Attachment F
Personnel Training Plan

Attachment F
Personnel Training Plan
Basic Remediation Company (BRC)
Corrective Action Management Unit (CAMU)
Henderson, Nevada

Table of Contents

Appendices

1.0 INTRODUCTION

This Personnel Training Plan describes the personnel and classroom or on-the-job training workers and other site personnel receive on how to perform their duties in a way that ensures the BRC CAMU complies with the conditions of this RAP and how to respond effectively to emergencies.

1.1 Personnel

To develop and maintain the overall BRC CAMU in conformance with the design and operational standards outlined in this document, three to four employees or contractors will be assigned, as required, to site operations. Other employees or contractors will be assigned, as needed, for support activities.

The following is a list of on-site personnel with a brief outline of their qualifications:

- BRC CAMU Construction Manager –The Construction Manager will be on site at least 50 percent (50%) of the time the site is open for waste disposal to oversee site operations. The Construction Manager will be responsible for keys to the site gates.
- Equipment Operators – The primary responsibility of these (two) positions is the normal construction and operational duties associated with the landfill operations, including spotting vehicles, spreading and compaction of waste material, landfill attendant duties, and installation of earthen cover. Equipment operators will report to the BRC CAMU Construction Manager.
- Laborers – Typical duties will include site and roadway construction, maintenance, and cleanup, as determined by the BRC CAMU Construction Manager. In addition, a minimum of one employee will be assigned the job of daily policing the site perimeter, providing directions to disposal locations, monitoring received waste and collecting management data. Laborers will report to the BRC CAMU Construction Manager.
- Security Guards – Full-time security guards, on-site during non-working hours or using remote video equipment, will be responsible for site access, daily monitoring of the condition of the perimeter fence, and communicating problems to the BRC CAMU Construction Manager. During working hours, a Laborer will be responsible for site access, daily monitoring of the condition of the perimeter fence, and communicating problems to the BRC CAMU Construction Manager.

2.0 TRAINING

BRC is committed to placing and maintaining individuals with such overall training, experience, capabilities, and/or other qualifications in the above noted positions as necessary to operate and develop the site in such a manner as to meet or exceed applicable requirements and regulations. Additional equipment and personnel will be provided as required to accomplish overall site maintenance and operation standards, which equal or exceed all applicable State and local rules and regulations pertaining to site safety measures, and the overall general protection of the area's environment.

Non-office site personnel will receive 40-hr Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standards (HAZWOPER) training, which will be provided by certified trainers. Personnel will renew this training annually with the 8-hr refresher course. Employees using a Nuclear Density Gauge will be required to have completed the 8-hour Nuclear Density Safety Course, which will be provided by a certified trainer (e.g. Troxler Electronics, etc.). Prior to beginning work at the CAMU site, employees, contractors, and subcontractor personnel are required to submit all applicable training certificates to BRC to be maintained and stored in accordance with the Report and Record Keeping Plan (Attachment T). The task supervisor will be responsible for providing the Construction Manager with records of training. The following table lists the training required for specific work tasks and personnel working at the CAMU site. Select course descriptions are provided in Appendix A.

Work Task	Training	Personnel Required to be Trained	Documentation Required
All work at the CAMU site	40 hour OSHA HAZWOPER	All on-site personnel	Certificate from certified training meeting 29 CFR 1910
All work at the CAMU site	8 hour OSHA refresher	All on-site personnel	Certificate from certified training meeting 29 CFR 1910
All work at the CAMU site	8 hour OSHA Supervisor Training	On-site supervisors	Certificate from certified training meeting
All work at the CAMU site	Respirator Fit Test	All on-site personnel	Certificate from certified trainer
All work at the CAMU site	Red Cross First Aid and CPR	On-site supervisors	Certificate from Red Cross
Liner system – geomembrane installation	Manufacturer training on seaming geomembrane	Geomembrane installation technicians	Approval letter from geomembrane manufacturer
Liner system –	Qualifications and	Geosynthetic material	Qualifications and

geosynthetic material installation	experience installing similar materials	installation technicians	resumes of personnel responsible for installing geosynthetic materials
Soil/waste moisture / density testing	8 hour Nuclear Density Safety Training	CQA monitor testing fill and waste moisture / density	Certificate from certified trainer
Landfill operations management	SWANA Manager of Landfill Operations Training	Landfill manager	Certificate from certified SWANA trainer
HDPE pipe joining	Manufacturer Butt-Fusion Training	HDPE pipe joining technicians	Certificate from certified trainer

Additional site specific training will be conducted and recorded by task supervisors related to their work tasks. Site specific training is discussed in Section 2.2.

2.1 Construction Manager Training

In addition to OSHA 40-hr HAZWOPER Training, the Construction Manager will receive the OSHA 8-hr HAZWOPER Supervisor course. The Construction Manager will be responsible for providing a health and safety training for site personnel to become familiar BRC CAMU-specific procedures. The BRC CAMU Construction Manager will keep records on names and dates of those who attended and passed training.

The Construction Manager will also be responsible for conducting pre-entry brief meetings and tailgate safety meetings. He/she will verify monitoring equipment and personal protective equipment is operational and will be responsible for verifying monitoring equipment has been calibrated. The Construction Manager will also be responsible for weekly inspections.

2.2 Equipment Operator and Laborer Training

In addition to OSHA 40-hr HAZWOPER training, employees shall receive BRC CAMU-specific training covering:

- Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment: Personnel receive instruction in the use of emergency and monitoring equipment described in the Attachment G. Personnel will be trained to inspect all facility emergency and monitoring equipment to mitigate the effects of equipment failure in the Inspection Plan. In addition, personnel will be trained in the use of emergency equipment in their job areas (e.g. fire extinguishers, respirators, etc.);

- Key parameters for equipment automatic shut-off: Plant and equipment operators will receive on-the-job training for automatic shut down of equipment in their work areas;
- Communications or alarm systems: Facility employees will be instructed as to the location and use of all telephones, intercoms, sirens, alarms, and two-way radios;
- Responses to fires or explosions: Personnel will receive fire prevention training and fire response;
- Response to spills: Personnel will receive instruction in spill and release prevention and response ; and
- Shutdowns of operations: Personnel will receive instruction in shutdown procedures during BRC CAMU operation. Personnel with operational responsibilities are instructed in procedures for planned and unplanned shutdowns during on-the-job training.

Training sessions will be held quarterly to review new health and safety hazards and provide new employees with training. The employees will be familiar with contingency plans to deal with accidents, injuries, fires, explosions, or natural disasters as outlined in Attachment G, Accident Prevention, Contingency, and Emergency Response Plan.

2.3 Post-Closure Personnel Training

Post-closure care personnel will have received adequate training in their specific job duties. This includes OSHA 24-hour health-and-safety training as well as pertinent training in BRC CAMU maintenance procedures. In addition, staff will be trained on emergency procedures and contacts as well as hazards they may encounter at the BRC CAMU. This post-closure staff will consist of a facility manager and various staff workers as needed. The name, address, and telephone number of the facility manager will be provided to the NDEP during the closure process.

3.0 RECORDKEEPING

The BRC will maintain the following documents and records for each hazardous waste management related position at the facility:

- The job title for each position
- The name of the employee filling each position
- A written job description including requisite skill, education, or other qualifications
- Duties of employees assigned
- Description of training
- Records documenting completion of training

The Construction Manager will maintain records at their onsite facilities. All records will be kept in accordance with the record retention requirements of the AOC3.

Appendix A
Training Course Descriptions

HAZWOPER 40 Hour Course

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powered by 360training

Course Description

This course covers broad issues pertaining to the hazard recognition at work sites. OSHA has developed the HAZWOPER program to protect the workers working at hazardous sites and devised extensive regulations to ensure their safety and health. This course, while identifying different types of hazards, also suggests possible precautions and protective measures to reduce or eliminate hazards at the work place. It is specifically designed for workers who are involved in clean-up operations, voluntary clean-up operations, emergency response operations, and storage, disposal, or treatment of hazardous substances or uncontrolled hazardous waste sites. Topics include: protection against hazardous chemicals, elimination of hazardous chemicals, safety of workers and the environment, and OSHA regulations. This course covers topics included in 29 CFR 1910.120.

Regulatory

This course meets the in class training requirements of the 1910.120 standard. An additional 8 hours of hands on training is required to meet the training requirements of the standard.

Seat Time

This course has been approved for 40 hours.

Course Pre-Requisite

There are no pre-requisite requirements for this course. Upon successful completion of this course, you will be able to print your certificate.

Testing:

Quizzes: Lesson quizzes require no mastery. Quizzes at the end of each module require a passing grade to proceed to the next module. Final Exam: Final Exam must be passed with a 70% to pass the course. The final exam can be taken three times if necessary.

Topics Covered

- Regulation Overview
- Site Characterization
- Toxicology
- Hazard Recognition
- Hazard & Safety Analysis
- Hazardous Chemical Awareness
- Radiological Hazards
- Respiratory Protection
- Personal Protective Equipment
- Site Control
- Decontamination
- Medical Surveillance
- Air Monitoring
- Confined Space Entry
- Emergency Procedures
- Material Sampling

HAZWOPER 8 Hour Annual Refresher Course

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Course Description

This course meets the requirements in OSHA 29 CFR 1910.120 for 8 hours of annual refresher training for workers at hazardous waste sites. This course is designed for general site workers who remove hazardous waste or who are exposed or potentially exposed to hazardous substances or health hazards. Topics include HAZWOPER regulations, safety and health plans, hazardous chemicals, safety hazards, air monitoring, medical surveillance, site control, decontamination, personal protective equipment, and respiratory equipment. This course covers the topics in OSHA 29 CFR 1910.120

Learning Objectives

- Read and understand OSHA regulations and requirements
- Use Site Characterization to identify hazards found in the workplace and steps to be taken to minimize hazards
- Understand the principles of toxicology and how they relate to various types of chemical exposures
- Develop a Medical Surveillance Program and understand its purpose
- Identify the uses for Personal Protective Equipment (PPE) and how to choose the correct PPE for a situation
- Understand the principles of decontamination as well as levels of decontamination and decontamination methods
- Have a better understanding of potentially hazardous situations involving corrosives, solvents, oxidizers, and reactive chemicals
- Understand the various considerations in an emergency and the importance of training and actions to personal safety and the safety of others

Topics Covered

- Regulation Overview
- Hazard Recognition
- Site Characterization, Analysis, and Control
- Toxicology
- Medical Surveillance
- Safe Work Practices and PPE
- Decontamination
- Chemical Awareness
- Emergency Procedures

Regulatory

Please refer to the state/regulatory requirement in the course catalog page.

Seat Time

This course has been approved for 8 hours

Course Pre-Requisite

Must have taken the 24 or 40 hour HAZWOPER course

Testing

Quizzes: All quizzes must be passed with a 100% to proceed to the next lesson. Final Exam: Final exam must be passed with a 70% to pass the next course. The final exam can be taken three times if necessary.

Contact us at: safety@360training.com or call 1.888.318.3497

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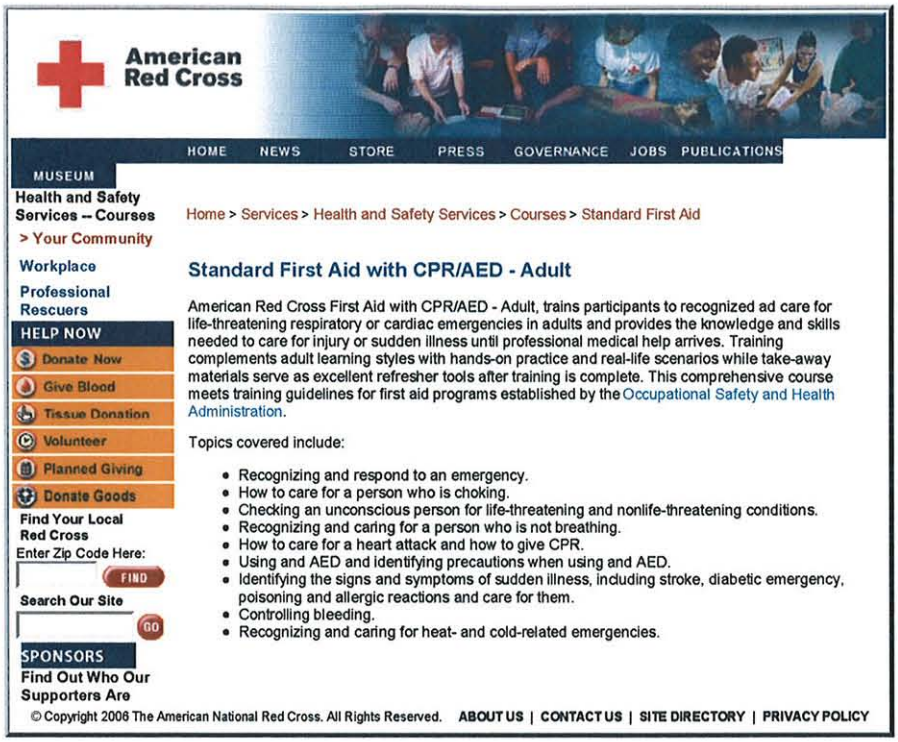
American
Red Cross
HOME NEWS STORE PRESS GOVERNANCE JOBS PUBLICATIONS
MUSEUM
Health and Safety Services -- Courses
> Your Community
Workplace
Professional Rescuers
HELP NOW
Donate Now
Give Blood
Tissue Donation
Volunteer
Planned Giving
Donate Goods
Find Your Local Red Cross
Enter Zip Code Here:
FIND
Search Our Site
GO
SPONSORS
Find Out Who Our Supporters Are
Home > Services > Health and Safety Services > Courses > Standard First Aid
Standard First Aid with CPR/AED - Adult
American Red Cross First Aid with CPR/AED - Adult, trains participants to recognized ad care for life-threatening respiratory or cardiac emergencies in adults and provides the knowledge and skills needed to care for injury or sudden illness until professional medical help arrives. Training complements adult learning styles with hands-on practice and real-life scenarios while take-away materials serve as excellent refresher tools after training is complete. This comprehensive course meets training guidelines for first aid programs established by the Occupational Safety and Health Administration.
Topics covered include:
Recognizing and respond to an emergency.
How to care for a person who is choking.
Checking an unconscious person for life-threatening and nonlife-threatening conditions.
Recognizing and caring for a person who is not breathing.
How to care for a heart attack and how to give CPR.
Using and AED and identifying precautions when using and AED.
Identifying the signs and symptoms of sudden illness, including stroke, diabetic emergency, poisoning and allergic reactions and care for them.
Controlling bleeding.
Recognizing and caring for heat- and cold-related emergencies.
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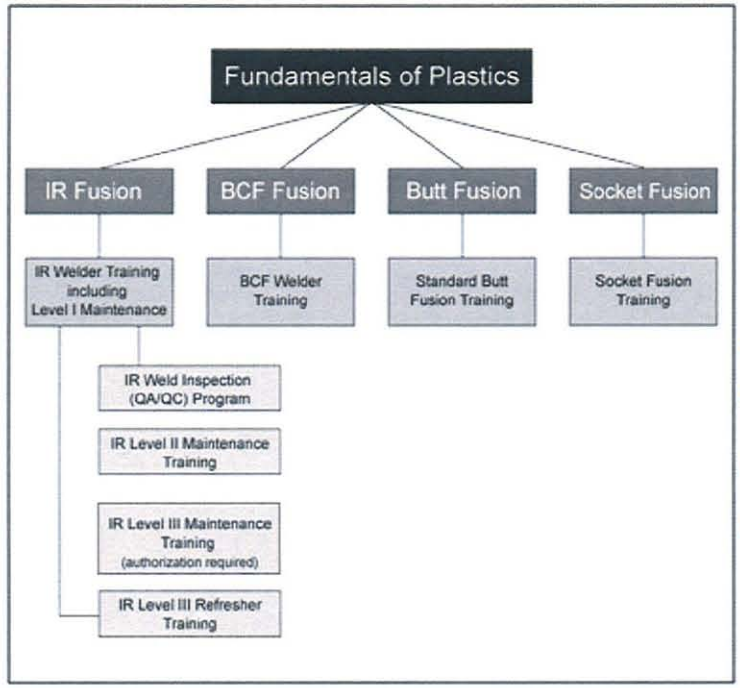
Fusion Machine Training Programs

Experience shows that improper installation, rather than faulty products, is the primary reason for system failures, delays, and cost overruns. Georg Fischer believes that the installation of our products is as important as the quality of the products we manufacture. In keeping with this belief, Georg Fischer offers several training courses.



Socket Fusion Training

Standard Butt Fusion Training

Infrared Welding
- IR Level I Welder Training
- IR Level II Maintenance Training
- IR Level III Maintenance Training
- IR Level III Refresher Training
- IR Weld Inspection Program (WIP)

BCF Welder Training

Course Description

Socket Fusion Training This four-hour course covers all aspects of hand-held and machine Socket Fusion Technology. Trainees will demonstrate their ability to perform socket fusion joining.	**Standard Butt Fusion Training (Conventional or CNC)** This four-hour course covers all aspects of Standard Butt Fusion Technology. Trainees will demonstrate

Upon successful completion and testing, the trainee will receive a Certificate of Completion and an Installer's Badge which may be worn on the job site.	their ability to prepare pipe, face pipe, heat and join piping.
IR Level I Welder Training This course covers fundamental training absolutely necessary for proper operation of the infrared (IR Plus) fusion machines. Topics: • Plastic pipe fundamentals • Infrared butt fusion • General information • Design/function/operation of the IR Plus fusion machines • Weld bead inspection • Basic machine maintenance Duration/Value: • 1 day/$250.00 per person Register now	**IR Level II Maintenance Training** Completion of this 16-hour (2 day) class allows the trainee to maintain external parts of the machine. Prerequisite: • All attendees must have completed the Georg Fischer IR Level I Welder Certification Program and Weld Inspection Program Topics: • Technical concepts of the machine • Machine inspections • Functional check • Maintenance procedures Level II • Alignment and adjustments • Weld evaluation • Documentation Duration/Value: • 2 days/$500.00 per person Register now
IR Level III Maintenance Training **(Authorization Required)** Completion of this 32-hour (4 day) class allows the trainee to maintain external and internal parts of the machine. This course is conducted at the Georg Fischer Tustin facility only. Prerequisite: • All attendees must have completed the Georg Fischer IR Level II Maintenance Training Topics: • Technical concepts of the machine • Machine inspections • Functional check • Maintenance procedures Level III • Alignment and adjustments • Weld Inspection Program • Documentation Duration/Value: • 4 days/$1,500.00 per person Register now	**IR Level III Refresher Training** **(Authorization Required)** This course is a refresher for Level III personnel and includes current updates for the IR 63, IR 225, and IR Plus machines. This course must be taken 1 year after the initial Level III course and then every two years after that. This course is condcuted at the Georg Fischer Tustin facility only. Prerequisite: • All attendees must have completed the Georg Fischer IR Welder Certification and IR Level II and Level III Maintenance Training. Duration/Value: • 2 days/$500.00 per person Register now
IR Weld Inspection Program (WIP) Upon completion of this eight-hour (1 day) class, the QU inspector will have a good basis to perform on-site visual IR weld evaluation. Topics: • Weld background • Terminology • Bead characteristics • Restmelt evaluation • Flow charts and checklist Duration/Value:	**BCF Welder Training** This four-hour course covers all aspects of using the BCF Flow Fusion Technology. Trainee will prepare pipe samples, insert and remove bladders, generate welds, and perform hot cleaning of the heater heads. Upon successful completion and testing, the trainee will receive a Certificate of Completion and an Installer's Badge which may be worn on the job site. Prerequisite: • All attendees must have completed the Georg Fischer IR Level I Welder Training

- 1 day/$250.00 per person

Print

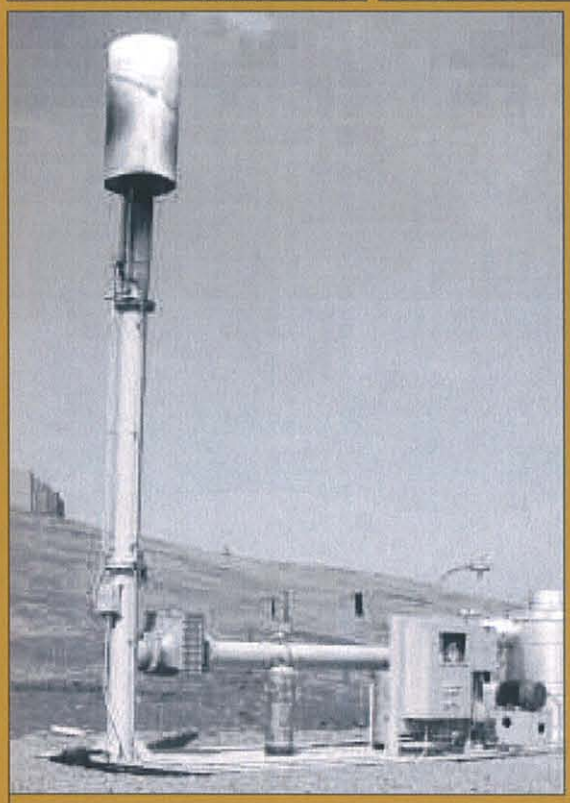
George Fischer Inc, 2882 Dow Avenue, Tustin, CA 92780-7258 USA,
Phone (714) 731-8800, Toll Free (800) 854-4090, Fax (714) 731-6201

2007 TRAINING COURSE CATALOG

SWANA®

SOLID WASTE ASSOCIATION of North America

THE LEADING PROFESSIONAL ASSOCIATION IN THE SOLID WASTE FIELD



I AM**SWANA**

"Many people overlook the hard work and dedication necessary to perform a public service like solid waste management. SWANA's training courses make it possible for these men and women to operate at the highest level of performance with a sense of pride and achievement."

Bill Tobin | Director of Field Operations
Waste Authority of Montgomery County

Message from SWANA's President

INTRODUCTORY LETTER FROM TOM PARKER

Dear Colleague,

Thank you for choosing SWANA as the provider of all your training and professional development needs. For over 40 years, SWANA has thrived at the forefront of all training and education for municipal solid waste needs. This effort results from our first-and-foremost commitment to you, our members, but also to the field of solid waste.

The 2007 catalog contains training opportunities for you and all your staff. Whether you need training for professional development, for SWANA certification, or to maintain a current certification, SWANA offers specific education to fit your needs. This year SWANA Training takes place as several great locations beginning in Tampa, Fla., and closing out the year at WASTECON 2007 in Reno, Nev.

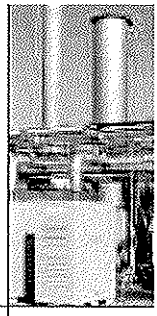
SWANA gives you what you need to stay ahead of them game with our new list of course offerings. We have updated the Manager of Landfill Operations Course (MOLO) and our ever-growing line of distance learning opportunities. With our increased offerings of E-Courses and E-Sessions, you can train individually at your desk or with your whole staff in a conference room to get the most out of your money! As with all SWANA events, in person and online, you will interact with and learn from some of the best and the brightest in the industry.

Thank you for your continued support of SWANA, and our mission to advance the practice of economically and environmentally sound management of municipal solid waste. I look forward to learning from you online or at one of our live events.

Sincerely,

Tom Parker, P.E
CDM, New Mexico
SWANA President

P.S. Receive the mark of professionalism in the solid waste industry with SWANA certification. SWANA offers eight different Certifications including the industry's only Bioreactor Landfill Certification. In this competitive landscape, it is integral to have an integrated MSW management background to efficiently manage your facility.



2007 Training Catalog Directory

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About the SWANA Training Catalog

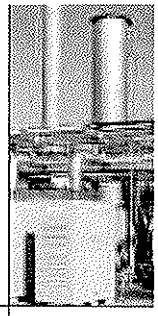
Congratulations on choosing SWANA for your professional development, training and certification!

For those of you who are new to SWANA: Welcome. To our over 7,700 loyal members, thank you for your continued support of SWANA's Technical Programs, and welcome to our new catalog format. Our new look has been designed to showcase SWANA's commitment to providing the best-in-class educational products to the entire solid waste industry. Today, SWANA continues that pledge with more educational products than ever before.

We hope the new format will make it easier for you to find just what you are looking for by using the following symbols to indicate the format of each product. Additional information including full course descriptions, is available on **www.SWANA.org** under "Educate".

- **SWANA Classroom Training:** Held at SWANA events throughout the year.
- **SWANA Chapter Partnering Events:** SWANA Chapters host additional SWANA training courses throughout North America.
- **E-Courses:** Traditional courses and brand new offerings that can be accessed from the convenience of your office. E-Courses are conducted through SWANA's web conferencing and teleconferencing system.
- **E-Sessions:** The best of SWANA's technical sessions brought to you each month through Web conferencing. These 75-minute sessions give you and your staff an opportunity to learn from the experts in this extended session. A different topic is covered every month.
- **E-Studies:** These self-paced, self-study options give you the training and the CEUs you need. All it takes is an internet browser.
- **On-Site Training:** Full training packages that you deliver to your staff at your own site and at your own pace.
- **Home Study Courses:** Written materials on important solid waste topics. Looking for CEUs – just pass the test that comes with the course and you'll qualify.
- **SWANA Training On Demand:** Do you have a group that needs to be trained and the next event isn't soon enough or your budget can't afford the cost? Let our best-in-class training come to you! Any of our courses can be customized to your needs. For quotes, contact **learn@SWANA.org**.

We love to hear about the training and educational products that you need. You can always reach us with your ideas, comments and feedback at **learn@SWANA.org**.



Getting SWANA Certified
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SWANA's Certification Training Courses

1. CHOOSE YOUR DISCIPLINE(S).

The Solid Waste Association of North America offers eight (8) certifications in the following solid waste disciplines:

- Landfill Management (MOLO)
- Bioreactor Landfill*
- Collections Systems
- Composting Programs
- Construction & Demolition Materials (C&D)
- Principles of MSW Management
- Recycling Systems
- Transfer Station Systems

* The Bioreactor Landfill certification requires candidates to hold a current SWANA Landfill management certification.

2. CHOOSE YOUR CERTIFICATION LEVEL.

Most SWANA Certifications offer at least two (2) eligibility levels, with an additional Inspector level offered to Landfill and Construction & Demolition SWANA Certification holders:

- **Technical Associate:** This level is ideal for professionals new to the industry and involved in the planning, design, implementation, operation or promotion of the MSW field. This would also include consultants, planners, vendors and regulators, etc. A minimum of a High School Degree or GED Required.
- **Manager:** This professional must meet all of the requirements of the Technical Associate level plus a minimum of five (5) years** experience in Municipal Solid Waste Management. Also required are at least two (2) years experience in a management/supervisory position*** in the discipline for which you are applying.

** 4-year degree in a related field may be substituted for up to 2 years of MSW experience
*** directly responsible for daily operations; compliance with design and permit conditions, utilization of field equipment and services, personnel needs, utilization and retention.

- **Inspector:** Unique to Landfill and Construction & Demolition certification holders, this professional must meet all of the requirements of the Technical Associate level as well as the ability to issue official citations for violations which require action/impose penalties. This professional must also be an active inspector with at least 2 years experience.

3. PASS THE SWANA CERTIFICATION EXAM FOR YOUR DISCIPLINE.

SWANA certification exams are offered at all SWANA and SWANA Chapter training events, even if the preparatory class is not being offered. You may only sit for one exam per testing session. You are not required to attend the preparatory training courses to become certified; however, it does reinforce your knowledge in a particular discipline. A passing score of 70% or above is needed to become SWANA certified. You will be allotted three (3) hours to complete your exam. All exams are proctored.

You may use calculators, preferably one capable of handling up to seven digits. Landfill Certification candidates may use MOLO scales for maps. The exam is a "closed book" exam so you may not bring manuals, worksheet or notes to the testing site. Before leaving the testing site, you will be asked to complete the SWANA Certification Application. Exam results will be mailed to the certification candidates within 60 days of the test date.

If you have any questions about becoming SWANA Certified, please contact us at **cert@SWANA.org**.

Classroom Training | Chapter Partnering Events | E-Courses | E-Sessions | E-Studies | On-Site Training | Home Study Course | Training On-Demand

SWANA[DL] (Distance Learning)

SWANA CEUs are available for most SWANA Courses

Can't get away from work? Enjoy the industry's top training from the comfort of your home or office with SWANA[DL] (Distance Learning). With these courses, get the training you need in a format you want. SWANA[DL] allows you to train from your home or office, with your computer, or with home study manuals. Also by attending these courses, Certified Professionals can earn SWANA Continuing Education Units (CEUs). With SWANA[DL], training has never been easier!

E-COURSES

Learn, Earn and Return with these new online courses! You'll learn about a wide range of solid waste topics. Every course is taught by SWANA faculty. All you need is an internet connection and separate phone line and you're ready to learn. Each session lasts up to two hours, making SWANA training more convenient than ever! For a schedule of upcoming E-Courses, visit **www.SWANAstore.com** and click on E-Courses.

E-SESSIONS

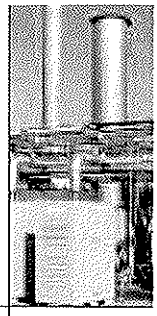
With these 75-minute presentations you can attend SWANA technical sessions all year long, from any location! These sessions bring you the latest on today's hot topics on the first three Wednesdays of the month. Each month focuses on a different area of MSW to keep you informed on all the current trends in solid waste. For a schedule of upcoming E-Session topics visit **www.SWANAstore.com** and click on E-Sessions.

E-STUDIES

Train your way with these self-paced online courses. These courses are completely online and are always a click away. The course also moves with you, so you spend your time on the areas that you need. Many of our courses also allow more than one user to train per account, with our new subscription-based pricing plan. Training has never been more flexible than it is with these courses!

Courses include:

- Landfill Operations
- Composting Operations
- Transfer Station Health and Safety
- Waste Screening
- Landfill Health and Safety
- Landfill Gas Primer
- Establishing An Electronics Recycling Program
- Integrated Solid Waste Management



SWANA[DL] (Distance Learning)

HOME STUDY COURSES ✉

Not quite ready for the world of online learning but still need convenient training? Well then look no further than SWANA Home Study Courses. Each course includes a manual that you review at your own pace. Once you're comfortable with the information, complete the enclosed exam. Score a 90% or better and you'll receive credit for the course. The manual also serves as a good reference once you've completed the course.

Courses include:

- Managing Landfill Gas at MSW Landfills
- Waste Screening at MSW Management Facilities
- Groundwater Monitoring, Sampling, Analysis & Construction
- Leachate Generation, Collection & Treatment at MSW Landfills
- Construction Waste and Demolition Debris Materials Manual

ON-SITE COURSES

Act as a trainer for your staff with these courses. Each course contains 8-10 hours of training, made up of smaller modules. This allows the courses to be tailor-made for your company.

Courses include:

- Training for Sanitary Landfill Operations Personnel
- Training for Collection Operations Personnel
- Waste Screening at MSW Management Facilities
- Health and Safety for MSW Landfill Training
- Health and Safety for MRF Personnel
- Health and Safety for Collection Personnel
- Health and Safety for Transfer Station Personnel

TRAIN YOUR WHOLE STAFF WITH SWANA E-TRAINING AND SAVE BIG!

When signing up for an E-Course or E-Sessions you register for one computer. By hooking up a projector and speaker phone, you could present E-Training to your whole staff for the cost of one registration, saving you big on training!

SWANA CEUs will only be allocated for registered individuals.

SWANA E-Training Calendar of Events

SWANA's E-Training allows you to receive the industry's best training from the comfort of your home or office. The Web seminars are the perfect way for busy professionals to stay current on the latest trends in the industry. These courses are always being updated in a continuing effort to bring you fresh, new training. The listing below is just a taste of what's to come. Keep an eye on **www.SWANAstore.com** for all the latest developments in SWANA's E-Training.

Have you attended a local training or technical session that you think all solid waste professionals could benefit from? Let us know! SWANA is always looking for ways to promote training that today's solid waste professionals can use. E-mail **learn@SWANA.org** with any topics or suggestions, as well as at which event the training was presented.

UPCOMING E-COURSES

*Course subjects and times subject to change. Visit **www.SWANAstore.com** for updated course listings.*

See page 28 for E-Course CEU information.

Fall 2006 Landfill Fire

Fall 2006 Erosion Control

Fall/Winter 2007 Electronics Recycling

Winter 2007 Landfill Operations

Winter 2007 Collections Operation

Winter 2007 Bioreactor Basics

*Have a course developed that you want to share online? Email **learn@SWANA.org** to find out how!*

UPCOMING E-SESSIONS *Tentative Schedule*

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Get 1 SWANA CEU for each E-Session (Registration required)

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November 2006: Overcoming Challenges in Transfer Station Design and Operation

December 2006: Multi-Family and Institutional Recycling Programs

January 2007: Life Cycle of a Landfill – Strategies for Permitting, Designing, Operating and Closing

February 2007: Waste-to-Energy and Waste Conversion

March 2007: Special Waste Management

April 2007: Construction and Demolition Debris Management

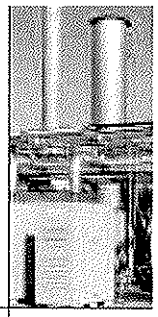
May 2007: Landfill Gas Control and Utilization

June 2007: Organics Management and Composting

July 2007: Boosting Recycling Rates: New and Innovative Programs

August 2007: Planning & Management

September 2007: Legislative and Regulatory Developments Impacting Solid Waste Management



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Landfill and Landfill Gas Courses

For SWANA CEU information, see pages 27-28.

MANAGER OF LANDFILL OPERATIONS (MOLO)

3-Day Certification Prep Course

Updated for 2007

Updated for 2007, this prep course for the Landfill Certification contains all the latest landfill techniques and technologies to keep you ahead of the competition. Learn to efficiently run your landfill, as well as gain knowledge on planning, operating and closing a landfill. Discuss issues surrounding regulatory standards, compliance with design requirements, and an introduction to state-of-the-art bioreactor landfill technologies. Upon completion of the course you will gain a better understanding of landfill economics, leachate and landfill gas management, and comprehend the importance of safety and contingency counter measures.

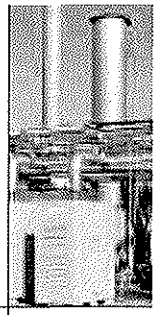
Need some help preparing for the MOLO, try these:

MOLO: JUST THE MATH E-COURSE

Planning to take the MOLO exam, but need to brush up on the math? With this live web course you can prepare for the math that is covered on the MOLO exam from your home or office. All you need is an internet connection and separate phone line and you're ready to learn the math. Taught by MOLO faculty, this course covers such calculations as elevation, area, slope, and volume. And because the course is only two hours long, you can learn and return to work. **MOLO: Just the Math does not allocate CEUs toward SWANA recertification.**

LANDFILL OPERATIONS

Need a boost to get ready for the MOLO or just need a refresher before taking the SWANA Landfill Certification Exam? Then get online with this new E-Study Course. Learn about such topics as Waste Decomposition, Geology and Hydrology, Landfill Design and Construction, General Operations, and Regulations from your computer. The course has also been enhanced with up-to-date photographs, audio, interactive exercises, related online links, and video to make learning more enjoyable.



Landfill and Landfill Gas Courses

SWANA'S PREMIER TRAINING COURSES

THE WORLD'S ONLY BIOREACTOR LANDFILL CERTIFICATION PROGRAM

Technology is changing and bioreactor landfills are emerging. Now it is your turn to learn what bioreactors can do for you. Get career-enhancing certification by taking this prep course for the Bioreactor Landfill Certification exam. Examine the unique characteristics of a bioreactor landfill in comparison with dry tomb landfills in this brand new course. Explore the methods of introducing air and water into landfill cells, while at the same time discovering how this cutting-edge technology can increase landfill gas activity.

MANAGER OF BIOREACTOR LANDFILL OPERATIONS

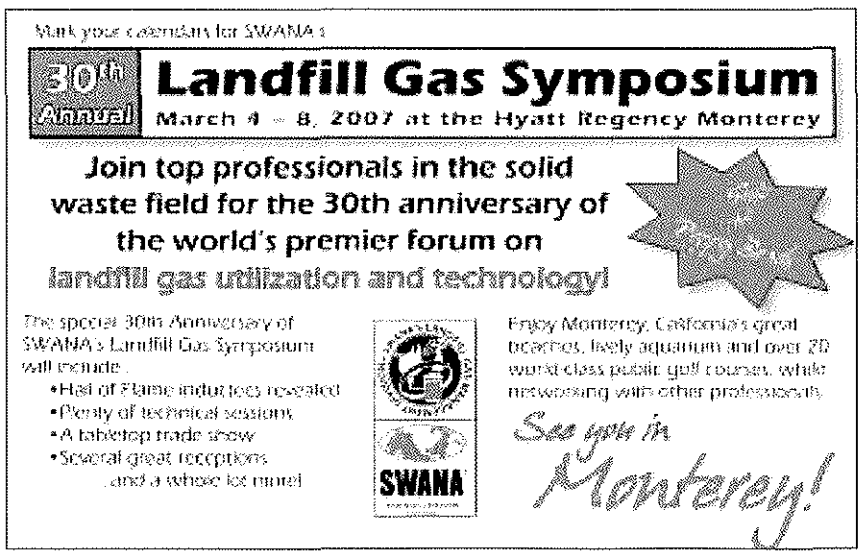
2-Day Certification Prep Course

Special Publication: *Manager of Bioreactor Landfill Operations Body Of Knowledge*

The SWANA Manager of Bioreactor Landfill Operations Body Of Knowledge (BOK) is a compendium of the basic knowledge an individual must know to accomplish the work of a Manager of Bioreactor Landfill Operations. This BOK includes both proven traditional practices and the innovative, advanced practices of managing a bioreactor landfill, as well as empirical, esthetical, ethical and tacit knowledge. The Manager of Bioreactor Landfill Operations BOK is the basis of the SWANA Bioreactor Landfill course and certification exam.

The BOK consists of eight comprehensive knowledge statements covering the knowledge and abilities a manager of bioreactor landfills should have in the areas of construction, operation and monitoring of bioreactor landfills. You can use the BOK to prepare for the SWANA certification exam or as a tool for your operations.

Go to **www.SWANAstore.com** to order.



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Landfill and Landfill Gas Courses

For SWANA CEU information, see pages 27-28.

LANDFILL OPERATIONAL ISSUES

2-Day Course/ 1-Day Workshop

This course is perfect for anyone interested in learning more about improving the daily operations at their landfill site. You will experience in-depth discussions that will help you solve everyday issues surrounding landfill operations and be able to understand successful landfill management practices, including equipment selection. Turn your landfill into a money maker by learning how to control cost, maximize your site's airspace, and determine if your landfill is really efficient. Upon completion of the course, you can earn valuable SWANA Continuing Education Units (CEUs). Furthermore, with your registration you will receive the book *The Handbook of Landfill Operations,* by Neal Bolton, P.E.

HEALTH AND SAFETY FOR MSW LANDFILL OPERATIONS PERSONNEL

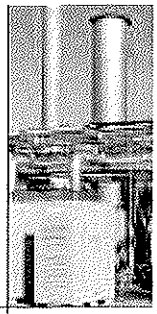
1-Day Course

Discover new horizons by enhancing your landfill health and safety program! This course prepares you to easily and intelligently identify and circumvent landfill health and safety issues. Not only will you learn exactly what elements constitute a proper loss control program, but you will understand the importance of establishing an effective program and overview OSHA and federal regulations. At the end of this course, participants will be able to recognize an unsafe practice and know how to handle it. Not only will you earn valuable SWANA Continuing Education Units (CEUs), but you will also gain imperative knowledge on how to keep your landfill safe.

LANDFILL GAS BASICS

1-Day Course

Don't waste landfill gas! Learn to "Control, Manage and Capture" it! These are the key concepts to successfully understanding landfill gas basics. Through exercises and case studies, SWANA instructors will help you grasp these three ideas in this introductory course. You will gain vital insight about gas regulations and become familiar with system design, construction and monitoring. In addition, you will be provided with information and guidance in order to understand the importance of landfill gas utilization. Anyone working with a landfill gas system will benefit from this course.



Landfill and Landfill Gas Courses

SWANA'S ADVANCED TRAINING COURSES

Go "beyond basics" with this interactive workshop exploring the daily challenges associated with operations and maintenance of LFG systems. Share knowledge with your colleagues and learn new approaches for capturing, controlling, and managing landfill gas. This interactive session will be moderated by a SWANA faculty member, and is a great way to actively increase your knowledge of landfill gas systems.

LANDFILL GAS SYSTEM OPERATION

2-Day Course and 1-Day Workshop

■ ⁘ ✪

Through interactive classroom exercises, discussions and case studies, you will overview landfill operations and how they relate to one another in order to learn how to be more effective on the job. Instructors with in-depth experience in landfill operations will help you gain a better understanding of the fundamentals of groundwater movement, accident analysis and recognize the factors that contribute to leachate production. In addition, receive top of the line training on how sanitary landfills work as components of integrated solid waste management systems.

TRAINING FOR SANITARY LANDFILL OPERATIONS PERSONNEL

1-Day Course

⬇

Gain vital insight about gas regulations and become familiar with system design, construction and monitoring. In addition, you will be provided with information and guidance in order to understand the importance of landfill gas utilization. Anyone working with a landfill gas system will benefit from this course. As with all online E-Study Courses, you determine the pace and schedule of the course.

LANDFILL GAS PRIMER

i

Finish your landfill off with style with this new E-Course. In a partnership with the Erosion Control Technology Council (ECTC), SWANA is proud to present this new E-Course to help landfill owners create more presentable landfill caps through the use of Rolled Erosion Control Products (RECPs). Presented by a member of ECTC, this course will cover such topics as NPDES Regulations, an overview of RECPs, as well as the installation, design, and selection of RECPs.

ECTC PRESENTS CONTROLLING EROSION & STORM WATER RUNOFF ON LANDFILL CAPS

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Landfill and Landfill Gas Courses

For SWANA CEU information, see pages 27-28.

CONSTRUCTION WASTE & DEMOLITION DEBRIS RECYCLING... A PRIMER

An educational tool for communities and private sector interests, this document focuses on the planning issues and implementation opportunities associated with the recycling of construction waste and demolition debris. Lessons covered include regulatory climate, generation data, materials, market opportunities, and management systems to name a few. Keep the manual for future reference, so you'll always have this valuable information at your fingertips.

MANAGING LANDFILL GAS AT MUNICIPAL SOLID WASTE LANDFILLS

This course is perfect for those seeking guidance on the complex issue of landfill gas management. This course covers such topics as MSW landfill emission generation, composition, migrations and extraction components, as well as regulatory codes pertaining to RCRA and the Clean Air Act. As with all Home Study Courses, keep the manual for future reference!

LITTER MANAGEMENT AT MSW LANDFILLS

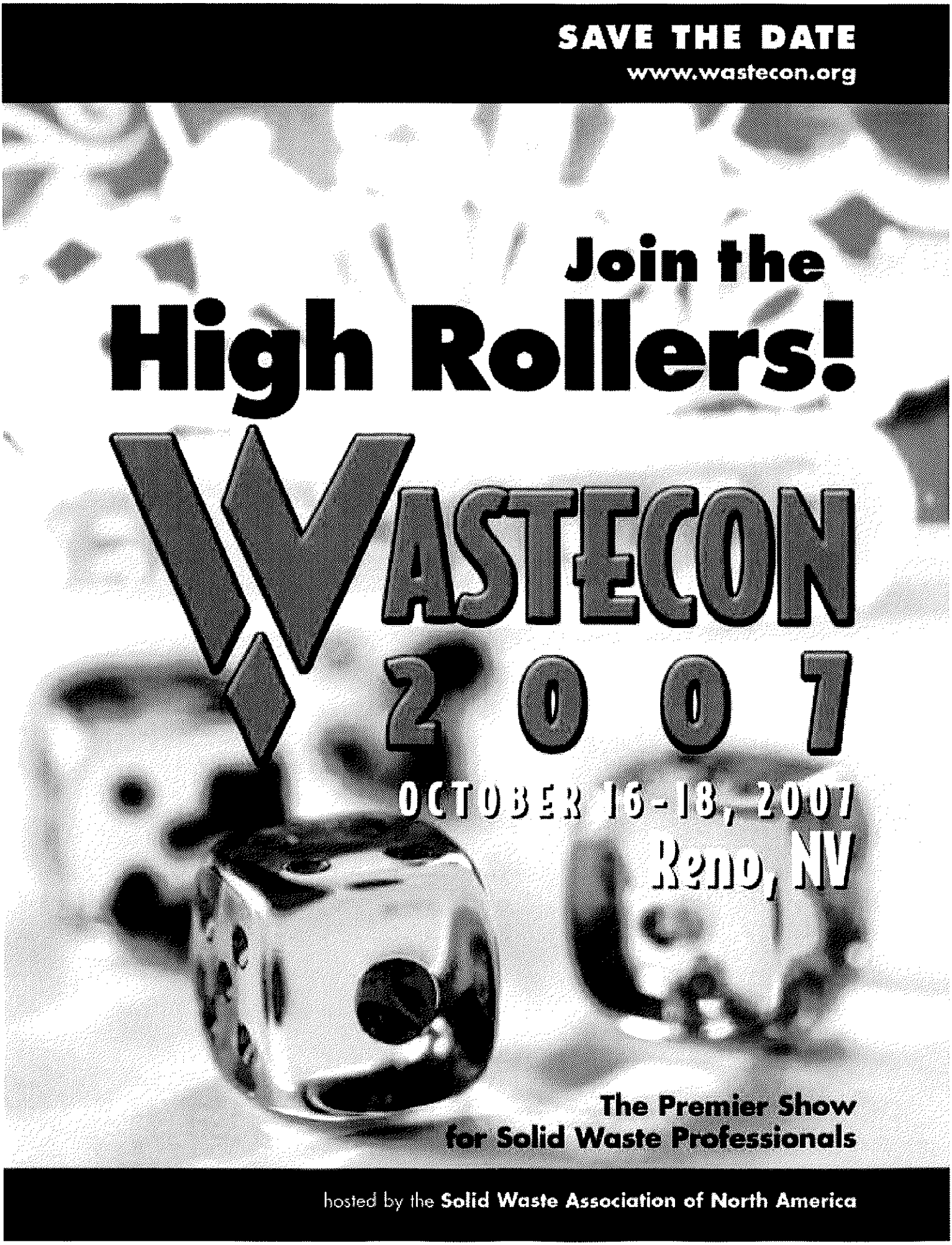
Are you blown away by the cost of litter at your landfill? Let SWANA help you clean up your act with Litter Management at MSW Landfills. Learn about the impact of litter and the importance of a good litter management program, as well as the sources and causes of litter. Learn about litter control techniques from one of the industry's top professionals from the comfort of your home or office.

LEACHATE GENERATION, COLLECTION AND TREATMENT AT MSW LANDFILLS

Learn about the common constituents that make up groundwater and biological treatment. Also get an understanding of the regulatory scope of RCRA Subtitle D in regards to groundwater monitoring, and become familiar with leachate recirculation methods. Keep the manual for future reference, so you'll always have this valuable information at your fingertips.

GROUNDWATER MONITORING, SAMPLING, ANALYSIS AND WELL CONSTRUCTION

This course provides MSW professionals with an understanding of monitoring groundwater within the scope of RCRA Subtitle D. Topics include design and construction of wells, monitoring programs, and corrective actions. As with all Home Study Courses, keep the manual for future reference!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for Solid Waste Professionals
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Collection and Transfer Courses

For SWANA CEU information, see pages 27-28.

MANAGING TRANSFER STATION SYSTEMS

3-Day Certification Prep Course

Be a lean mean, transfer operations machine! As a prep course for the Transfer Systems Certification exam, anyone who is or would like to become a transfer station manager or consulting engineer will be provided with fundamental information on ways to effectively plan, design, and operate MSW transfer stations. Receive cutting edge training on how to run a MSW transfer station in the most successful way by experiencing a hands-on tour, a field exercise at a local transfer station facility and classroom taught exercises. In addition, learn about design objectives including capacity, selection of appropriate technology, structure considerations and site planning.

MANAGING MUNICIPAL SOLID WASTE COLLECTION SYSTEMS

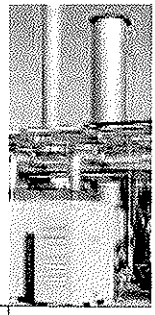
3-Day Certification Prep Course

Be able to handle waste with haste through this prep course for the Collection Systems Certification exam. Receive instruction in all the areas tested on the exam, such as an understanding of the logistics of planning, managing and operating solid waste and recyclables collection services. This course consists of presentations, classroom exercises and case studies that will enable you to navigate and chart routes more effectively. You will examine waste characteristics, service types, equipment, routing and system design. Furthermore, learn up-to-date practices for handling various materials, including residential MSW, traditional recyclables, yard wastes, bulky items and commercial wastes.

TRAINING FOR COLLECTION OPERATIONS PERSONNEL

1-Day Course

Save time and money on every route, every day! Individuals who are responsible for the collection of solid waste and recyclables from household and commercial establishments on a day-to-day basis can increase their knowledge of collection strategies. Be provided with what every collection operations personnel should know through interactive classroom exercises, discussions and case studies. Time is money, and this course will help you to acquire a higher understanding of routing in order to be cost-efficient. Furthermore, learn how to define a preventative maintenance program, go over the importance of effective sanitation practices, and obtain insight on important health and safety issues.



Collection and Transfer Courses

SWANA'S PREMIER TRAINING COURSES

Why "waste" an opportunity to improve your safety performance? At SWANA, we recognize the importance of minimizing risk and developing an effective safety program for transfer station personnel. During this course, you will get an overview of OSHA and federal regulations. Also, you will discuss musculo-skeletal disorders and how to prevent ergonomic injuries. Upon completion, you will understand why it is essential to establish a transfer station health and safety program as well as learn to recognize unsafe practices of others. Earn valuable SWANA CEUs for a range of Certification Disciplines by participating in this extremely important course!

HEALTH AND SAFETY FOR TRANSFER STATION PERSONNEL

1-Day Course

Does it pain you to see the unsafe work habits of your collection personnel? Well let SWANA help you reduce those pains with our Health and Safety for Collections Personnel Course. This kit comes with everything a supervisor or manager needs to train their employees on proper techniques and precautions to reduce workplace injuries. Other topics covered in this course include loss control, and health and safety issues, as well as regulatory issues.

HEALTH AND SAFETY FOR COLLECTION PERSONNEL

1-Day Course

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You Can Bet On:

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New MOLO Course - Updated for 2007

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- Manager of Landfill Operations (MOLO), April 23-25
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- Managing MSW Transfer Systems, April 23-25
- Principles of MSW Management, April 23-25
- FEMA: Debris Management, April 23-25
- Landfill Operations, April 23-24
- Landfill Gas Operations Workshop, April 25
- Testing Center (All certification exams), April 26 7:00 am Only!

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Appendix B
Site Specific Training
Lesson Plan and Exam

Pre-Entry Briefing

Objective: The objective of this pre-entry briefing is to introduce visitors and first-day employees to the safety controls of the BRC CAMU. Attendees should understand where active portions of the site are, where emergency response equipment is located, site hazards (chemical, physical, biological), and general safety rules of the BRC CAMU.

Active Areas
Indicate on map:

- haul routes
- waste excavation (exclusion, contamination reduction, support zones, as appropriate)
- waste placement (exclusion, contamination reduction, support zones, as appropriate)

Emergency Response:

Contact Name

Phone number(s)

Hospital Location

Location of emergency equipment (fire extinguishers, alarms)

Meeting location(s)

First Aid steps: Check-Call-Care

Personal Protection Equipment

Hardhat – at all times

Steel Toe Boots – at all times

Eye protection – at all times

Hearing Protection – where applicable

Tyvek – where applicable

Gloves – where applicable

Respirator – where applicable

Basic Site Safety:

1. Keep your mind on your work at all times. No horseplay on the job. Injury or termination or both can be the result.

2. Personal safety equipment must be worn as prescribed for each job, such as: safety glasses for eye protection, hard hats at all times, gloves when handling materials, and safety shoes..

3. Watch where you are walking. Don't run.

4. Seat belts are required at all times when driving/operating.

5. The use of illegal drugs or alcohol or being under the influence of the same on the project shall be cause for your immediate termination. Inform your supervisor if taking strong prescription drugs that warn against driving or using machinery.

6. Do not distract the attention of fellow workers. Do no engage in any act that would endanger another employee.

7. Sanitation facilities are provided for your use. Defacing or damaging these facilities is forbidden.

8. Never move an injured person unless it is absolutely necessary. Further injury may result. Keep the injured as comfortable as possible and utilize job site first-aid equipment until an ambulance arrives.

9. Know where firefighting equipment is located and be trained on how to use it.

10. Nobody but operator shall be allowed to ride on equipment unless proper seating is provided.

11. Do not use power tools and equipment until you have been properly instructed in the safe work methods and become authorized to use them.

12. Do not enter an area that is barricaded or otherwise blocked from entry.

13. If you must work around trucks or heavy equipment, make sure operators can always see you and know that you are there. Barricades are required for cranes.

14. Never oil, lubricate, or fuel equipment while it is running or in motion. Do not perform these operations on equipment in areas not specifically designated for these operations.

15. Before servicing, repairing, or adjusting any powered tool or piece of equipment, disconnect it, lock out the source of power, and tag it out.

16. Barricade danger areas. Guard rails or perimeter cables may be required.

17. Trenches over five feet deep must be shored or sloped as required. Keep out of trenches or cuts that have not been properly shored or sloped. Excavated or other material shall not be stored nearer than two feet from the edge of the excavation. Excavations less than 5 ft may also require cave in protection.

18. Use the "four and one" rule when using a ladder. One foot of base for every four feet of height.

19. Know what emergency procedures have been established for your job site. (location of first aid kit, fire extinguisher locations, evacuation plan, etc.)

Hazard Analysis

Physical
Heat Stress
Excavation
Hand/Foot Injury
Heavy Equipment
Noise
Portable Power/Hand Tool
Slip/Trip/Fall

Chemical
Inhalation
Skin absorption
Fire
Reactivity

Biological
Insect/Vermin/Snake Bites

Exam

The pre-entry briefing exam will be taken at the conclusion of the meeting. A passing rate of 75% is required for access to the site. Incorrect answers will be explained and topics covered again.

Pre-entry Briefing Exam

Name:_____
I have read and understand the BRC CAMU Health and Safety Plan Yes No
Date:_____

Position:_____

1. What are the three emergency first aid steps?

   A. Stop-Look-Listen
   B. Call-Check-Care
   C. Check-Call-Care
   D. None of the Above

2. You are working near an excavator, what PPE do you need?

   A. Hardhat, boots, eye protection, hearing protection
   B. Boots, hardhat
   C. Hardhat, hearing protection
   D. None of the above

3. When excavating, at what depth is shoring required?

   A. 3 feet
   B. 1 foot
   C. 5 feet
   D. 2 feet

4. You are not 24-hour or 40-hour HAZWOPER certified, how close can you be to the excavation or waste placement activities?

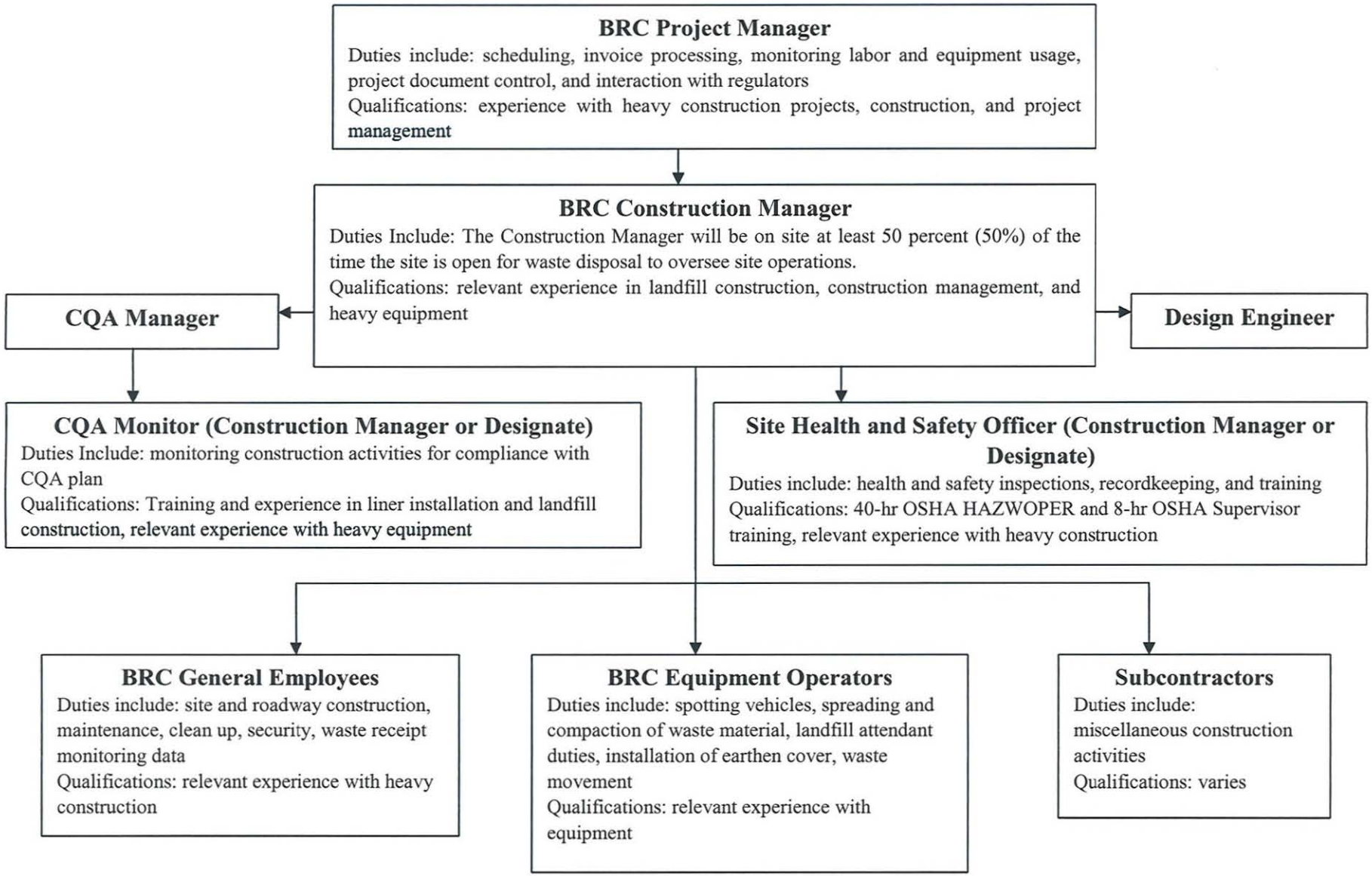
   A. Exclusion Zone
   B. Contamination Reduction Zone
   C. Support Zone
   D. None of the Above

5. What's the first step in an emergency?

   A. Call the Construction Manager
   B. Go to a safe location
   C. Go Home
   D. None of the above

Number Incorrect:_____ Pass / Fail Trainer's Name:_____

Appendix C
Organizational Flowchart


BRC Project Manager
Duties include: scheduling, invoice processing, monitoring labor and equipment usage, project document control, and interaction with regulators
Qualifications: experience with heavy construction projects, construction, and project management
BRC Construction Manager
Duties Include: The Construction Manager will be on site at least 50 percent (50%) of the time the site is open for waste disposal to oversee site operations.
Qualifications: relevant experience in landfill construction, construction management, and heavy equipment
CQA Manager
Design Engineer
CQA Monitor (Construction Manager or Designate)
Duties Include: monitoring construction activities for compliance with CQA plan
Qualifications: Training and experience in liner installation and landfill construction, relevant experience with heavy equipment
Site Health and Safety Officer (Construction Manager or Designate)
Duties include: health and safety inspections, recordkeeping, and training
Qualifications: 40-hr OSHA HAZWOPER and 8-hr OSHA Supervisor training, relevant experience with heavy construction
BRC General Employees
Duties include: site and roadway construction, maintenance, clean up, security, waste receipt monitoring data
Qualifications: relevant experience with heavy construction
BRC Equipment Operators
Duties include: spotting vehicles, spreading and compaction of waste material, landfill attendant duties, installation of earthen cover, waste movement
Qualifications: relevant experience with equipment
Subcontractors
Duties include: miscellaneous construction activities
Qualifications: varies

Attachment G
Accident Prevention, Contingency, and Emergency Response Plan

Attachment G
Accident Prevention, Contingency, and Emergency Response Plan
Basic Remediation Company (BRC)
Corrective Action Management Unit (CAMU)
Henderson, Nevada

Table of Contents

List of Figures

List of Tables

Appendix

1.0 INTRODUCTION

This Accident Prevention, Contingency, and Emergency Response Plan describes the precautions taken to prevent accidental ignition or reaction of ignitable or reactive wastes, and precautions taken to prevent interaction of incompatible wastes. This plan also includes other procedures to minimize the possibility of, and hazards from, a fire, explosion, or unplanned sudden or non-sudden release of hazardous waste constituent to air, soil, or surface water. These procedures also address the proper design, construction, maintenance, and operating practices designed to reduce the potential for injury or other threats to human health or the environment.

1.1 Contaminants

Extensive testing of the waste material determined the majority of wastes to be non-hazardous. The following is a list of general contaminants found in the waste material to be placed in the CAMU:

- VOCs
- SVOCs
- PCBs
- Metals
- Pesticides

The waste materials are not incompatible, reactive, or ignitable. Additional waste characterization detail can be found in Attachment C, Waste Analysis Plan.

2.0 PREVENTION

2.1 Health and Safety Plan

The BRC CAMU will have an active Health and Safety program for workers at the BRC CAMU. Either the current BRC Health and Safety Plan (HASP) or a similar plan developed by the pertinent contractor will be used, periodically updated, and kept on site. A safety meeting will be held at least quarterly to review safety procedures and issues, or whenever operations change. Daily safety tailgate meetings will address health and safety issues of the day. Employees working at the BRC CAMU will attend. Personal safety equipment such as eye protection, steel-toed boots and hard hats will be required of all BRC CAMU non-office personnel. In case of personal injury, the field office will be notified immediately by two-way radio or cellular telephone and, if necessary, an ambulance summoned from the local hospital, St. Rose de Lima

approximately 1 ¼ miles from the BRC CAMU (Figure G-1), or the local (City of Henderson or Clark County) Fire Department.

2.2 Arrangements with Local Authorities

Prior to operation, the BRC CAMU Construction Manager will contact the Henderson Police and Fire Departments and the Clark County Sheriff and Fire Departments and their emergency response teams to make arrangements to familiarize them with the BRC CAMU. The BRC CAMU Construction Manager will provide details of the BRC CAMU including layout, properties of wastes handled and associated hazards, normal operating areas, entrances, and possible evacuation routes. In addition, the BRC CAMU Construction Manager will contact the St. Rose de Lima Hospital with the types of injuries or illnesses that could potentially occur at the BRC CAMU.

2.3 Personal Protective Equipment (PPE)

Level D PPE will be required at all times at the Site. Level D equipment required includes long pants, gloves, steel-toe boots, hard hats, safety glasses, and hearing protection (when appropriate).

2.4 Exposure Assessment and Air Monitoring

Dust monitoring will be conducted during the construction activities. The objectives are to monitor working conditions and to assess potential fugitive dust migration at the Site perimeter. MIE® DATA RAM air particulate monitors, or similar, will be set up at four dust monitoring stations during field activities to record total levels of dust. Air monitoring stations will be positioned with one station located upwind at the Site perimeter, two stations downwind at the Site perimeter, and one station in the workers' breathing zone. In addition, GilAir 5® air sampling pumps, or similar, will be placed at each dust monitoring station, with filter cassettes changed daily. Filter cassettes will be sent to a laboratory for analysis.

Frequency of air monitoring readings will be adjusted on site accordingly, with the consent of the Site Health and Safety Officer (SHSO and Project Manager). Equipment will be calibrated before work begins each day and at the end of the day. Air monitoring readings and calibration records will be documented in the Field Logbook.

2.5 Activity Hazard Analysis

The chemical, physical, and biological hazards are discussed in detail in the Site HASP for each activity performed on-site.

2.6 Personnel Training

Employees assisting in construction activities within the exclusion zone will have Occupational Safety and Health Administration (OSHA) 40-hr Hazardous Waste Operations and Emergency Response Standards (HAZWOPER) certification. In addition, the BRC CAMU Construction Manager will have 8-hr OSHA Site Supervisor training. The CAMU Construction Manager will be required to provide health and safety "tail gate" meetings for new workers and visitors. Employees are responsible for knowing the site chemical, biological, and physical hazards as well as how to prevent accidental release of wastes.

2.7 Site Map

A site map will be maintained on site. The site map will be regularly updated to show the exclusion zone, decontamination zone, and support zone as they change throughout BRC CAMU construction. The site map shall be posted in the work area and will include the following information:

- General Wind Direction
- Evacuation Routes
- Refuge Locations
- Route to St. Rose de Lima Hospital and First Aid Medical Assistance (may be provided on separate map)
- Boundaries of Exclusion Zone (as described below)
- Boundaries of Contamination Reduction Zone (as described below)
- Boundaries of Support Zone (as described below)

Changes will be made to the site map by the SHSO, as needed, based on site conditions.

2.7.1 Work Zones

Three work zones will be established for each task. The Exclusion Zone is defined as the area on-site where contamination is suspected and tasks are to be performed. The Contamination Reduction Zone (CRZ) is defined as the area where equipment and workers are to be decontaminated. The Support Zone is defined as the command area and also serves as a storage area for supplies. The exact location and extent of the work zones will be modified as necessary.

2.8 Site Access

Access to the site will be controlled using a sign-in/sign-out log.

2.9 Visitors

Visitors to the site will be continually escorted in order to assure their safety since they may be unfamiliar with the site. Visitors will not be allowed past the Support Zone unless they read, understand, sign, and meet the requirements outlined in the Site HASP.

2.10 Communications

On-site communications will be conducted through the use of the following:

- Verbal
- Two-way radio
- Horn
- Mobile telephone
- Siren
- Hand signals

Off-site communications will be conducted through the use of mobile telephones.

2.11 Safe Work Practices

General Safe Work Practices that will be implemented during work activities at this site are:

- Minimization of contact with waste materials.

- Smoking, eating, or drinking after entering the work zone and before decontamination will not be allowed. Employees who are suspected of being under the influence of illegal drugs or alcohol will be removed from the site. Workers taking prescribed medication that may cause drowsiness will not be permitted to operate heavy equipment, and will be prohibited from performing tasks where Level C, B, or A PPE is required.
- Good housekeeping will be practiced.
- Use of contact lenses on-site will not be allowed when dictated by working conditions.
- The following conditions will be observed when operating a motor vehicle.
  - Wearing of seat belts is mandatory
  - During periods of rain, fog, or other adverse weather conditions, the use of headlights is mandatory
  - A backup warning system or use of vehicle horn is mandatory when the vehicle is engaged in a backward motion
  - All posted traffic signs and directions from flagmen will be observed
  - Equipment and/or samples transported in vehicles will be secured from movement
- In an unknown situation, the worst conditions will always be assumed.
- Conflicting situations may arise concerning safety requirements and working conditions and will be addressed and resolved rapidly by the BRC CAMU Construction Manager to relieve any motivations or pressures to circumvent established safety policies.
- Breaches of specified safety protocol will not be allowed.

2.12 Inspections

The BRC CAMU Construction Manager will conduct weekly health and safety inspections. The inspections will be documented using the Inspection checklist included with Attachment E. The Weekly Health & Safety Inspection Checklist will be kept on file at the project site.

2.13 Decontamination

PPE will be decontaminated as per 29 CFR §1910.120(k). The decontamination procedures, equipment and decontamination solution required for each task will be included in the Site Health and Safety Plan. In an emergency, the primary concern is to prevent the loss of life or severe injury to site personnel. If immediate medical

treatment is required to save a life, decontamination will be delayed until the victim is stabilized. If decontamination can be performed without interfering with essential life-saving measures or first aid, or if worker has been contaminated with an extremely toxic or corrosive material that could cause severe injury or loss of life, decontamination will be performed in coordination with or prior to initial medical treatment at the scene.

3.0 CONTINGENCY AND EMERGENCY RESPONSE PLAN

3.1 Fire Control

Fire extinguishers will be on hand to put out small fires near the working area, in the remote possibility they may occur. In the event of a significant fire emergency, the Henderson Fire Department will be notified immediately and the emergency will be reported.

3.2 Shut Down Procedures

In the event the BRC CAMU needs to be shut down, a detailed procedure list will be available at the site in the contingency plan. Step-by-step procedures will be detailed, including maps showing pertinent locations of systems.

3.3 Hazardous or Toxic Materials Release

A Hazardous Materials Emergency Plan will be prepared. It will mainly focus on those chemicals and materials associated with vehicle fueling and maintenance. Because the waste material being disposed of in the BRC CAMU is from a known source area, the likelihood of hazardous or toxic material release resulting from the waste materials is minimal.

3.4 Emergency Procedures

The following steps will be followed when there is an emergency:

1. The BRC CAMU Construction Manager, or alternate, will be immediately notified. The BRC CAMU Construction Manager assumes control of the emergency response.
2. As necessary, off-site emergency responders (e.g., fire department, hospital, police department, etc.) will be notified as to the nature and

location of the emergency on site. Please see Table G-1 for contact information.

3. If applicable, the BRC CAMU Construction Manager evacuates the site. Site workers will move to their respective refuge stations using the evacuation routes provided on the Site Map.
4. BRC CAMU Construction Manager will assess possible hazards to human health or the environment resulting from the emergency and shall contact the appropriate authorities for the Henderson, Nevada area or the National Response Center (toll free: (800) 424-8802). The report will include:
    a. Name and telephone number of the reporter;
    b. Name and address of the BRC CAMU;
    c. Time and type of incident;
    d. Name and quantity of material(s) involved, to the extent known;
    e. The extent of injuries, if any; and
    f. The possible hazards to human health, or the environment, outside the facility.
5. For small fires, flames will be extinguished using the fire extinguisher. Large fires will be handled by the fire department.
6. In an unknown situation or if responding to toxic gas emergencies, appropriate PPE, including SCBAs, will be donned.
7. If chemicals are accidentally spilled or splashed into eyes or on skin, safety eyewash and/or shower will be used.
8. Before continuing site operations, after an emergency involving toxic gas, the BRC CAMU Construction Manager will don a SCBA and utilize appropriate air monitoring equipment to verify that the site is safe.
9. An injured worker shall be decontaminated appropriately.
10. If a worker is injured, first aid will be administered by workers certified in first aid.

3.5 Reporting

The BRC CAMU Construction Manager will note in the operating record the time, date, and details of any incident that requires implementing this plan. The report will be submitted to the NDEP and include:

a. Name, address, and telephone number of the owner or operator;
b. Name, address, and telephone number of the facility;
c. Date, time, and type of incident;

d. Name and quantity of material(s) involved;
e. The extent of injuries, if any;
f. An assessment of actual or potential hazards to human health or the environment, where applicable; and
g. The estimated quantity and disposition of recovered material that resulted from the incident.

Incident reports will be kept as part of the operational records and maintained by BRC for at least 3 years and otherwise in accordance with the records retention provision of the AOC3.

FIGURE G-1
HOSPITAL LOCATION

TABLE G-1
EMERGENCY RESPONSE CONTACTS

Name	*Telephone Numbers*		*Date of Pre-Emergency Notification*
	Office	*Home*	
Fire Department – Henderson Fire Dept.	911 (702) 267-2222		February 20, 2007
Hospital – St. Rose Dominican-Rose de Lima Campus 102 E. Lake Mead Parkway Henderson, NV 89015 (702)616-5000	(702) 616-5000		February 20, 2007
Police Department – Henderson Police Dept	911 (702) 267-4550		February 20, 2007
Construction Manager – Weston Solutions*			TBD*
Nevada DEP*			TBD*
Other			

* To be completed before site activities are initiated.

Copy of letter sent is provided in Appendix A to this Attachment

Appendix A

Copies of Letters Sent to Police, Fire, and Hospital Emergency Contacts

Basic Remediation
COMPANY

February 20, 2007

Mr. Val Baciarelli
President
St. Rose Dominican Hospital-Rose de Lima
102 East Lake Mead Parkway
Henderson, Nevada 89015

Dear Mr. Baciarelli,

As you may know, work will soon commence on the clean-up and restoration of the 2200 acre tract owned by our affiliate, the LandWell Company, that is bounded on the south by Lake Mead Parkway, on the west by Boulder Highway, and on the north by the Las Vegas Wash. This clean-up and restoration is being conducted under the jurisdiction and supervision of the Nevada Division of Environmental Protection, with significant input from the City of Henderson and Clark County. As part of this project, we have developed Accident Prevention, Contingency, and Emergency Response Plans. These plans provide for fire, police, and medical responses, if needed. We have designated the St. Rose Dominican Hospital as primary responder in the event of injury. While we do not expect problems to arise that would require a response by the Hospital's emergency room, we want to be prepared for such a contingency. If you would like a more detailed briefing in person on details of the clean-up and restoration project, I would be happy to provide this. I can be contacted at 702-567-0400 and at sahuron@earthlink.net.

Sincerely,

Ron Sahu, Ph.D., CEM
Project Manager

875 West Warm Springs, Henderson, Nevada 89015 • Phone 702.567.0400 • Fax 702.567.0473

Basic Remediation
COMPANY

February 20, 2007

Mr. Richard D. Perkins
Chief of Police
Henderson Police Department
223 Lead Street
Henderson, Nevada 89015

Dear Chief Perkins,

As you may know, work will soon commence on the clean-up and restoration of the 2200 acre tract owned by our affiliate, the LandWell Company, that is bounded on the south by Lake Mead Parkway, on the west by Boulder Highway, and on the north by the Las Vegas Wash. This clean-up and restoration is being conducted under the jurisdiction and supervision of the Nevada Division of Environmental Protection, with significant input from the City of Henderson and Clark County. As part of this project, we have developed Accident Prevention, Contingency, and Emergency Response Plans. These plans provide for fire, police, and medical responses, if needed. We have designated the Henderson Police Department as primary responder in the event of theft or assault. While we do not expect problems to arise that would require a response by the Police Department, we want to be prepared for such a contingency. If you would like a more detailed briefing in person on details of the clean-up and restoration project, I would be happy to provide this. I can be contacted at 702-567-0400 and at sahuron@earthlink.net.

Sincerely,

Ron Sahu, Ph.D., CEM
Project Manager

875 West Warm Springs, Henderson, Nevada 89015 • Phone 702.567.0400 • Fax 702.567.0473

Basic Remediation
COMPANY

February 20, 2007

Mr. Douglas Stevens
Deputy Fire Chief
Henderson Fire Department
City Hall
240 Water Street
PO Box 95050
Henderson, Nevada 89009-5050

Dear Chief Stevens,

As you may know, work will soon commence on the clean-up and restoration of the 2200 acre tract owned by our affiliate, the LandWell Company, that is bounded on the south by Lake Mead Parkway, on the west by Boulder Highway, and on the north by the Las Vegas Wash. This clean-up and restoration is being conducted under the jurisdiction and supervision of the Nevada Division of Environmental Protection, with significant input from the City of Henderson and Clark County. As part of this project, we have developed Accident Prevention, Contingency, and Emergency Response Plans. These plans provide for fire, police, and medical responses, if needed. We have designated the Henderson Fire Department as primary responder in the event of fire. While we do not expect problems to arise that would require a response by the Fire Department, we want to be prepared for such a contingency. If you would like a more detailed briefing in person on details of the clean-up and restoration project, I would be happy to provide this. I can be contacted at 702-567-0400 and at sahuron@earthlink.net.

Sincerely,

Ron Sahu, Ph.D., CEM
Project Manager

875 West Warm Springs, Henderson, Nevada 89015 • Phone 702.567.0400 • Fax 702.567.0473

Attachment H
Emergency Coordinator

Attachment H
Emergency Coordinator
Basic Remediation Company (BRC)
Corrective Action Management Unit (CAMU)
Henderson, Nevada

1.0 INTRODUCTION

The BRC CAMU emergency coordinator is completely familiar with the site operation and Accident Prevention, Contingency, and Emergency Response Plan. In addition, the emergency coordinator must be familiar with all activities at the facility, the location and characteristics of waste handled, the location of all records within the facility, and the layout. The emergency coordinator is responsible for directing the emergency procedures outlined in Attachment G. He or she shall have successfully completed all training and is responsible for the training records of all personnel outlined in Attachment G. The contact information for two additional individuals is also provided who can also fulfill this role. At least one individual shall be within 30 minutes of the BRC CAMU until closure.

3.6 Emergency Coordinator

Name: Construction Manager – Weston Solutions
Address:
Cell Phone: Will be provided prior to commencement of operations
Home Phone: Will be provided prior to commencement of operations

3.7 Back Up

Name: Lee Farris, P.E. (or designee)
Address: 875 W Warm Springs Road
Henderson, NV 89011
Office Phone: (702) 567-0400

Attachment I
Location Standards and Siting Requirement

Attachment I
Location Standards and Siting Requirements
Basic Remediation Company (BRC)
Corrective Action Management Unit (CAMU)
Henderson, Nevada

Table of Contents

List of Figures

1.0 INTRODUCTION

This attachment describes the geological, hydrogeological, and climatic conditions at the BRC CAMU. In addition, location standards and siting requirements for the proposed BRC CAMU are discussed.

2.0 GEOLOGIC CONDITIONS

This section summarizes the geological conditions present at the BRC CAMU site. The Draft Conceptual Site Model (CSM) for the Common Areas prepared by Daniel B. Stevens & Associates (DBS&A, 2006) provides greater detail about the geological and hydrogeological conditions at the site.

2.1 Geology

Regional Geology in Southern Nevada is the Basin and Range Province morphology of the Western Cordillera of North America. In this region, Cenozoic tectonic extension has resulted it a system of fault-bounded mountains separated by sediment-filled valleys. The basins consist of down-dropped blocks of crust while the ranges are upthrust slabs with a regional tilt to the east. The typical arrangement in the Basin and Range system is a valley bounded on each side by a normal fault running parallel to the range (DBS&A, 2006).

The BRC CAMU site is located in the Las Vegas Valley, a northwest-southeast trending basin within the Basin and Range Province. The predominate range influencing the BRC CAMU site conditions is the McCullough Mountains bounding the valley to the south (DBS&A, 2006).

Valley fill in the vicinity of the BRC CAMU site consists of Tertiary Muddy Creek Formation (TMCf) and overlying Quaternary Alluvium (Qa) associated with alluvial fan deposits shed from the McCullough Range Mountains. The Qa is the present-day land surface at the CAMU as well as in most of the Henderson area and has an average thickness of 50 to 60 feet. The Qa is predominantly sands and gravels classified as poorly graded gravels (GP), silty gravels (GM), well-graded sands (SW), poorly graded sands (SP), and silty sands (SM) in accordance with the Common Unified Soil Classification System (USCS) (DBS&A, 2006).

Beneath the BRC CAMU site, the boundary between the Qa and TMCf is an unconformity that represents a period of time when the TMCf strata was likely exposed to weathering and erosion. Erosion by streams originating in the McCullough Mountains cut into the TMCf resulting in paleochannels that were later filled by Qa. Two paleochannels have been inferred in the vicinity of the CAMU site: one paleochannel

from the south-central area to the northwest corner and a second paleochannel from the northeast corner of the CAMU site trending almost due north (DBS&A, 2006).

Beneath the Qa is lies the TMCf consisting of predominantly fine-grained sandy silts and clayey silts. Layers with increasing sand content are encountered. With the increasing distance east and north from the McCullough Range, the proportion of coarse-grained sediments in the upper portion of the TMCf appears to decrease. The total thickness of the TMCf is unknown with measurements varying from 2,158 feet to 3,050 (DBS&A, 2006).

2.2 Hydrogeology

Groundwater flow beneath the BRC CAMU site is generally to the north, northeast. Groundwater ranges from approximately 1725 ft Mean Sea Level (MSL) to 1695 ft MSL from the southern to northern areas of the BRC CAMU (Figure C7). The groundwater flow is approximately parallel to the slope of the land surface. The average gradient of the water table ranges from about 0.02 to 0.04 ft/ft with a hydraulic conductivity typically ranging from a few inches to up to 33 feet per day (ft/d). The Qa is unsaturated towards the east, with saturation first noted in the uppermost TMCf, near the contact between the Qa and the TMCf. The groundwater treatment system located on the eastern property adjacent to the CAMU is thought to have dewatered the Qa (DBS&A, 2006).

Groundwater quality in the Qa is poor. General water quality analysis performed on a groundwater sample collected from Kerr-McGee monitoring well M-10, which is installed upgradient of the BMI Complex, reported relatively high concentrations of total dissolved solids (2,680 mg/L), chloride (732 mg/L), and sulfate (857 mg/L) (ERM-West Inc., 1996).

Beneath the Qa, within the TMCf, groundwater exists generally under confined conditions in saturated coarser-grained lenses. Water in wells screened in the upper portion of the TMCf rose under the confining pressure to elevations within the Qa indicating an upward flux gradient from the TMCf into the overlying alluvium. The hydraulic conductivity in the TMCf was approximately 12 ft/d (DBS&A, 2006).

Recharge to the Qa due to precipitation is generally considered to be negligible but has increased in recent years due to increasing irrigation infiltration, sewage treatment plant effluent, and from the removal of phreatophytic vegetation near the washes (Geraghty & Miller, 1993). Natural discharge from the Qa is primarily due to springs, direct evaporation, and evapotranspiration, with little or no water discharging to the Las Vegas Wash (Geraghty & Miller, 1993, after USBR, 1982).

3.0 CLIMATE

The Las Vegas Valley is one of the driest and warmest areas in the nation. The climate consists of hot summers, and cool winters. Summer temperatures above 105° Fahrenheit (F) and winter temperatures below freezing are common. The average daily minimum and maximum temperatures during winter months are about 35° and 60° F. During summer nights, minimum temperatures average 70° to 75° F. The frost-free period averages about 241 days per year (Geraghty & Miller, 1993, after USBR, 1982).

The Las Vegas Valley is characterized by low annual rainfall, approximately 4.5 inches per year, that fall during two rainy seasons. During the winter, the rainfall is generally low-intensity and falls over a wide area. In the spring and fall, local thunderstorms subject the area to high-intensity rains of short duration, which can cause high-runoff conditions. Maximum rainfall within a 24-hour period for a 25-year storm is approximately 2.3 inches (NOAA Atlas 2, undated) in the site area.

Evaporation is high in the Las Vegas Valley, influenced by high temperatures, high winds, and low humidity (average 20%). Pan evaporation data form the period of 1985 through 1988 range from approximately 2.5 inches/month to more than 17 inches/month (ERM-West, Inc., 1996, after Law Engineering, 1993). The months with the highest evaporation (May through September) correspond to the times of high-intensity rainfall, which indicates that rainfall does not contribute significantly to the recharge of groundwater in this area (ERM-West, 1996). Measurements of evaporation at Boulder City and Lake Mead indicate an annual loss of about 6.5 feet of water, three-fourths of which occurs during the six warmer months. The evapotranspiration within Las Vegas Wash is expected to be significantly higher due to high consumptive use by cattails, warmer temperatures, and lower humidity (Geraghty & Miller, 1993, after USBR, 1982).

Winds are typically out of the southwest or northwest and average nine miles per hour (mph). Gusts greater than 50 mph occur several times a year during the massage of major frontal systems. Topography influences the wind flow patterns.

4.0 LOCATION RESTRICTIONS

4.1 Flood Plains

The proposed BRC CAMU is located in an area determined to be outside the 100-year flood plain (Figure I-1) (FEMA, 2002).

4.2 Fault Areas

The proposed BRC CAMU is not located within 200 feet of a fault that has had displacement in Holocene time. Two north-trending fault scarps are located approximately ½ mile northwest and southwest of the proposed BRC CAMU (Figure I-2) (Converse Consultants, 1999). Displacement on both faults is recorded as pre-Holocene.

4.3 Seismic Impact Zones

The proposed BRC CAMU is located in a seismic impact zone (USGS, 1982). The site is located in an area with a 10 percent or greater probability that the maximum horizontal acceleration in lithified earth material will exceed 10 percent of the earth's gravitational pull in 250 years (USGS, 1982). The maximum horizontal acceleration depicted on the seismic hazard map with a 90 percent or greater probability that the acceleration will not be exceeded in 250 years is 14 percent of the earth's gravity. The peak horizontal ground acceleration recommended for the design of the project is 0.15g (Converse Consultants, 1999). A soil profile type of S_D per Table 16-J of the 1997 Uniform Building Code is recommended for the site.

Structures for containment, including liners, systems for the collection of leachate and systems for the control of surface water, will be designed to resist the maximum horizontal acceleration in lithified earth material for the site. Proof of meeting these design requirements will be placed in the operating records for the site and the solid waste management authority will be notified that the proof has been placed in the operating records.

4.4 Unstable Areas

Portions of the land on which the North Mesa will be constructed have been historically used for waste disposal – namely, the slit trenches. Wastes, consisting of various industrial wastes, construction and demolition debris, and office trash was disposed of in "slit trenches" that were excavated below grade. The Draft Conceptual Site Model prepared by DBS&A details the recent investigation of the "slit trenches" revealing the depth and extent of waste material (DBS&A, 2006). The waste was placed in the trenches without compaction effort and covered with previously excavated native material. There is also evidence that some waste may have been ignited and burned. As a result of the waste being placed without compaction, the "slit trenches" have experienced settlement over the years.

As noted above, the BRC CAMU is sited to overlay the slit trench area, and this overlay will in itself protect the slit trenches from erosion by wind and water. However, the potential for continued settlement of the "slit trenches" may cause instability of the

BRC CAMU liner system, if not addressed. Therefore, engineering measures will be incorporated into the structural design of the BRC CAMU to consolidate (compact) these materials prior to construction of the overlying BRC CAMU liner system. These measures are more particularly specified in Attachment J, CAMU Design- Conceptual.

In addition, it should be noted that BRC expects to excavate certain portions of the slit trenches, based on a Slit Trench Remedial Alternative Study (Slit Trench RAS), which is in preparation. The goal is to remove waste materials in "hot spot" areas within the slit trenches on a preventive basis and to meet regulatory requirements. Locations so excavated will be properly backfilled and consolidated prior to construction of the CAMU.

5.0 REFERENCES

Converse Consultants, 1999. Preliminary Geotechincal and Geologic Investigation, Industrial Non-Hazardous Disposal Facility, Basic Remediation Incorporated, Clark County, Nevada, October.

DBS&A, 2006 "Draft Conceptual Site Model for the Common Areas" prepared by Daniel B. Stevens and Associates, October.

ERM-West, 1996. Project Workplan – BMI Common Area, Environmental Conditions Investigation, Henderson, Nevada. February.

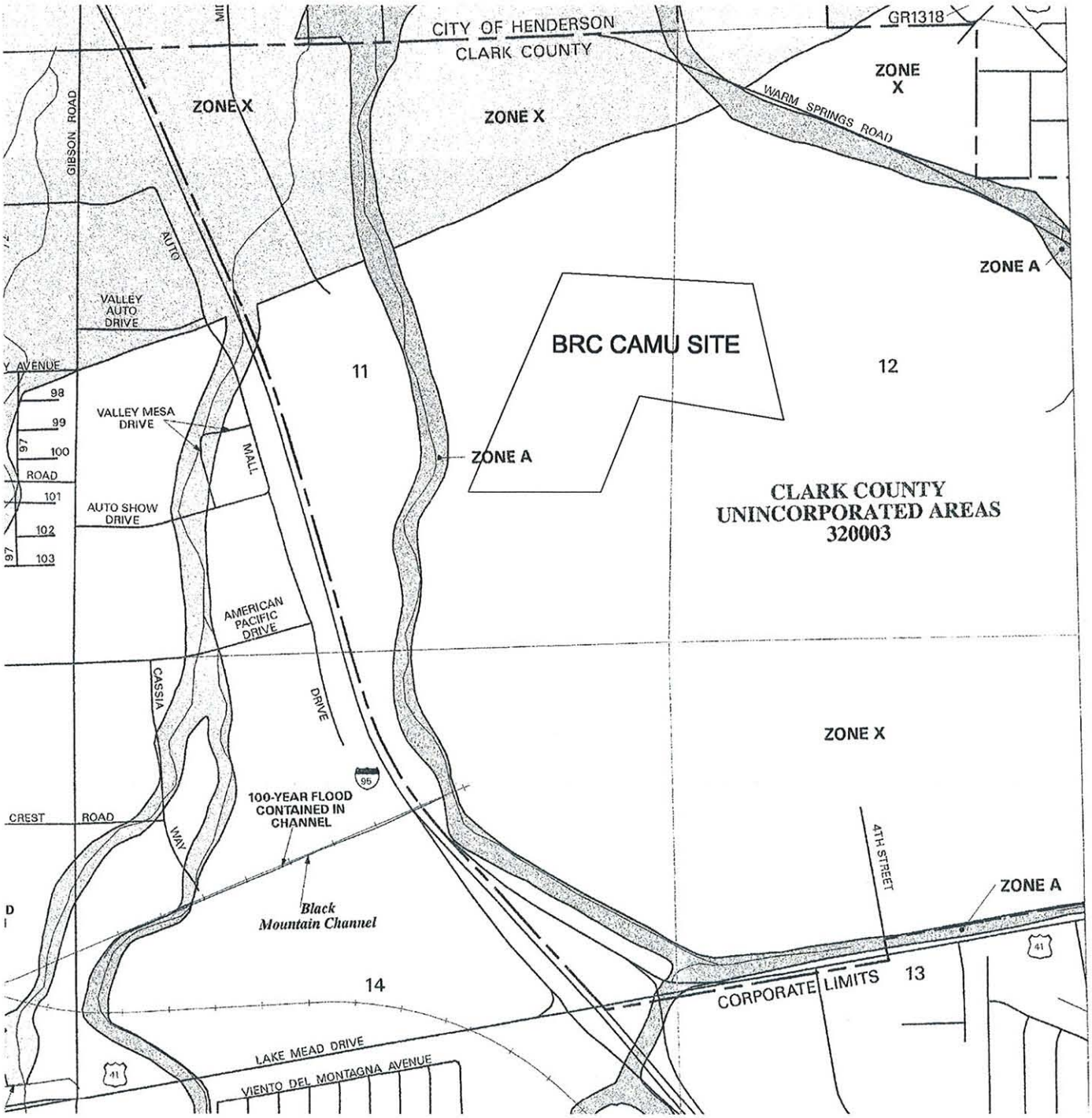
FEMA, 2002. Flood Insurance Rate Map No. 32003C2595E. Federal Emergency Management Agency. Revised September 27.

Geraghty & Miller, Inc., 1993. Phase I Environmental Conditions Assessment for BMI Complex – Clark County, Nevada, April.

Kerr-McGee, 1985, Phase II Groundwater Perchlorate Investigation, Henderson, Nevada Facility, July.

NOAA Atlas 2, Undated. "Precipitation Frequency Atlas of the Western United States," volume VII-Nevada, prepared by the national Weather Service and National Oceanic and Atmospheric Administration, United States Department of Commerce.

United States Geological Survey, 1982. Open File Report 82-1033, "Probabilistic Estimates of Maximum Acceleration and Velocity in Rock in the Contiguous United States."



LEGEND

100 YEAR FLOOD PLAIN

NOT TO SCALE

GeoSyntec Consultants

FEMA FLOOD INSURANCE MAP NO. 32003C2595 E
MAP REVISED SEPTEMBER 27, 2002
APPROXIMATE BRC CAMU LOCATION
BRC CAMU

FIGURE NO.	I-1
PROJECT NO.	SC0313
DATE:	NOVEMBER 2006

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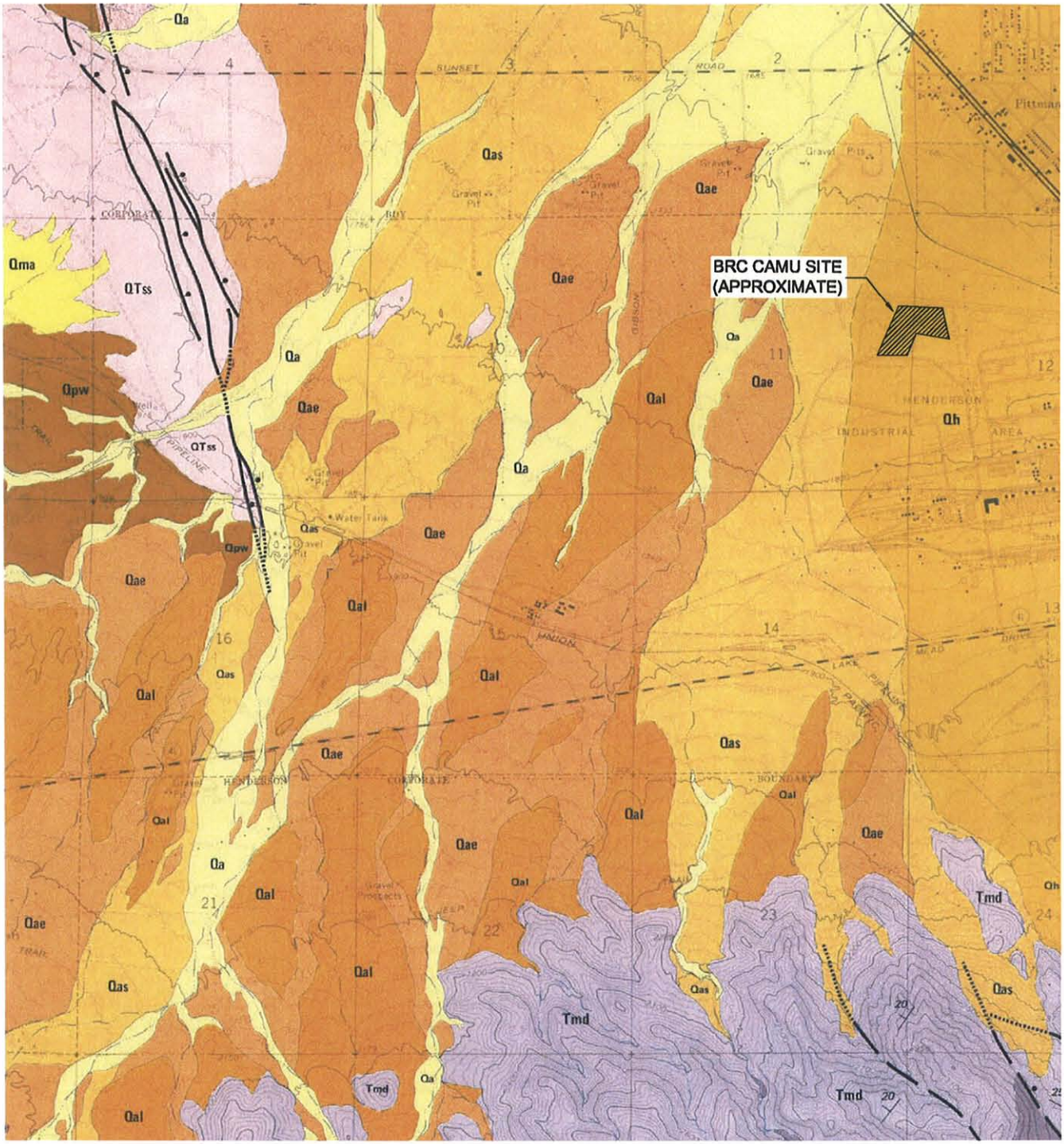

NOT TO SCALE

GeoSyntec Consultants

USGS SE FOLIO GEOLOGIC MAP – LAS VEGAS AREA
BRC CAMU
HENDERSON, NEVADA

FIGURE NO.	I-2
PROJECT NO.	SC0313
DATE:	NOVEMBER 2006

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Attachment J
CAMU (Landfill) Design – Conceptual

Attachment J
CAMU (Landfill) Design – Conceptual
Basic Remediation Company (BRC)
Corrective Action Management Unit (CAMU)
Henderson, Nevada

Table of Contents

List of Tables

List of Details

Appendices

CERTIFICATION PAGE

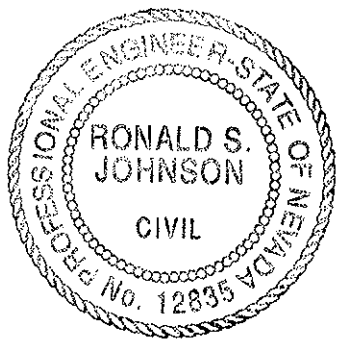
CONCEPTUAL DESIGN FOR
THE CONSTRUCTION OF
THE BASIC REMEDIATION COMPANY
CORRECTIVE ACTION MANAGEMENT UNIT

HENDERSON, NEVADA

The Engineering material and data contained in this Conceptual Design Plan were prepared under the supervision and direction of the undersigned, whose seal as a registered Professional Engineer is affixed below.

The Engineering system in this conceptual design will prevent the migration of any hazardous constituents into the ground water or surface water at least as effectively as the liner and leachate collection and removal system specified in 40 CFR 264.301(c).

Ronald Johnson, P.E.
Nevada No. 12835



1.0 INTRODUCTION

This conceptual design is prepared in accordance with 40 CFR Parts 264, 266 and 268. The technical approaches discussed in this section are intended to outline the key conceptual design features and components of the proposed landfill. Upon regulatory review and approval, the conceptual design will be refined to provide detailed specifications to meet the design standards and performance criteria outlined in this permit.

1.1 Maps and Plans

A series of maps, plans and cross-sections referenced throughout this section is located in Section 1 of the Supplemental RAP Information (SRAPI). The design plans include the following:

- Figure J-1 – Title Sheet and Drawing List (includes general location map).
- Figure J-2 – Legend, Abbreviations, and General Notes;
- Figure J-3 – Overall Site Plan;
- Figure J-4 – Construction Sequence Plan;
- Figure J-5 – Surcharge Plan;
- Figure J-6 – Site Preparation Plan;
- Figure J-7 – Construction Grading Plan;
- Figure J-8 – Storm Drain Plan;
- Figure J-9 – Final Cover Grading Plan;
- Figure J-10 – Cross Sections
- Figure J-11 – Final Cover and Liner Details and Sections;
- Figure J-12 – Fence Plan.

1.2 Anticipated Waste Material

The source materials for the proposed BRC CAMU include approximately 3.5 million cubic yards of residual solids (i.e., sediments and associated soils) from the industrial ponds, ditches, and other sources areas within the BMI Common Areas known as the Eastside Area. Extensive testing of the waste material has determined the majority of wastes to be non-hazardous. Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOCs), and Polychlorinated Biphenyls (PCBs) were detected sporadically, with VOCs and SVOCs throughout the site and PCBs in the Beta Ditch and first eight Upper Pond rows. Pesticides, metals, and cyanide were detected at low levels in the Beta Ditch and first eight Upper Pond rows. Asbestos was tested at measureable levels in the Beta Ditch and first eight Upper Pond rows. These wastes are not incompatible, reactive, or ignitable. Additional waste characterization detail can be found

in the Waste Analysis Plan (Attachment C). No wastes will be accepted from other sources.

Unlike typical landfills, both the source material and the proposed BRC CAMU will be under sole control of BRC. Consequently, there will be direct control over the types of waste materials placed at the BRC CAMU. Physical and chemical descriptions of the anticipated waste materials are presented in the Waste Analysis Plan (Attachment C).

1.2.1 Predicted Leachate Generation

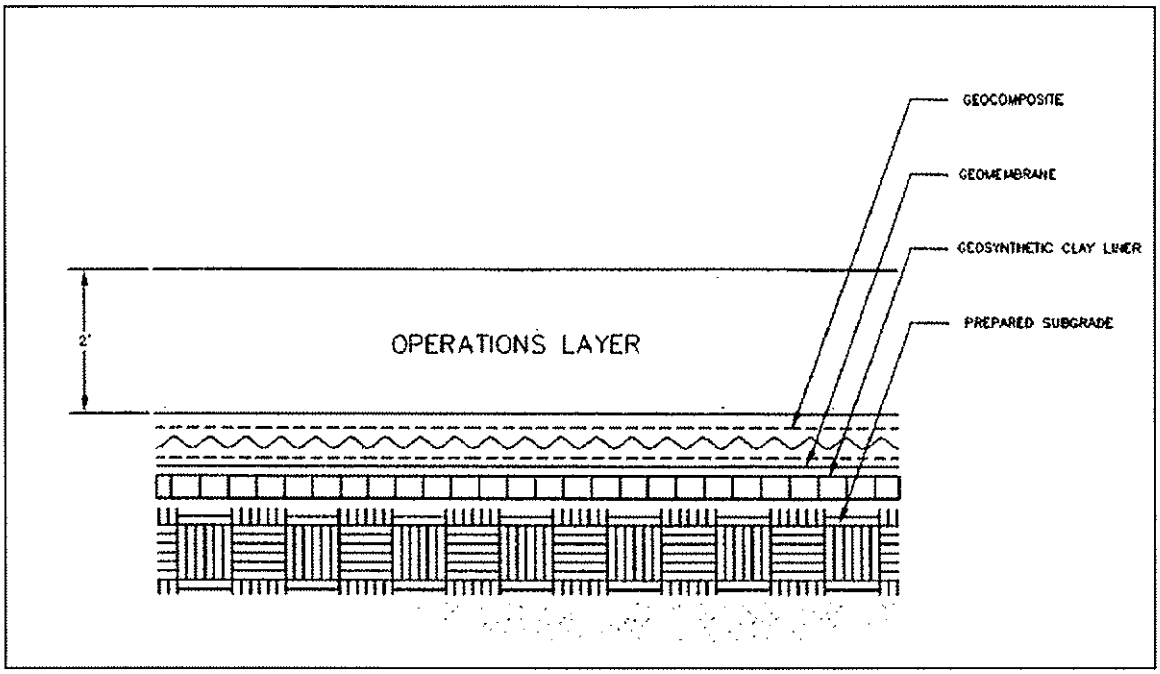
In the case of the proposed BRC CAMU, the mass of waste material will be compacted in place to form a hard-packed, monolithic "block," through which little or no saturated flow is expected to occur. Achieving the most favorable hydraulic conductivity in the compacted sediments depends on the degree of compaction, compaction method, type of soil, soil moisture content, and *in-situ* density. Wet waste sediments from the TIMET ponds will be mixed with dry solids, or otherwise dewatered, and then transported and placed to maintain a moisture content below that which is capable of generating leachate. The process will be designed such that waste sediments placed in the landfill meet the density and moisture content requirements that will in turn reduce leachate generation.

While waste material placed within the landfill will not be intrinsically capable of generating leachate, the ability for the landfill to produce leachate will be dependent on the quantity of the water allowed to infiltrate the interim and final cover materials and penetrate into the underlying waste materials. Therefore, final cover design and operational specifications for interim covers are important for the landfill system to provide for protection of the waters of the state. For this reason, the proposed interim and final cover are designed to reduce infiltration of water as described in Attachment O (Closure and Post-Closure Plan) and Attachment P (Final Cover Design).

2.0 LINER DESIGN

2.1 Liner and Leachate Collection System

A composite liner and leachate collection system is proposed as shown in cross-sections in Detail J-1 below. The composite liner will underlie the waste materials, providing a barrier to the underlying native soils and groundwater. Although leachate generation is not anticipated, this liner system is designed with a leachate collection system to reduce potential liquid accumulation at the base of the waste materials. Liner and leachate collection components will be constructed of materials having appropriate strength and chemical compatibility.



Detail J- 1, Composite Liner Layout

As shown in Detail J-1 above, the liner system is anticipated to consist of the following elements, or layers, from top to bottom: a geocomposite drainage layer, a geomembrane, and a geosynthetic clay liner (GCL). GCLs consist of a layer of bentonite-clay-backed geotextile. GCLs exhibit properties of low permeability soil liners, and have successfully substituted for the soil component in composite liner designs. Placement of a GCL under the geomembrane is commonly employed to increase effectiveness of the composite liner by limiting flow through potential flaws or pinholes in the geomembrane.

Geomembranes are relatively thin sheets of flexible polymeric materials that are manufactured and prefabricated at a factory and transported to the site. Because of their inherent impermeability, use of geomembranes in landfill construction is typically standard in the industry. Geomembranes are made of one or more polymers along with a variety of other ingredients such as carbon black, pigments, fillers, plasticizers, processing aids, crosslinking chemicals, anti-degradants, and biocides. The polymers used to manufacture geomembranes include a wide range of plastics differing in properties such as chemical resistance and basic composition. The polymeric materials may be categorized as follows:

- Thermoplastics such as polyvinyl chloride (PVC);

- Crystalline thermoplastics such as high density polyethylene (HDPE), low density polyethylene (LDPE), and linear low density polyethylene (LLDPE); and

- Thermoplastic elastomers such as chlorosulfonated polyethylene (CSPE).

The polymeric materials used most frequently as geomembranes are HDPE, PVC, and CSPE. Geomembrane thickness range from 20 to 120 mil (1 mil = 0.001 inch). The recommended minimum thickness for all geomembranes is 30 mil, with the exception of HDPE, which must be at least 60 mil. A 60-mil HDPE geomembrane is proposed for the BRC CAMU, which is widely recognized in the industry as a very chemically resistant, durable, long-lasting material.

Geocomposite is to be placed on the geomembrane to protect it from puncture by the overlying operations layer soil. The geocomposite is designed to allow leachate, if generated by the waste materials, to flow toward perforated HDPE collection piping and be collected at the pump-out locations. The base grade of the landfill is engineered to slope toward these leachate collection areas.

Components of the leachate collection system (LCS) will have sufficient strength to support overlying compressive stresses. Pipe strength calculations will include resistance to wall crushing, pipe deflection, and buckling pressure. Perforated drainage pipes have been shown to provide good long-term performance in LCSs (USEPA, 1993).

Geotextile filter is a component of the geocomposite that will reduce physical clogging of the drainage layer from the overlying fine-grained material.

The liner system is intended to work together with other design components to isolate the waste materials from the environment. The main objective of BRC CAMU design is to provide a design that protects waters of the state. Design components that are intended to accomplish this objective are as follows:

1. The final cover, or cap, of the landfill is designed to allow essentially no infiltration of water into the waste materials. The final cover is described in the CAMU (Landfill) Closure and Post Closure Plan (Attachment O).

2. The waste material will be compacted to the degree necessary to reduce saturated flow within the interred materials. As discussed earlier, material from the TIMET ponds will be mixed with dry soils or dewatered, as necessary, prior to interment in the BRC CAMU. Together with a cap that reduces infiltration in an arid environment, the resulting potential for contaminant mobilization and leachate generation is considered minimal.

3. In addition to the above precautions, the underlying liner system will be designed to collect leachate generated, thereby providing an additional factor of safety in reducing waste migration into the groundwater.

4. The base of the landfill will be at least 5 feet higher than first groundwater at the groundwater's highest elevation, providing a buffer between groundwater and the landfill (Section 9 of the Supplemental Rap Information [SRAPI]).

Engineering design calculations and construction specifications for the base liner system and leachate collection system are presented with the Supplemental RAP Information (SRAPI), Sections 2 and 4, respectively. A summary is provided in the following section.

3.0 SUMMARY OF ENGINEERING ANALYSIS

3.1 General

This section summarizes the results of the conceptual design calculations performed for the base liner system at the BRC CAMU Landfill site. The following calculations were performed:

- Slope Stability Evaluation - Cut Slopes (Calculation Package A);
- Slope Stability Evaluation - Final Waste Slopes (Calculation Package B);
- Drainage Pipe Size Calculations (Calculation Package C);
- Pipe Strength Calculations (Calculation Package D);
- Veneer Stability Calculations (Calculation Package E);
- Geotextile Separation/Filtration Calculations (Calculation Package F);
- Geotextile Puncture Protection Calculations (Calculation Package G);
- Sump Capacity Calculations (Calculation Package H);
- Comparison of Flow Through the Prescriptive Composite Liner and a Proposed Alternative Composite Liner (Calculation Package I);
- Tension Due to Wind Uplift (Calculation Package J);
- Evaluation of Liner System Anchor Capacity (Calculation Package K);
- Drainage Geocomposite Equivalency Demonstration (Calculation Package L); and
- Consolidation Analyses (Calculation Packages M and N)

The base liner system calculations are based on the conceptual design grading plans shown on Figures J-7 and J-9 Additional calculations may have to be performed if there are changes to elevation and grade in the aforementioned design grading plans.

3.2 Slope Stability Evaluation

3.2.1 General

This section summarizes the analyses performed for the cut slopes and the final waste slopes. The analyses summarized herein are for static stability. Seismic site response, stability, and permanent deformation analyses are presented in Attachment O.

3.2.2 Cut Slopes

Slope stability was evaluated for the proposed cut slopes for the BRC CAMU. One cross-section was analyzed that represents the most critical case. Cut slopes with the highest height, weakest materials, and/or steepest slope are chosen for this analysis. The analyzed native soil cut slope has a height of approximately 44 ft and a base sloping at 3%. The proposed native soil cut slopes are at a slope angle of 2.1:1 (horizontal:vertical). The material properties selected and used in these analyses were based on a preliminary investigation by Converse Consultants, Inc. [Converse, 1999]. The calculations suggest that the most critical potential failure surface of the 2.1H:1V native soil cut slope possesses a factor of safety of approximately 1.5. Since the native soil cut slopes are considered interim, seismic evaluations were not conducted. Native soil cut slope stability calculations are presented in Section 2, Calculation Package A of the SRAPI.

3.2.3 Final Waste Slopes

The stability of the final waste slopes for the BRC CAMU was analyzed. Two cross-sections were analyzed that represent the most critical cases. Similar to cut slope analysis, waste slopes with the highest height, weakest materials, and/or steepest slope are chosen for this analysis. The analyzed final waste slope has a height of approximately 47 ft above surrounding grades at a slope angle of 3:1 (horizontal:vertical). The material properties selected and used in these analyses were based on a preliminary investigation by Converse Consultants, Inc. [Converse, 1999]. The calculations suggest that an apparent internal or interface friction angle of 12 degrees for any component of the composite liner system is the minimum allowable value provides a static factor of safety of 1.6. Furthermore, the calculations suggest that the yield acceleration for the final waste slopes is approximately 1.10 g (where "g" is the gravitational acceleration of 32.2 ft/s^2). Final waste slope stability calculations are presented in Section 2, Calculation Package B of the SRAPI.

3.3 Drainage Pipe Size Requirement

Drainage pipes will be placed on the base liner system to collect and transport potential leachate to the sump for removal. Analyses were performed to model leachate

generation by using the Hydrologic Evaluation of Landfill Performance (HELP) model. The calculations suggest that a 4-inch diameter pipe with four 1/4-inch perforations spaced at 1-ft intervals will accommodate the flow predicted by HELP model analyses. Drainage pipe size calculations are presented in Section 2, Calculation Package C of the SRAPI.

3.4 Pipe Strength

Based on drainage pipe size analyses, a 4-inch diameter drainage pipe will be used for leachate collection and transport. An 18- inch diameter pipe will be used for the side slope riser. Based on the calculations performed for the 4-inch diameter drainage pipe and the 18-inch diameter side slope riser, the appropriate standard dimension ratio (SDR) is 13.5 or smaller. This calculation assumes the maximum height above the pipe of waste is 93 ft (South Mesa). Pipe strength calculations are presented in Section 2, Calculation Package D of the SRAPI.

3.5 Veneer Stability

The design criteria for the side slope liner system is to develop zero tension in the geosynthetics during installation of the operations layer on the side slopes. Potential causes of tension in the liner system include construction equipment loading and overburden stresses (e.g., operations layer materials). Based on the proposed grades and expected construction conditions, the calculations suggest that the side slope liner system will not be placed into tension provided a minimum dry interface friction angle of 18 degrees is maintained and the operations layer is staged in 10-ft high increments inclined at 2.5H:1V. Veneer stability calculations are presented in Section 2, Calculation Package E of the SRAPI.

3.6 Geotextile/Separation/Filtration Requirements

A separation/filtration geotextile will be placed between the operations layer and the drainage aggregate surrounding the leachate collection pipe and as a component of the geocomposite drainage layer. The purpose of the geotextile is to limit migration of fine material from the operations layer into the drainage aggregate and/or geonet component of the geocomposite. The calculations suggest that the separation/filtration geotextile overlying the drainage aggregate layer has an apparent opening size (AOS) less than Sieve No. 70, a permittivity greater than 0.8 sec^{-1}, a minimum mass per unit area of 6 $oz./yd^2$, and sufficient mechanical properties. Geotextile separation/filtration calculations are presented in Section 2, Calculation Package F of the SRAPI.

3.7 Geotextile Cushion Protection

The geomembrane needs to be protected from puncture by particles from the prepared subgrade and operations material. Based upon the selection of using a geocomposite as the drainage layer in the leachate collection system, the geocomposite is selected such that the combined weight of the geocomposite geotextiles will act as an equivalent cushion. With respect to subgrade puncture, the geotextile components of the GCL will protect the geomembrane from the prepared subgrade. This calculation is based on a maximum overburden height of 93 feet. The analysis suggests that the following maximum particle sizes and geotextile mass per unit areas will be required:

Soil Component of Liner	Maximum Particle Size	Minimum Mass per Unit Area
Subgrade	0.75 inch	9 oz./yd^2 (GCL)
Angular Drainage Aggregate	1.00 inch	16 oz./yd^2

Table J -1- Cushion Geotextile requirements

Geotextile cushion protection calculations are presented in Section 2, Calculation Package G of the SRAPI.

3.8 Sump Capacity

The USEPA regulations limit the head over the liner system to less than 12 inches. Therefore, the available capacity to retain the peak daily runoff includes the sump and the volume of 12 inches of leachate in the geocomposite and operations layer extending away from the sump. The maximum, average daily runoff calculated from the HELP model analyses (see drainage pipe sizing calculation) is 231 ft^3. A sump will be located at three low points (two in both the South Mesa and one in the North Mesa). Each sump will be approximately 10 ft x 10 ft x 2 ft deep. The sump has a capacity of approximately 112 ft^3. The capacity of the drainage geocomposite/operations layer extending away from the sump (at a 12-inch head) is greater than 342 ft^3. The combined capacity of the sump and drainage geocomposite/operations layer is 453 ft^3, which exceeds the maximum, average daily runoff noted above of 231 ft^3.

The capacity of the three sumps located throughout the site will be able to accommodate the anticipated peak daily flow (as evaluated from the HELP model – drainage pipe sizing calculation, Section 2, Calculation C of the SRAPI) and meet the EPA requirement of less than 12 inches of head over the liner. Sump and drainage aggregate capacity calculations are presented in Section 2, Calculation Package H of the SRAPI.

3.9 Comparison of Flow Through a CCL and GCL

The calculations suggest that the flow rate through the prescriptive composite liner system containing a compacted clay liner (CCL) is approximately 1.64 times greater than the flow rate through the alternative composite liner system containing a geosynthetic clay liner (GCL). The comparison calculations are presented in Section 2, Calculation Package I of the SRAPI.

3.10 Tension Due to Wind Uplift

The most critical scenario for wind uplift is after the 10-ft vertical height of operations material has been placed against the slope while the remainder of the geosynthetic liner is exposed on the upper portion of the slope. A UV-protective woven geotextile will be installed to overlie the exposed portions of geosynthetics on these cut slopes. The woven geotextile will be subjected to tension due to wind uplift.

Due to proximity of the site, the Las Vegas Airport wind speed data was used for this analysis. A design wind speed of 90 mph is used, which is the peak gust recorded since 1961. This is a conservative design wind speed since the likelihood of this wind speed occurring during the period of construction is very low. Assuming the design wind speed, the calculations suggest that the maximum tension the woven geotextile will experience is 82.8 lb/in. In order to resist the uplift forces from wind loads, the woven geotextile shall have a minimum ultimate wide width tensile strength of 110 lb/in. The tension due to wind uplift calculations is presented in Section 2, Calculation Package J of the SRAPI.

3.11 Anchorage Capacity

The geosynthetics' anchor must have the capacity to withstand potential pullout tension due to wind uplift from the UV-protective woven geotextile. The proposed anchor consists of a 2-ft wide and 2.5-ft deep trench filled with compacted soil. The anchor trench will be overlain by 1 ft of soil with a 3-ft runout length from the top of slope. The capacity of the anchor trench is sufficient to withstand pullout tension from the woven geotextile. The anchorage capacity calculations are presented in Calculation Package K.

3.12 Geocomposite Equivalency Demonstration

A geocomposite layer will be used in lieu of a leachate collection gravel and separation/filtration geotextile. A geocomposite layer, consisting of two 8 oz/yd^2 nonwoven geotextiles bonded to either side of a geonet, is proposed. The top geotextile shall conform to the requirements presented in the geotextile separation/filter calculation

package (Section 2, Calculation Package F in the SRAPI). The combined weight of the geotextiles will act as an equivalent cushion. The calculations suggest that a drainage composite will provide equivalent transmissivity to the aggregate drainage layer. The geocomposite equivalency demonstration calculations are presented in Section 2, Calculation Package L of the SRAPI.

3.13 Consolidation Analysis

Consolidation analyses were performed to evaluate the potential affect on the performance of the proposed liner system under increased loads related to the BRC CAMU. Borings and associated laboratory test results were used for locations beneath the South Mesa (higher loads due to thicker waste profile). Conservative analyses suggest that consolidation will not adversely impact the performance of the proposed liner or leachate collection systems. The consolidation analysis for the South Mesa is presented in Section 2, Calculation Package M of the SRAPI.

In addition, a consolidation analysis was performed to evaluate the effects of the consolidation settlement of waste in the "slit trenches" that will be overlain by the North Mesa disposal area. Since limited information is available regarding the consolidation characteristics of the waste materials contained in the "slit trenches", interpretation was required and the analyses were approached on a conservative basis. The calculations suggest that settlement of waste in the unconsolidated "slit trenches" is likely to cause unacceptable strain in the liner system. As a result, the North Mesa will be pre-loaded with surcharge fill, prior to construction of the overlying liner system, to heights of approximately 36 ft.

Surcharge fill will be monitored using settlement plates to assess the settlement progress and to ascertain the point at which the surcharge is removed and the liner system construction can begin. Since the waste materials contained in the "slit trenches" are primarily inert industrial wastes, long-term settlement due to biodegradation is minimal. Therefore, the time to achieve slit trench consolidation is anticipated to be very short. Settlement will be deemed complete once the difference between any two subsequent settlement plate readings is no more than 5%, or no greater than 0.05 ft change in one week's time.

The calculations suggest that after pre-loading, the strain on the liner system due to differential settlement is within tolerable amounts. In addition, the proposed grading plan can accommodate the calculated post-surcharge differential settlement without significant effects on drainage. The consolidation analysis is presented in Section 2, Calculation Package N of the SRAPI.

4.0 REFERENCES

Converse Consultants, 1999. Preliminary Geotechnical and Geologic Investigation, Industrial Non-Hazardous Disposal Facility, Basic Remediation Incorporated, Clark County, Nevada, October.

USEPA 1993, "Solid Waste Disposal Facility Criteria, Technical Manual." EPA530-R-93-017. Soild Waste and Emergency Response, November.

Appendix A

Groundwater Elevation Letter

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6 April 2007

Ranajit Sahu, Ph.D.
Director of Environmental Services
Basic Remediation Company
875 West Warm Springs Road
Henderson, Nevada 89015

Subject: Groundwater Elevations
BRC CAMU
Henderson, Nevada

Dear Dr. Sahu:

In accordance with the Nevada Department of Environmental Protection (NDEP) draft Notice of Deficiency (NOD) dated 13 February 2007, Geosyntec has evaluated the groundwater elevation data associated with the Basic Remediation Company Correction Action Management Unit (CAMU) located in Henderson, Nevada. The proposed CAMU liner system, as illustrated on Drawing J-7, is designed to be a minimum of 5 feet above the groundwater elevation. The groundwater elevations presented on Drawing J-7 were obtained by Montgomery Watson Harza (MWH) in July 2005.

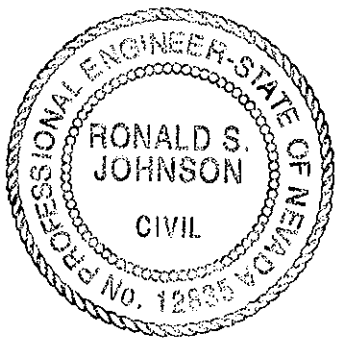
Based on the groundwater contours provided by MWH, the north mesa portion of the CAMU (i.e., the portion over the slit trenches) liner system is greater than approximately 40 feet above groundwater and the south mesa portion of the CAMU liner system (i.e., in the borrow pit area) greater than 5 feet above groundwater. Approximately 93% of the south mesa portion of the CAMU liner system area is more than 10 feet above the groundwater.

The CAMU liner system is designed to limit migration of liquids in the CAMU to the groundwater, which will also limit the migration of groundwater into the CAMU if groundwater were to rise above the base liner system elevation. Furthermore, if groundwater were to rise to an elevation above and migrate through the CAMU liner system, the liquid would be collected in the leachate collection and removal system and would then be removed from the landfill as outlined in the operations plan.

Based on this information, we do not anticipate that rising groundwater levels, if they occur, would adversely impact the performance of the liner system or CAMU.

Sincerely,

Ronald S. Johnson, P.E.
Associate Engineer



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Attachment K
CAMU (Landfill) Design – Final [Reserved]

Attachment L
CAMU (Landfill) Construction Plan

Attachment L
CAMU (Landfill) Liner Construction Plan
Basic Remediation Company (BRC)
Corrective Action Management Unit (CAMU)
Henderson, Nevada

Table of Contents

1.0 INTRODUCTION

This BRC CAMU Construction Plan outlines the general construction requirements and schedule for the base liner systems. This plan addresses the construction materials, installation, and grading requirements for the BRC CAMU. The rationale for selecting the liner materials is described in the supporting calculations. A Base Liner System Construction Quality Assurance (CQA) plan, base liner system technical specifications, and conceptual drawings are included with the Supplemental RAP Information (SRAPI).

2.0 LINER CONSTRUCTION SCHEDULE AND SEQUENCE

Construction of the CAMU components will be phased so as to increase efficiency of waste disposal. One unit of the BRC CAMU will receive wastes while the base liner system is being constructed for the next unit. These different sections will be divided using storm water controls to reduce surface water, leachate, and waste interaction. The liners in adjacent units will be joined using the seaming techniques outlined in the Base Liner CQA and Technical Specifications (Sections 3 and 4 of the SRAPI, respectively). As lined areas are completed with waste placement, they will be closed and the final cover system will be constructed, as discussed in the CAMU (Landfill) Closure and Post-Closure Plan (Attachment O).

The general construction sequence of the CAMU, as shown on Figure J-4 of the Conceptual Drawings, Section 1, in the SRAPI, is outlined in the following sections.

2.1 Site Preparation

The site will be prepared by removing surface vegetation and portions of the fence currently on site. The temporary perimeter fence will be established and all support facilities brought on-site. At this time, the haul roads and storm water controls (ditches, culverts, silt fences, check dams, and basins) will be constructed. Hot spot excavation of specific areas of the slit trenches will be performed. Surcharge will be constructed, monitored, and removed over the slit trenches in the North Mesa, as shown on Figure J-5 of the Conceptual Drawings. The liner foundation will be graded in accordance with the Conceptual Drawings to prepare for liner installation. The grading requirements are summarized in Section 3 of this Attachment and in shown detail in Section 1 of the SRAPI.

2.2 Liner Installation

After the liner foundation grading, the leachate collection system and liner installation will begin. The flowlines, sumps, and berms for leachate conveyance and storage will be constructed as shown on the Drawings at this time. Liner construction will begin with the installation of the geosynthetic clay liner (GCL), and geomembrane. Requirements for installation are summarized in Section 3 of this Attachment and in detail in the SRAPI.

2.3 Leachate Collection and Removal System Installation

The leachate collection and removal system will be installed next, with collection pipes, drainage aggregate, geotextile, and geocomposite. The geocomposite and filter geotextile will be overlain with 2 feet of soil acting as an operations layer. Requirements of the geocomposite and filter geotextile are summarized in Section 3 of this Attachment and in detail in the SRAPI.

3.0 LINER CONSTRUCTION REQUIREMENTS

3.1 General

This section describes the construction requirements for installation of the base liner system at the BRC CAMU. These construction requirements are necessary in order to ensure that the construction of the liner system is consistent with the design performance goals and assumptions.

3.2 Slope Inclinations

Native soil cut slopes shall be excavated no steeper than a slope inclination of 2.1H:1V. Waste soil slopes shall be placed no steeper than a slope inclination of 3H:1V.

3.3 Drainage Pipe Size Requirement

In accordance with the analyses performed, the drainage pipe shall be 4-inch diameter HDPE pipe with four 1/4-inch perforations per foot of pipe. The side slope riser shall be 18-inch diameter HDPE solid-wall pipe. The standard dimension ratio (SDR) for the 4-inch diameter pipe and the 18-inch side slope riser shall be less than or equal to 13.5.

3.4 Equipment Loading

Equipment loads shall be limited to a maximum loading of 5 psi overlying a minimum of 1 ft of operations materials. In addition, roads for haul trucks shall be a minimum of 3 ft in thickness overlying the liner system.

3.5 Geotextile Requirements

Two geotextile components of the base liner system are utilized, a 6 oz/yd^2 separation/filtration geotextile and a 16 oz./yd^2 cushion geotextile. A UV protective geotextile will be used on the exposed liner system components on the side slopes. To ensure proper manufacturing and durability, the 6 oz/yd^2 separation/filter geotextile shall have the following properties:

Matrix	Nonwoven
Mass per Unit Area	$\geq$ 6 oz/yd^2
Apparent Opening	$\leq$Sieve No. 70
Permittivity	$\geq$ 0.8 sec-1
Grab Strength	$\geq$ 130 lb
Puncture Strength	$\geq$ 40 lb
Ultraviolet strength retention	$\geq$ 70%

The 16 oz/yd^2 cushion geotextile shall have the following properties:

Matrix	Nonwoven
Mass per Unit Area	$\geq$ 16 oz/yd^2
Puncture Strength	$\geq$ 155 lb
Grab Strength	$\geq$ 350 lb
Ultraviolet strength retention	$\geq$ 70%

The UV protective layer woven geotextile shall have the following properties:

Matrix	woven
Wide Width Tensile Strength	$\geq$ 110 lb/in (ultimate strength)
Apparent Opening	$\leq$ Sieve No. 40

3.6 Geosynthetic Clay Liner (GCL)

The GCL component of the base liner system shall have the following properties:

- Index flux > 1.0×10^{-8} ft^3/ft^2-sec;
- Minimum interface shear strength of 12 degrees;
- The GCL shall be dry during installation; and
- combined geotextile mass per unit area of 9 oz/yd^2.

3.7 Leachate Collection Layer

3.7.1 Geocomposite Requirements

In lieu of using drainage aggregate, a geocomposite will be used to collect potential leachate. The selected geocomposite shall have the following properties:

- Transmissivity > 3.05×10^{-5} ft^2/sec under a confining pressure of 12,000 psf and a hydraulic gradient of 0.10;
- an 8 oz/yd^2 non-woven geotextile bonded to each side of the geonet; and
- the top 8 $oz./yd^2$ non-woven geotextile shall have an AOS greater than Sieve No. 70, permittivity greater than 0.6 sec-1, and sufficient mechanical properties.

3.7.2 Geomembrane Requirements

The geomembrane shall be high-density polyethylene (HDPE), have a nominal thickness of 60 mil, and be textured on both sides.

3.8 Prepared Subgrade Requirements

The prepared subgrade shall have a maximum exposed particle diameter less than 3/4 inch.

4.0 RECORDS AND RECORDKEEPING

4.1 General

Liner and Leachate Collection System construction records will be kept in accordance with the CQA plan. The CQA Site Manager will document that all quality assurance requirements have been addressed and satisfied.

The CQA Site Manager will provide the Construction Manager with signed descriptive remarks, data sheets, and logs to verify that monitoring activities have been carried out. The CQA Site Manager will also maintain, at the job site, a complete file of Drawings and Technical Specifications, a CQA Plan, checklists, test procedures, daily logs, and other pertinent documents.

4.2 Daily Recordkeeping

Preparation of daily CQA documentation will consist of daily reports prepared by the CQA Site Manager which will include CQA monitoring logs, and testing data sheets. This information may be regularly submitted to and reviewed by the Construction Manager.

The CQA Site Manager will prepare daily reports that document the activities observed during each day of activity. The daily reports may include monitoring logs and testing data sheets. At a minimum, these logs and data sheets will include the following information:

- the date, project name, location, and other identification;
- a summary of the weather conditions;
- a summary of locations where construction is occurring;
- equipment and personnel on the project;
- a summary of meetings held and attendees;
- a description of materials used and references of results of testing and documentation;
- identification of deficient work and materials;
- results of re-testing corrected "deficient work;"
- an identifying sheet number for cross referencing and document control;
- descriptions and locations of construction inspected;
- type of construction and inspection performed;

- description of construction procedures and procedures used to evaluate construction;
- a summary of test data and results;
- calibrations or re-calibrations of test equipment and actions taken as a result of re-calibration;
- decisions made regarding acceptance of units of work and/or corrective actions to be taken in instances of substandard testing results;
- a discussion of agreements made between the interested parties which may affect the work; and
- signature of the respective CQA Site Manager.

4.3 Construction Problems and Resolution Data Sheets

Construction Problems and Resolution Data Sheets, to be submitted with the daily reports prepared by the CQA Site Manager, describing special construction situations will be cross-referenced with daily reports, specific observation logs, and testing data sheets and will include the following information, where available:

- an identifying sheet number for cross-referencing and document control;
- a detailed description of the situation or deficiency;
- the location and probable cause of the situation or deficiency;
- how and when the situation or deficiency was found or located;
- documentation of the response to the situation or deficiency;
- final results of responses;
- measures taken to prevent a similar situation from occurring in the future; and
- signature of the CQA Site Manager and a signature indicating concurrence by the Construction Manager.

The Construction Manager will be made aware of significant recurring nonconformance with the Drawings, Technical Specifications, or CQA Plan. The cause of the nonconformance will be determined and appropriate changes in procedures or specifications will be recommended. These changes will be submitted to the Engineer for approval. When this type of evaluation is made, the results will be documented and revision to procedures or specifications will be approved by the Contractor and Engineer.

4.4 Photographic Documentation

Photographs will be taken and documented in order to serve as a pictorial record of work progress, problems, and mitigation activities.

4.5 Design Changes

Design changes may be required during construction. In such cases, the CQA Site Manager will notify the Construction Manager. Design changes will be made with the written agreement of the Construction Manager and the Engineer and will take the form of an addendum to the Drawings and Technical Specifications.

4.6 CQA Report

At the completion of the Project, the CQA Consultant will submit to the Construction Manager the CQA report signed and sealed by a Professional Engineer licensed in the State of Nevada. The CQA report will acknowledge: (i) that the work has been performed in compliance with the Drawings and Technical Specifications; (ii) physical sampling and testing has been conducted at the appropriate frequencies; and (iii) that the summary document provides the necessary supporting information. At a minimum, this report will include:

- Manufacturers' quality control documentation;
- a summary report describing the CQA activities and indicating compliance with the Drawings and Technical Specifications which is signed and sealed by the CQA Officer;
- a summary of CQA/CQC testing, including failures, corrective measures, and retest results;
- contractor personnel resumes and qualifications;
- documentation that the geomembrane trial seams were performed in general accordance with the CQA Plan and *Technical Specifications*;
- documentation that field seams were non-destructively tested using a method in general accordance with the applicable test standards;
- documentation that nondestructive testing was monitored by the CQA Consultant, that the CQA Consultant informed the Geosynthetic Installer of any required repairs, and that the CQA Consultant inspected the seaming and patching operations for uniformity and completeness;
- records of sample locations, the name of the individual conducting the tests, and the results of tests;

- record drawings as provided by the Surveyor;
- documentation showing that piping was tested in general accordance with the Technical Specifications; and
- daily inspection reports.

The record drawings will include scale drawings depicting the location of the construction and details pertaining to the extent of construction (e.g., depths, plan dimensions, elevations, soil component thicknesses). Base maps required for development of the record drawings and the record drawings themselves will be prepared by a qualified Professional Land Surveyor registered in the State of Nevada. These documents will be reviewed by the CQA Consultant and included as part of the CQA Report, which will be kept with the project records in accordance with the records retention requirement of the AOC3.

Attachment M
CAMU (Landfill) Operation Plan

Attachment M
CAMU (Landfill) Operation Plan
Basic Remediation Company (BRC)
BRC Corrective Action Management Unit (CAMU)
Henderson, Nevada

Table of Contents

1.0 INTRODUCTION

The purpose of this Operation Plan is to delineate the procedures and operating practices that will be implemented to ensure the safe and efficient excavation, loading, transportation, receipt, and placement of remediation wastes at the BRC CAMU. This Operation Plan summarizes operational procedures discussed in detail in the Corrective Action Plan (CAP) for the BRC Common Areas Remediation Project prepared by Dr. Ranajit Sahu, C.E.M. for BRC dated September 2006. This Operation Plan is intended to provide guidelines to the operator and managers of the BRC CAMU in conducting CAMU operations.

2.0 FACILITIES

2.1 Equipment

The proposed equipment at the BRC CAMU is listed in Table 3 of the CAP. The equipment will be adequate in type, capacity and number, and sufficiently maintained to permit the site operation to meet requirements of these standards. Periodically, the overall maintenance level of site equipment and the quality of site maintenance facilities will be evaluated. In addition, periodically the size and adequacy of the equipment to carry out operations, including the types and quantities of major landfill equipment such as bulldozers, scrapers, compactors, graders and water trucks will be evaluated by the BRC CAMU Construction Manager.

Selection of type, size, quantity, and combination of machines required to move, dry, spread, and compact waste depend on the following factors:

- Amount and type of waste to be handled;
- Weather conditions;
- Compaction requirements;
- Site and soil conditions (topography, soil moisture, and difficulty of excavation); and
- Supplemental tasks such as maintaining roads, assisting in vehicle unloading, and moving other materials and equipment around the site.

In addition to the above, BRC is committed, through either purchase or lease, to provide other equipment to serve as replacements, backups, or supplements to existing operations, or for such special needs that may arise.

2.2 Operation Support

Suitable shelter and sanitary facilities will be provided for operating personnel and waste transport personnel. In addition, a storage area will be provided for BRC CAMU operators to store equipment.

2.3 Access, Traffic Control, and Roads

Site access will be gained through the entry gate located off Fourth Street on the east side of the property. Access will be controlled through full time security (24 hours a day, 365 days per year) during site operations in order to prevent unauthorized vehicular traffic and illegal dumping. In addition to full-time security, access will be controlled by using artificial barriers to protect public health, safety, and the environment. The entry gate will be equipped with a lockable mechanism to prevent unauthorized entry and/or uncontrolled waste deposition when the site is closed. Access to the site at points other than the entry gate will be discouraged by maintenance of site perimeter fencing and full time security during site operations.

The BRC CAMU entrance or gate attendant's office, located beyond the entry gate, will serve as the checkpoint to facilitate access and traffic control. The office will be manned continuously. Loads will be inspected at this point by assigned site personnel. Subsequent to this inspection, loads will be directed to the appropriate BRC CAMU disposal areas.

Temporary roads will be provided as necessary to the working face. All roads will be passable during inclement weather. The entire site will be enclosed with a continuous chain link fence. Figure F-1 through F-3 of the CAP show the locations of the proposed haul roads.

2.4 Signs

At the main entrance gate off Fourth Street a sign will be posted indicating the following:

- Facility name;
- The owner and operator of the site;
- The hours of operation; and
- Materials accepted or excluded.

It will be noted on the signage that the BRC CAMU is a private operation.

Instructional signs will be placed at this site entrance addressing prescribed safety measures on the site and include instructions regarding prohibition of smoking within the disposal areas and mandating that all instruction from site personnel be obeyed.

Interior site haul roads will be appropriately signed so as to direct each load to its designated disposal area. Typical directional and information signs will be posted at the site. Location of signage may be changed from time-to-time to facilitate operations. In addition, authorized personnel may be utilized to direct traffic at the active working face of the landfill operation.

"No Trespassing" signs will be posted at 100-foot intervals along the site perimeter fencing. "Danger- Unauthorized Personnel Keep Out," will be posted at each entrance to the active portion of the BRC CAMU and additional locations as necessary. All signs will be posted in English and Spanish.

Additional signs and/or measures may be required to protect personnel and public health and safety.

3.0 OPERATING CRITERIA

This section presents operating criteria of the BRC CAMU and methodologies to be used to meet such criteria.

3.1 Health and Safety

All activities will be performed in accordance with a Health and Safety Plan(s) (HASP) developed for Site remediation activities by the contractor(s) selected for the project. These HASP(s) shall apply to the contractor's employees and subcontractors. The parameters and details that will be included in the HASP are described in the Accident Prevention, Contingency, and Emergency Response Plan. Briefly, the HASP shall include the following:

- Identification of chemical and physical hazards associated with the remediation activities;
- Minimum training requirements for site workers;
- Minimum Personal Protective Equipment (PPE) for site workers and visitors and criteria for upgrades;
- Air monitoring requirements for workers' breathing zone and site perimeter (for public protection);
- Emergency information, such as emergency telephone numbers and directions to the nearest hospital; and

- Administrative requirements, such as documentation of training, daily health and safety tailgate meetings, and documentation of air monitoring.

A sample Health and Safety Plan table of contents for the BRC CAMU and the Common Areas Remediation Project is included as Appendix D of the CAP.

3.2 Fire Prevention

Fire hazard at the BRC CAMU is expected to be minimal due to the type of material being landfilled. Explosive gases (e.g. methane) are not anticipated at the BRC CAMU because putrescible material will not be accepted at the BRC CAMU for disposal.

No open burning of wastes will be allowed at this site. Fire control protection will be provided by the utilization of on-site equipment such as a water truck, track type dozer and front-end loaders for wetting and smothering accidental fires. In addition, site-related operational vehicles will be equipped with fully functional fire extinguishers. Backup fire protection will be available from units of the Clark County Fire Department.

Site personnel will receive periodic on-the-job training in fire fighting practices conducted by the BRC CAMU Construction Manager and/or other authorized representatives.

3.3 Control of Windblown Material

Scattering of papers, plastic, or other debris by the wind will not be an issue at the BRC CAMU as such types of wastes will not be accepted. Dust control measures will be implemented to limit the amounts of wind-blown dust. Dust control will be accomplished via moisture management and synthetic covers, as required. Operations will cease during periods of high winds, consistent with Clark County requirements as provided in the Dust Control Plan Application included in the CAP.

3.4 Special Waste Disposal

The projected mix of wastes to be received from the service area is a by-product of industrial process fluids allowed to settle in various evaporation ponds. The resulting residual soil is the solid waste requiring disposal. No other special wastes are anticipated.

3.5 Control of Authorized and Unauthorized Waste

The source materials for the BRC CAMU include the residual solids (i.e., sediments and associated soils) from the industrial ponds, ditches, and related source areas. Municipal wastes will not be accepted from private individuals. Unlike typical landfills, both the source material and the BRC CAMU will be under sole control of BRC. Consequently, there will be control over the types of waste materials accepted at the BRC CAMU.

3.6 Disposal of Liquids

Liquids will not be disposed of at the BRC CAMU.

3.7 Control of Explosive Gas

Due to the nature of material to be placed in the landfill, generation of methane or other explosive gases is not anticipated. Controls for explosive gas are not required.

3.8 Disposal of Vegetation

Vegetation, if any, will be removed from excavation areas and access routes. Soil attached to plant roots will be shaken loose and left on the ground surface in the pond in which the vegetation was present, to be collected with the other soils in that pond. The vegetation will be relocated and temporarily stockpiled within the Debris Storage Area, as discussed in the CAP, where it will be tested to determine whether chemicals within the site soils have bioaccumulated within the vegetative matter at levels that would cause it to be unsuitable for disposal at a municipal landfill. In the event that vegetation meets disposal requirements in municipal landfills, they will be so disposed. In the event that contaminate levels dictate that they should be disposed in hazardous waste landfills, they will so be disposed. Vegetation grubbed during excavation will not be disposed in the BRC CAMU.

3.9 Compliance with State Implementation Plan

BRC will ensure that the BRC CAMU does not violate applicable requirements developed by the state implementation plan, if any, approved or adopted by the Administrator of the USEPA, pursuant to Section 110 of the Federal Clean Air Act, as amended (42 U.S.C. § 7410), and the regulations adopted pursuant thereto. As noted earlier, dust mitigation will be ensured by adherence to the Dust Mitigation Plan Application, Appendix C of the CAP. In addition, there will be no open burning of solid wastes at the BRC CAMU.

3.10 Putrescible Wastes and Vector Control

Due to the nature of material to be placed in the BRC CAMU, putrescible wastes and vector control issues do not apply.

3.11 Nuisance Control

The operation and maintenance of the BRC CAMU will be in a manner which will not create odors, unsightliness or other nuisances. There will be no ponded and stored water at the site; thus this source of obnoxious odors and vector breeding is obviated.

As necessary, water or other dust palliatives such as magnesium chloride will be applied to the landfill and its roads to minimize nuisance dust consistent with the Dust Mitigation Plan.

3.12 Disposition, Compaction, and Coverage

Since the waste to be disposed will be soil and sediment a daily cover will not be required to control disease vectors, fires, odors, blowing litter and scavenging. Instead, if operations cease for prolonged periods of time, which is not expected, an intermediate cover will be applied on an as-needed basis. Moisture will be added periodically as needed to reduce dust and particulates.

Solid wastes will be spread and compacted in layers. Waste will be offloaded from the haul vehicles, and spread by a tracked dozer in lifts with a maximum thickness of two feet. A landfill compactor or other suitable equipment will accomplish a sufficient number of passes over each lift in order to reduce voids and produce a compact mass.

The BRC CAMU will be operated to facilitate efficient placement of the waste material. At any given time, the compacted waste mass will be contoured to allow effective drainage in case of inclement (rainy) operations. Construction Sequence Plan, included in the Supplemental RAP Information, presents general steps of landfilling activities.

Horizontal and vertical control is necessary to ensure that the final grades and cell geometry are constructed as planned. The BRC CAMU will be filled to within two feet of the required final elevation. Elevation control for equipment operators at the landfill is achieved through the use of steel pipe grade poles installed in the fill area and marked with red rings against a yellow background at the fill level (two feet below the

final grade). The ring elevations are surveyed with respect to a BRC CAMU surveyed benchmark, which will be a concrete monument.

3.13 Miscellaneous Requirements for Operation

Scavenging through waste at the working face of the BRC CAMU by citizens or non-employees of the landfill operations will be prohibited and is not expected.

The working face area will be inspected daily and lightweight debris will be returned to the fill area and covered.

Provisions will be established concerning weighing and recording all solid waste delivered to the site. Specifically, a scale will be employed to weigh incoming hauling vehicles. The tare weight of each vehicle will be checked on a daily basis to establish the quantities of waste being placed in the BRC CAMU. In addition, topographic surveys will be performed on a quarterly basis to double-check and further quantify the volume of materials placed within the BRC CAMU.

3.14 Control of Erosion, Mud and Dust

An adequate amount of water from storm water or municipal well sources will be available at all times for the control of dust and the compaction of cover material.

Adequate measures will be taken to minimize the creation of dust and minimize safety hazards due to obscured visibility. Roadways will be sprayed with water and/or magnesium chloride to reduce dust generation. Dust control measures are described in detail in the Dust Mitigation Plan Application which is provided as Appendix C of the CAP.

Primary interior roadways will be surfaced with compacted crushed stone or gravel materials, as necessary. Ramps and unloading areas at designated interior disposal areas will be graded for proper drainage with earth-moving and grading equipment.

During periods of wet weather, such surfacing and maintenance practices will be eliminated, or at least minimized to reduce the tracking of mud off-site. During wet periods, the BRC CAMU Construction Manager or his/her designee will be responsible for a daily inspection of the main incoming road and will be responsible for the timely removal of any accumulated mud on that portion of the roadway within the immediate site vicinity. In addition, temporary shaker plates will be installed to minimize tracking of mud off site. Accumulated mud deposits remaining on interior haul road surfaces will be similarly removed as needed by light grading to control dust emissions resulting from normal traffic.

3.15 Run-on and Runoff Control Systems

BRC will provide a system to control run-on and runoff of surface water as outlined in the Technical Drainage Study for Eastside Landfill (PBS&J, 2006). The goal of the run-on system is to collect and control the flow of surface waters entering the BRC CAMU boundaries.

Runoff from the active portion of the BRC CAMU will be managed so as to not cause a discharge of pollutants, silts, or a nonpoint source of pollution from the BRC CAMU into the waters of the state or waters of the United States, including wetlands. Surface water runoff throughout the active portion of the site will be managed to minimize contact of water with solid waste.

Rainfall within the BRC CAMU will be drained away from the active working face. Such drainage will be maintained by constructing each disposal area bottom, or floor, on a uniform grade, with the working face progressing in a downslope direction.

Water coming into contact with the active working face, and thus retained within the BRC CAMU, will be evaporated or may be used for such on-site activities as waste compaction and dust control within the BRC CAMU lined areas. Water not coming into contact with the active working face and collected in the downslope portions of designated water disposal areas may be utilized for such site-related operations as dust control, waste compaction, windblown dust minimization, construction and compaction of disposal area liners, and maintenance of access roadways.

All interim surface water runoff and post closure runoff from the site and surrounding areas will be managed through a series of permanent perimeter drainage channels (Figure J-8). Natural drainage patterns or discharge quantities associated with the site and surrounding areas will not be significantly altered. Runoff will be periodically sampled and tested for general compliance with Nevada National Pollution Discharge Elimination System (NPDES) permit standards.

3.16 Leachate

During waste placement activities, the leachate will be removed from the sumps using portable submersible pumps and will be used for dust control on waste materials placed within the lined limits of the BRC CAMU. Leachate levels will be inspected weekly and after storm events.

3.17 Decontamination

The Contractor will inspect the equipment to confirm that the equipment arrives on the site in a clean state. If obvious indications of contamination are observed, the Contractor will refuse entrance of the equipment onto the site, or decontaminate the equipment before it is used subject to the approval of the Construction Manager. No personal vehicles, "lunch wagons" or other non-essential vehicles will be permitted within the area of active work where the potential to encounter waste may occur. Vehicular traffic will be kept to a minimum. To the extent practical, equipment will be stored when not in use in the location last used or the nearest safe location. Overnight staging in clean areas is not permitted unless the equipment is first decontaminated to prevent the potential for tracking contamination back and forth across the site.

The Contractor will operate the equipment in a manner that minimizes contact with waste, including minimizing the surface area contacting waste and minimizing the potential for spills, drips, splashes or sprays. Equipment, once decontaminated, will be stored in a designated clean area of the site, or preferably removed from the site as soon as practicable.

As described in the CAP, construction equipment decontamination is summarized as follows:

- Transport trucks will be driven across gravel track out aprons with scraping of mud and/or use of water spray to be performed at dedicated decontamination areas.
- Equipment heavily caked with soil and/or other material will be scraped off with a flat-bladed scraper. The scrapings will be placed in the soil staging area for disposal with the excavated soils.
- Equipment will be decontaminated using steam cleaning equipment prior to departure from the work site.

The dozer blades and tracks, and compactor wheels and drum will require decontamination only when removed from the surface of the waste. The frequency of decontamination will be a field decision based on the type of waste materials being encountered.

4.0 REMEDIATION

This section summarizes the excavation procedures, the methods for transporting soils to the BRC CAMU, and documentation which are discussed in detail in the CAP. The BRC CAMU has been sized to contain approximately 3.5 million cubic yards of material, which is significantly in excess of the volume of material calculated to

be disposed. However, in the event that impacted soils exceeding even this maximum BRC CAMU volume are generated, those excess soils will be dispose of off-site, at a properly-licensed facility.

4.1 Soil Excavation

A BRC contractor will complete the excavations in accordance with the plans and specifications developed for this work, under the direction of the BRC Construction Manager. Soil excavation will be performed as described in the CAP. The contractor will use appropriate construction equipment to excavate, load, and transport the materials to the BRC CAMU.

BRC anticipates that 7,500 cubic yards of soil will be excavated, transported, and interred, on average, each day, with the actual volume dependent on equipment used, daily conditions, and hours of operation.

4.2 Dewatering Procedures for TIMET Ponds

Currently, some of the TIMET Ponds contain material with moisture content higher than ideal, or comparably, higher than the excavated soils after dust suppression. Dewatering of these materials is necessary to decrease the moisture content to levels which will reduce the potential for leachate generation. BRC has conducted pilot testing for options to dewater the TIMET Ponds. Based on these studies, BRC may dewater the material in the ponds if needed using a combination of 1) air drying, and 2) draining of liquid through geotextile bag filters. However, BRC expects that moisture will be managed by mixing pond solids with other dry materials destined for the BRC CAMU.

4.3 Soil Transportation to BRC CAMU

To minimize effects on Boulder Highway traffic, remediation will occur during two distinct phases: during daylight hours, work will be restricted to the Eastside Area proper; during evening hours, the contaminated soils excavated during the day from the Eastside Area will be transported across Boulder Highway via the haulage road and then interred into the BRC CAMU.

Soils excavated from the Eastside area will be transported by truck to the BRC CAMU approximately 1.5 to 2 miles away as discussed in the CAP. While the soils to be transported are not hazardous waste, the haulers will possess a valid hazardous waste hauler license and will be certified to handle hazardous waste.

Trucks hauling waste materials from the Eastside Area will enter the BRC CAMU Area from the eastern site ingress/egress at 4th Street. Trucks will then travel

along site access roads adjacent to the BRC CAMU lined landfill area and enter into the BRC CAMU lined landfill area at dedicated access points or ramps. Upon entering the BRC CAMU lined landfill area, the trucks will travel directly on the operations layer above the liner system or above previously placed waste materials. Each truck will be directed to a "working face" where the contents of the truck will be dumped. Trucks will then travel off of the lined landfill area, across "rumble strips" and track-out aprons summarized in Section 3.17 and described in greater detail in the CAP. Water spray will be performed at dedicated decontamination areas as needed to minimize tracking waste materials off of the landfill. Trucks will exit the BRC CAMU Area at 4th Street.

Spillage of soils from trucks during transportation will be minimized by not overloading the transport vehicles, by grading smooth haul roads, and by employing trucks with enclosed or covered cargo bays. Dust will be controlled by water in accordance with the Dust Control and Mitigation Plan Application in Appendix C of the CAP. Because the access routes will be wetted to suppress dust, some mud will be generated, and it is likely that this mud would be transferred to truck tires and the vehicle body. When needed, prior to crossing Boulder Highway, the transport trucks will be decontaminated by scraping and/or water spray to avoid transfer of dirt to the pavement. In addition, after excavation/transport operation cease for a given day, the affected portion of Boulder Highway will be cleaned to remove soils from the roadway.

In the event of an accident resulting in release of the soils being transported, the truck driver will immediately contact the Construction Manager. The Construction Manager will immediately inspect the site of the accident and notify the local emergency management agencies. The potential for immediate threat to workers and people nearby will be evaluated, and the Construction Manager will instruct the remediation contractor to take appropriate corrective steps to rectify the problem. Any spilled material will be returned to the truck (or another truck, if the original truck is disabled) and transport to the BRC CAMU will be complete. If the spill occurred on a public roadway (i.e., Boulder Highway), the spilled material will be removed, and the road surface will be immediately vacuumed to remove remaining materials.

4.4 Soil Placement

The waste material at the working face will be spread by a bulldozer in a lift no greater than two feet in thickness and compacted using standard earthworks construction equipment. The compacted waste material will be tested using a nuclear moisture/density gauge to determine the estimated in-situ moisture content and density of the waste material. The moisture content will be compared to the optimum moisture content result from previously performed moisture/density laboratory testing. Ideally, the in-situ moisture content will be less than the optimum moisture content, thereby minimizing the potential for liquids to "squeeze out" of the waste material upon

placement of overlying materials that will increase the normal static pressure and thus the "squeezing" of the underlying waste material.

Periodically, undisturbed samples of the in situ waste materials will be collected using thin wall samplers (Shelby Tubes) and will be subjected to laboratory one-dimensional consolidation testing. The specifics of the consolidation testing are described in the CAP. If the results of testing indicate that the moisture content of the waste materials is too high, the material will be spread in a thin lift (e.g., 6-inches thick) to allow for evaporation of excess moisture or mixed with drier waste materials to achieve the desired moisture content.

5.0 REPORTING AND RECORDKEEPING

5.1 General

BRC will prepare daily progress reports documenting all daily activities. Daily activity records include, but are not limited to, documentation that evidences the quantity of waste materials placed in the BRC CAMU, truck weigh tickets, and log in/out forms. In addition to this summary daily report, the contractor will also keep detailed field notes and daily logs. Daily photographic and video record will be kept by BRC documenting all remediation activities. Records and results of daily, weekly, and monthly inspections will be maintained and kept onsite consistent with requirements specified in the AOC3.

Records and results of waste analysis and waste determinations will be maintained and kept on site. In addition, all monitoring, testing or analytical data, and corrective action records resulting from BRC CAMU releases shall be maintained onsite consistent with requirements specified in the AOC3. Groundwater monitoring and clean up records will be maintained until closure of the BRC CAMU.

Summary reports of all incidents that require the use of the Contingency Plan will contain the details outlined in Attachment G, Accident Prevention, Contingency, and Emergency Response Plan. The incident reports will be maintained and kept onsite until closure of the BRC CAMU.

Additional items to be included with the operating records are: closure and post-closure cost estimates, plans for closure and post-closure, EPA identification number, detailed chemical and physical analysis of a representative waste sample, Quality Control (QC) and Quality Assurance (QA) documentation.

5.2 Interim Status Reports

During remediation activities at the Site, BRC will submit monthly status reports to the NDEP as stated in the CAP. The purpose of the monthly status reports will be to keep the NDEP informed of the progress of remedial activities at the Site. The reports will present a summary of the remediation progress during the previous month, including as appropriate:

- Significant milestones in CAMU construction;
- Pond and ditch locations where excavation has been completed (including graphical format);
- Pond and ditch locations where special control measures (except dust control, which is routine measure) were necessary and/or where excavation had to be prematurely terminated due to the presence of ground water or based on any of the other "stopping rules" discussed in Figure J; and
- Estimates of volumes of soil excavated and placed in the CAMU (monthly and cumulative). Other information (e.g., discovery of significant environmental conditions previously unidentified) will be provided in the monthly status reports as warranted. Interim status meetings will also be conducted by telephone to supplement these written reports.

Other information (e.g., discovery of significant environmental conditions previously unidentified) will be provided in the monthly status reports as warranted or otherwise required by the AOC3. Interim status meetings will also be conducted by telephone to supplement these written reports.

6.0 REFERENCES

PBS&J, 2006. "Technical Drainage Study for Eastside Landfill," Henderson, Nevada, October.

Attachment N
CAMU (Landfill) Monitoring Plan

Attachment N
CAMU (Landfill) Monitoring Plan
Basic Remediation Company (BRC)
Corrective Action Management Unit (CAMU)
Henderson, Nevada

Table of Contents

1.0 INTRODUCTION

This BRC CAMU Monitoring Plan describes the procedures and activities that BRC will undertake to detect and subsequently characterize releases of wastes or hazardous constituents to groundwater that may occur from areas of the BRC CAMU during operation and after closure.

2.0 CONSTRUCTION MONITORING

2.1 Surface water

BRC will carefully maintain drainage to expedite storm water collection. A portable pump will be provided at the low end of the BRC CAMU to remove accumulated storm water. The operator will maintain access to this pump and maintain the pump in good working condition with a good supply of fuel and suction hoses in position for water removal at all appropriate times.

During operating hours, the operator will pump water from the working cell as quickly as possible whenever it accumulates. When heavy rainfalls occur during non-operating hours, standing water will be pumped out before normal operations resume.

Surface water exiting the site from the on-site storm water basin will periodically be sampled and tested for general compliance with Nevada surface water standards for the Las Vegas Wash. BRC will obtain necessary NPDES permits from the NDEP prior to discharge of such waters.

2.2 Leachate

The BRC CAMU will be managed to reduce the generation of leachate. However, leachate, if generated, will slowly accumulate in the leachate collection sumps designed as part of the BRC CAMU. The base grade of the BRC CAMU will be engineered so that leachate generated will accumulate at the designated leachate collection points. The operator will monitor the leachate level and remove and dispose of the leachate, as needed, consistent with proper waste disposal practices. During active waste placement, leachate collected from the sumps will be used for dust control and waste material moisture conditioning purposes over the lined areas only.

As stated in the Inspection Plan (Attachment E), leachate sumps will be monitored weekly and after storm events to confirm proper functioning of the leachate collection and removal system. The amount of leachate will be recorded and the average daily flow rate (gallons per acre per day) will be calculated.

In addition, pan lysimeters will be installed beneath the sump areas of the BRC CAMU to monitor for possible leakage from the liner system at the locations of the lowest elevations in the liner system (sumps), which is where leachate, if any, will accumulate.

2.3 Air Monitoring

Dust control measures and air monitoring will be implemented during the project to comply with the air quality regulations administered and enforced by the Clark County Department of Air Quality and Environmental Management. Air monitoring and sampling will be performed continuously during the project to assess the potential exposure of the general public. Air monitoring stations will be established daily at each soil management zone in the Eastside Area and at the BRC CAMU to measure upwind and downwind fugitive dust emissions as discussed in the CAP. Meteorological conditions will be monitored during the work to assist in determining the proper location of the monitoring stations. Air monitoring for respirable particulates will be performed using a direct-read instrument such as a DataRAM dust monitor. Additional details on air monitoring during the project are in Appendix B, Perimeter Air Monitoring Plan (PAMP) of the CAP.

3.0 POST CLOSURE

3.1 General

Formal periodic inspections will be performed using site walks. These site walks will be performed within one week of significant precipitation events (e.g., greater than ½ inch of rain during a 24-hour period) that could potentially impact either the surface water drainage system or the BRC CAMU cover. At a minimum, a site-wide inspection will be performed at least quarterly.

The condition of the facility will be documented with field notes, maps, and photographs, as appropriate. Evidence of potential compromises in the cover will be recorded including eroded patches, patches of dead vegetation, animal burrows, subsidence, and cracks along the cover. Surface water drainage features will be inspected for the presence of debris, physical integrity, and evidence of conditions that are different from design assumptions.

3.2 Final Cover

Final cover performance will be evaluated through a monitoring program of the final cover and periodic groundwater monitoring. The basis for this strategy is the

fact that the final cover will be the critical element to reduce moisture infiltration into the BRC CAMU. Therefore, it is proposed that monitoring efforts be focused on direct observation, measurement, and analysis of the performance of the final cover.

The final cover system shall be periodically monitored in order to evaluate the performance of the final cover. The final cover monitoring plan consists of:

- visual inspection of the final cover system performed on a semi-annual basis and after all major precipitation events; and
- if erosion has occurred, ascertain damage to the geosynthetics, if any, and repair as necessary in accordance with the Technical Specifications and CQA Plan.

The vegetation on the cover system will be visually inspected for signs of systemic or localized stress. Recommendations will be made regarding the need for nutrient enhancements or other measures to maintain the viability of the vegetative cover, such as the use of pesticides and/or fertilizer.

3.3 Leachate

The leachate collection system will be inspected quarterly and its levels recorded. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquid in the sumps must be recorded at least semi-annually. If the liquid level in the sump stays below the pump operating level for two consecutive periods, the amount of liquids in the sumps must be recorded at least annually. If at any time during the CAMU post-closure care period the pump operating level is exceeded at units on semi-annual or annual recording schedules, BRC will return to quarterly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive quarters.

If leachate is measurable above the pump operating level, the liquid will be removed from the sump, sampled, and analyzed in an off-site laboratory for compounds detected in the waste materials (Waste Analysis Plan, Attachment C), and properly disposed off-site. If compounds not already found in the upgradient groundwater at the site are detected, groundwater monitoring will be performed, on an annual basis, to monitor for the specific constituent(s) detected in the leachate.

Because the proposed BRC CAMU is located in an arid environment receiving approximately 4.5 inches of average rainfall annually, with high rates of evaporation and low infiltration rates, it is unlikely that significant amounts of precipitation will be introduced to the BRC CAMU leachate collection and removal system. These factors will limit the generation of leachate. Moreover, the waste material

consists primarily of soil, which will be monitored for moisture content prior to placement into the landfill.

Pan lysimeters will be installed beneath the sumps to monitor leaks within the collection system. Pan lysimeters will be monitored at the same time as the leachate sumps.

3.4 Settlement

A topography survey using 1-foot contour intervals will be performed within 3 months after final closure of the CAMU to document baseline conditions in support of post-closure settlement evaluations. Although settlement is not expected to be a significant issue, this will provide a convenient mechanism to document the surface elevation. Excessive settlement can lead to depressions and ponding causing stress in the infiltration layer. When depressions are identified through the survey, they will immediately be filled with the appropriate cover material.

3.5 Groundwater

The groundwater at the site ranges from 30 to 60 feet bgs, as discussed in the Draft CAMU Area Conceptual Site Model (DBS&A, 2006). At a minimum, the BRC CAMU base liner is approximately 5 feet above the groundwater. Constituent release to the groundwater from the BRC CAMU, post-closure, is considered unlikely for the following reasons:

- The BRC CAMU will not receive liquid waste or waste containing free liquids;
- Waste materials within the BRC CAMU are relatively immobile;
- The BRC CAMU will be designed and operated to reduce liquid, precipitation, and other run-on and run-off; and
- The BRC CAMU will have both a base liner system, with a leachate collection and removal system, and final cover system.

It should be noted that releases, if any, into the upper aquifer are difficult to monitor because of the nature of the existing groundwater beneath the BRC CAMU. Most or all of the same constituents which will be present in the BRC CAMU are currently present in groundwater at the site. Constituents present in upgradient groundwater make differentiating potential releases from the BRC CAMU difficult or impossible. Nonetheless, groundwater monitoring will be conducted annually through completion of post-closure activities. The list of analytes for such groundwater monitoring will be established based on discussions with the NDEP and will include constituents present in leachate (if any) in the leachate collection and removal system.

Groundwater monitoring will be conducted for a period of at least 30 years from the date of substantial completion of the final closure construction. Analytical results will be compared with historical results and with upgradient and downgradient groundwater results to monitor for anomalies indicating a release from the BRC CAMU.

4.0 REPORTING AND RECORDKEEPING

Monitoring results will be maintained by BRC in accordance with the provisions of the AOC3 following closure of the CAMU. Monitoring results will be summarized and submitted to NDEP with the annual post-closure report of inspection and monitoring activities.

5.0 REFERENCES

DBS&A, 2006. Draft Conceptual Site Model of the Common Areas. Henderson, Nevada, October.

Attachment O
CAMU (Landfill) Closure and Post-Closure Plan

Attachment O
CAMU (Landfill) Closure and Post-Closure Plan
Basic Remediation Company (BRC)
Corrective Action Management Unit (CAMU)
Henderson, Nevada

Table of Contents

List of Details

List of Tables

1.0 INTRODUCTION

This section of the permit application addresses the closure of the BRC CAMU, which will occur when disposal operations are complete. This Closure Plan addresses pertinent regulatory requirements, including a description of the final cover. It is anticipated that a final CAMU Closure Plan will be prepared approximately six months prior to closure. By that time, additional details regarding BRC CAMU volume will be available. For purposes of this permit application, the Closure Plan addresses activities that will occur when waste placement activities are complete.

Access to the BRC CAMU will be controlled during the closure phase using procedures employed during the operational phase (see Security Plan, Attachment D). Fugitive dust control measures will be maintained and traffic management procedures continued. Site aesthetics will continue to be an important element during this phase. Community outreach programs will be continued as part of the overall remediation effort (as discussed in the Community Involvement Plan) to address public concerns and issues associated with the BRC CAMU.

1.1 Notice of Intent to Close

At least 60 days before beginning the closure of the BRC CAMU, the NDEP will be notified in writing of the intent to close. BRC CAMU closure activities will begin no later than 30 days after the date on which the final receipt of wastes occurs.

All closure activities will be completed in accordance with this CAMU Closure Plan within 180 days after the beginning of the closure. An extension beyond this 180-day deadline may be requested if it is determined that additional time is needed and all actions are taken necessary to prevent threats to public health and safety and the environment.

A request for an extension to these deadlines will include a description of the measures needed to control access to the unclosed unit prior to closure or receipt of additional wastes. It would also include a description of activities to prevent threats to public health and safety and the environment from the open unit.

1.2 Construction Schedule and Sequence

1.2.1 Final Waste Placement

After receipt of the final waste, either construction of the final cover will begin or an interim cover will be placed. If the unit is going to be left without the final

cover for longer than 30 days, the interim cover layer will be placed and compacted on top of the final waste layer.

1.2.2 Infiltration Layer Construction

Prior to final cover construction, the interim cover layer, if installed, will be removed. The infiltration layer will be placed beginning with the geosynthetic clay liner (GCL). The geomembrane is placed above the GCL with the geocomposite placed last. Details of each layer are discussed in later sections.

1.2.3 Final Cover Construction

The soil materials for the final cover will be placed, compacted, and graded. The permanent storm drain facilities (gutters, ditches, culverts, headwalls, etc.) will be installed as the cover is being completed.

2.0 FINAL COVER COMPONENTS

The final cover is designed to minimize infiltration and erosion. A final cover that reduces infiltration is an essential component in the overall design strategy for the BRC CAMU. This, combined with adequate moisture control of the wastes prior to placement, should ensure that no leachate is formed.

Specific design objectives of the final cover system include:

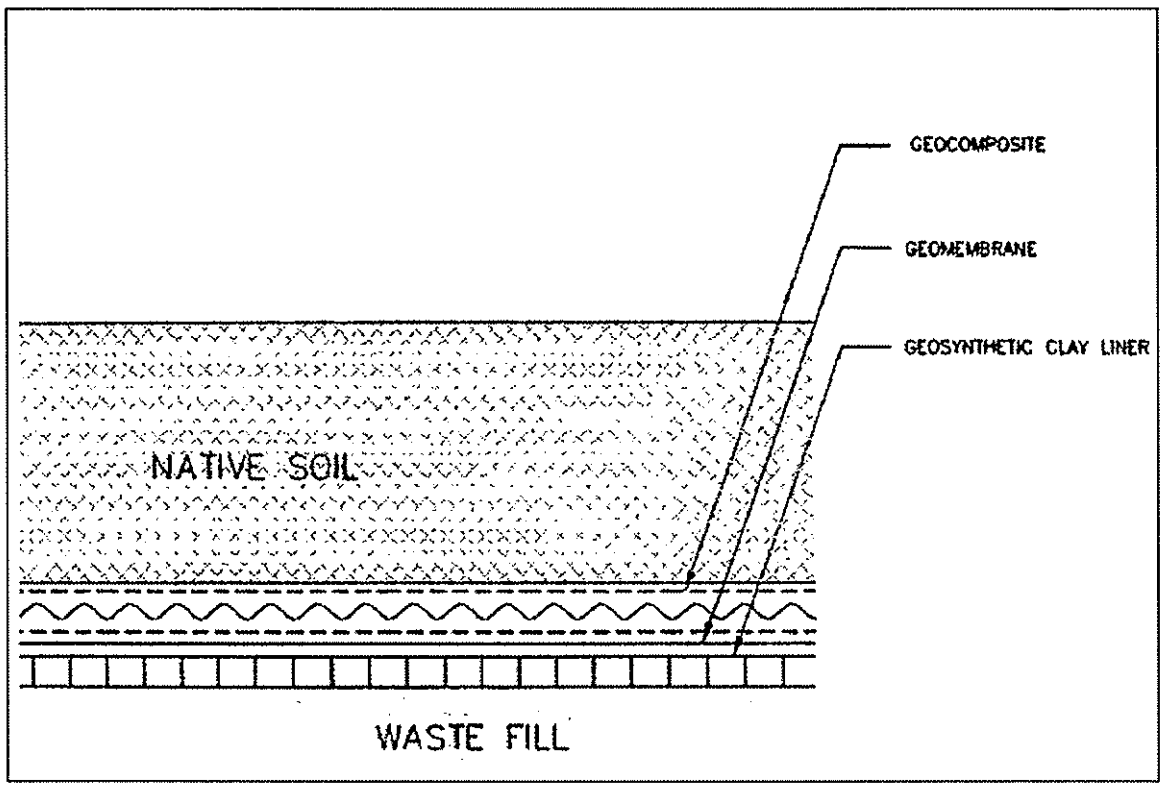
- Minimize infiltration of precipitation into the waste;
- Promote good surface drainage;
- Resist erosion by rain and wind;
- Protect human health and the environment;
- Improve aesthetics;
- Reduce long-term maintenance; and
- Be consistent with land use.

Several of these objectives are directly related to regulatory requirements while the others represent design considerations. BRC CAMU closure technology, design, and maintenance procedures continue to evolve, and it is possible that the cover design for the BRC CAMU may be refined prior to final closure to incorporate the latest design procedures. Modifications or enhancements to this proposed design would be submitted to the NDEP for approval prior to implementation.

Infiltration through the final cover will be minimized through:

- Design of adequate surface drainage and runoff with minimal erosion;
- Transpiration of water by native plants in the root zone, if present; and
- Design of composite barrier system (HDPE geomembrane over GCL) with an overlying drainage layer (geocomposite) to minimize hydrostatic head build-up on the geomembrane.

The final cover will consist of a separate infiltration and erosion layer. Engineering design calculations and construction specifications for the final cover system are presented within Sections 5, 6, and 7 of the Supplemental RAP Information (SRAPI). A cross section of the Final Cover System is shown in Detail O-1 below with an explanation of the components explained in the following sections.



Detail O- 1, Final Cover System

2.1 Infiltration Layer

40 CFR 264.310 specifies that the final cover be designed and constructed to have a permeability less than or equal to the permeability of any bottom liner system. Based on the proposed base liner system, construction of this type of cover will involve the use of a geomembrane and GCL composite liner system to serve as the infiltration layer as shown in Detail O-1 above.

The cover system will be designed to be physically stable to reduce failure, such as sliding between cover layers or within the waste.

Settlement is not expected to be a significant issue given the nature of the waste material and the manner of its placement (i.e. well compacted). Excessive settlement and subsidence at MSW landfills, caused by decomposition and consolidation of the wastes, can impair the integrity of the final cover system. Specifically, it can contribute to ponding of surface water on the cover and fracturing of the low-permeability layers of the cover. However, because the source materials for this BRC CAMU consist primarily of soil materials, the waste placement will be fairly homogeneous with little potential for significant differential settlement. Moreover, the soils will be compacted after placement.

The methods, procedures, and processes used to install the final cover system will be consistent with standard industry practices. Detailed design documents and construction specifications are included in Section 7 of the SRAPI. Included in the CQA plan is a description of quality control testing procedures for the construction materials and associated quality assurance procedures for construction activities. An independent registered professional engineer will be hired to observe closure activities and provide necessary certifications.

2.2 Protection Layer

Protection of the infiltration layer will be accomplished by the use of a 24-inch thick layer consisting of earthen material or an aggregate material (base course). The source for erosion layer soils will be native, clean soil. It is expected to be from the vicinity of the BRC CAMU or from elsewhere in the BMI Common Areas. The earthen material used for the erosion layer will be free of debris, cobbles, rubbish, and roots. If the CAMU materials are used, then they will not be exposed to the atmosphere and will be covered with additional clean materials procured from outside the CAMU area.

The erosion layer will be designed to be geotechnically stable to reduce failure, such as sloughing of the soils overlying the geomembrane/GCL composite infiltration layer (Section 2, Calculation Package I in the SRAPI).

The surface of the erosion layer will have a minimum slope of 2 percent to facilitate run-off while reducing erosion. The side slopes will have a 3H:1V (Horizontal:Vertical) slope. The final grading plan is shown on Figure J-9 in the SRAPI.

2.3 Surface Water Drainage System

A surface water drainage system, designed by PBS&J, will be constructed to convey runoff around and away from waste disposal areas. Surface water will be conveyed around the BRC CAMU to two retention basins located at the northeast and northwest corners of the site. The water will be conveyed by concrete channels and pipes as shown on Figure J-8. The channel and pipe locations correspond to the locations of the access roads for the BRC CAMU. Surface water from the top deck will be conveyed to the conveyance channels via two rip-rap lined channels in the northeast and northwest corners. Drainage channels are designed along existing natural features to enhance surface runoff during high-precipitation events. Based on a 25-year storm event, the design will be sufficient to control erosion and maintain the stability of the slope (PBS&J, 2006).

2.4 Performance Evaluation of the Final Cover

The design of the final cover was evaluated using the Hydrologic Evaluation of Landfill Performance (HELP) model, which was developed by the U.S. Army Corps of Engineers for the USEPA and is widely used for evaluating the hydraulic performance of landfill cover systems (USEPA, 1993). The HELP model calculates daily, average, and worst-case estimates of water movement across, into, through, and out of landfills. The input parameters for the model include soil properties, precipitation and other climatological data, vegetation type, and landfill design information. Useful information provided by the HELP model includes surface run-off, duration, and quantity of water storage within the erosion layer, and net infiltration through the cover system. The information is used for performance evaluation of the geocomposite and drainage pipe sizing, as described in Section 3.4 below.

Site-specific input parameters were used in the HELP model and are documented in Section 5, Calculation Package A in the SRAPI. The results indicated that the net infiltration through the cover system would be 0.000002 in/year.

3.0 SUMMARY OF COVER ANALYSIS

3.1 General

This section summarizes the results of design analyses that were performed for the final cover at the BRC CAMU Landfill site. The following calculations were performed and are located in the respective Calculation Package found in Section 5 unless otherwise noted of the SRAPI:

- Slope Stability Evaluation - Final Waste Slopes (Section 2, Calculation Package B);
- Comparison of Flow between a compacted clay liner (CCL) and geosynthetic clay liner (GCL) (Section 2, Calculation Package I);
- Drainage Geocomposite and Pipe Size Calculations (Calculation Package A);
- Veneer Stability Calculations (Calculation Package B);
- Cover Soil Sloughing Stability Calculations (Calculation Package C);
- Geotextile Filtration Calculations (Calculation Package D);
- Geotextile Puncture Protection Calculations(Calculation Package E);
- Pipe Strength Calculations (Calculation Package F); and
- Seismic Performance Evaluation (Calculation Package G).

The final cover system calculations are based on the conceptual design grading plans shown on Figure J-9 in Section 1 of the SRAPI. Additional calculations and/or design modifications may have to be performed if there are changes to elevation and grade in the aforementioned design grading plans.

3.2 Slope Stability Evaluation - Final Waste Slopes

GeoSyntec analyzed the stability of the final waste slopes for the BRC CAMU as discussed in Attachment J. The slope stability analysis is included in Section 2, Calculation Package B of the SRAPI.

3.3 Comparison of Flow between a CCL and GCL

GeoSyntec demonstrated that the flow rate through the prescriptive composite liner system (i.e. - CCL) is greater than the flow rate through the alternative composite liner system (i.e. - GCL), as discussed in Attachment J. The comparison of flow between a CCL and GCL is presented in the SRAPI, Section 2, Calculation Package I.

3.4 Geocomposite and Pipe Size Calculations

A geocomposite will be placed above the geomembrane to collect and drain surface water that has infiltrated through the cover soil. Drainage pipes will be placed in the final cover to collect water from the geocomposite and drain the water to the perimeter surface water collection channels. Analyses were performed to model infiltration using U.S. Environmental Protection Agency's (USEPA) Hydrologic Evaluation of Landfill Performance (HELP) model. For the calculations presented in this section, it is assumed that irrigation of the final cover will occur in the future. Irrigation rates were estimated based on conversations with Mesquite Country Club and Canyon South Golf Course in Palm Springs, California. GeoSyntec assumed that these operating

golf courses would represent future irrigation rates in the similar climate of Henderson, Nevada. Based on these conversations, the irrigation rates used for the HELP analyses were assumed to be approximately 0.11-in. per day in the winter, fall, and spring, and 0.24-in. per day in the summer. In addition, GeoSyntec assumed a 3-in rainfall event occurred at the end of the simulation year.

Based on these irrigation rates, the head on the cover liner was evaluated to be less than 12-in. at the top deck area, and negligible (i.e., less than 1/10-inch) on the side slopes. Furthermore, the calculations suggest that a 6-in diameter perforated corrugated polyethylene (CPE) pipe bedded in drainage aggregate will accommodate the maximum flow predicted by HELP model analyses. The 6-in. diameter perforated CPE pipe shall have a smooth interior wall to maximize pipe efficiency. Geocomposite and drainage pipe size calculations are presented in the SRAPI, Section 5, Calculation Package A.

3.5 Veneer Stability

The design criteria for the side slope liner system is to develop zero tension in the geosynthetics during installation of the final cover on the side slopes. Potential causes of tension in the liner system include construction equipment loading and overburden stresses (e.g., final cover materials). Based on the proposed grades and expected construction conditions, the calculations suggest that the side slope liner system will not be placed into tension provided a minimum interface friction angle of 20 degrees is maintained. Veneer stability calculations are presented in the SRAPI, Section 5, Calculation Package B.

3.6 Cover Liner Sloughing Stability

Based on the geocomposite and pipe size calculation results, no head buildup is expected above the side slope final cover system geosynthetic components. Calculations suggest that the minimum cover soil shear strength (interface with geocomposite or internal) of 27 degrees will meet the design factor of safety criteria of 1.5. the yield acceleration was found to be 0.15g ($g = 32.2$ ft/s^2). Cover liner sloughing calculations are presented in the SRAPI, Section 5, Calculation Package C.

3.7 Geotextile Filtration Requirements

A separation/filtration geotextile will be used in the following applications: (i) a component of the geocomposite for the final cover system, and (ii) separation/filtration between the cover soil and drainage aggregate. The purpose of the separation/filtration geotextile is to limit migration of fine material from the cover soil into the geocomposite and drainage aggregate, thereby reducing the transmissivity and hydraulic conductivity of the respective materials. The calculations suggest that the

separation/filtration geotextile have an apparent opening size (AOS) less than sieve No. 70, a permittivity greater than 0.5 sec^{-1}, and sufficient mechanical strength properties. Geotextile separation/filtration calculations are presented in the SRAPI, Section 5, Calculation Package D.

3.8 Geotextile Puncture Protection

The geocomposite and geosynthetic clay liner (GCL) will protect the geomembrane from puncture by particles from the prepared subgrade and cover soil. The geotextile components of the drainage geocomposite will protect the geomembrane from puncture by oversized particles in the cover soil. The geotextile components of the GCL will protect the geomembrane from puncture by particles from the prepared subgrade. For the design loading condition, GeoSyntec conservatively assumed an H-20 haul truck tire loading which exhibits a very high force related to hauling equipment. The analysis suggests that the following maximum particle sizes and geotextile mass per unit areas will be required:

Soil Component of Liner	Maximum Particle Size	Minimum Mass per Unit Area
Prepared Subgrade	1.5-in.	9 oz./yd^2 (GCL)
Cover Soil	1-in.	6 oz./yd^2 (single-sided geocomposite)

Table O-1, Geotextile Puncture Protection

Geotextile puncture protection calculations are presented in the SRAPI, Section 5, Calculation Package E.

3.9 Pipe Strength Calculations

Based on drainage pipe size analyses, a 6-in. diameter perforated CPE pipe will be used to collect and transport surface water that has infiltrated through the final cover soil into the geocomposite on the top deck area of the landfill. Based on the calculations performed for the 6-in. diameter perforated CPE pipe, the pipe has adequate strength to withstand equipment (i.e., H-20 haul truck) and soil overburden loads. Pipe strength calculations are presented in the SRAPI, Section 5, Calculation Package F.

3.10 Seismic Performance Evaluation

3.10.1 General

GeoSyntec performed an evaluation of the seismic performance of the BRC CAMU. The evaluation included a seismic hazard evaluation, site response analyses, development of site-specific deformation charts, and seismic deformation analyses for the final cover and base liner of the proposed BRC CAMU.

3.10.2 Seismic Hazard Evaluation

GeoSyntec evaluated the seismic hazard at the site using the most recent United States Geological Survey (USGS) probabilistic seismic hazard maps (Frankel et al., 1996). For compliance with the State of Nevada regulations, GeoSyntec considered motions with 2 percent probability of being exceeded in 50 years for use in design. The USGS data was used to establish the design free-field peak horizontal ground acceleration (PHGA) and set limits on the target acceleration response spectrum for design ground motions. The 2 percent probability of exceedence in 50 years USGS map values indicate that the free-field bedrock PHGA at the site equals 0.34 g from USGS. Based on the deaggregated hazard for Las Vegas, this PHGA was assigned a representative moment magnitude (M_w) of 6.5. The seismic hazard evaluation is presented in the SRAPI, Section 5, Calculation Package G.

3.10.3 Evaluation of Design Ground Motions

A suite of acceleration time histories considered representative of the 2 percent in 50 year ground motions evaluated in the seismic hazard analysis was selected for use in the seismic response analyses. GeoSyntec selected a suite of three time histories that enveloped the target response spectrum using the following methodology: (i) screen the database of acceleration time histories on the basis of earthquake magnitude to select a reduced set of accelerograms; and (ii) plot the acceleration response spectra of the candidate accelerograms against the target acceleration response spectrum and select the representative accelerograms for use in design analyses. Using the above methodology, GeoSyntec selected three candidate accelerograms to represent design ground motions at the BRC CAMU site: (i) the Parkfield earthquake, M_w 6.3, (ii) the Superstition Mountain earthquake, M_w 6.5, and (iii) the Big Bear Lake earthquake, M_w 6.7. Evaluation of the design seismic ground motions are presented in the SRAPI, Section 5, Calculation Package G-1.

3.10.4 Site Response Analyses

One-dimensional site response analyses were performed for the BRC CAMU using the computer program SHAKE91 (Idriss et al., 1992). Analyses were performed for two conditions; (i) 30-ft of contaminated soil placed on the ground surface (i.e., the North Mesa), and (ii) 60-ft of contaminated soil placed 30-ft below grade (i.e., the South Mesa). Shear wave velocity and layer thickness data for the native soil was derived from spectral-analysis of surface waves (SASW) testing performed at the site by Dr. Barbara Luke at the University of Nevada at Las Vegas. Since the depth to bedrock is not known, the thickness to bedrock was varied to evaluate the effect of depth to bedrock on the results of the analysis. The calculated accelerations are all less than 0.50 g and generally

decrease with increasing depth to bedrock. Site response analyses results are presented in the SRAPI, Section 5, Calculation Package G-2.

3.10.5 Site-Specific Seismic Deformation Charts

The site-specific deformation charts were developed using the computer program YSLIP_PM (Yan et al., 1996). YSLIP_PM is based upon the Newmark (Newmark, 1965) method for seismic deformation analysis. YSLIP_PM uses the yield acceleration of the slope (e.g., liner system or final cover system) and the output of the seismic site response analysis to compute seismic deformations. The results indicate that the largest seismic displacement response is calculated by applying the Parkfield earthquake record. The site-specific seismic deformation charts are presented in the SRAPI, Section 5, Calculation Package G-3.

3.10.6 Deformation Analyses

GeoSyntec evaluated the expected seismically-induced permanent deformations at the BRC CAMU. The calculations suggest that the calculated seismically-induced permanent deformations are less than 3-in. for the final cover and less than 6-in. for the base liner. These deformations are less than current generally accepted limits for the final cover and for the base liner. Therefore, the seismic performance of the waste containment system proposed for the BRC CAMU is considered to meet current design standards. The site-specific seismic deformation calculations are presented in the SRAPI, Section 5, Calculation Package G-4.

4.0 COVER CONSTRUCTION REQUIREMENTS

4.1 General

This section describes the construction requirements for installation of the final cover system at the BRC CAMU. These construction requirements are necessary in order to ensure that the construction of the final cover system is consistent with the design performance goals and assumptions.

Technical Specifications and a Construction Quality Assurance (CQA) plan have been prepared for the construction of the final cover system that incorporates the construction requirements presented in this section. GeoSyntec's proposed CQA Plan and Technical Specifications related to the final cover system are presented in the SRAPI, Section 6 and 7, respectively.

4.2 Slope Stability Evaluation

Final cover and interim waste soil slopes shall be constructed no steeper than a slope inclination of 3:1 (horizontal:vertical).

4.3 Geocomposite Requirements

A geocomposite will be used to collect infiltration of surface water through the cover soil. The geocomposite shall have the following properties:

- transmissivity no less than 1×10^{-3} under a confining pressure of 2,000 psf and a hydraulic gradient of 0.10.
- an 6 oz/yd^2 nonwoven geotextile bonded to each side of the geonet for the side slopes (i.e., double-sided) and one 6 oz/yd^2 nonwoven geotextile bonded to the top side of the geonet for the top deck (i.e., single-sided); and
- the 6 oz/yd^2 nonwoven geotextile shall have sufficient permittivity and mechanical properties as summarized in Section 3.7.

4.4 Drainage Pipe Requirements

The drainage pipes used to collect water from the geocomposite shall be 6-in. diameter perforated CPE pipe with a smooth interior wall. The drainage pipes shall be backfilled with aggregate. The aggregate shall have a maximum particle size of 1-inch and a minimum hydraulic conductivity of 1×10^{-2} cm/sec.

4.5 Final Cover Soil

The cover soil shall be placed from the bottom-up, using equipment exerting a ground pressure no greater than 10 psi. Cover soil shall be compacted to minimum of 90 percent of the maximum dry density determined by ASTM D 1557 and have a maximum particle size of 1-in. diameter. Surface water control and drainage shall be promoted.

4.6 Equipment Loadings

Equipment loads shall be limited to a maximum loading of 10 psi overlying a minimum of 1 ft of cover soil. In addition, roads for haul trucks shall be a minimum of 2 ft in thickness overlying the final cover system geosynthetic components.

4.7 Geotextile Requirements

A geocomposite consisting of either one or two geotextile components of the final cover liner system is proposed. The geotextiles will serve a dual purpose - separation/filtration and cushion protection. The geotextile shall have the following properties:

Matrix	Nonwoven
Mass per Unit Area	6 oz/yd^2
Apparent Opening	≤ Sieve No. 70
Permittivity	≥ 0.5 sec-1
Grab Strength	≥ 130 lb
Puncture Strength	≥ 40 lb
Mullen Burst	≥ 210 psi
Trapezoidal Tear	≥ 40 lb
Ultraviolet strength retention	≥ 70%

4.8 Geosynthetic Clay Liner (GCL)

The GCL component of the final cover system shall have the following properties:

- Index flux not greater than 1 x 10^{-8} m^3/m^2-sec;
- Minimum interface/internal shear strength of 20 degrees;
- The GCL shall be dry during installation; and
- combined geotextile mass per unit area of 9 oz./yd^2.

4.9 Geomembrane Requirements

The geomembrane shall be HDPE and have a nominal thickness of 60-mil. The geomembrane shall be double-sided textured on the side slopes and may be smooth on the top deck.

4.10 Prepared Subgrade Requirements

The prepared subgrade shall have a maximum exposed particle diameter less than 1.5-inch.

4.11 Final Cover Surface Treatment

The final cover will require surface treatment to reduce surface erosion due to rainfall or wind forces. There are a wide variety of possible surface treatments to reduce

erosion. For example, cobbles or rip rap can be placed on the outer slope surfaces, aggregate base or crusher-run rock can be applied to flatter surfaces such as the top deck or roadways, and some areas can be treated chemically to bind the soil together. Side slopes typically require a different treatment than the top deck or roadways. The final selection of materials and treatment will be performed prior to commencing closure activities and will be consistent with the NDEP's guidelines for erosion mitigation.

5.0 CAMU POST-CLOSURE PLAN

This section of the permit application addresses post-closure activities for the BRC CAMU, which commence after final closure is completed and extends for a period of 30 years therefrom. This preliminary Post-Closure Plan provides a description of procedures that will be used to maintain the integrity of the final cover system. It is anticipated that the Post-Closure Plan will be updated prior to completing closure activities.

5.1 Requirements After Closure

After closure of the BRC CAMU, a notation on the landfill property deed, or any other instrument that is normally examined during a title search, will be recorded in Clark County. The notation on the deed, or other instrument, will in perpetuity notify any potential purchaser of the property that the land has been used as a landfill and that its use is restricted to uses that would not negatively affect the integrity of the landfill.

Permission may be requested in the future from Clark County to remove the notation from the deed, or other instrument, if all wastes are removed from the site. Any request would document that all wastes have been removed from the facility. Such documentation might include photographs, soil testing in the area where the wastes were deposited, and reports of waste removal activity.

5.2 Program for Postclosure

After closure of the BRC CAMU, a program for post-closure will be conducted as stipulated by the AOC3. This post-closure program will ensure that the integrity and effectiveness of the final cover will be maintained, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion or other events.

Following closure of the CAMU, certification will be submitted to the NDEP verifying closure. This will be signed by an independent Nevada registered professional engineer and will verify that the program was completed in accordance with the CAMU Closure Plan. The certification will be placed in the operating record. The certification

will be based on knowledge of the Closure Plan, observations made during closure, and documentation of closure activities.

Post-closure use of the property will be managed to not disturb the integrity of the final cover, liner or other components of the BRC CAMU (e.g., surface water drainage network, infiltration monitoring system, etc.).

5.3 Land Use

The post-closure use of the BRC CAMU site is to maintain it as open space containing a variety of native vegetation. Access to the site will continue to be restricted. This type of land use will reduce the likelihood that the final cover is inadvertently compromised due to incompatible development. It is anticipated that this land use will be maintained beyond the 30-year required post-closure monitoring duration. However, no land use will be allowed that would compromise the integrity of the final cover system, the liner system, or other components of the containment or monitoring systems.

A precise, metes-and-bounds survey of the closed BRC CAMU will be conducted and the resulting map recorded with the clerk of Clark County. The recordation will include a notation that the property is a Corrective Action Management Unit and contains remediation waste.

5.4 Personnel

Post-closure care personnel will have received adequate training in their specific job duties. This includes applicable OSHA health-and-safety training as well as pertinent training in BRC CAMU maintenance procedures. This staff will consist of a facility manager and various staff workers as needed. The name, address, and telephone number of the facility manager will be provided to the NDEP during the closure process.

Specific duties of these staff will include:

- Limiting access to the site and providing security;
- Performance of routine operations and maintenance activities;
- Responding to public or community inquiries;
- Ensuring regulatory compliance and maintaining appropriate documentation;
- Managing and coordinating post-closure monitoring (i.e., the leachate collection system); and
- Maintenance of the vegetative cover, if necessary.

5.5 Security

The perimeter fencing will remain after closure of the BRC CAMU. Security personnel will not be required 24-hrs because the waste will not be exposed nor will access by the public or domestic livestock pose a health hazard. The perimeter fence will be maintained to deter trespassing. The periodic site inspection walks to assess the cover system will include an evaluation of the perimeter fence.

5.6 Operation and Maintenance

Routine maintenance will be required to maintain the effectiveness of the various BRC CAMU sub-systems. This will include periodic maintenance, and repairs of the final cover, the surface water drainage system, the leachate collection system, and the vegetative cover.

Routine operations and maintenance activities will include frequent inspections of the BRC CAMU. Particular attention will be given to any conditions that could compromise the integrity of the final cover or the associated surface water drainage system or the soil moisture monitoring system. Normal erosion processes are expected to result in the need to periodically replace some cover material and to fill depressions caused by settlement. Extensive maintenance of the vegetative layer is not anticipated since it is being designed to be tolerant of the low rainfall and large temperature extremes in Las Vegas. Occasional fertilizing, if vegetated, may be needed, especially during the first few years after closure.

5.7 Post-Closure Inspections and Monitoring

Post-closure monitoring will be performed as outlined in Attachment N, Landfill (CAMU) Monitoring Plan. In summary, the final cover, leachate, settlement, and groundwater monitoring will be performed for a period of 30 years after closure of the BRC CAMU. Formal periodic inspections will be performed using site walks. These site walks will be performed within one week of significant precipitation events (e.g., greater than ½ inch of rain during a 24-hour period) that could potentially impact either the surface water drainage system or the BRC CAMU cover. At a minimum, a site-wide inspection will be performed at least bi-annually.

At least annually, an internal audit will be performed to verify that all activities at the site have been performed in accordance with the provisions of this Post-Closure Plan. Inspection records will kept and maintained in a log book in order to clearly document any changes in physical conditions. Copies of the inspection report will be provided to the NDEP annually. Post-closure inspections will occur for at least 30 years after BRC CAMU closure.

5.8 Reports and Recordkeeping

The condition of the facility will be documented with field notes, maps, and photographs, as appropriate. Evidence of potential compromises in the cover will be recorded including eroded patches, patches of dead vegetation, extensive or significant animal burrows, subsidence, and cracks along the cover. Surface water drainage features will be inspected for the presence of debris, physical integrity, and evidence of conditions that exceeded design assumptions.

A copy of the plans for closure and post-closure will be maintained in the operating records of the site.

6.0 REFERENCES

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Attachment P
CAMU (Landfill) Final Cover Design – [Reserved]

Attachment Q
Closure and Post-Closure Cost Estimates

Attachment Q
Closure and Post-Closure Cost Estimates
Basic Remediation Company (BRC)
Corrective Action Management Unit (CAMU)
Henderson, Nevada

Table of Contents

List of Tables

1.0 INTRODUCTION

The estimated and projected cost to close and post close the BRC CAMU is explained in this Attachment. A breakdown of the costs is included in Tables Q-1 and Q-2 of this report. These cost estimates summarized herein are for budgeting and planning purposes only.

The estimate is based on the RS Means Heavy Construction Cost Data for 2006 and professional judgment and experience. The cost is then adjusted for indexes such as city costs and consulting costs. The cost estimates are based on the costs to the owner or operator for hiring a third party to close the facility.

The current closure and post closure cost estimates will remain on site during the operating life of the BRC CAMU.

2.0 CLOSURE COSTS

Components of the final cover system used for this estimate include liner, drainage, and soil cover materials, as shown in Table Q-1. The total cost of CAMU closure is currently estimated at $8,408,000.

3.0 POST-CLOSURE COSTS

The post-closure cost estimate is based on the 30-year cost of annual inspection, monitoring, and maintenance at the BRC CAMU. Inspections, monitoring, and maintenance activities are covered in detail in Attachment O, Closure and Post-Closure Plan. The components of post-closure cost estimate are broken down in Table Q-2. The Net Present Value (NPV) of the 30-year total cost of post-closure is $1,990,000, which is based on a 4% discount rate.

Table Q-1
Closure Cost Estimate
Basic Remediation Company
Corrective Action Management Unit
Henderson, Nevada

Capital Cost Item	Quantity	Units	Unit Cost	Total Cost	Notes
Topographical Site Survey	52	Acre	$ 133.00	$ 6,916	2006 Means Heavy Const. - 01100-700-1800
Layout Survey	15	day	$ 1,525.00	$ 22,875	2006 Means Heavy Const. - 01100-700-1200
Foundation Layer (existing cover)					
Mobilize grader, 2 dozers, 2 scrapers, 2 water trucks, and compactor	16	EA	$ 370.00	$ 5,920	2006 Means Heavy Const. - 02305-250-0400
Grade surface	277,780	SY	$ 0.64	$ 177,779	2006 Means Heavy Const. - 02310-100-0100
Cover Liner System					
Mobilization	1	EA	$ 6,000.00	$ 6,000	COMANCO Environmental Corporation
GCL	2,400,000	SF	$ 0.61	$ 1,471,200	COMANCO Environmental Corporation
Geomembrane	2,400,000	SF	$ 0.56	$ 1,334,400	COMANCO Environmental Corporation
Drainage Geocomposite	2,400,000	SF	$ 0.58	$ 1,396,800	COMANCO Environmental Corporation
Anchor Trench	10,500	LF	$ 10.00	$ 105,000	
6" diameter CPE Pipe	5,600	LF	$ 2.96	$ 16,576	2006 Means Heavy Const. - 02620-660-0060
Geotextile	39,200	SF	$ 0.30	$ 11,760	
Drainage Aggregate	700	CY	$ 65.00	$ 45,500	2006 Means Heavy Const. - 02620-300-0300
Cover Soil - 24" thick					
Purchase soil	177,780	CY	$ 3.00	$ 533,340	On-Site Source, Screening by Others
Load and haul, 20 CY bottom dump	177,780	CY	$ 5.00	$ 888,900	
Place soil	177,780	CY	$ 1.62	$ 288,004	2006 Means Heavy Const. - 02315-520-0020
Moisture condition soil	177,780	CY	$ 0.57	$ 101,335	2006 Means Heavy Const. - 02315-310-9030
Compact soil	177,780	CY	$ 0.21	$ 37,334	2006 Means Heavy Const. - 02315-310-5060
Surface Treatment (minimize erosion)					
Soil binder	11,000	gal	$ 8.00	$ 88,000	Soil Tac
Application	29,630	CY	$ 0.57	$ 16,889	Aply to top 4" of soil
Site Perimeter Fencing					
6' high chainlink fence w/ barbed wire	480	LF	$ 23.00	$ 11,040	2006 Means Heavy Const. - 02820-130-0300
6' high gate, 20' opening	2	EA	$ 1,550.00	$ 3,100	2002 Means Heavy Const. - 02820-130-5070
			Subtotal	$ 6,568,667	
Engineering Design			2%	$ 131,373	
Construction Management/Construction Quality Assurance			6%	$ 394,120	
Contingency			20%	$ 1,313,733	

Total Estimated Capital Cost: $ 8,407,894

Table Q-2
Post-Closure Cost Estimate
Basic Remediation Company
Corrective Action Management Unit
Henderson, Nevada

O&M Cost Item	Quantity	Units	Unit Cost	Total Cost	Notes
Topographical Site Survey	1	EA	$ 6,916.00	$ 23,918	every 5 years, 4% discount rate
Leachate Collection System Maintenance					
LeachateMonitoring Event	48	EA	$ 750.00	$ 622,513	quarterly for 30 years, 4% discount rate
Leachate Pump Maintenance	1	EA	$ 500.00	$ 4,323	bi-annually for 30 years, 4% discount rate
Groundwater Monitoring					
Reporting	1	EA	$ 3,500.00	$ 60,522	annually for 30 years, 4% discount rate
Project Management	1	EA	$ 2,630.00	$ 45,478	annually for 30 years, 4% discount rate
Semi-annual groundwater monitoring event, includes pan lysimeter	1	EA	$ 20,000.00	$ 345,841	annually for 30 years, 4% discount rate
Surface Water Control					
Surface treatment re-application	1	EA	$ 34,620.00	$ 197,555	every 3 years, 4% discount rate
Inspect V-ditches	2	EA	$ 500.00	$ 17,292	Prior to significant storm events for 30 years (average 2/yr), 4% discount rate
Clean out V-ditches	1	EA	$ 5,000.00	$ 43,230	bi-annually for 30 years, 4% discount rate
Cover Maintenance, including:	1	LS	$ 20,000.00	$ 172,920	bi-annually for 30 years, 4% discount rate
Gridwalk deck					
Surface faults/ponding					
Rodent damage					
Site Security					
Fence Inspection	12	EA	$ 250.00	$ 51,876	monthly for 30 years, 4% discount rate
Fence Repairs	1	LS	$ 2,000.00	$ 17,292	bi-annually for 30 years, 4% discount rate
Annual Report					
Reporting	1	EA	$ 6,000.00	$ 103,752	annually for 30 years, 4% discount rate
Project Management	1	EA	$ 2,630.00	$ 45,478	annually for 30 years, 4% discount rate
Bi-Annual Report					
Reporting	1	EA	$ 5,000.00	$ 43,230	bi-annually for 30 years, 4% discount rate
Project Management	1	EA	$ 2,500.00	$ 21,615	bi-annually for 30 years, 4% discount rate
Agency Interaction	1	LS	$ 10,000.00	$ 172,920	annually for 30 years, 4% discount rate
TOTAL ESTIMATED O&M COST				**$ 1,989,756**	

Attachment R
Financial Assurance

Attachment R
Financial Assurance
Basic Remediation Company (BRC)
Corrective Action Management Unit (CAMU)
Henderson, Nevada

The mechanism for financial assurance for the entire cleanup project, which includes post-closure costs associated with the CAMU itself, is discussed in the AOC3. Thus, no additional financial assurance guarantees are provided here.

Attachment S
Sudden and Non-sudden Insurance Documentation

Attachment S
Sudden and Non-sudden Insurance Documentation
Basic Remediation Company (BRC)
Corrective Action Management Unit (CAMU)
Henderson, Nevada

Provisions for insurance including sudden and non-sudden insurance coverage for the entire cleanup project are discussed in the AOC3. Thus, no additional details for such coverage are provided here.