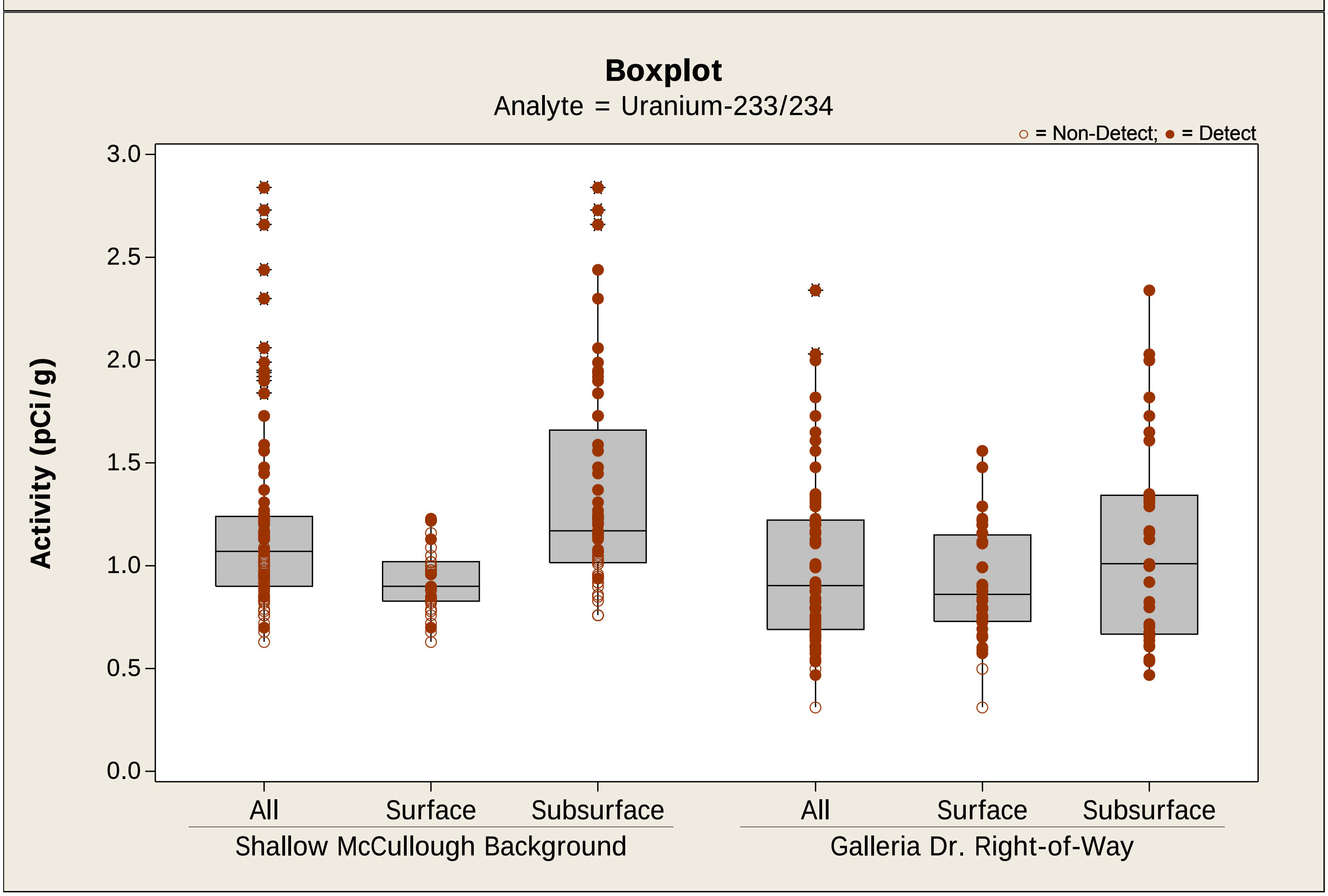


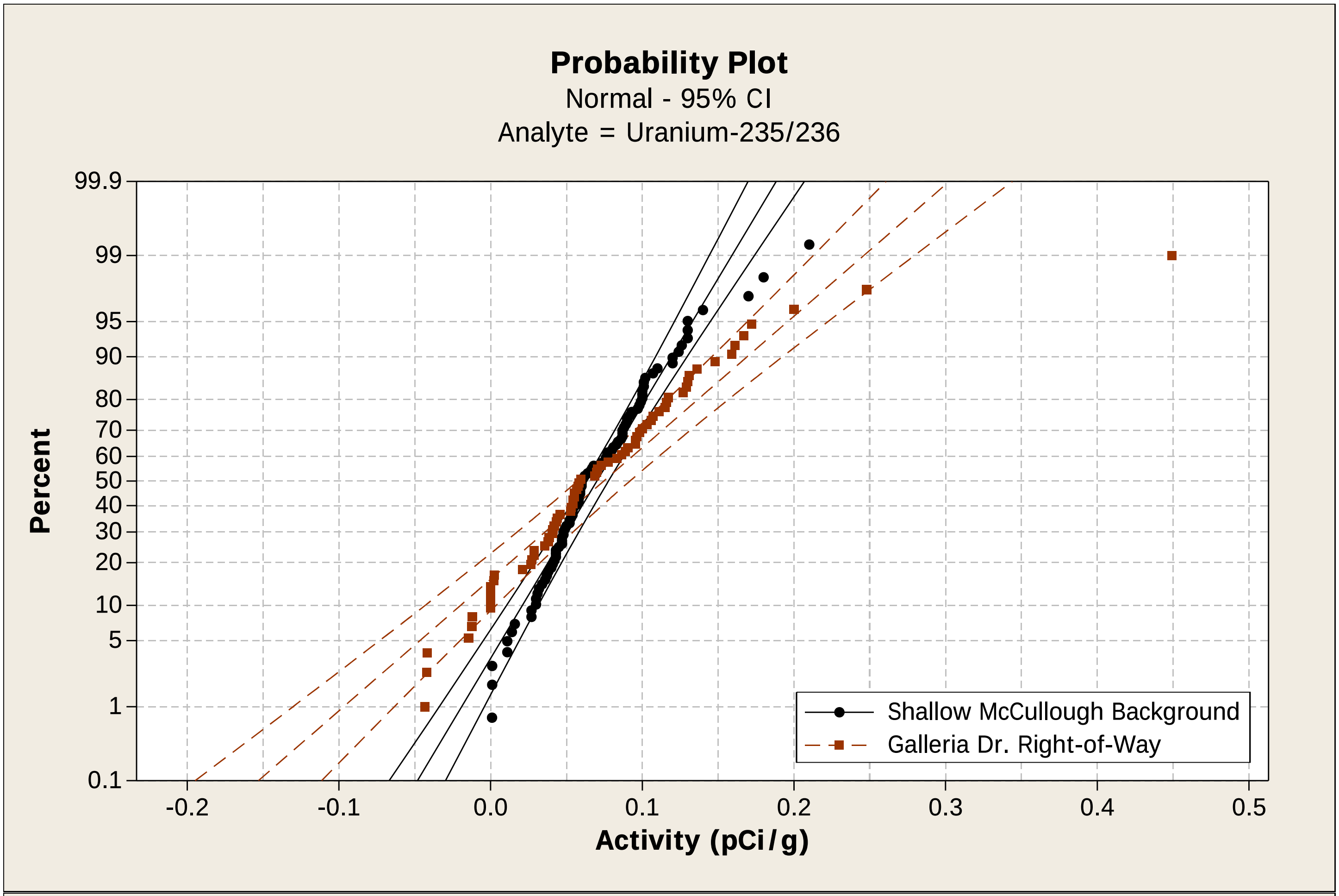
Probability Plot
Normal - 95% CI
Analyte = Thorium-232
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Activity (pCi/g)
Shallow McCullough Background
Galleria Dr. Right-of-Way

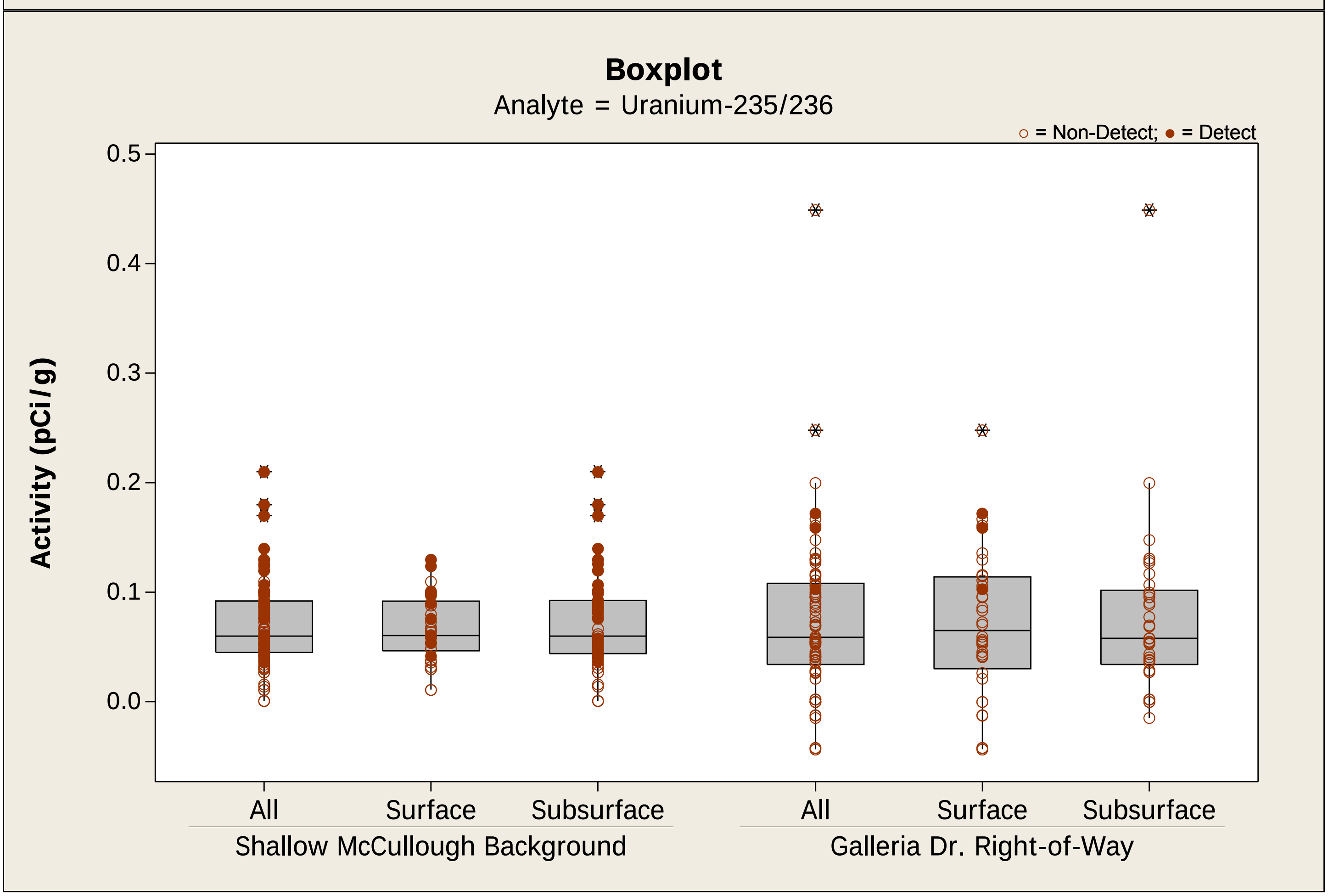


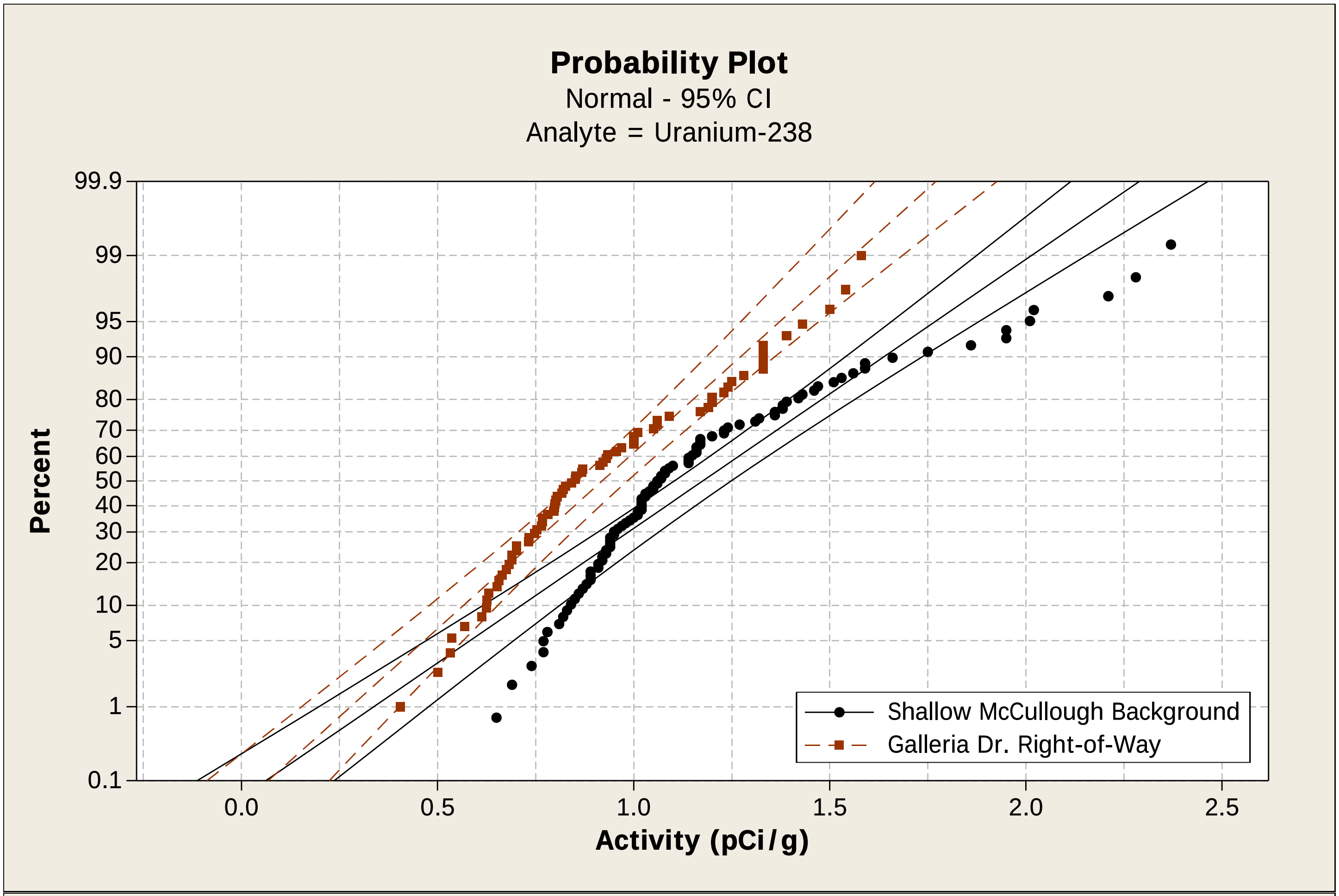
Boxplot
Analyte = Thorium-232
○ = Non-Detect; ● = Detect
Activity (pCi/g)
3.0
2.5
2.0
1.5
1.0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Uranium-233/234
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-0.5
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Activity (pCi/g)
Shallow McCullough Background
Galleria Dr. Right-of-Way

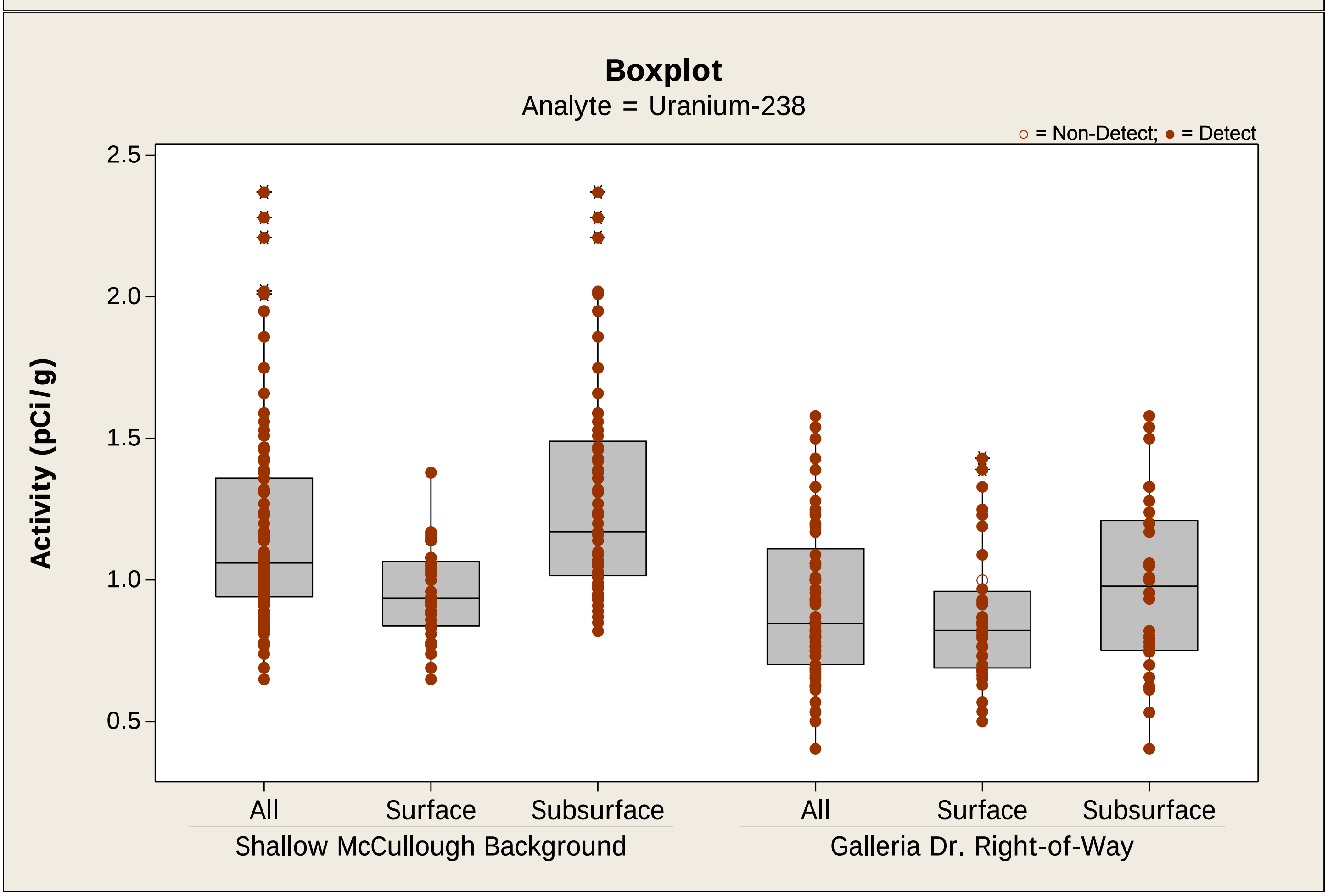

Boxplot
Analyte = Uranium-233/234
○ = Non-Detect; ● = Detect
Activity (pCi/g)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way


Probability Plot
Normal - 95% CI
Analyte = Uranium-235/236
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-0.2
-0.1
0.0
0.1
0.2
0.3
0.4
0.5
Activity (pCi/g)
Shallow McCullough Background
Galleria Dr. Right-of-Way


Boxplot
Analyte = Uranium-235/236
○ = Non-Detect; ● = Detect
Activity (pCi/g)
0.5
0.4
0.3
0.2
0.1
0.0
All
Surface
Subsurface
All
Surface
Subsurface
Shallow McCullough Background
Galleria Dr. Right-of-Way



Probability Plot
Normal - 95% CI
Analyte = Uranium-238
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0.0
0.5
1.0
1.5
2.0
2.5
Activity (pCi/g)
Shallow McCullough Background
Galleria Dr. Right-of-Way



Boxplot
Analyte = Uranium-238
○ = Non-Detect; ● = Detect
Activity (pCi/g)
2.5
2.0
1.5
1.0
0.5
All
Surface
Subsurface
Shallow McCullough Background
All
Surface
Subsurface
Galleria Dr. Right-of-Way

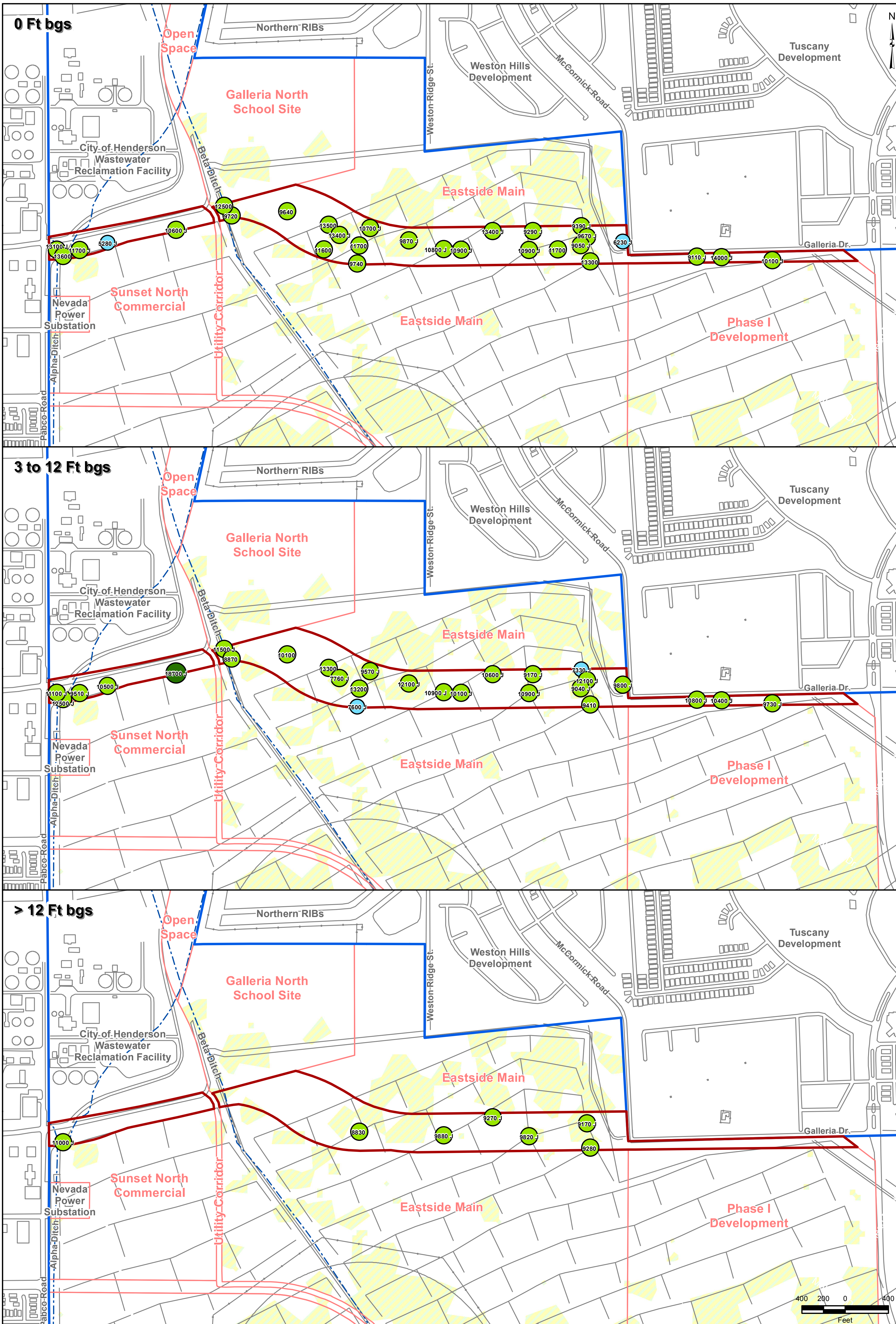
APPENDIX H

HUMAN HEALTH RISK ASSESSMENT CALCULATION SPREADSHEETS
(on the report CD in Appendix B)

APPENDIX I

METALS AND CHEMICALS OF POTENTIAL CONCERN INTENSITY PLOTS

LIST OF FIGURES (APPENDIX I)



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Max. Shallow Background (15,300 mg/kg)
Remediation Areas	>= Max. Shallow Background and < Residential BCL (77,200 mg/kg)
	>= Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

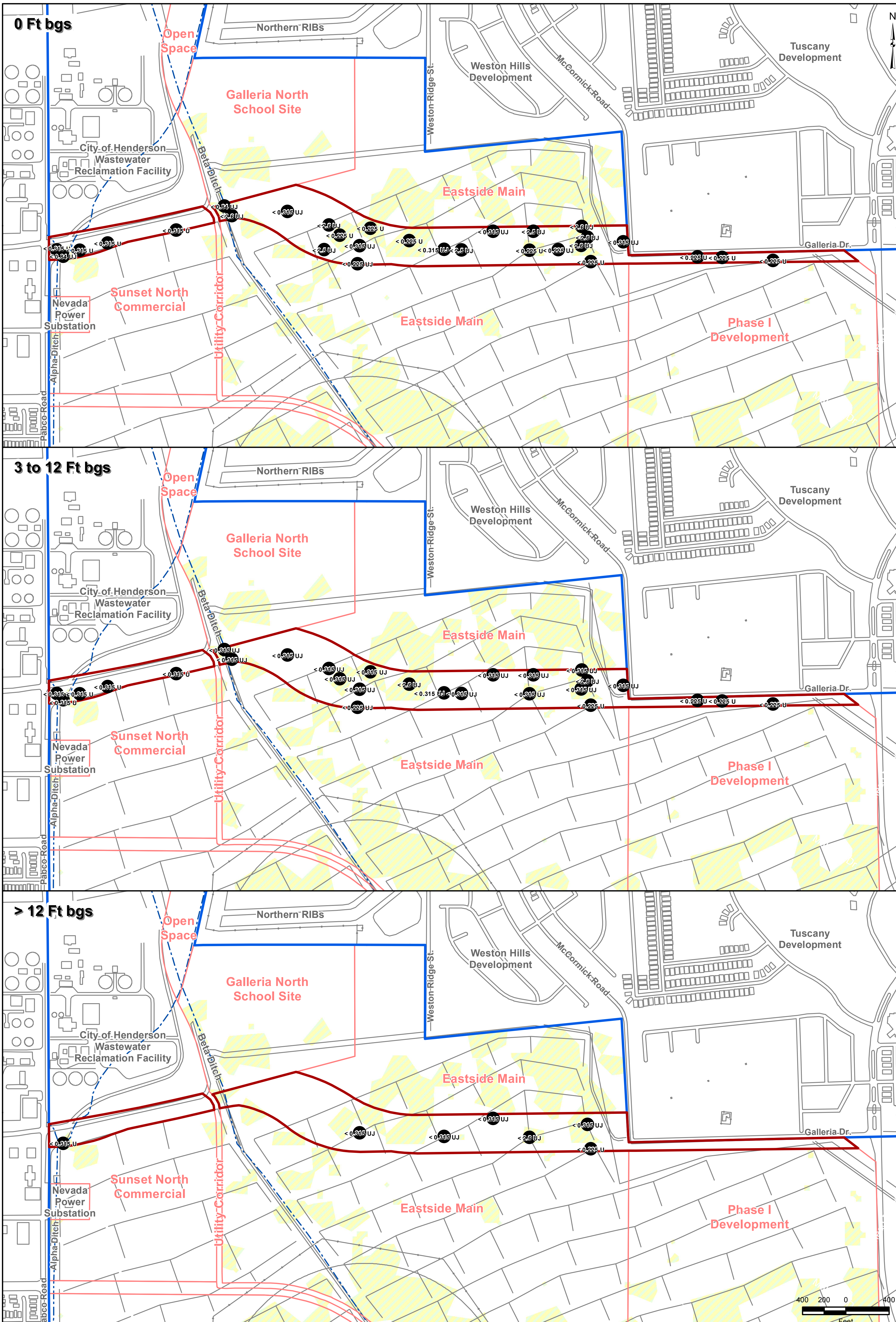
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-1

ALUMINUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (31.3 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

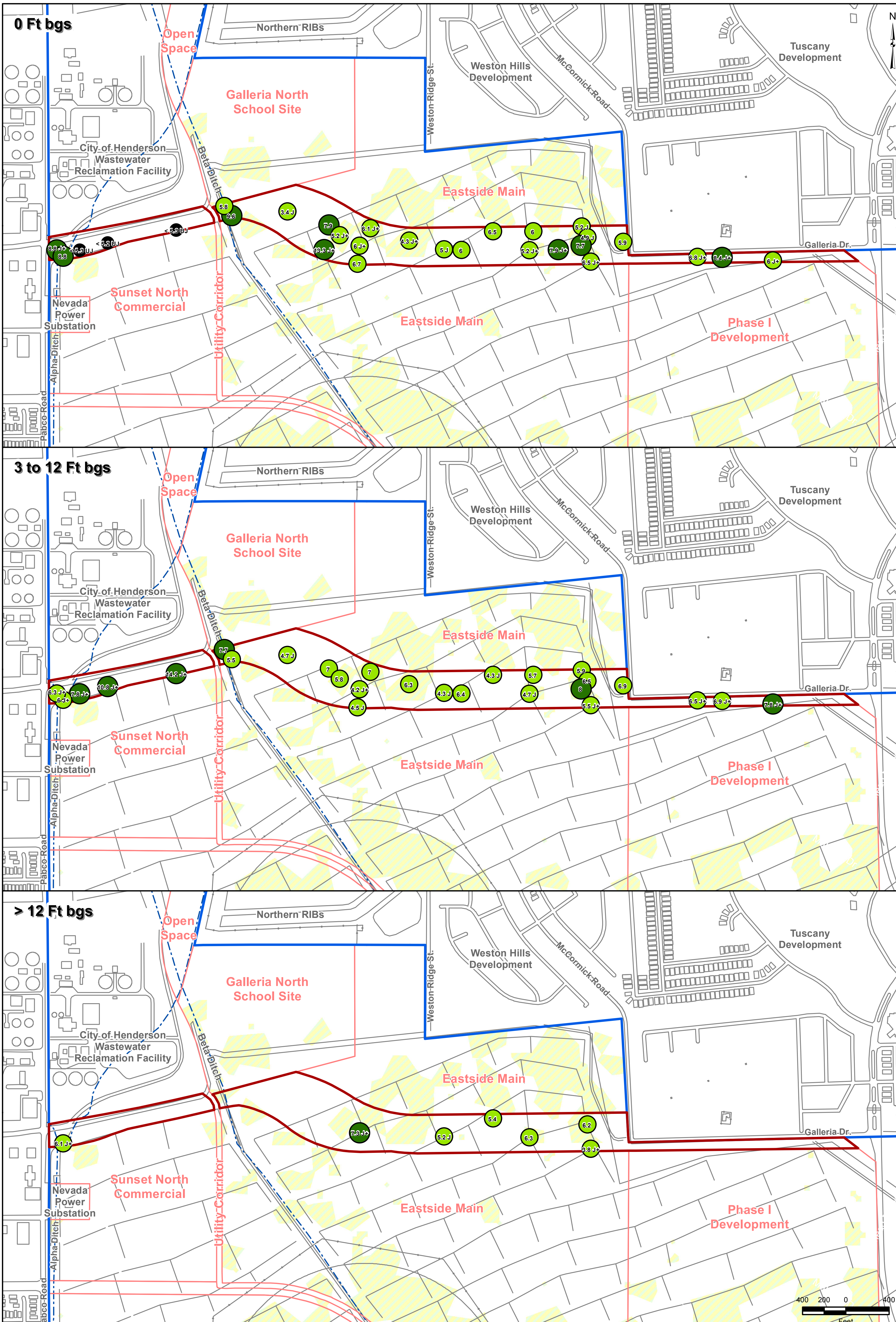
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-2

ANTIMONY SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation Company

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < Residential BCL (0.39 mg/kg)
Eastside Soil Sub-Areas	>= Residential BCL and < Max. Qal McCullough Background (7.2 mg/kg)
Remediation Areas	>= Max. Qal McCullough Background and < Max. Qal (All) Background
	>= Max. Qal (All) Background (27.6 mg/kg)

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

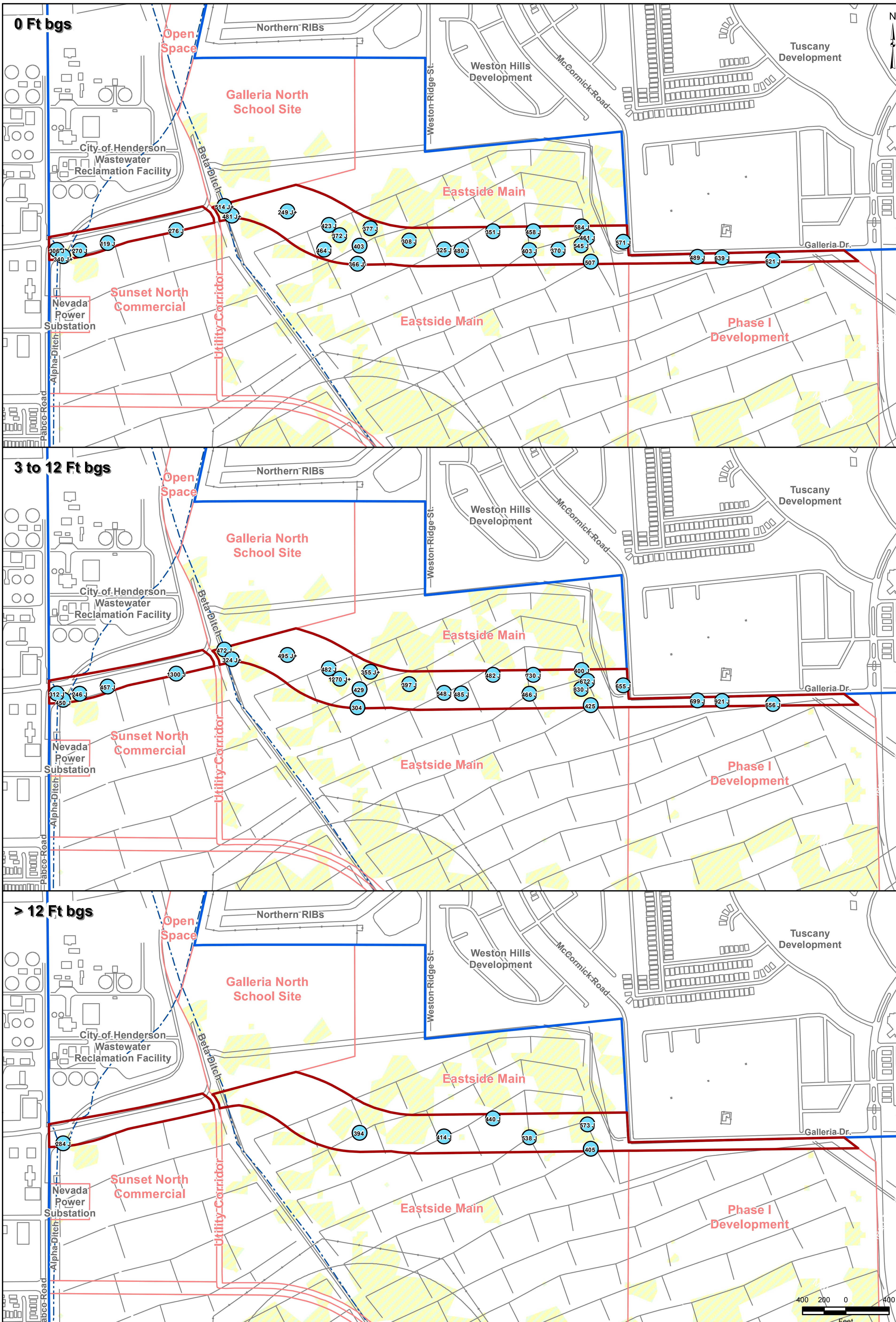
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-3

ARSENIC SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation Company

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (15,300 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

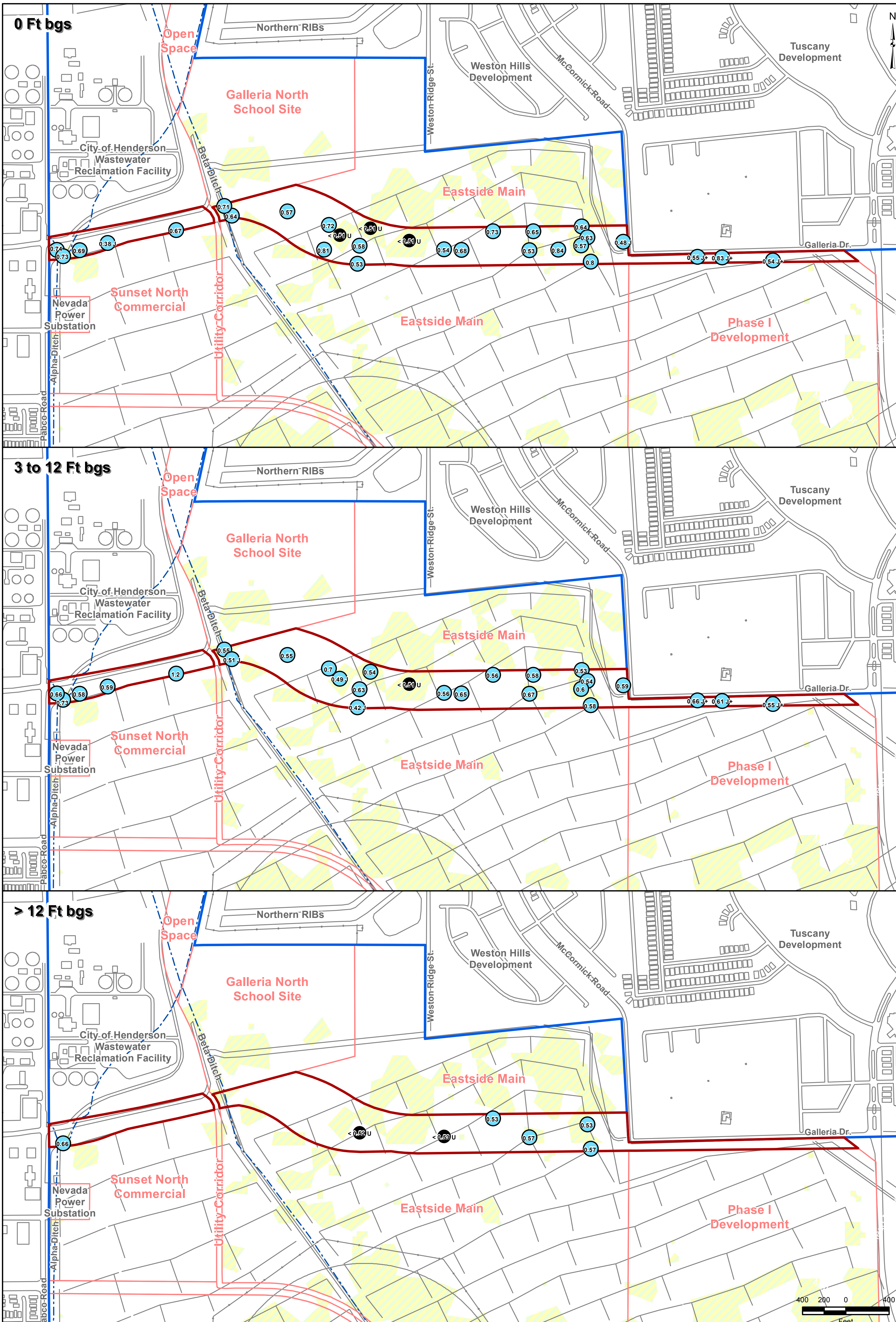
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-4

BARIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Legend	
Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (155 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

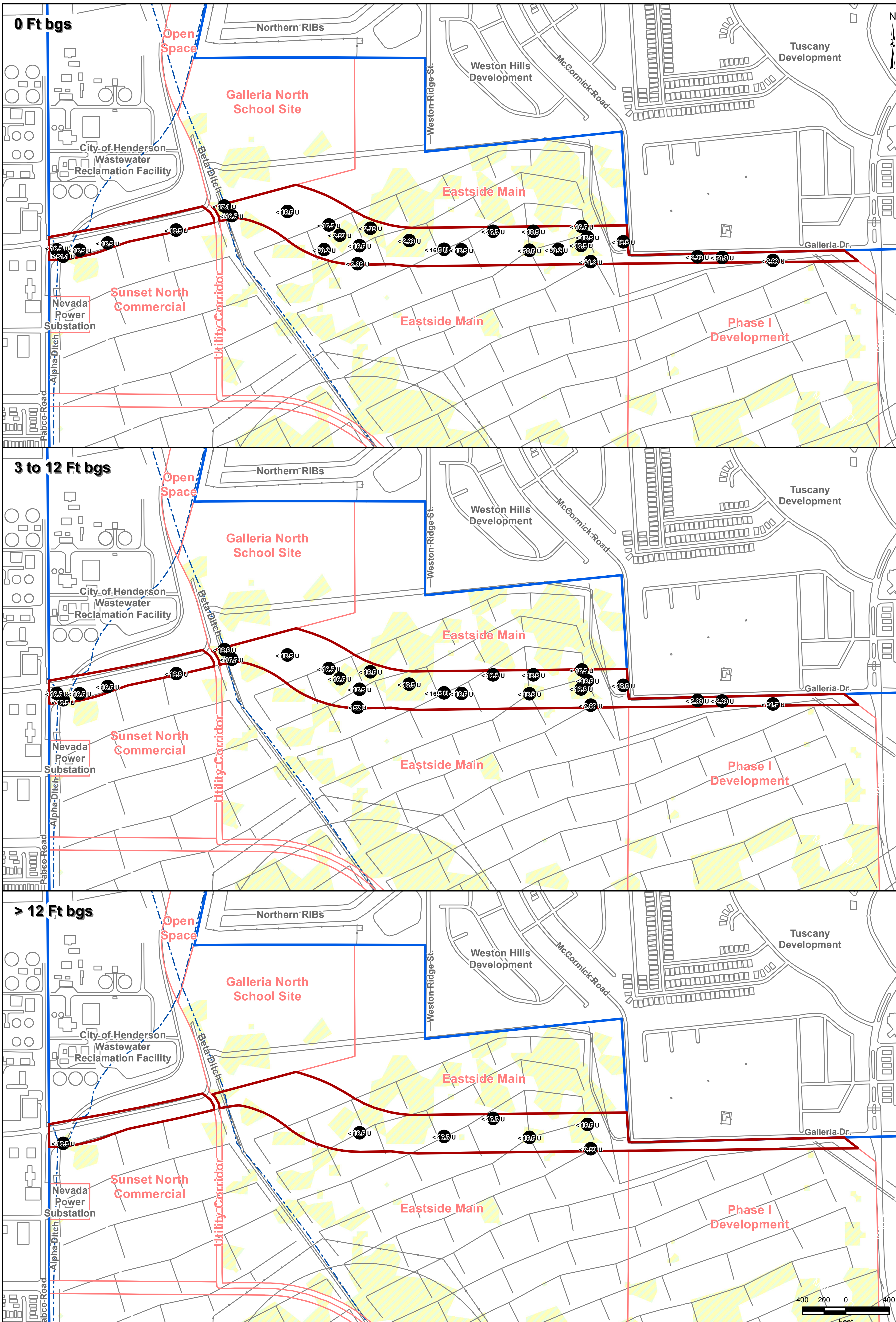
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-5

BERYLLIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Non-Detect

Detect < 1/10-Residential BCL

>= 1/10-Residential BCL and < Residential BCL (15,600 mg/kg)

>= Residential BCL and < 10x Residential BCL

>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

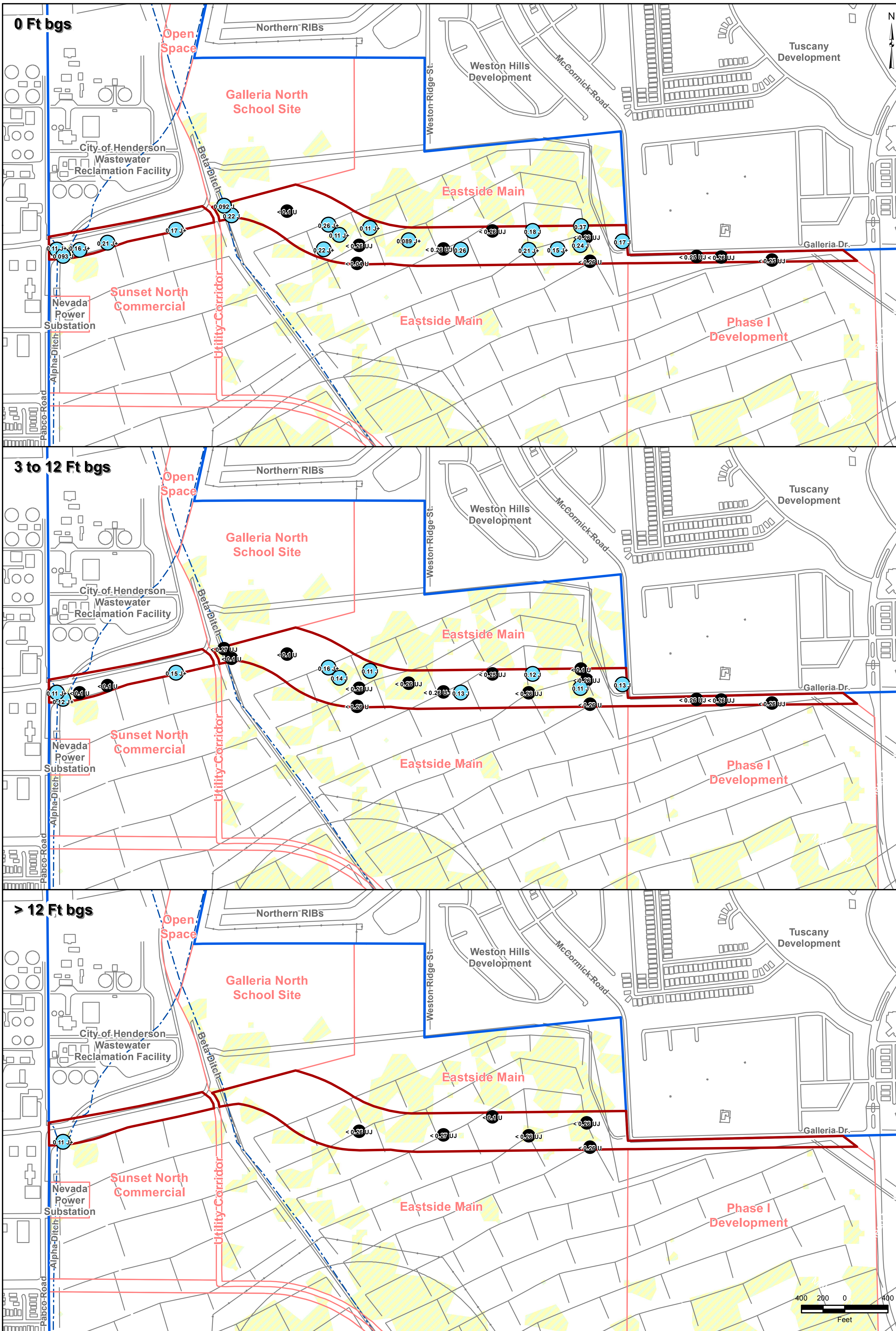
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-6

BORON SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by		Date	JOB No. 0064276
MKJ (ERM)	ERM	11/01/12	FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Non-Detect

Detect < 1/10-Residential BCL

>= 1/10-Residential BCL and < Residential BCL (38.9 mg/kg)

>= Residential BCL and < 10x Residential BCL

>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

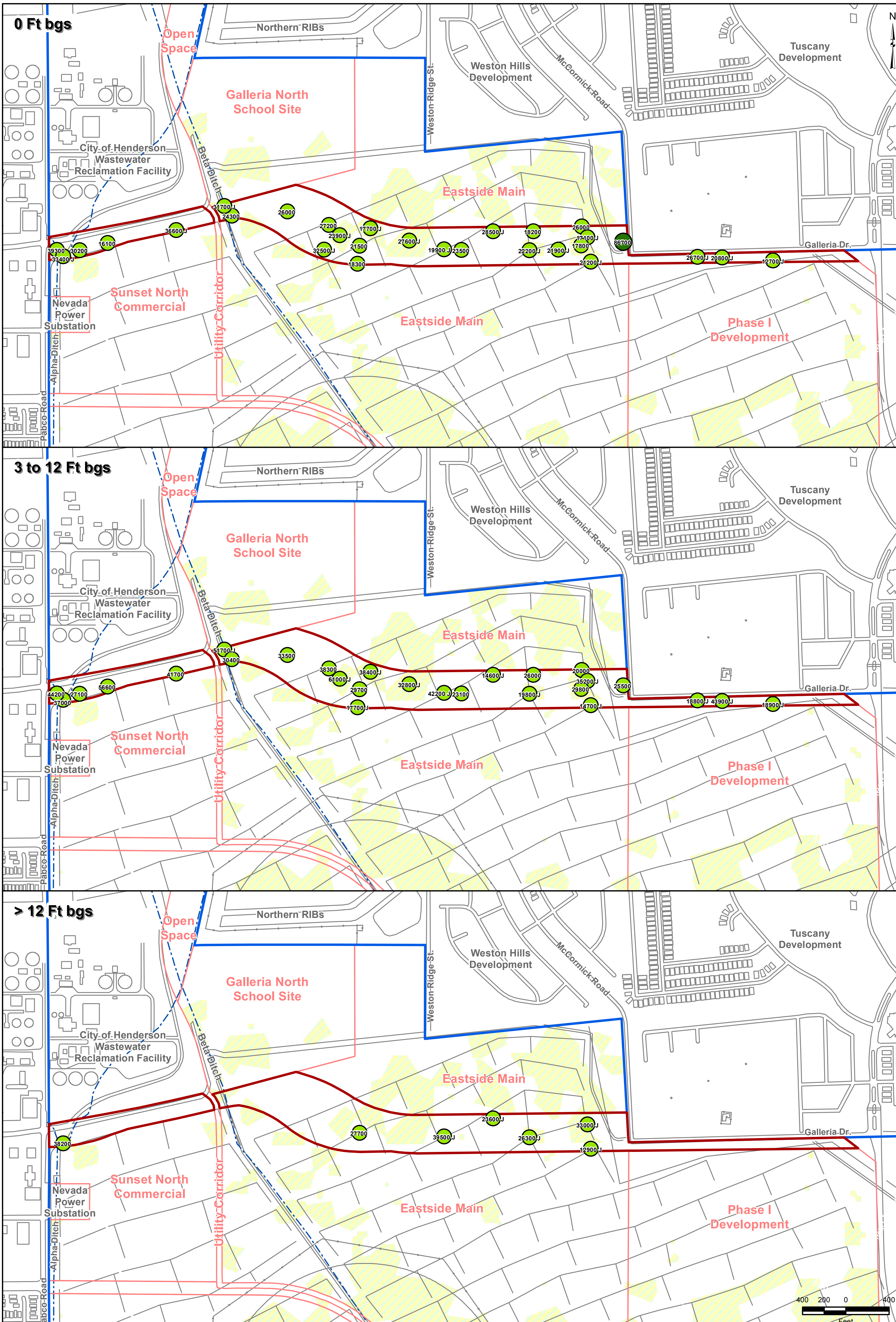
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-7

CADMIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Non-Detect

Detect < Max. Shallow Background (82,800 mg/kg)

>= Max. Shallow Background

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

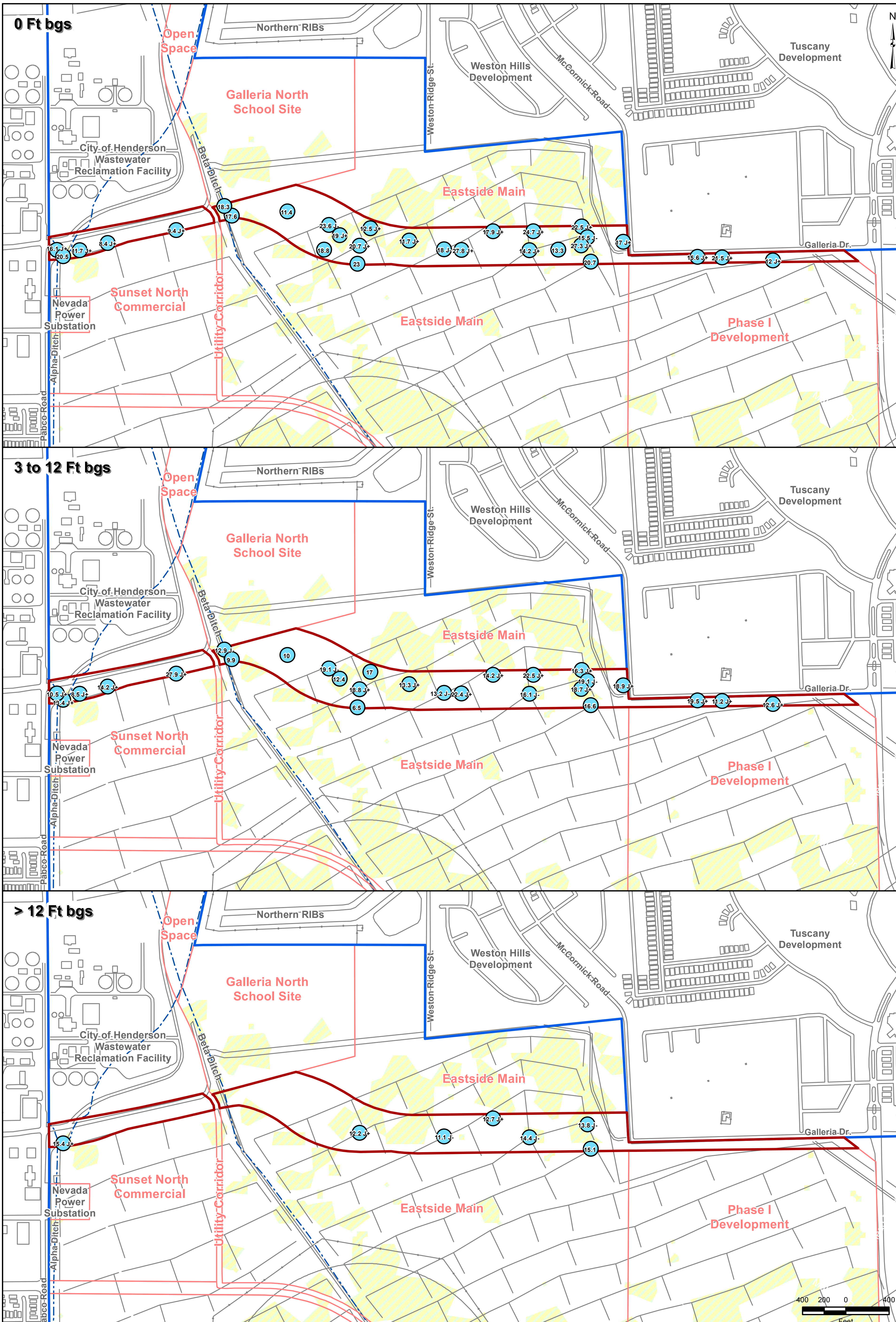
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-8

CALCIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by		Date	JOB No. 0064276
MKJ (ERM)	ERM	11/01/12	FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Non-Detect

Detect < 1/10-Residential BCL

>= 1/10-Residential BCL and < Residential BCL (100,000 mg/kg)

>= Residential BCL and < 10x Residential BCL

>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

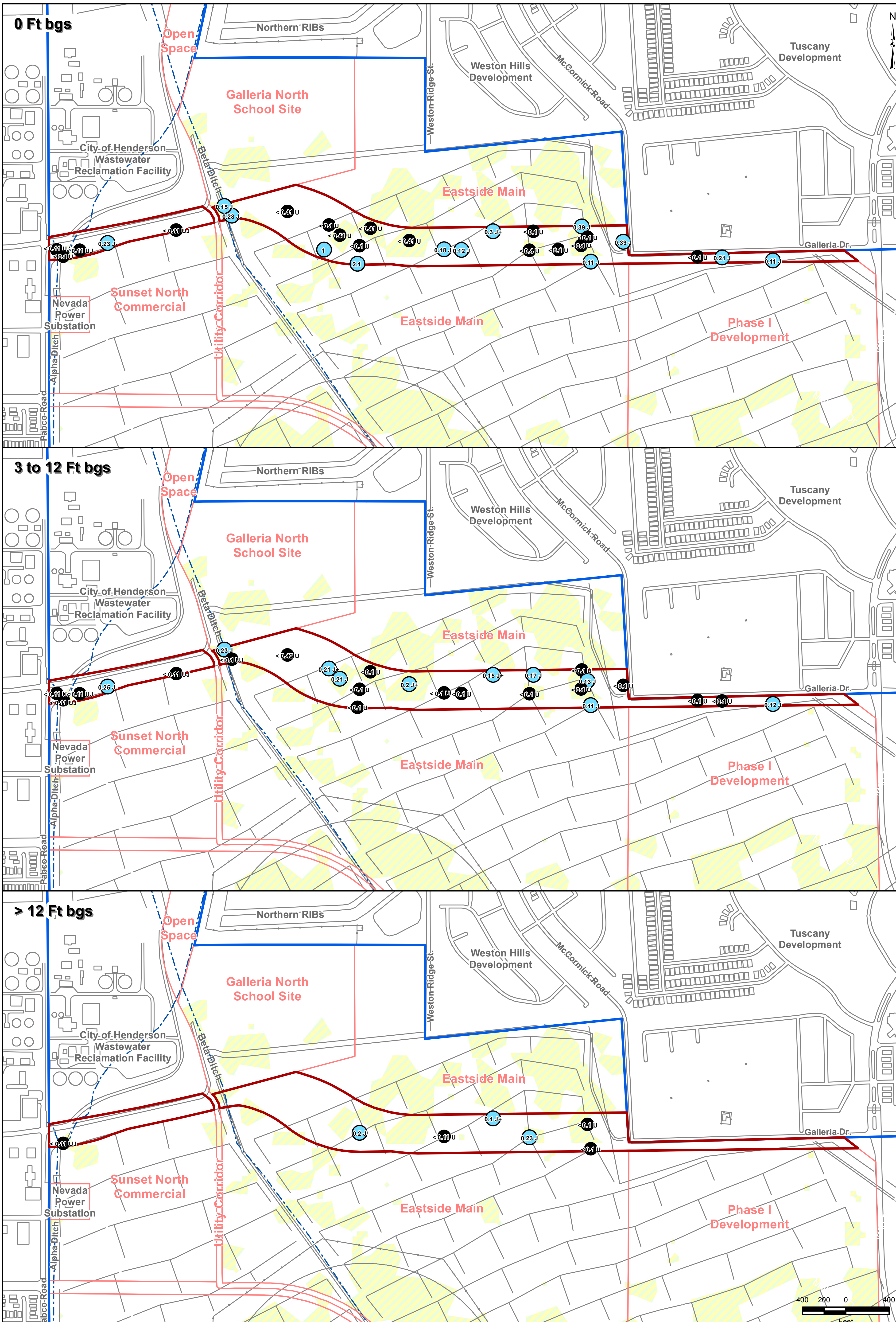
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-9

CHROMIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Non-Detect

Detect < 1/10-Residential BCL

>= 1/10-Residential BCL and < Residential BCL (234 mg/kg)

>= Residential BCL and < 10x Residential BCL

>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

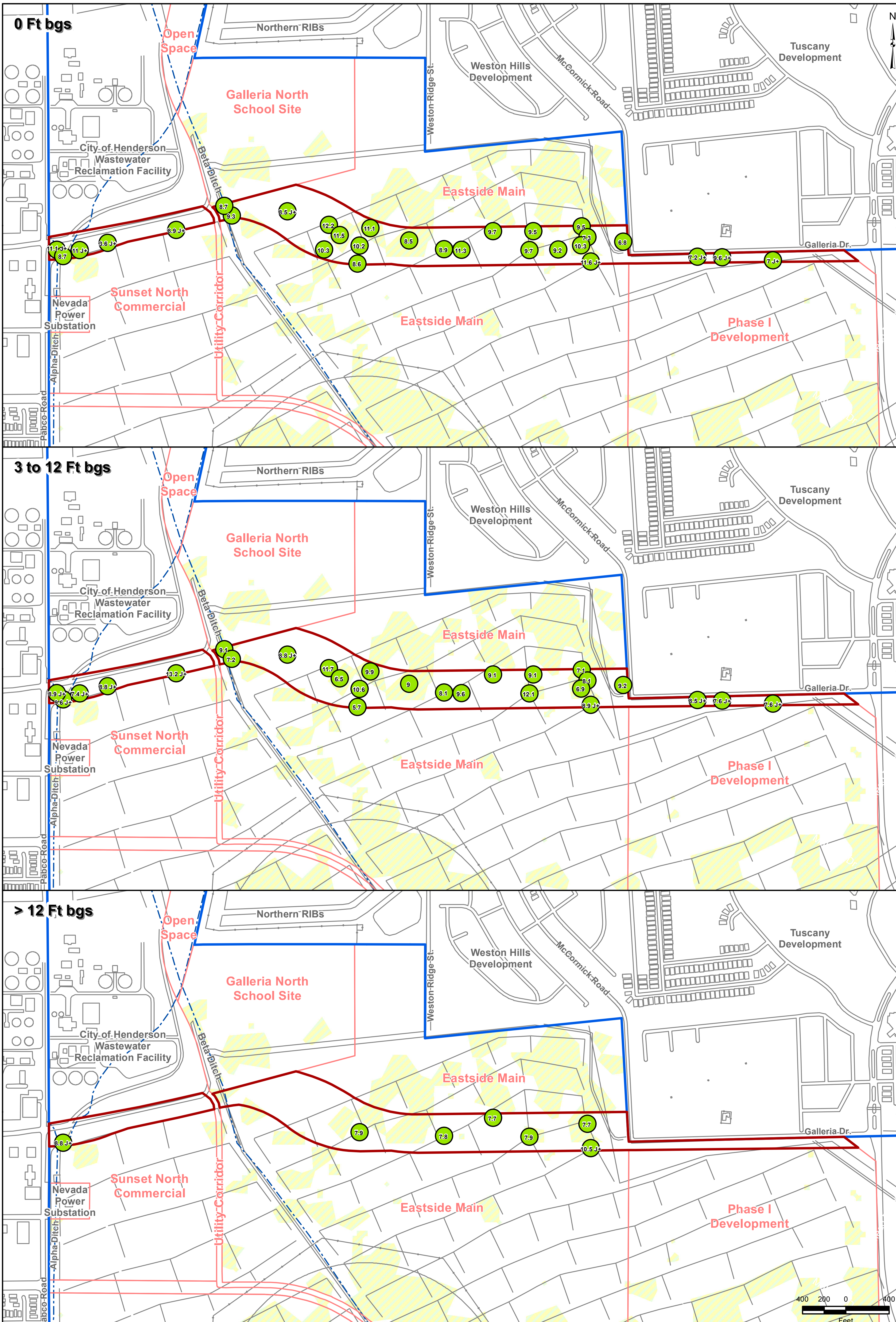
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-10

CHROMIUM (VI) SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation Company

Prepared by		Date	JOB No. 0064276
MKJ (ERM)	ERM	11/01/12	FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Non-Detect

Detect < 1/10-Residential BCL

>= 1/10-Residential BCL and < Max. Shallow Background (16.3 mg/kg)

>= Max. Shallow Background and < Residential BCL (23.4 mg/kg)

>= Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

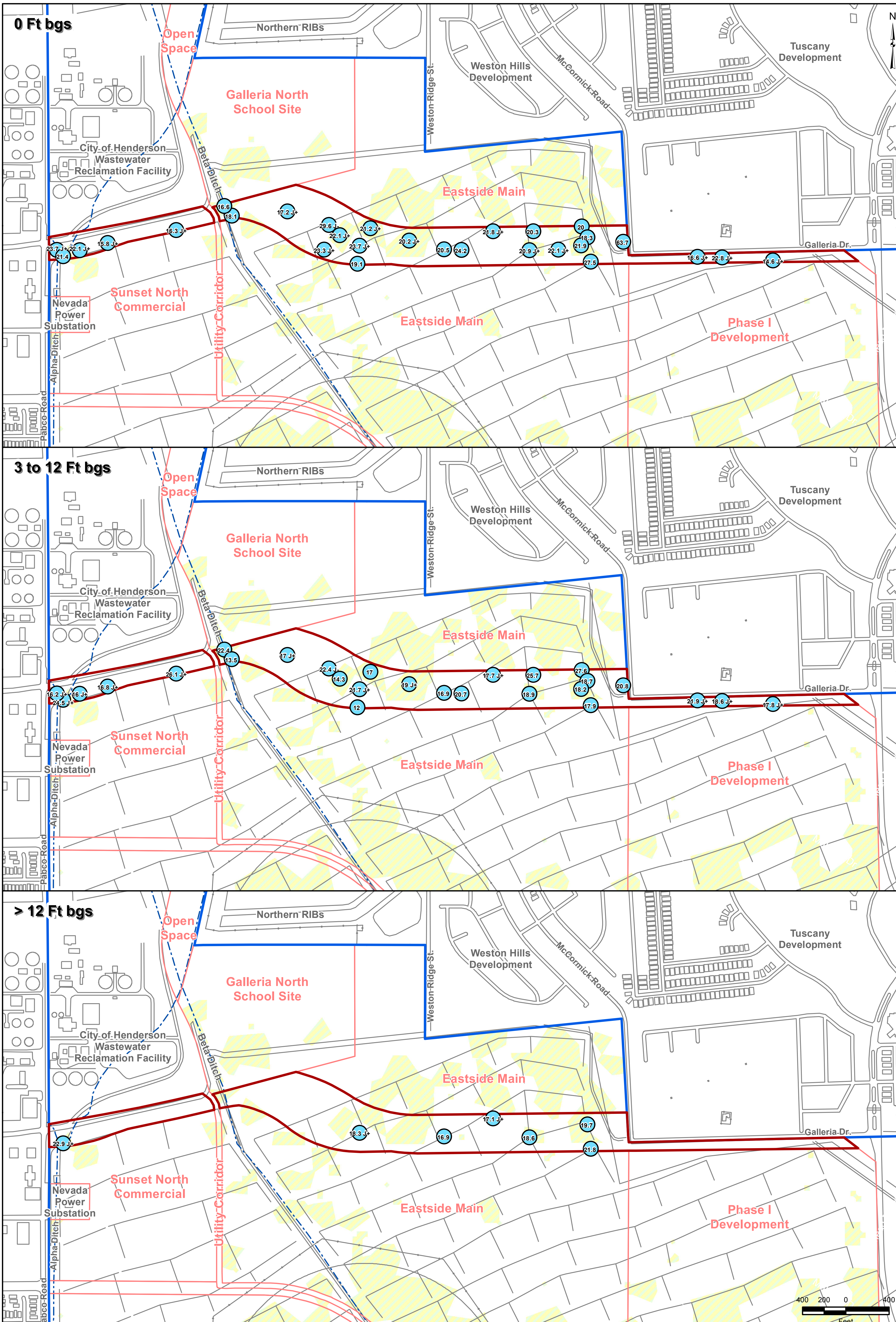
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-11

COBALT SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation Company

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (2,910 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

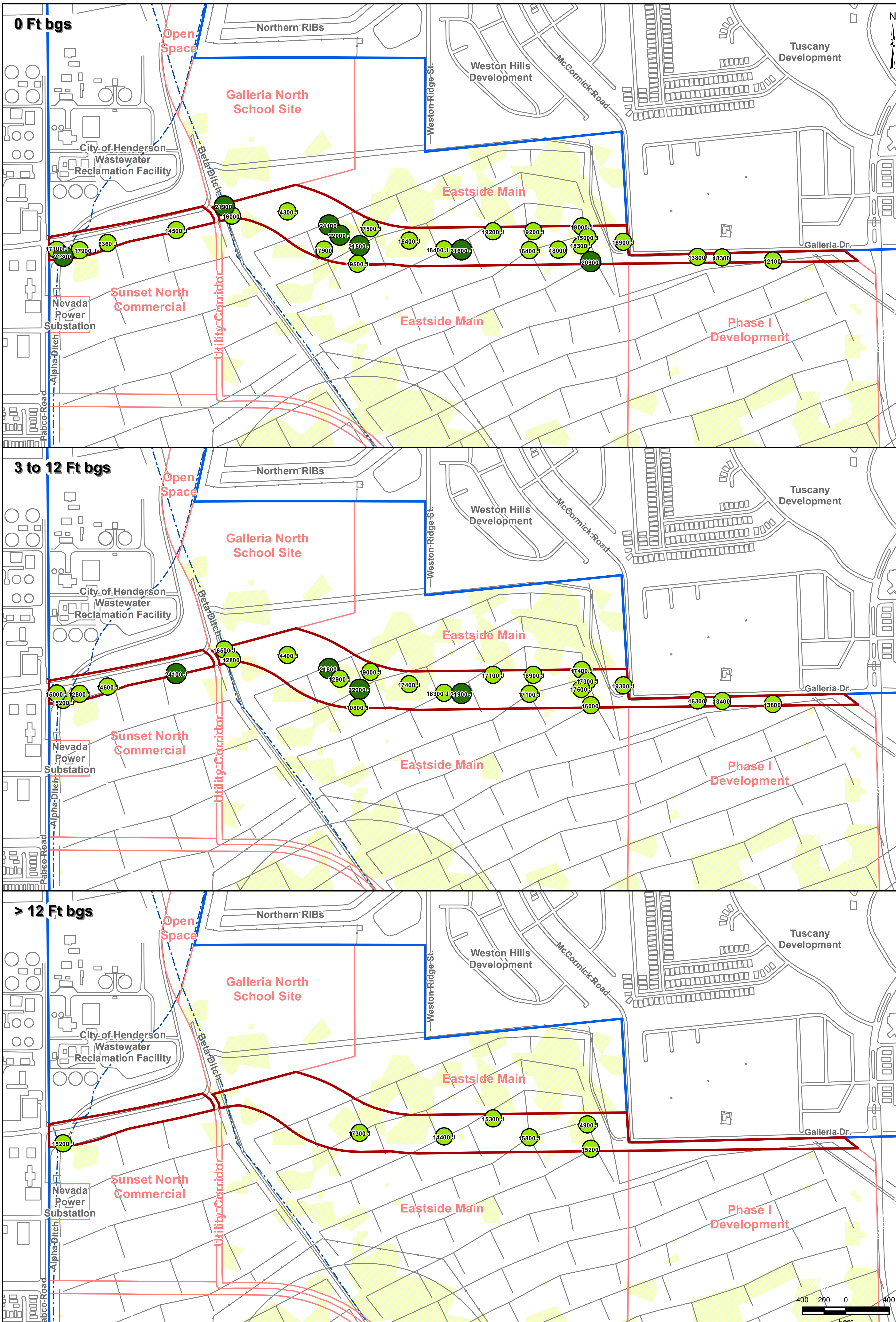
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-12

COPPER SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation Company

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Non-Detect

Detect < 1/10-Residential BCL

>= 1/10-Residential BCL and < Max. Shallow Background (19,700 mg/kg)

>= Max. Shallow Background and < Residential BCL (54,800 mg/kg)

>= Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

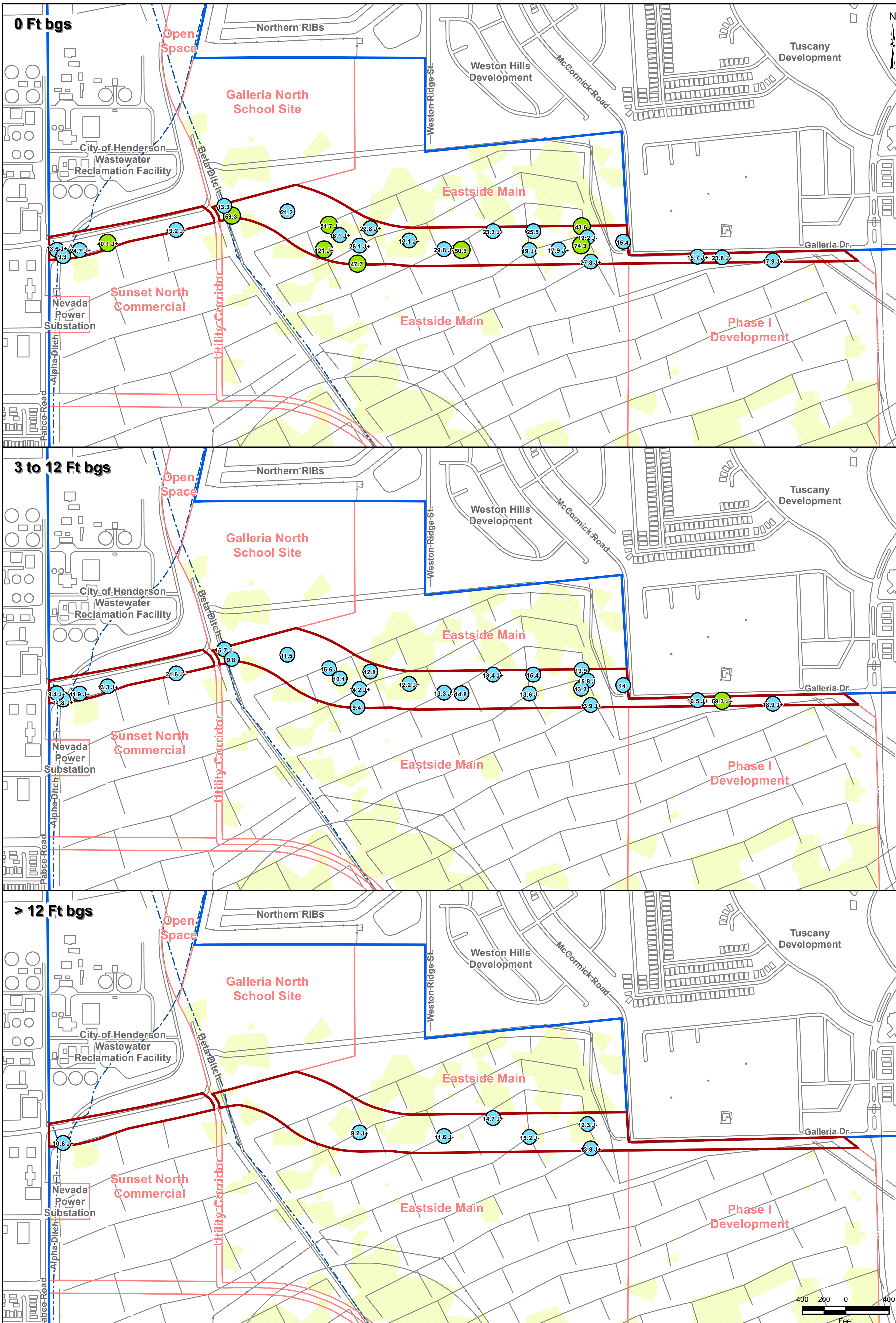
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-13

IRON SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (400 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

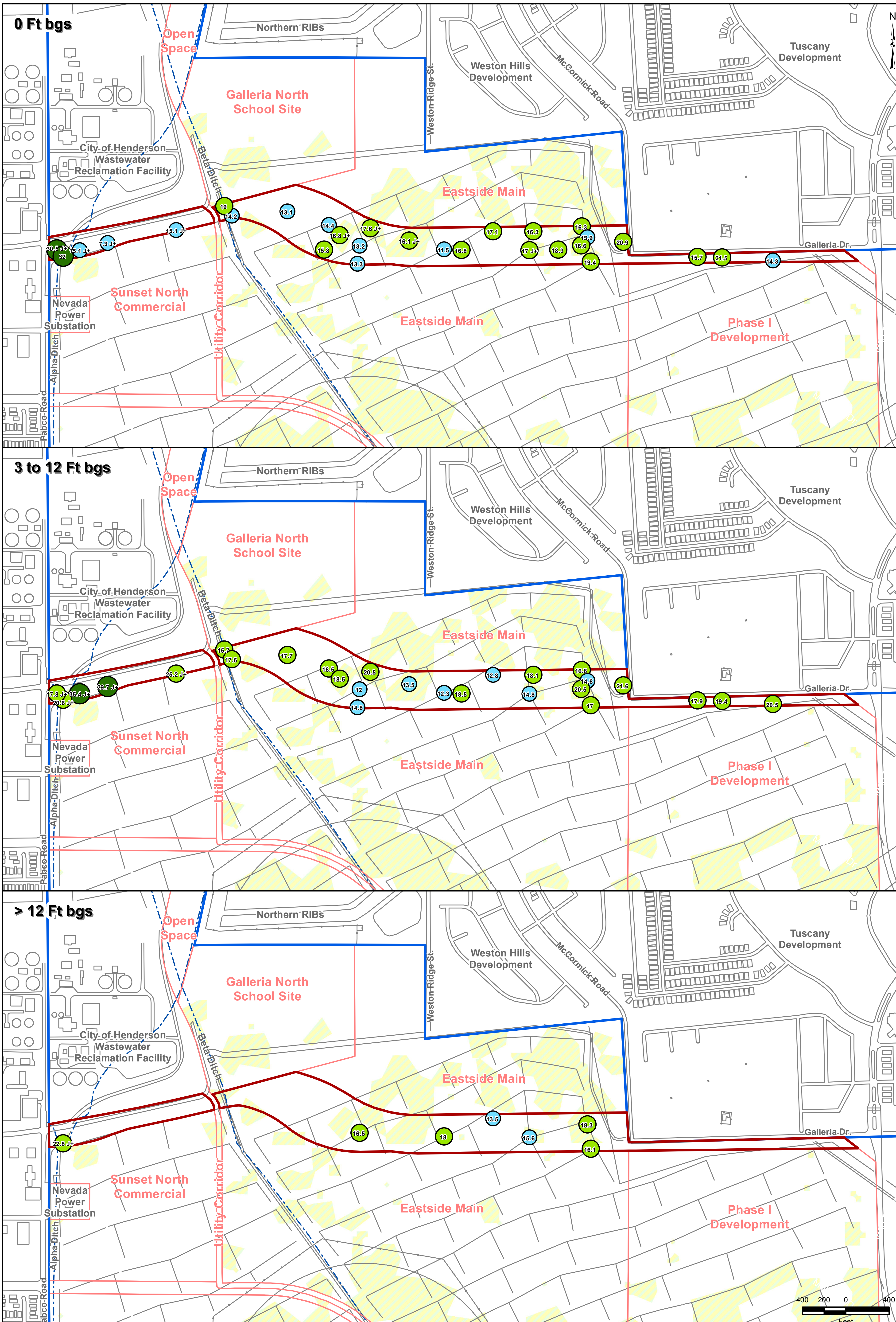
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-14

LEAD SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Max. Shallow Background (26.5 mg/kg)
Remediation Areas	>= Max. Shallow Background and < Residential BCL (156 mg/kg)
	>= Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

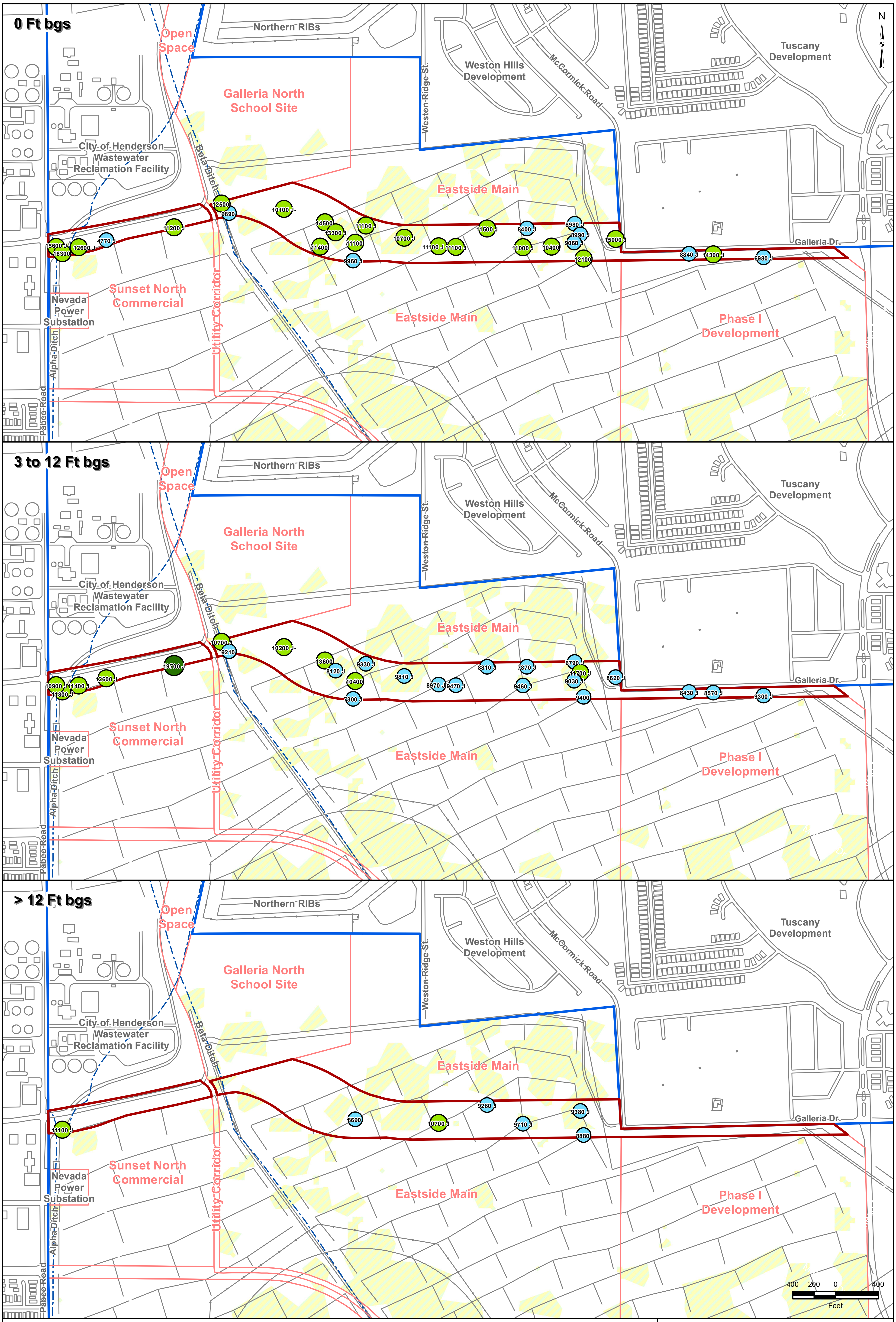
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-15

LITHIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way
Site AOC3 Boundary
Eastside Soil Sub-Areas
Remediation Areas

Non-Detect
Detect < 1/10-Residential BCL
>= 1/10-Residential BCL and < Max. Shallow Background (17,500 mg/kg)
>= Max. Shallow Background and < Residential BCL (100,000 mg/kg)
>= Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

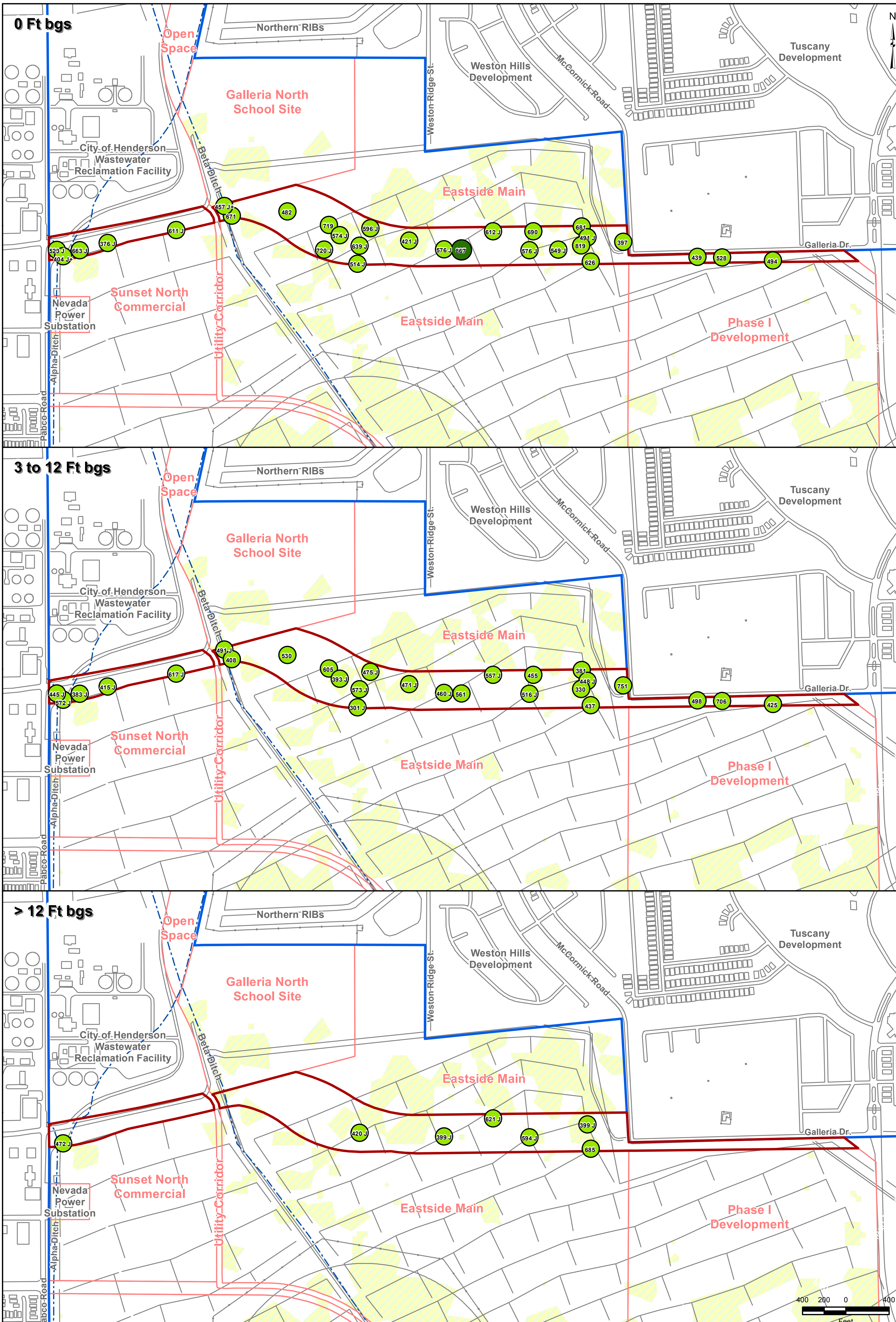
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-16

MAGNESIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation Company

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



- Galleria Dr. Right-of-Way
- Site AOC3 Boundary
- Eastside Soil Sub-Areas
- Remediation Areas

- Non-Detect
- Detect < 1/10-Residential BCL
- >= 1/10-Residential BCL and < Max. Shallow Background (863 mg/kg)
- >= Max. Shallow Background and < Residential BCL (1,820 mg/kg)
- >= Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

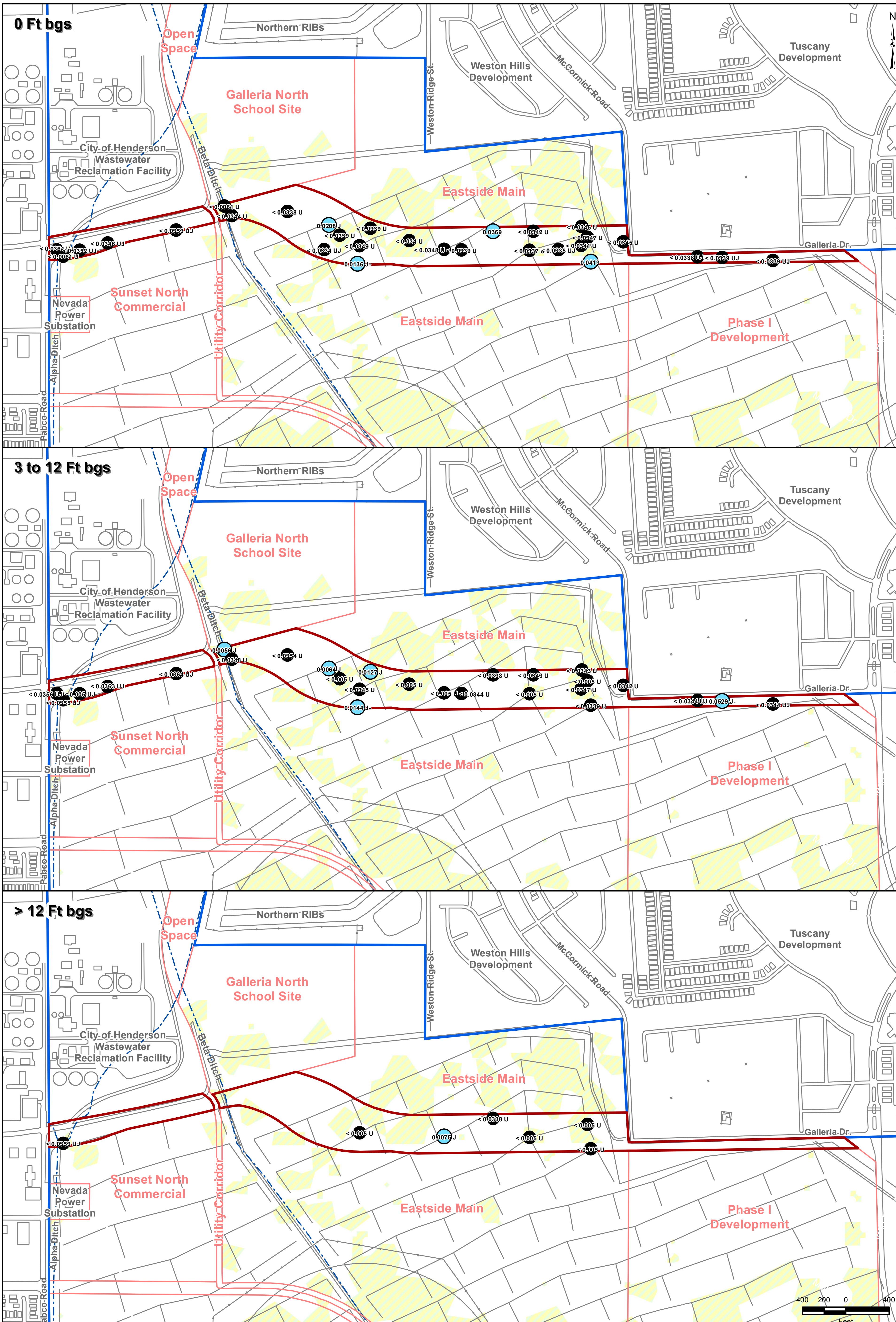
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-17

MANGANESE SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (23.5 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

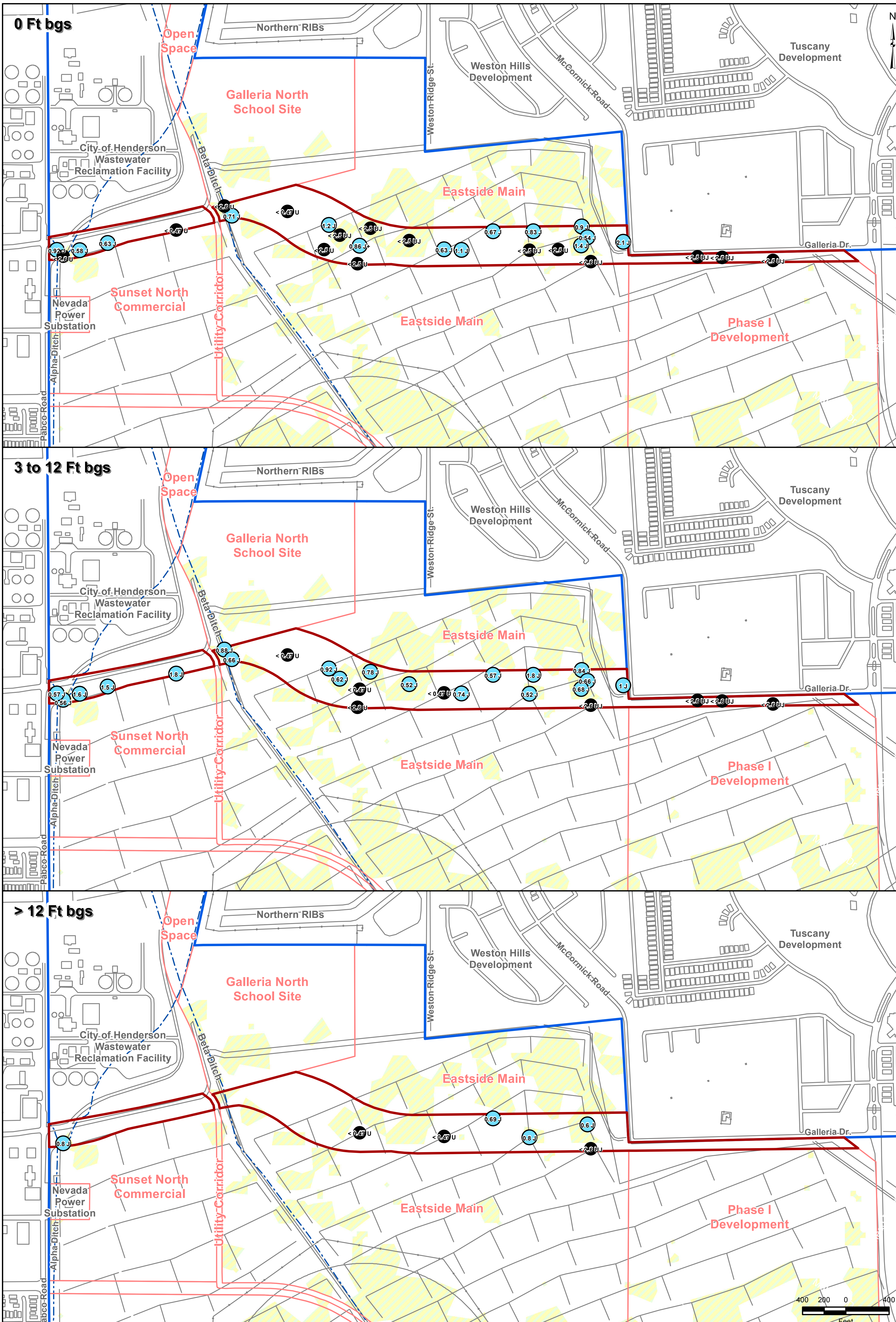
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-18

MERCURY SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Non-Detect

Detect < 1/10-Residential BCL

>= 1/10-Residential BCL and < Residential BCL (391 mg/kg)

>= Residential BCL and < 10x Residential BCL

>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

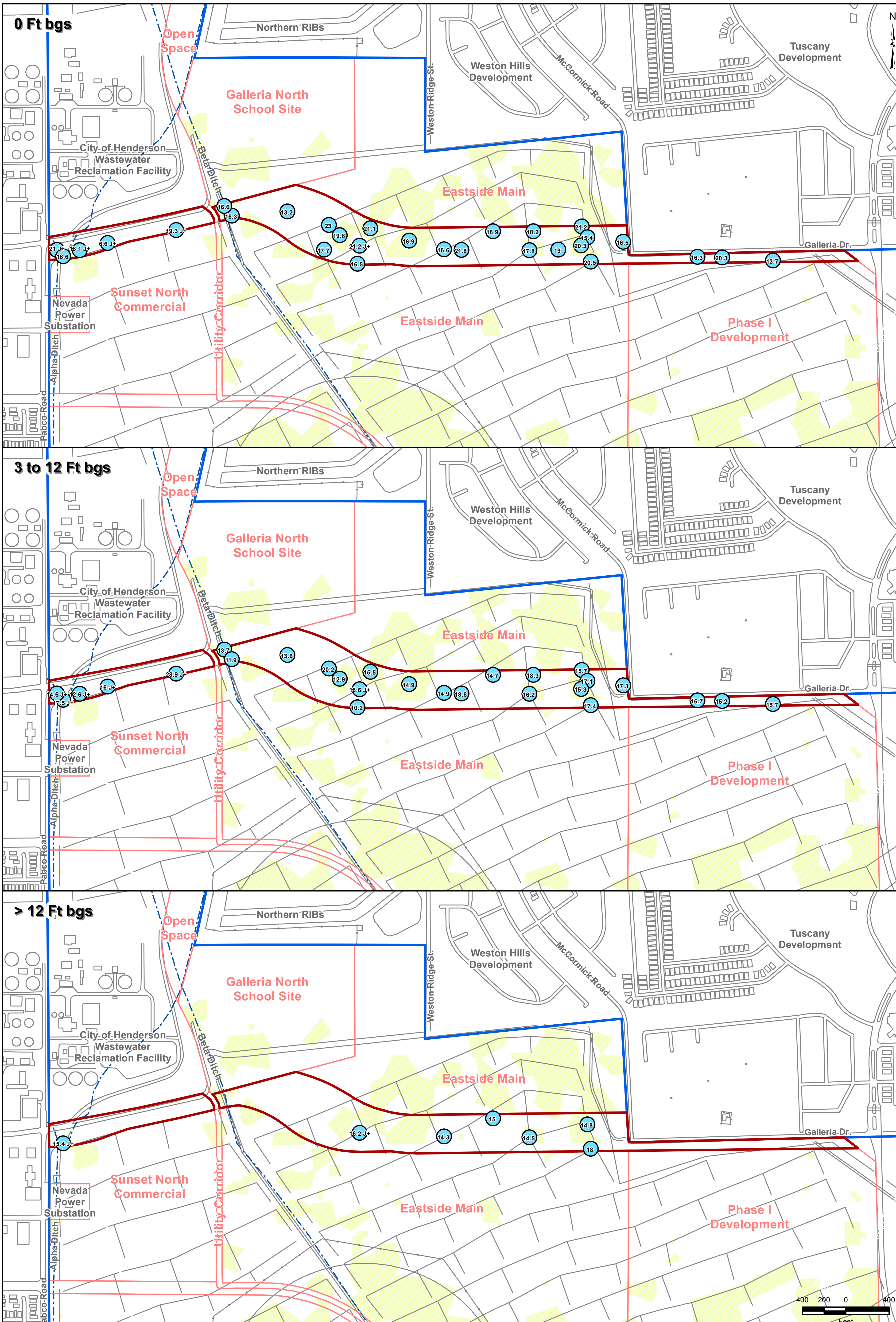
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-19

MOLYBDENUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (1,540 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

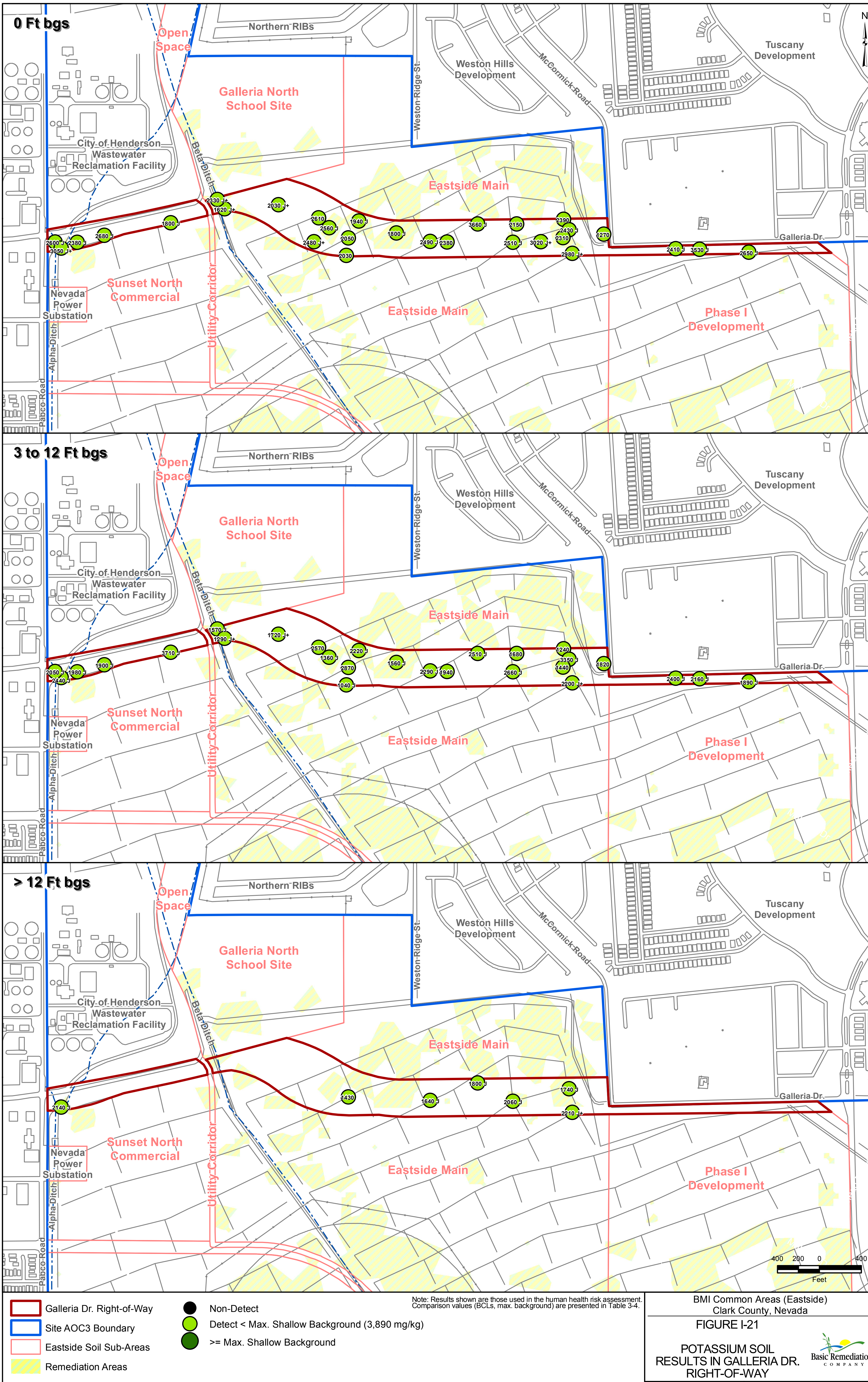
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-20

NICKEL SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

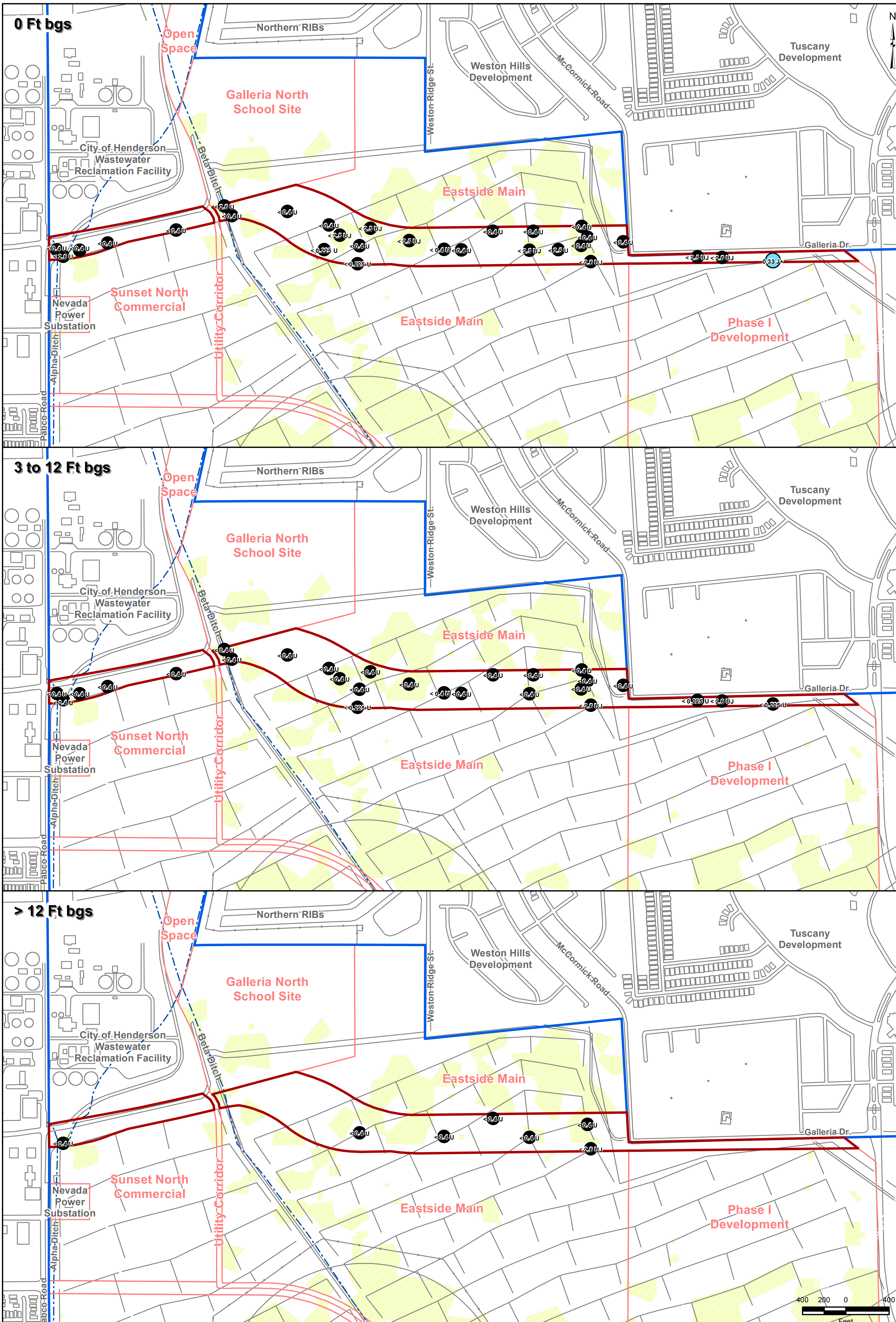
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-21

POTASSIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way
Site AOC3 Boundary
Eastside Soil Sub-Areas
Remediation Areas

Non-Detect
Detect < 1/10-Residential BCL
>= 1/10-Residential BCL and < Residential BCL (391 mg/kg)
>= Residential BCL and < 10x Residential BCL
>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

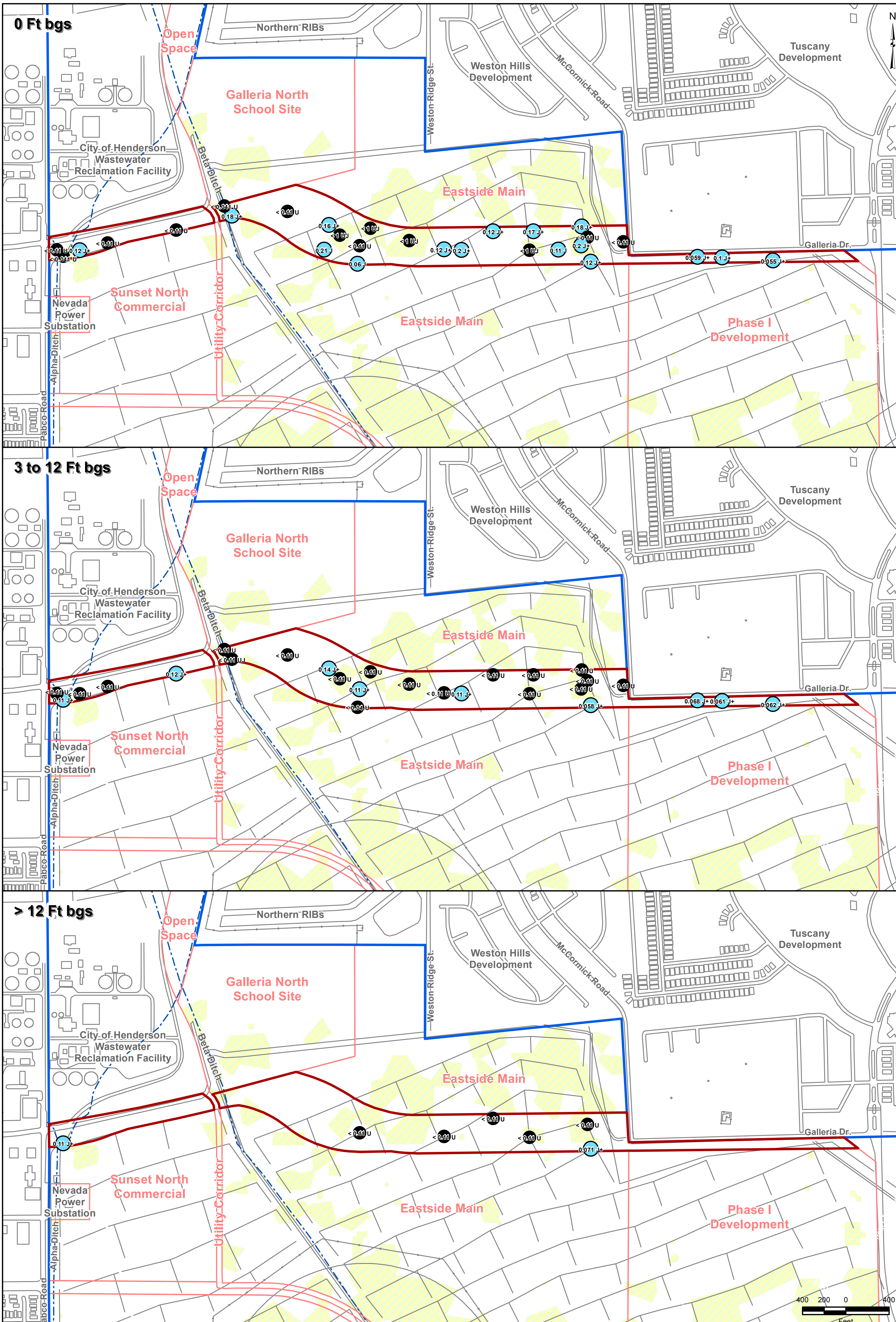
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-22

SELENIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



- Galleria Dr. Right-of-Way
- Site AOC3 Boundary
- Eastside Soil Sub-Areas
- Remediation Areas

- Non-Detect
- Detect < 1/10-Residential BCL
- >= 1/10-Residential BCL and < Residential BCL (391 mg/kg)
- >= Residential BCL and < 10x Residential BCL
- >= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

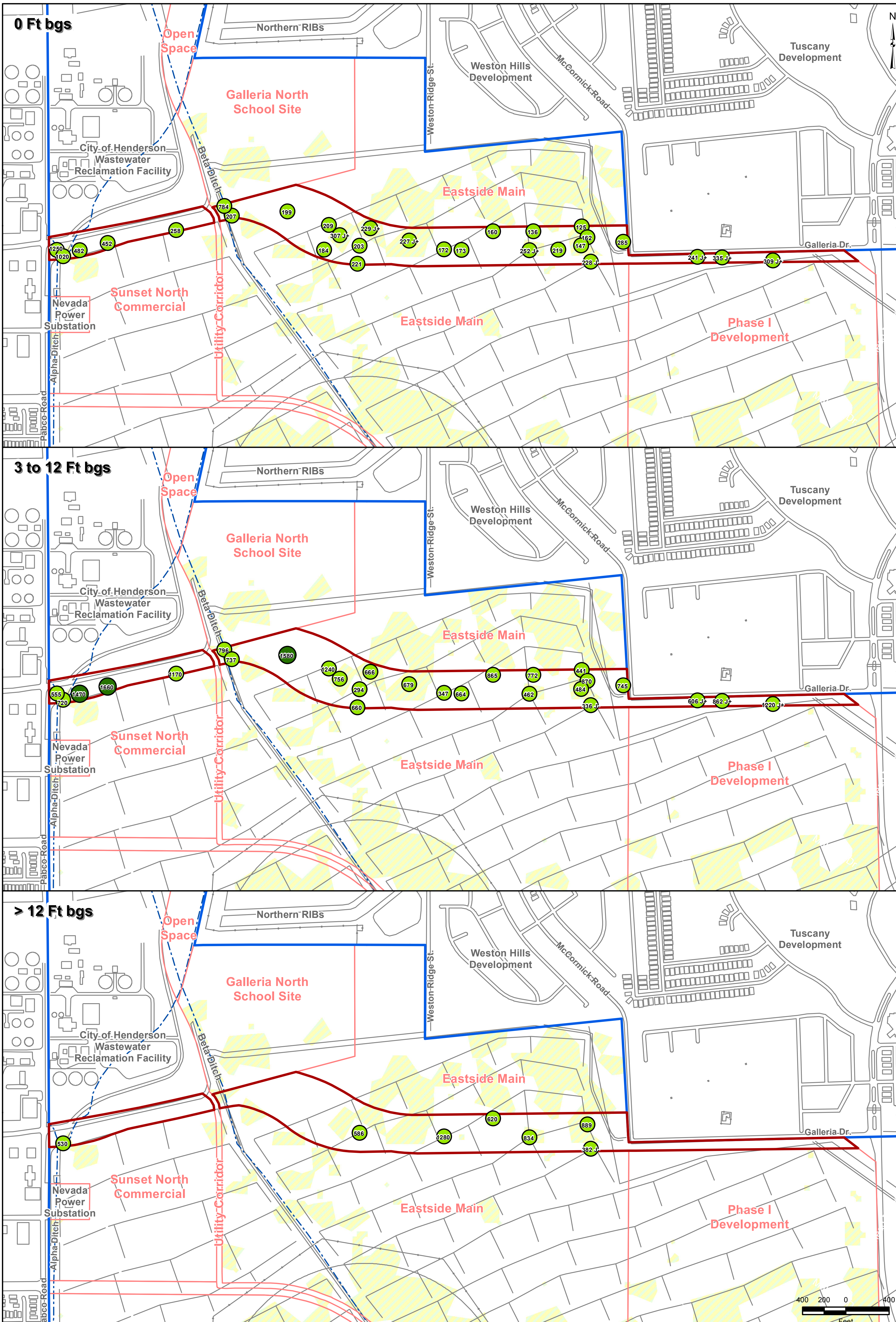
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-23

SILVER SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by		Date	JOB No. 0064276
MKJ (ERM)	ERM	11/01/12	FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Non-Detect

Detect < Max. Shallow Background (1,320 mg/kg)

>= Max. Shallow Background

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

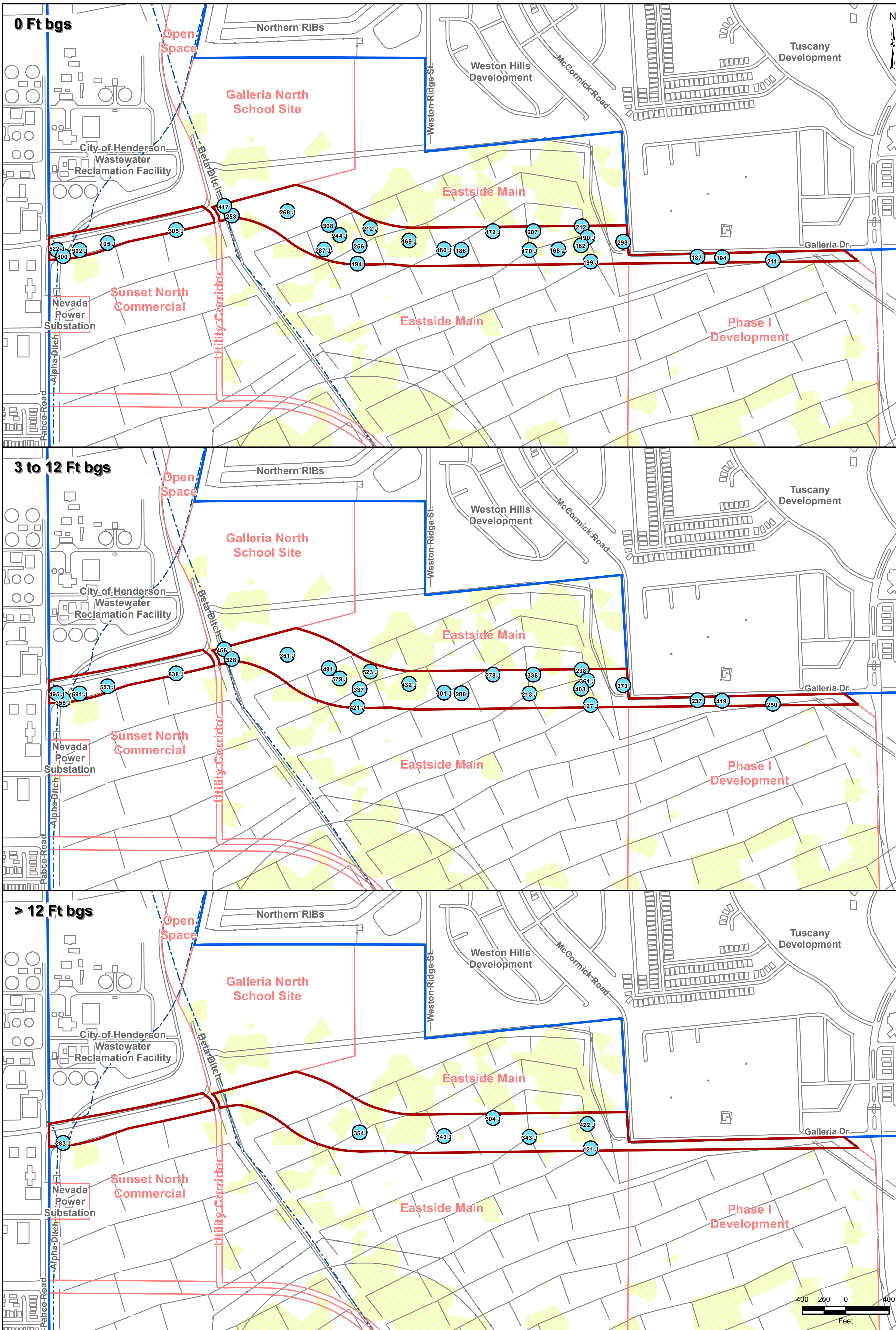
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-24

SODIUM SOIL
RESULTS IN GALLERIA DR.
RIGHT-OF-WAY

Basic Remediation Company

Prepared by		Date	JOB No. 0064276
MKJ (ERM)	ERM	11/01/12	FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Non-Detect

Detect < 1/10-Residential BCL

>= 1/10-Residential BCL and < Residential BCL (46,900 mg/kg)

>= Residential BCL and < 10x Residential BCL

>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

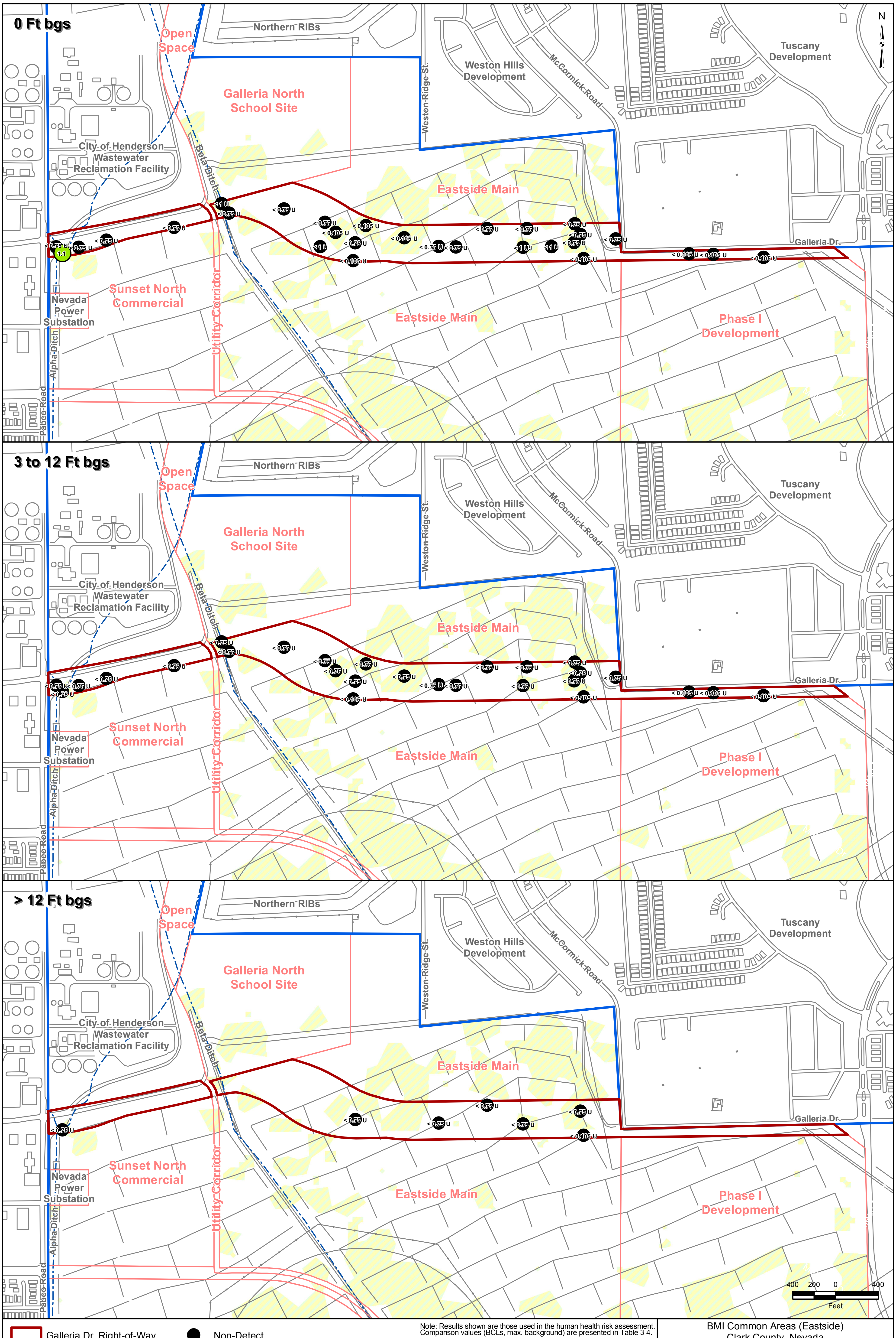
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-25

STRONTIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way
Site AOC3 Boundary
Eastside Soil Sub-Areas
Remediation Areas

Non-Detect
Detect < 1/10-Residential BCL
>= 1/10-Residential BCL and < Max. Shallow Background (1.8 mg/kg)
>= Max. Shallow Background and < Residential BCL (5.48 mg/kg)
>= Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

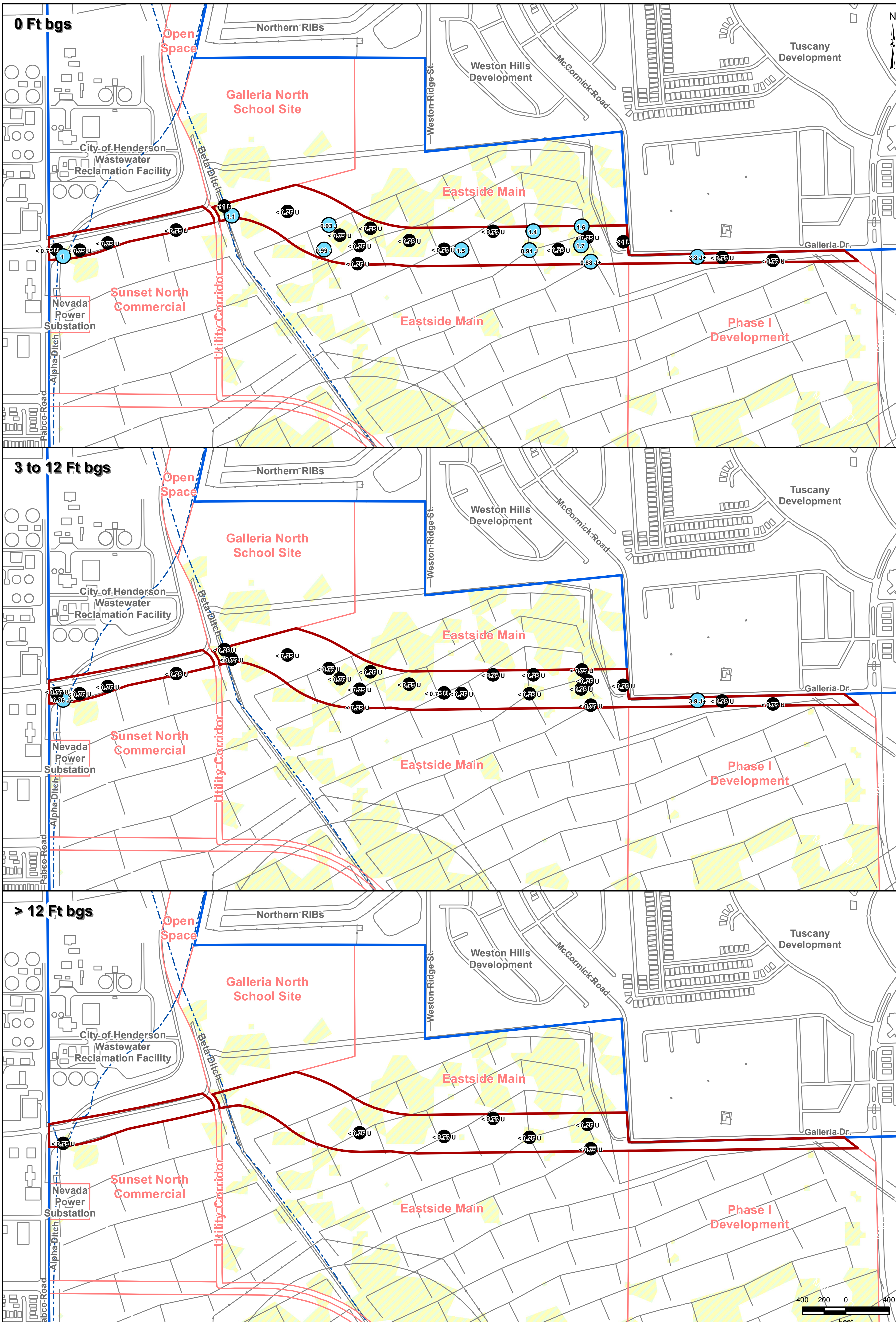
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-26

THALLIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation Company

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (46,900 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

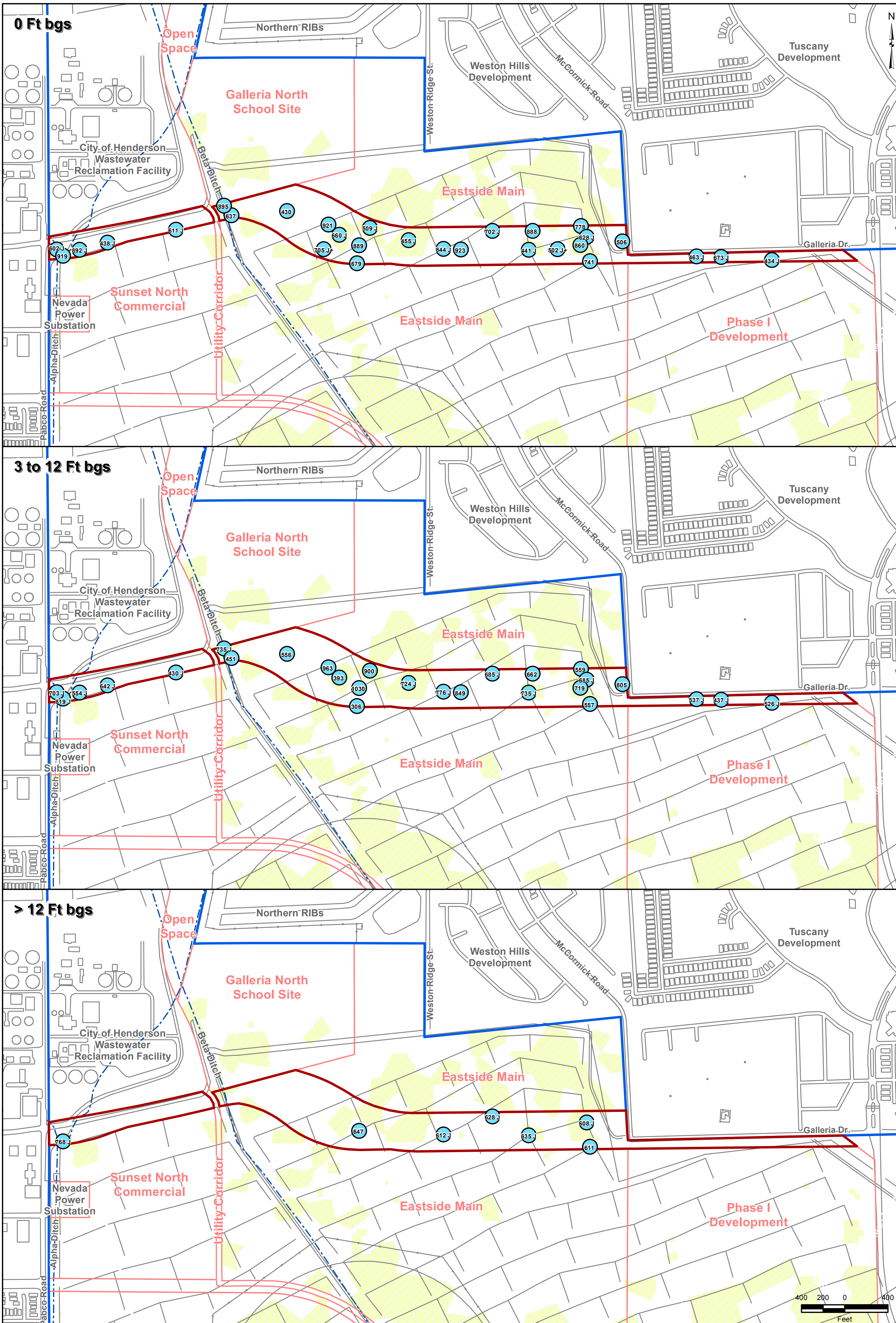
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-27

TIN SOIL
RESULTS IN GALLERIA DR.
RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (100,000 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

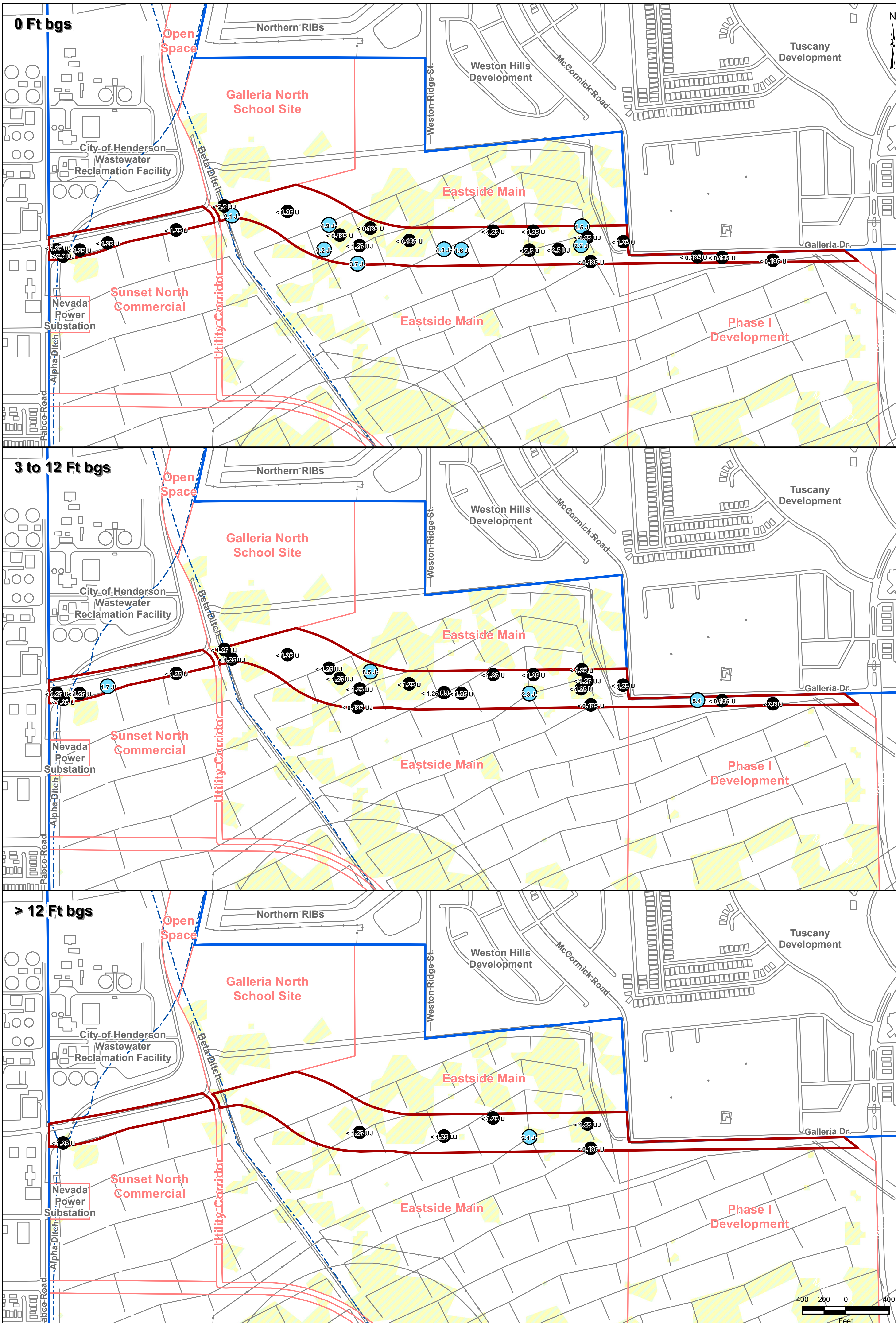
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-28

TITANIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (587 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

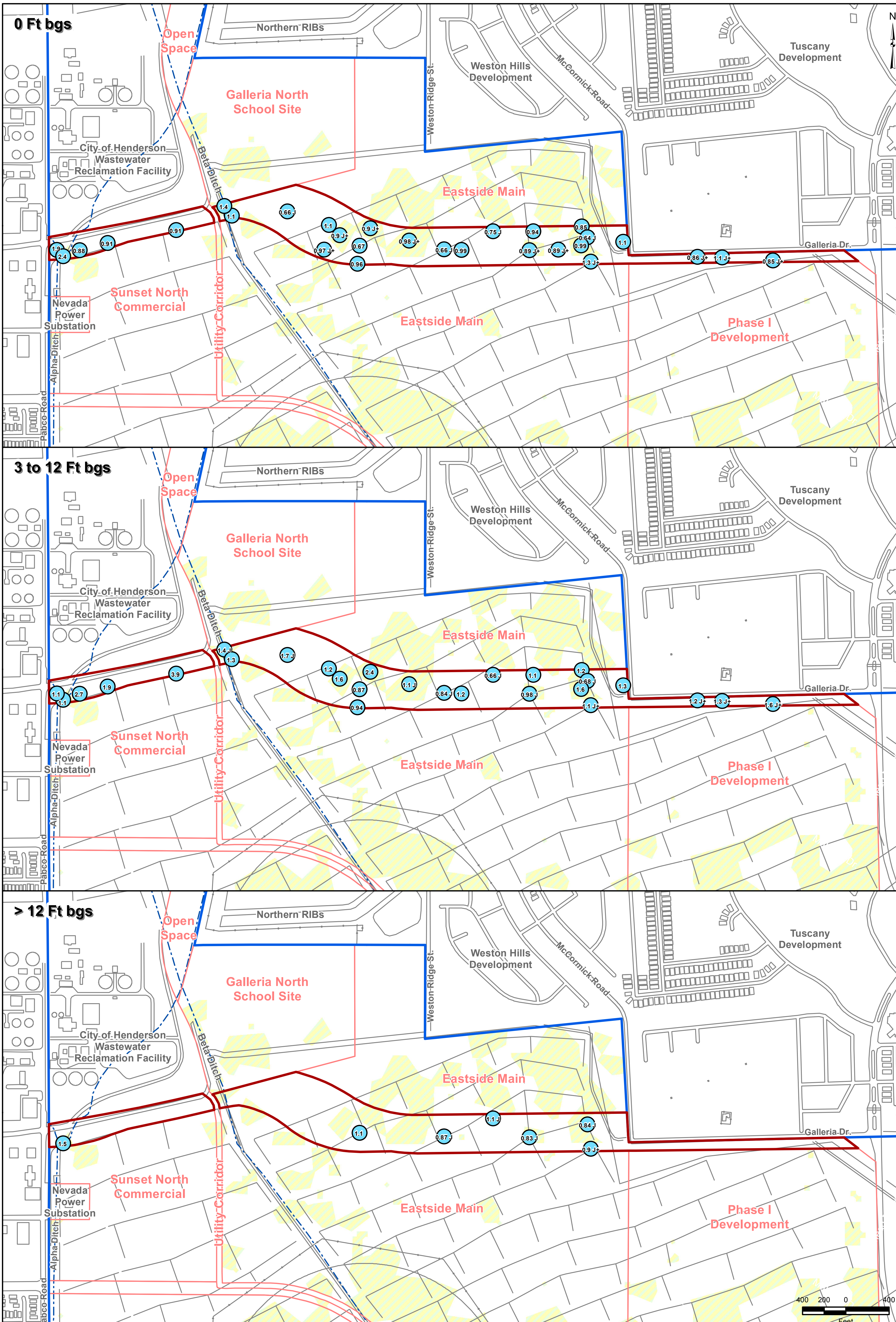
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-29

TUNGSTEN SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Legend	
Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (234 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

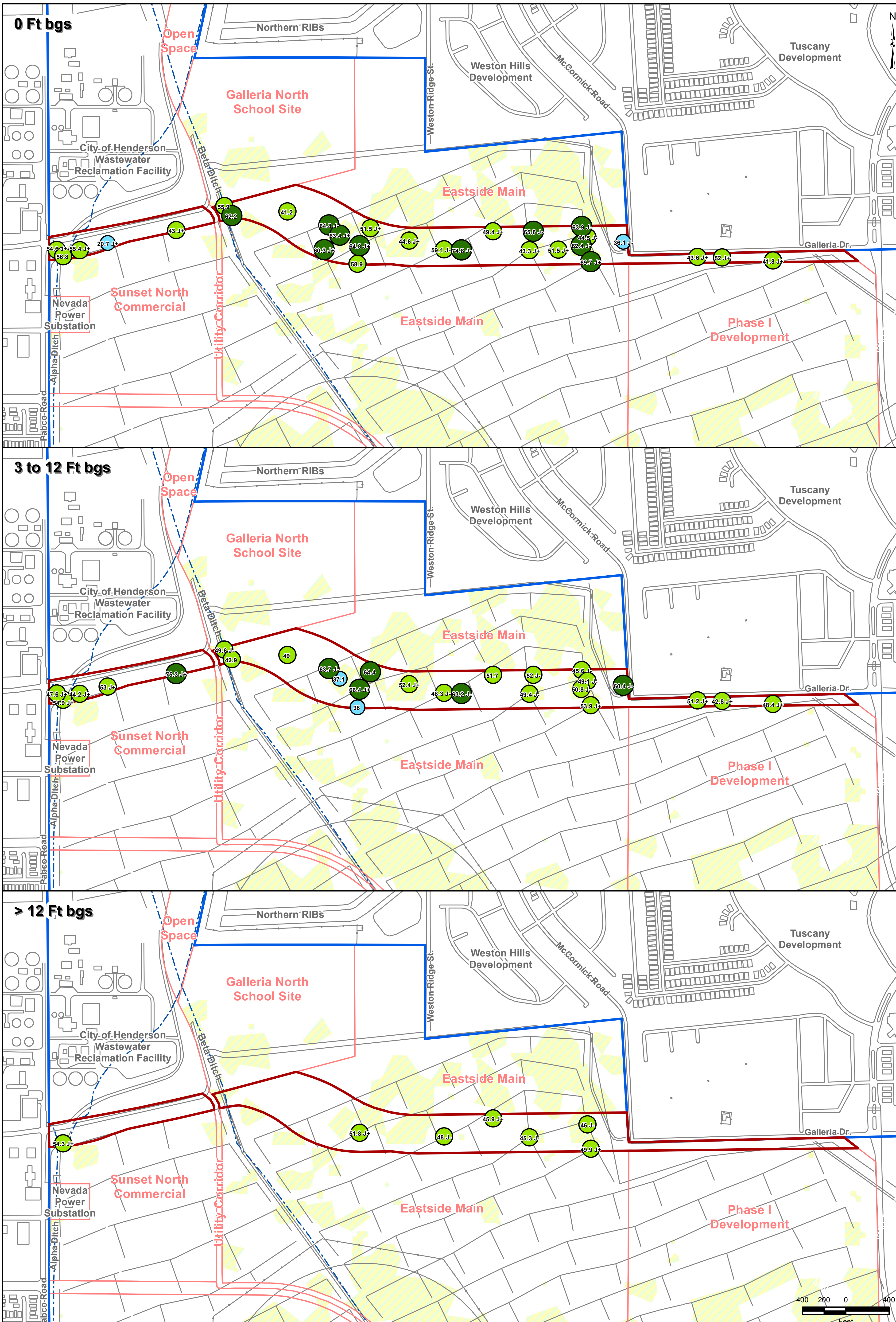
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-30

URANIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation Company

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Non-Detect

Detect < 1/10-Residential BCL

>= 1/10-Residential BCL and < Max. Shallow Background (59.1 mg/kg)

>= Max. Shallow Background and < Residential BCL (391 mg/kg)

>= Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

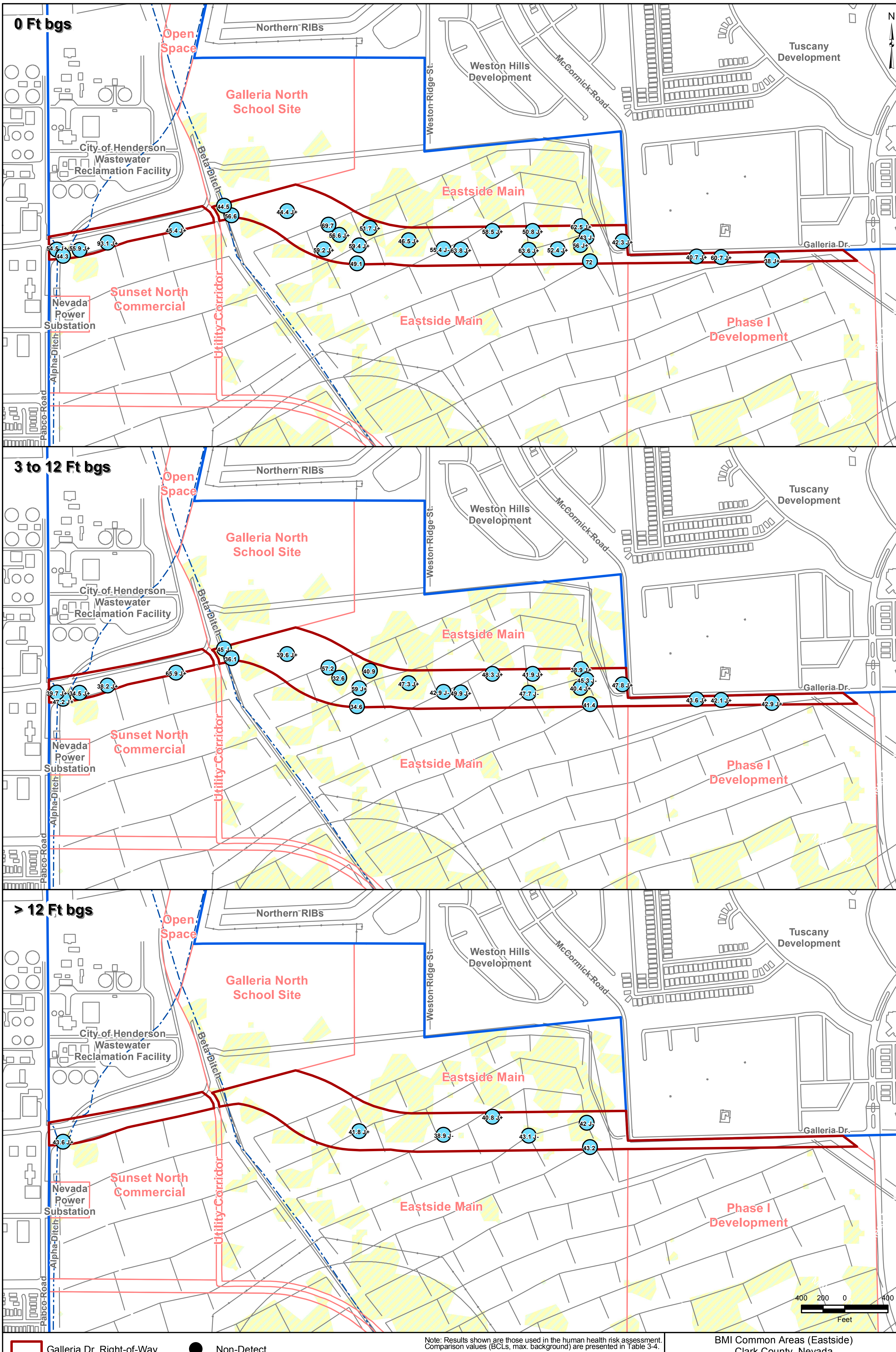
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-31

VANADIUM SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation Company

Prepared by		Date	JOB No. 0064276
MKJ (ERM)	ERM	11/01/12	FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (23,500 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

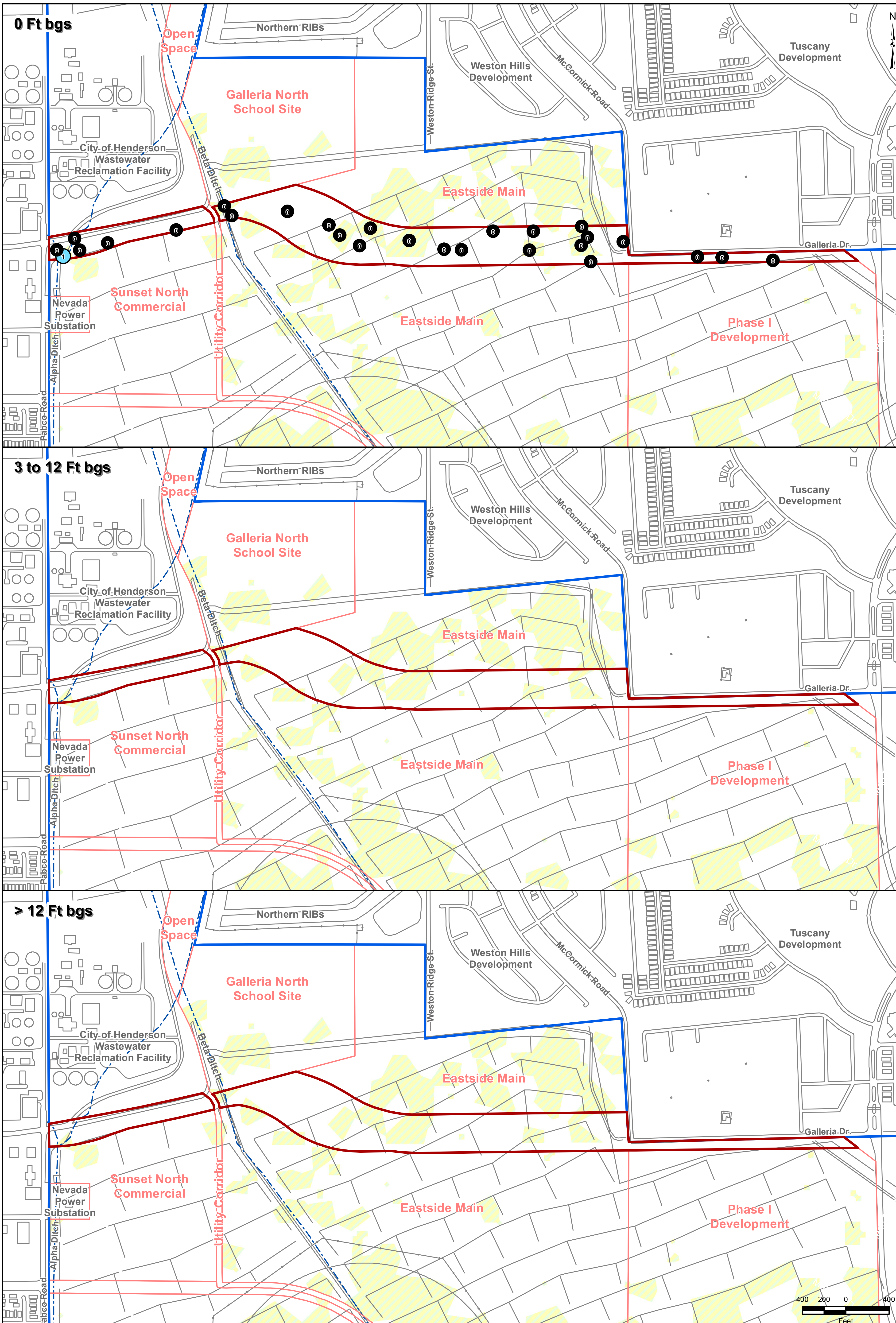
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-32

ZINC SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation Company

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	None Detected
Site AOC3 Boundary	1 Long Chrysotile Fiber
Eastside Soil Sub-Areas	2-3 Long Chrysotile Fibers
Remediation Areas	4-7 Long Chrysotile Fibers
	>7 Long Chrysotile Fibers

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

Results shown are for long fibers. No long amphibole fibers were detected in the human health risk assessment dataset.

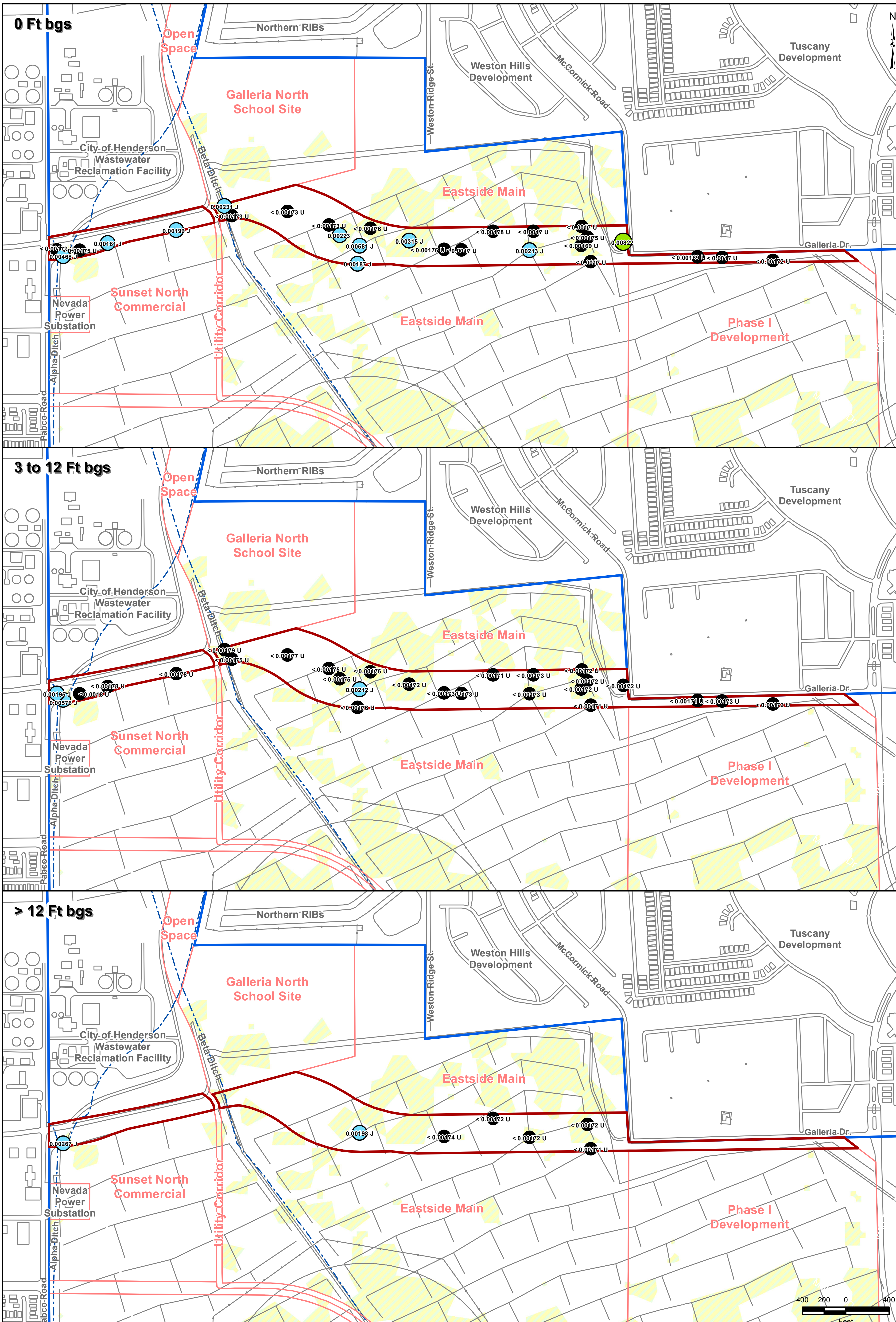
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-33

ASBESTOS SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



- Galleria Dr. Right-of-Way
- Site AOC3 Boundary
- Eastside Soil Sub-Areas
- Remediation Areas

- Non-Detect
- Detect < 1/10-Residential BCL
- >= 1/10-Residential BCL and < Residential BCL (0.0622 mg/kg)
- >= Residential BCL and < 10x Residential BCL
- >= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.
Benzo(a)pyrene is shown as representative of the PAH COPCs.

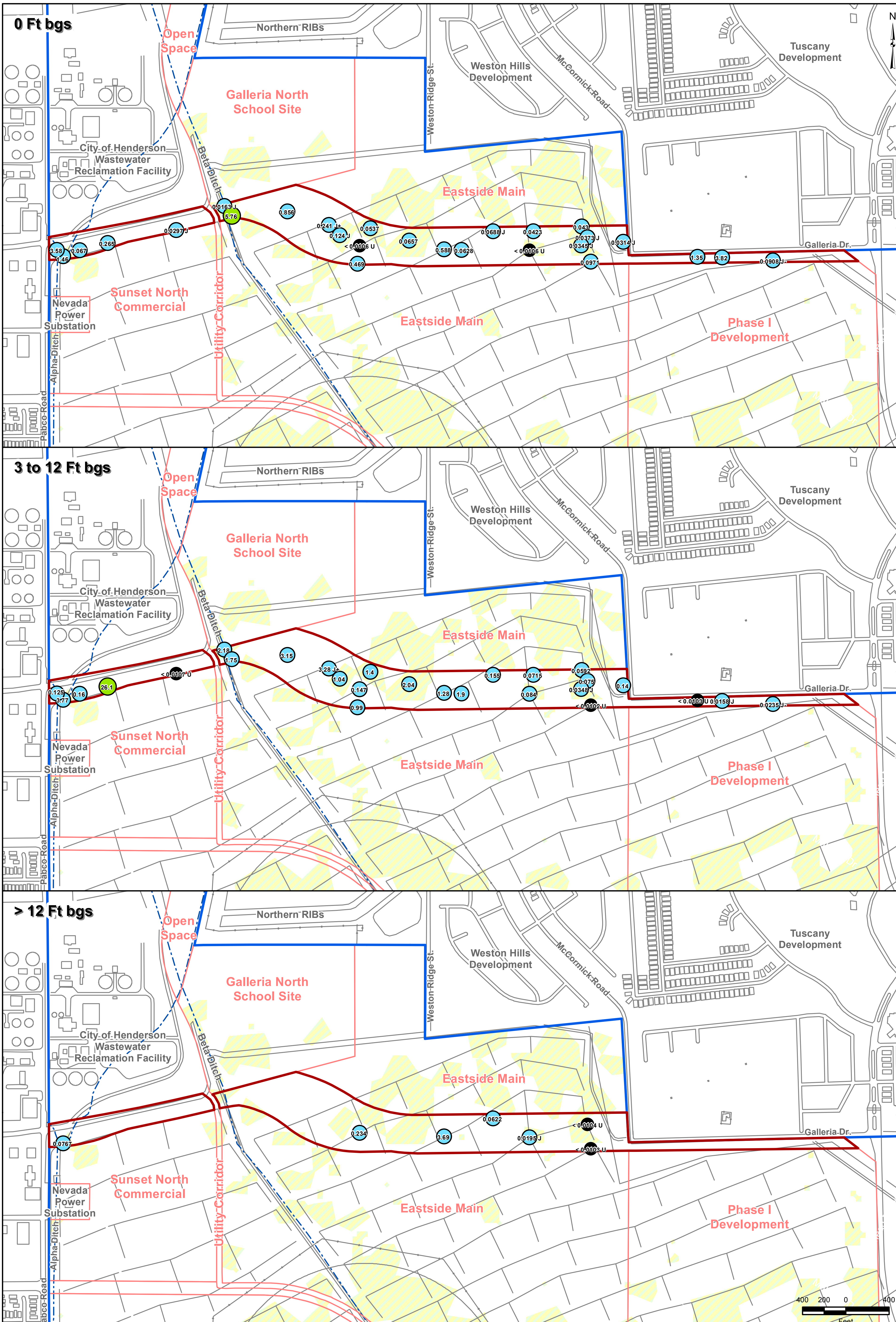
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-34

BENZO(A)PYRENE SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation Company

Prepared by		Date	JOB No. 0064276
MKJ (ERM)	ERM	11/01/12	FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way	Non-Detect
Site AOC3 Boundary	Detect < 1/10-Residential BCL
Eastside Soil Sub-Areas	>= 1/10-Residential BCL and < Residential BCL (54.8 mg/kg)
Remediation Areas	>= Residential BCL and < 10x Residential BCL
	>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

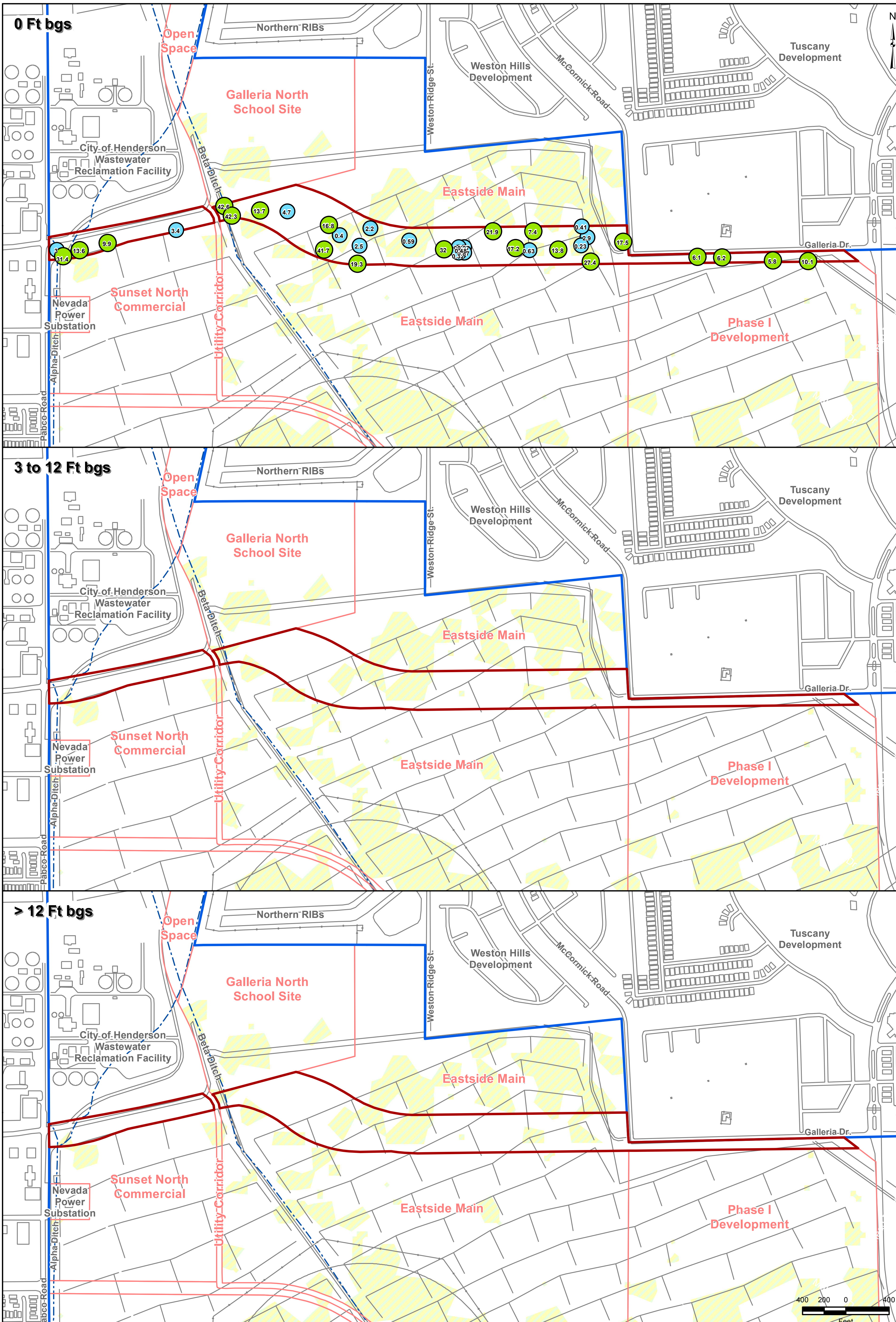
BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-35

PERCHLORATE SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD



Galleria Dr. Right-of-Way

Site AOC3 Boundary

Eastside Soil Sub-Areas

Remediation Areas

Non-Detect

Detect < 1/10-Residential BCL

>= 1/10-Residential BCL and < Residential BCL (50 ppt)

>= Residential BCL and < 10x Residential BCL

>= 10x Residential BCL

Note: Results shown are those used in the human health risk assessment. Comparison values (BCLs, max. background) are presented in Table 3-4.

Although not a COPC in the human health risk assessment, TCDD TEQ is presented here because it is a primary chemical of interest for the project.

BMI Common Areas (Eastside)
Clark County, Nevada

FIGURE I-36

TCDD TEQ SOIL RESULTS IN GALLERIA DR. RIGHT-OF-WAY

Basic Remediation COMPANY

Prepared by MKJ (ERM) | ERM | Date 11/01/12 | JOB No. 0064276 | FILE: GIS/BRC/GALLERIA_ROW/APPENDIX_I.MXD

APPENDIX J

LEGAL DESCRIPTION OF THE GALLERIA DR. RIGHT-OF-WAY

ATKINS

Atkins North America, Inc.
2270 Corporate Circle, Suite 200
Henderson, Nevada 89074-7755

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Fax: 702.263.7200

www.atkinsglobal.com/northamerica

LEGAL DESCRIPTION
NFA – GALLERIA DRIVE

A PORTION OF THE SOUTH HALF (S1/2) OF SECTIONS 31 AND 32, TOWNSHIP 21 SOUTH, RANGE 63 EAST, M.D.M., A PORTION OF THE SOUTHEAST QUARTER (SE1/4) OF SECTION 36, TOWNSHIP 21 SOUTH, RANGE 62 EAST, M.D.M., A PORTION OF THE NORTHEAST QUARTER (NE1/4) OF SECTION 1, TOWNSHIP 22 SOUTH, RANGE 62 EAST, M.D.M. AND A PORTION OF THE NORTH HALF (N1/2) OF SECTIONS 5 AND 6, TOWNSHIP 22 SOUTH, RANGE 63 EAST, M.D.M., CITY OF HENDERSON, CLARK COUNTY, NEVADA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF THE SOUTHWEST QUARTER (SW1/4) OF SAID SECTION 32; THENCE ALONG THE SOUTH LINE THEREOF, NORTH 88°41'08" EAST, 34.42 FEET TO THE **POINT OF BEGINNING**; THENCE CONTINUING ALONG SAID SOUTH LINE, NORTH 88°41'08" EAST, 2286.69 FEET; THENCE DEPARTING SAID SOUTH LINE, SOUTH 00°00'00" WEST, 106.37 FEET; THENCE SOUTH 89°19'57" WEST, 267.41 FEET; THENCE SOUTH 89°19'57" WEST, 4037.55 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE NORTHEASTERLY HAVING A RADIUS OF 1480.01 FEET; THENCE ALONG SAID CURVE TO THE RIGHT THROUGH A CENTRAL ANGLE OF 9°25'48", AN ARC LENGTH OF 243.59 FEET; THENCE SOUTH 89°19'57" WEST, 286.82 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE NORTHEASTERLY HAVING A RADIUS OF 1080.01 FEET; THENCE ALONG SAID CURVE TO THE RIGHT THROUGH A CENTRAL ANGLE OF 39°24'06", AN ARC LENGTH OF 742.71 FEET TO THE BEGINNING OF A REVERSE CURVE CONCAVE SOUTHWESTERLY HAVING A RADIUS OF 919.99 FEET, A RADIAL LINE TO SAID BEGINNING BEARS NORTH 38°44'03" EAST; THENCE ALONG SAID CURVE TO THE LEFT THROUGH A CENTRAL ANGLE OF 29°54'42", AN ARC LENGTH OF 480.29 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE SOUTHEASTERLY HAVING A RADIUS OF 1319.99 FEET, A RADIAL LINE TO SAID BEGINNING BEARS NORTH 05°02'25" WEST; THENCE ALONG SAID CURVE TO THE LEFT THROUGH A CENTRAL ANGLE OF 8°42'20", AN ARC LENGTH OF 200.56 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE NORTHWESTERLY HAVING A RADIUS OF 19099.62 FEET, A RADIAL LINE TO SAID BEGINNING BEARS SOUTH 13°44'08" EAST; THENCE ALONG SAID CURVE TO THE RIGHT THROUGH A CENTRAL ANGLE OF 2°14'26", AN ARC LENGTH OF 746.85 FEET TO THE BEGINNING OF A REVERSE CURVE CONCAVE SOUTHEASTERLY HAVING A RADIUS OF 1410.53 FEET, A RADIAL LINE TO SAID BEGINNING BEARS NORTH 11°29'42" WEST; THENCE ALONG SAID CURVE TO THE LEFT THROUGH A CENTRAL ANGLE OF 10°27'45", AN ARC LENGTH OF 257.57 FEET TO THE BEGINNING OF A REVERSE CURVE CONCAVE NORTHWESTERLY HAVING A RADIUS OF 1579.99 FEET, A RADIAL LINE TO SAID BEGINNING BEARS SOUTH 21°57'28" EAST; THENCE ALONG SAID CURVE TO THE RIGHT

THROUGH A CENTRAL ANGLE OF 21°36'52", AN ARC LENGTH OF 596.04 FEET; THENCE NORTH 90°00'00" WEST, 76.90 FEET; THENCE NORTH 00°00'00" EAST, 195.78 FEET; THENCE NORTH 79°53'06" EAST, 596.57 FEET; THENCE NORTH 78°54'21" EAST, 327.73 FEET; THENCE NORTH 77°54'21" EAST, 327.73 FEET; THENCE NORTH 76°54'21" EAST, 343.01 FEET; THENCE NORTH 14°19'23" WEST, 184.41 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE SOUTHWESTERLY HAVING A RADIUS OF 1675.04 FEET, A RADIAL LINE TO SAID BEGINNING BEARS NORTH 14°50'42" WEST; THENCE ALONG SAID CURVE TO THE RIGHT THROUGH A CENTRAL ANGLE OF 47°42'12", AN ARC LENGTH OF 1394.61 FEET TO THE BEGINNING OF A REVERSE CURVE CONCAVE NORTHEASTERLY HAVING A RADIUS OF 1124.96 FEET, A RADIAL LINE TO SAID BEGINNING BEARS SOUTH 32°51'31" WEST; THENCE ALONG SAID CURVE TO THE LEFT THROUGH A CENTRAL ANGLE OF 33°31'34", AN ARC LENGTH OF 658.26 FEET; THENCE NORTH 89°19'57" EAST, 2010.92 FEET; THENCE SOUTH 03°25'31" EAST, 198.73 FEET; THENCE SOUTH 00°02'33" EAST, 76.02 FEET TO THE **POINT OF BEGINNING**.

SAID PARCEL CONTAINS APPROXIMATELY 48.47 ACRES.

BASIS OF BEARINGS

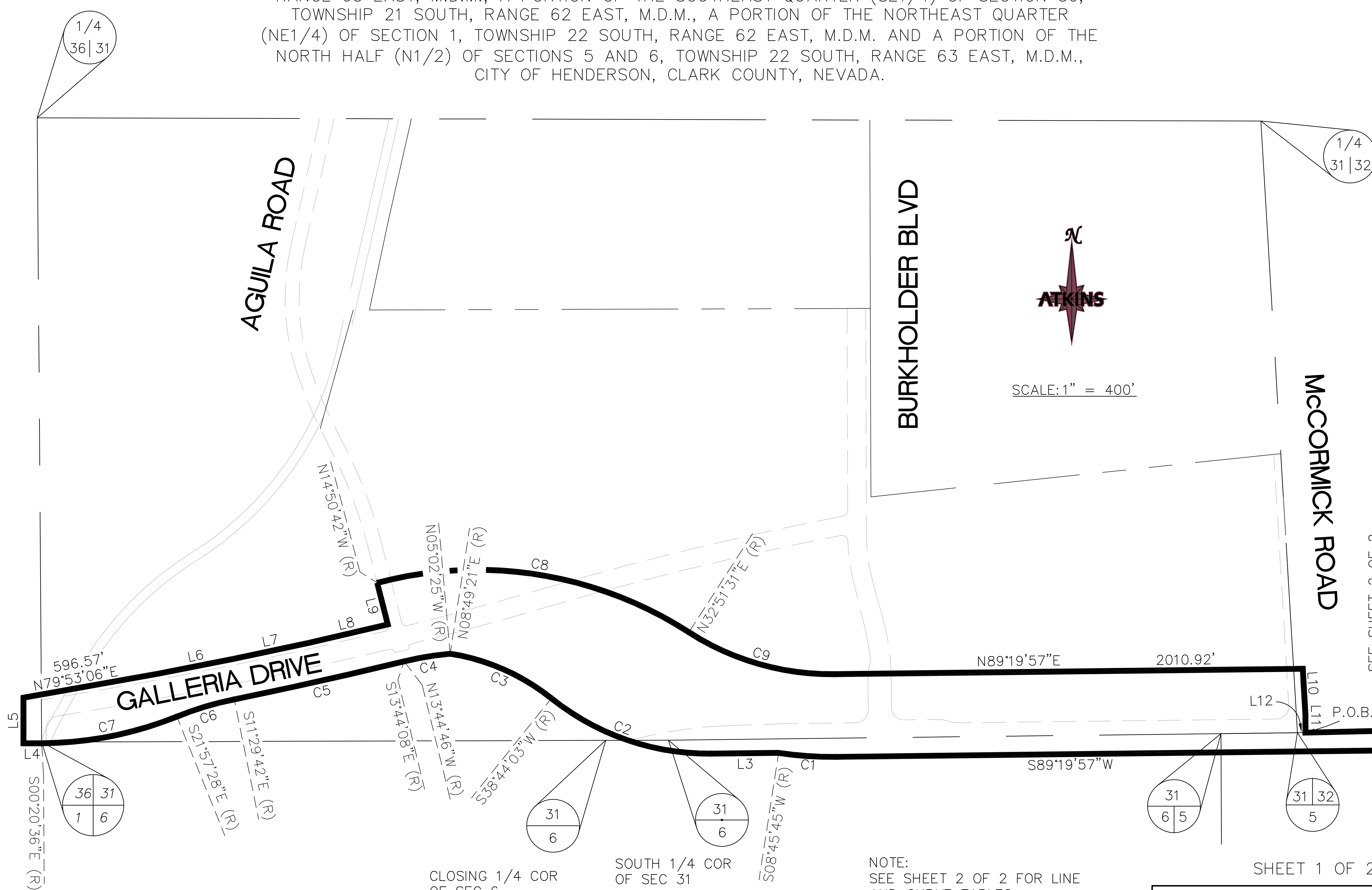
THE BASIS OF BEARINGS FOR THIS LEGAL DESCRIPTION IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983(NC83) EAST ZONE (2701).

PROFESSIONAL LAND SURVEYOR - STATE OF NEVADA
ERIC CHRISTIANSON
Exp. 12/31/14
No. 8895

1/17/13

NFA GALLERIA DRIVE EXHIBIT

A PORTION OF THE SOUTH HALF (S1/2) OF SECTIONS 31 AND 32, TOWNSHIP 21 SOUTH, RANGE 63 EAST, M.D.M., A PORTION OF THE SOUTHEAST QUARTER (SE1/4) OF SECTION 36, TOWNSHIP 21 SOUTH, RANGE 62 EAST, M.D.M., A PORTION OF THE NORTHEAST QUARTER (NE1/4) OF SECTION 1, TOWNSHIP 22 SOUTH, RANGE 62 EAST, M.D.M. AND A PORTION OF THE NORTH HALF (N1/2) OF SECTIONS 5 AND 6, TOWNSHIP 22 SOUTH, RANGE 63 EAST, M.D.M., CITY OF HENDERSON, CLARK COUNTY, NEVADA.



NOTE:
SEE SHEET 2 OF 2 FOR LINE AND CURVE TABLES.

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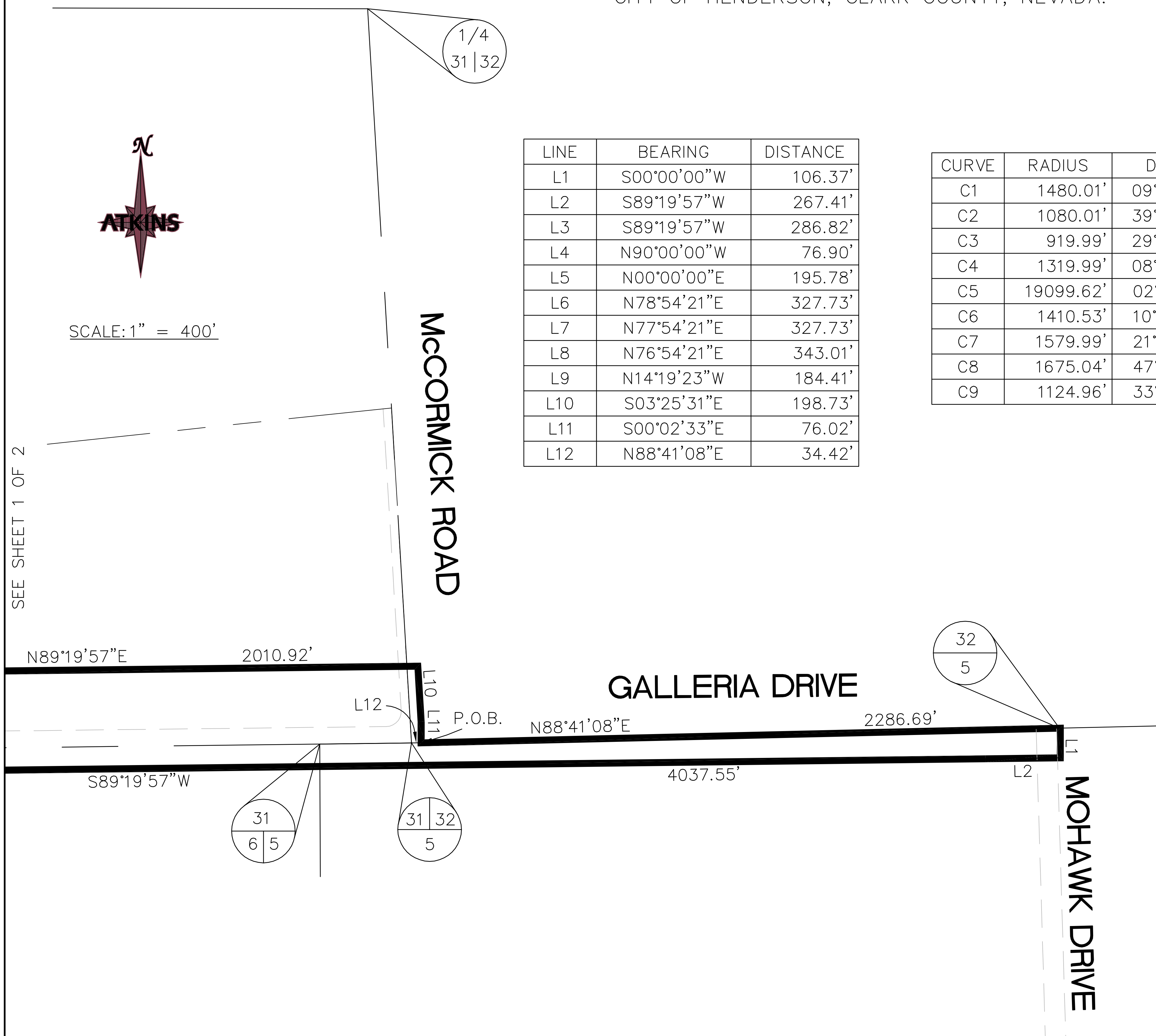

LINE	BEARING	DISTANCE
L1	S00°00'00"W	106.37'
L2	S89°19'57"W	267.41'
L3	S89°19'57"W	286.82'
L4	N90°00'00"W	76.90'
L5	N00°00'00"E	195.78'
L6	N78°54'21"E	327.73'
L7	N77°54'21"E	327.73'
L8	N76°54'21"E	343.01'
L9	N14°19'23"W	184.41'
L10	S03°25'31"E	198.73'
L11	S00°02'33"E	76.02'
L12	N88°41'08"E	34.42'

CURVE	RADIUS	DELTA	LENGTH	TANGENT
C1	1480.01'	09°25'48"	243.59'	122.07'
C2	1080.01'	39°24'06"	742.71'	386.72'
C3	919.99'	29°54'42"	480.29'	245.75
C4	1319.99'	08°42'20"	200.56'	100.47'
C5	19099.62'	02°14'26"	746.85'	373.47'
C6	1410.53'	10°27'45"	257.57'	129.15'
C7	1579.99'	21°36'52"	596.04'	301.61'
C8	1675.04'	47°42'12"	1394.61'	740.59'
C9	1124.96'	33°31'34"	658.26'	338.85'

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