APPLICATION FOR A PERMIT TO CONSTRUCT AND OPERATE A CLASS I LANDFILL FACILITY

JUNGO DISPOSAL SITE

Humboldt County, Nevada

VOLUME III

PLAN OF OPERATIONS

REVISION 4

Prepared For

Jungo Land & Investments, Inc.

Prepared by:

Golder Associates Inc.

1000 Enterprise Way, Suite 190

Roseville, CA 95678

(916) 786-2424

April 2011

063-7079-200

APPLICATION FOR A PERMIT TO CONSTRUCT AND OPERATE A CLASS I LANDFILL FACILITY

JUNGO DISPOSAL SITE

Humboldt County, Nevada

VOLUME III

PLAN OF OPERATIONS

REVISION 4

Prepared For

Jungo Land & Investments, Inc.

Prepared by:

Golder Associates Inc.

1000 Enterprise Way, Suite 190

Roseville, CA 95678

(916) 786-2424

July 2011

063-7079-200

TABLE OF CONTENTS

Page **Section**

1.0 INTRODUCTION 1
1.1 Site Description 1
1.2 Site Facilities 2
2.0 LOCATION RESTRICTIONS 3
2.1 General Restrictions 3
2.1.1 Accessibility 3
2.1.2 Prevention of Degradation of Waters of the State 3
2.1.3 Prevention of Uncontrolled Landfill Gas Migration 3
2.1.4 Availability of Cover Material 3
2.1.5 Conformance with Land Use Planning 4
2.1.6 Proximity to Dwellings, Highways, Surface Water and Groundwater 4
2.1.7 Regulatory Approval 4
2.2 Airport Safety (NAC 444.6783) 4
2.3 Floodplains (NAC 444.6785) 4
2.4 Wetlands (NAC 444.679) 5
2.5 Fault Areas (NAC 444.6791) 5
2.6 Seismic Impact Zones (NAC 444.6793) 5
2.7 Unstable Areas (NAC 444.6795) 5
2.8 Proof of Compliance (NAC 444.678) 6
3.0 WASTE MANAGEMENT EQUIPMENT AND PERSONNEL (NAC 444.684(1)) 7
4.0 LITTER CONTROL PROGRAM (NAC 444.684(2B)) 9
5.0 WASTE HANDLING PROCEDURES (NAC 444.684(2C)) 10
5.1 Open burning of waste (NAC 444.640, NAC 444.6675) 11
5.2 Construction and Demolition Debris (NAC 444.652) 11
5.3 Medical Waste (NAC 444.646) 12
5.4 Asbestos (NAC 444.971, NAC 444.974, NAC 444.975, NAC 444.976) 12
5.5 Tires (NAC 444.648) 12
5.6 Liquid Waste Exclusion Program (NAC 444.692) 12
5.7 Sewage Sludge and Septic Tank Pumpings, Commercial Grease Traps and Sand-Oil Separators (NAC 444.646, NAC 444.650, and NAC 444.654) 12
5.8 Hazardous/PCB Waste Exclusion Program (NAC 444.6665) 13
5.8.1 Pre-screening of Incoming Loads 13
5.8.2 Random Inspection of Incoming Loads 13
5.8.3 Records Maintenance 14
5.8.4 Training of Landfill Personnel 14
5.8.5 Handling Procedures for Hazardous or PCB Wastes 14
5.8.6 Notification 15
5.8.7 Waste Acceptance Program 15
6.0 CONTROL OF EXPLOSIVE GAS (NAC 444.667) 16
7.0 VECTOR CONTROLS (NAC 444.6678, NAC 444.694) 17
8.0 OPERATION & MAINTENANCE (NAC 444.686) 18
9.0 COVER OF COMPACTED WASTE (NAC 444.688) 19
10.0 RUN-ON AND RUN-OFF CONTROL SYSTEM (NAC 444.6885); PROTECTION OF SURFACE WATERS FROM POLLUTANTS AND CONTAMINANTS (NAC 444.6887) 20
11.0 OPERATING RECORDS (NAC 444.7025) 21
12.0 INTEGRATED SITEWIDE CONTINGENCY PLAN (NAC 444.684(4A-F)) 22

12.1 Site Personnel Staffing and Training....22
12.2 Fire Response....22
12.3 Personnel Safety....23
12.4 Landfill Shutdown....23
12.5 Equipment Breakdown....24
12.6 Hazardous Materials Release....24
12.7 Leachate Release....24
13.0 MISCELLANEOUS REQUIREMENTS FOR OPERATION....25
13.1 Signs....25
13.2 Erosion and Dust Control....25
13.3 Access Control....25
13.4 Personnel Facilities....25
13.5 Miscellaneous Requirements....25
14.0 CLOSURE AND POSTCLOSURE AND FINANCIAL ASSURANCE (NAC 444.6891 THROUGH NAC 444.6897 AND NAC 444.685 THROUGH NAC 444.6859)....27
15.0 MONITORING PLAN (NAC 444.683)....28

TABLES

Table 1 Job Description Summary
Table 2 Minimum Requirements for a Integrated Sitewide Contingency Plan

FIGURES

Figure 1 Site Vicinity Map
Figure 2 Site Property Map With Township and Range
Figure 3 Site Facilities Plan
Figure 4 Designated Regional Groundwater Basins and Nearby Rivers
Figure 5 Landfill Base Grading Plan
Figure 6 Landfill Final Cover Grading Plan

APPENDICES

Appendix A Preliminary Title Report
Appendix B Site Survey Map
Appendix C Closure and Postclosure Monitoring and Maintenance Plans
Appendix D Monitoring Plan
Appendix E Weed Management Plan

1.0 INTRODUCTION

Jungo Land & Investments, Inc. (JLII), the landfill owner and operator, is submitting the following Plan of Operations for a Class I municipal solid waste disposal site as required by the general provisions for solid waste disposal defined in the Nevada Administrative Code (NAC 444.684). This Plan of Operations was initially prepared by Golder Associates Inc. (Golder) and SCS Engineers, and submitted to the Nevada Division of Environmental Protection (NDEP), Solid Waste Bureau, State Solid Waste Authority for Humboldt County. Subsequent revisions to this document have been completed by Golder. This plan conforms to the regulations that govern solid waste disposal in the State of Nevada, and is submitted as part of the *Application for a Permit to Construct and Operate a Class I Solid Waste Disposal Site at the Jungo Disposal Site, Humboldt County, Nevada.*

As required by NAC 444.684, this Plan of Operations presents the general procedures for operation and maintenance, fire control, litter prevention, and handling of various types of waste, which are either prohibited or accepted for disposal at the site when specifically addressed within this Plan of Operations. In addition, this plan addresses the compliance of the facility with the requirements set forth in NAC 444.6665 through 444.6678, and NAC 444.686 through 444.6887, including procedures for the following activities: compacting and covering solid waste; preventing the receipt and disposal of liquid, hazardous, and PCB wastes; controlling run-on and run-off drainage; providing nuisance control; monitoring explosive gas; and, providing for site access control. A discussion of the conformance of the site with respect to location restrictions defined in NAC 444.678 through 444.6795 is also provided.

The Jungo Disposal Site will serve as a regional disposal site for portions of Northern California that generally includes the nine counties which make up the San Francisco Bay Area, and including tributary communities along the rail route. Refuse will be delivered to the site by primarily by rail at an estimated average annual rate of up to 4,000 tons/day. In addition, it may be possible that wastes generated in Humboldt County and other counties of the State of Nevada may also be disposed of at the facility.

1.1 Site Description

The Jungo Disposal Site will be located on a parcel totaling approximately 634 acres. Site location is graphically illustrated on **Figure 1.** The site is accessed via Jungo Road via the Jungo Road crossing of the Union Pacific Railroad. It is approximately 25 miles west of Winnemucca in an area identified as Desert Valley on a County Road identified as Jungo Road. The location of the property is described by the Public Land Survey system as Township 35 North, Range 33 East, Mount Diablo Baseline and Meridian, Section 7. **Figure 2** displays the Township and Range map for the area.

The facility will be operated by JLII in accordance with applicable State of Nevada solid waste regulations. The land is currently owned by Nevada Land and Resources, Inc. but will be acquired by JLII prior to development. JLII currently has a leasehold interest with an option to purchase the property, which JLII plans to exercise once the necessary State permits have been obtained. Property ownership documents will be maintained in the landfill operating record.

The property site is surrounded by Bureau of Land Management (BLM) land. The BLM property is not zoned. It is considered open range. **Figure 2** also serves as the Site Property Map to comply with NAC 444.680(2). Waste will be delivered to the landfill site via the Union Pacific Railroad. A private transload facility will be constructed by JLII adjacent to the landfill.

Daily operations at the Jungo Disposal Site will be conducted under the direct management of the assigned Operations Manager of JLII who will report to a General Manager who provides guidance and direction for the facility. The Operations Manager will be reachable at the JLII office location.

The Jungo Disposal Site will be operated as a Class I solid waste disposal landfill. With its link to the rail system, the Jungo Disposal Site will receive wastes generated from outside of Humboldt County. However, it may be possible that certain in-county wastes may also be disposed of at the facility.

The Jungo Disposal Site will be capable of operating 7 days per week, 24 hours per day. However, peak hours of activity will be associated with the arrival of a unit waste train. Generally a full train can be unloaded and the waste placed in the landfill within a 10-hour period. At other times, personnel may be onsite for maintenance, monitoring and construction purposes.

1.2 Site Facilities

The Jungo Disposal Site will include the following facilities:

- A rail yard for unloading and loading waste containers;
- An administrative trailer;
- A equipment maintenance shop; and
- A break-room trailer for equipment operators and laborers.

Figure 3 shows the anticipated location of the initial facilities development. The locations of the equipment maintenance shop, and administrative and break-room trailers are anticipated to be temporary and may be relocated on the site as the landfill is developed. Specifically, the equipment maintenance shop and break-room trailer are likely to be periodically relocated near the active disposal area to reduce the travel time for equipment and site personnel.

The administration trailer and break-room will provide potable water and restrooms for site personnel. Wastewater will be discharge to a septic system located at the northwestern boundary of the site. Percolation tests will be completed to properly size and design the septic system.

2.0 LOCATION RESTRICTIONS

Sections 444.678 through 444.6795 of the Nevada Administrative Code (NAC) require that the location of a new municipal solid waste disposal facility satisfy all restrictions defined by NAC 444.678 through 444.6795. The following sections discuss the location of the Jungo Disposal Site relative to these location restrictions.

2.1 General Restrictions

The location of a solid waste disposal landfill must satisfy several general location criteria defined in NAC 444.678. These criteria involve the following: accessibility; prevention of degradation of waters of the state; prevention of uncontrolled landfill gas migration; availability of cover material; conformance with land use planning and proximity to dwellings, highways, surface water, and ground water. In addition, the location of a new solid waste disposal landfill must meet with the approval of the Nevada Department of Environmental Protection (NDEP). The conformance of the site with respect to these general location restrictions is discussed below.

2.1.1 Accessibility

Access to the Jungo Disposal Site is via Jungo Road, which is an improved, County maintained, gravel road. Off of this road, the operator will construct a private access road across the Union Pacific Railroad Right of Way from Jungo Road crossing eastward to the disposal site. Access on this private road will be gate controlled. All on-site roads will be cleared (snow removal in the winter months) and maintained using landfill equipment and operators.

2.1.2 Prevention of Degradation of Waters of the State

There are no surface waters located within 1,000 feet of the site. Depth to groundwater is defined in the Report of Design of this Application. Groundwater at the site is approximately 58 to 60 feet below ground surface. The construction of surface drainage controls and landfill liners will prevent degradation of Waters of the State. Drainage control, landfill liners, leachate and gas collection and control systems are discussed in detail in the Report of Design (Volume I).

2.1.3 Prevention of Uncontrolled Landfill Gas Migration

Subsurface landfill gas migration will be prevented by the landfill liner and gas collection and control systems. The purpose of the gas collection system will be to provide a means of collecting landfill gas in a safe manner so that it can be vented or properly disposed. Perimeter monitoring will be performed to allow for the detection of methane gas concentrations in excess of the lower explosive limit (LEL). Permanent monitors with alarms will be installed in all structures to ensure continual monitoring. Uncontrolled migration of landfill gas will be controlled at the site per NAC 444.678[3].

2.1.4 Availability of Cover Material

An adequate quantity of earth cover is available at the site that is workable and compactable and does not contain organic material of a quantity to harbor or breed disease vectors. As discussed in detail in the Report of Design (Volume I) and in Section 9.0 of this Plan of Operations, daily cover soils will be supplemented by the extensive use of Alternative Daily Cover (ADC) whenever practicable. Cover soil will be augmented with the use of ADC, as described in Sec. 9.0. Soil will be obtained through excavation associated with cell and liner development. Site exploratory investigations, including the drilling of four borings indicate a subsurface lithology of upper silty sands from ground surface to depths of approximately 35 to 40 feet below ground surface. Silty clays and clayey silts underlie the uppermost silty sands. Middle sands underlie the upper silty clays. A lower layer of clay and clayey sands underlies

the middle sands. A final layer of lower sand and silty sands were encountered at approximately 115 feet below ground surface. See Section 2.1.4.2, Site Geology, Report of Design (Volume I).

2.1.5 Conformance with Land Use Planning

The Jungo Disposal Site is surrounded by publicly owned land administered by the Bureau of Land Management (BLM). Surrounding land is designated as open range by the BLM. The disposal site is zoned M3 which can accommodate a disposal site as a special use. Union Pacific Railroad (UPR) owns 100-feet of land on each side of the rail line crossing through the property. The Jungo Disposal Site will not encroach on this property. An access easement will be obtained from UPR to Jungo. A Special Use Permit was obtained from Humboldt County in April, 2007. As noted on the Title Report, no other easements exist on the property. The Preliminary Title Report, dated January 28, 2008 is attached as **Appendix A**. A site survey map is included in **Appendix B**.

2.1.6 Proximity to Dwellings, Highways, Surface Water and Groundwater

The landfill location does not lie within one-fourth mile of a residence or place of public gathering. The nearest highway is approximately 25 miles away. The site does not lie within 1,000 feet of a surface water body. Subsurface investigations have determined that groundwater beneath the site is approximately 58 to 60 feet below ground surface. See Section 2.1.5.2, Report of Design (Volume I).

The designated ground water basin underlying the site is defined as State of Nevada Administrative Groundwater Basin 31. A map illustrating Designated Regional Groundwater Basins and Nearby Rivers is presented in **Figure 4**. The nearest surface water body is the Humboldt River located more than 15 miles to the southeast and is located in a separate hydrographic basin.

2.1.7 Regulatory Approval

The location of a class I site must meet with the approval of the solid waste management authority. The location of a class I site must comply with the requirements set forth in NAC 444.6765 and 444.6783 through 444.6795.

2.2 Airport Safety (NAC 444.6783)

In accordance with NAC 444.6783, a Class I site located farther than 10,000 feet from the end of any airport runway used by turbo-jet aircraft, or 5,000 feet of the end of any airport runway used by piston-type aircraft, does not pose a hazard to aircraft. The Humboldt County Airport is the closest airport to the subject property. The airport is located five miles west of the City of Winnemucca. This is about 20 miles from the Jungo Disposal Site and well in excess of the 10,000 feet requirement.

2.3 Floodplains (NAC 444.6785)

New or existing municipal solid waste disposal facilities or lateral expansions located in a 100-year floodplain must demonstrate to NDEP that the unit will not restrict the flow of a 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in a washout of solid waste. Data available from the U.S. Department of Housing and Urban Development, Federal Emergency Management Agency (FEMA), Community Panel Map Index for Humboldt County Unincorporated Areas, indicate that the area has not been mapped and therefore, is not in a flood zone and has not been designated as a floodplain. A review of the existing site topography indicates that there are no major drainages or washes which cross the site. The site will be designed to drain rainwater away from the active cell after a rainfall event so that standing water will not be allowed to pool on the site. The surrounding mountains, especially the Eugene Range most likely have drainages running from the down slopes, but the Jungo Disposal Site lies in a flatland area and has no such down slopes. The site is located

within a desert basin where water precipitation temporarily collects in shallow depressions until it evaporates or infiltrates into the underlying soils.

2.4 Wetlands (NAC 444.679)

Lateral expansions of new or existing municipal solid waste disposal facilities must not be located in wetlands, as stated in NAC 444.679. NAC 444.679(2) defines "wetlands" as those areas that are "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and which under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil, including swamps, marshes, bogs, and other similar areas." Vegetation on the property is not the type associated with swamps, marshes, bogs or other similar areas. On site groundwater monitoring well development has confirmed that there are no saturated soils at or near the ground surface.

2.5 Fault Areas (NAC 444.6791)

Lateral expansions at new or existing municipal solid waste landfills may not be located within 200 feet of a fault, which has had displacement in Holocene time unless the owner or operator demonstrates that a lesser setback will prevent damage to the structural integrity of the landfill, according to NAC 444.6791. A review of the *Preliminary Map of Young Faults in the United States as a Guide to Possible Fault Activity* (USGS, 1978) does not indicate the presence of Holocene faults in the vicinity of the Jungo Disposal Site location.

2.6 Seismic Impact Zones (NAC 444.6793)

NAC 444.6793 states that new or lateral expansions at a municipal solid waste landfill shall not be located within a "seismic impact zone unless the owner or operator submits proof that all structures for containment, including liners, leachate collection systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site." The site is located within a seismic impact zone that has a 10 percent probability of exceedance in a 250 year period of experiencing a seismically induced peak ground acceleration of 0.1g or greater. The site has been designed to withstand the peak ground acceleration without damaging environmental containment systems and controls, including the liner, systems for the collection of leachate, system for the control of surface water and cover systems. Section 2.1.6 of the Report of Design describes the seismic conditions for the site.

The Jungo Disposal Site containment systems and environmental controls have been designed to withstand an earthquake event resulting in a PGA of 0.25g without compromising the integrity of the containment systems and environmental controls. This PGA value is associated with an earthquake event producing ground accelerations at the site that correspond to 10 percent chance of exceedance during a 250-year period. Section 2.3.4 of the Report of Design describes these seismic impact evaluations.

2.7 Unstable Areas (NAC 444.6795)

In accordance with NAC 444.6795, the owner or operator of a new or existing landfill or lateral expansions at a municipal solid waste disposal landfill must demonstrate that engineering measures have been incorporated into the design of the landfill to ensure that the integrity of the structural components of the landfill will not be disrupted as a result of the location of the landfill in an unstable area. This demonstration must consider on-site or local soil conditions that may result in significant differential settling, on-site or local geologic or geomorphologic features, and on-site or local man-made features or events, both surface and subsurface.

As described above, a field investigation was undertaken at the site, which included four borings to ground water, investigation of geologic or geomorphic features and man-made features or events.

Information obtained during this investigation indicates that there are no rock types mapped in the vicinity of the landfill, which are characteristic of "karst terrains". Site soils are expected to experience consolidation under loading by refuse, but the landfill has been designed to accommodate settlement without adversely affecting the liner system. See Section 2.3.4, Report of Design (Volume I).

2.8 Proof of Compliance (NAC 444.678)

Compliance with NAC 444.678 will be achieved through NDEP's approval of the Groundwater Monitoring Plan that is included in Appendix D.

The inclusion of this information in the submission of the *Application for a Permit to Construct and Operate a Class I Solid Waste Disposal Site at the Jungo Disposal Site, Humboldt County, Nevada* and the official operating record for the site, maintained as part of the Operating Plan at the Jungo Disposal Site office constitutes the submission of proof required by NAC 444.6765.

3.0 WASTE MANAGEMENT EQUIPMENT AND PERSONNEL (NAC 444.684(1))

3.1 Equipment Requirements

The following equipment will be used at the Jungo Disposal Site:

- 1 Caterpillar Bulldozer (CAT D6)
- 3 Caterpillar Bulldozer (CAT D9T)
- 1 Caterpillar Scraper (CAT 631G)
- 1 Caterpillar Scraper (CAT 637G)
- 1 Tarpomatic Tarping unit
- 1 Caterpillar Backhoe (CAT 430E)
- 1 Forklift (Hyster 8000)
- 1 Sweeper (Tymco 600)
- 1 Caterpillar Motorgrader (CAT 14H)
- 3 Caterpillar Compacter (CAT 836)
- 1 Reach Stacker (Titan TS1068)
- 2 Gantry Cranes (Mijack MJ1000 RDDS)

Haul trucks will be used to transport containers to/from the rail loading/unloading area. Standard pickup trucks or large SUV's will be used for landfill site personnel transportation. An adequate number of wind screens will be used to prevent blowing trash from escaping the site. Routine maintenance and fueling will be conducted onsite. As necessary, equipment will be taken offsite for major repairs. An equipment maintenance shop will be housed on the property in a pre-fabricated building.

3.2 Personnel

The Jungo Disposal Site will operate under the guidance and direction of a General Manager. The General Manager will be assisted by an Operations Manager. Waste handling and environmental stewardship activities will be handled on a daily basis by equipment operators and laborers. It is anticipated that when operating at a volume of one trainload per day, site personnel will number between 25 and 30 people. Site personnel duties, in general, will include overseeing and conducting the general operation of the landfill, maintaining compliance with the permit requirements, overseeing equipment, daily activities, including recording incoming waste volumes, screening loads for prohibited wastes, equipment operation and maintenance, and site maintenance.

Positions and expected number of employees for the Jungo Disposal Site are as follows:

- General Manager (1)
- Operations/Landfill Manager (1)
- Equipment Operator 3 - Crane (3)
- Equipment Operator 2 (9)

- Driver/Lube Technician (1)
- Weighmaster (1)
- Laborer/Loadchecker (5)
- Mechanic (4)
- Security Guard (3)
- Office Clerk (1)

Descriptions for above positions are attached as Table 1. In addition, temporary workers for tasks such as litter picking may be utilized.

4.0 LITTER CONTROL PROGRAM (NAC 444.684(2b))

Litter control measures will be implemented at the Jungo Disposal Site to prevent scattering of papers and other lightweight debris. The primary control measures will include daily compaction and covering of waste. A temporary litter fence will be installed around the active disposal area to control off-site migration of litter from the direction of prevailing winds. Portable litter fences will be strategically placed at and around the active disposal areas. This may also include the placement of portable litter control barriers. Site attendants will be trained in proper litter control and will perform litter pick-up on a daily basis.

5.0 WASTE HANDLING PROCEDURES (NAC 444.684(2c))

NAC 444.684(2c) requires that the Plan of Operations describe provisions for the disposal of any special wastes accepted at a municipal solid waste disposal landfill.

Only solid waste will be accepted for disposal. The waste will be from residential, commercial and selected special wastes, which will include construction and demolition (C&D) wastes, waste tires,. Wastes will be containerized for rail delivery to the disposal site. At the point of loading, most wastes will be commingled. Exceptions to commingling can include tires, and inerts. No hazardous wastes will be accepted. Specific waste handling procedures have been developed for several of the segregated waste types accepted for disposal. The Jungo Disposal Site will not accept bulky metal waste, medical waste, liquid waste, asbestos containing wastes, and sludges, including wastewater treatment sludges, pumped sewage sludges, raw sewage, and septic tank sludges.

JLII anticipates that the majority of the waste stream will be comprised of municipal solid waste from residential and commercial sources. The estimated quantities of the MSW and the various special wastes are summarized as follows:

- Residential and Commercial MSW: 70% to 100%
- Contaminated Soils (non-hazardous) 0 to 30%
- C&D Wastes: 0 to 15%
- Tires: 0 to 15%

The quantities of special wastes may vary seasonally depending on the length and size of the disposal contracts. However, residential and commercial MSW is expected to comprise at least 70 percent of the waste stream, and at times, may comprise the entire waste stream. A brief discussion of the handling procedures for special wastes is presented in the sections 5.1 to 5.8 of this Plan of Operation.

All containerized loads delivered to the site will have undergone inspection and waste exclusion screening prior to loading into the rail transport containers. At the point of origin, screening programs will be in place to intercept prohibited wastes. In addition to California and Nevada regulation which requires a plan be in place to prevent acceptance of prohibited materials, the Jungo Disposal Site will also require that all points of origin for the containerized wastes employ a prohibited/hazardous waste exclusion program which includes employee training. The programs must also be applied to PCB wastes and all regulated wastes noted herein. Loaded container manifests indicating the contents and weight of each container will be prepared at the point of origin and provided to the unloading facility prior to train arrival. These records will be maintained at the site per Section 11.0.

Trains loaded with filled waste containers will enter the unloading facility on a schedule coordinated with the Union Pacific Railroad. The schedule will be established in advance based on the number of unit trains that will be used per regular run. Containers will be transported on flat bed rail cars. Containers filled with solid waste will be localized on specific flat cars. Containers filled with special waste materials, will be source-separated at the point of loading and redirected as appropriate.

Containers loaded with solid waste will be off-loaded via inter-modal cranes and/or reach stackers from the flat cars to waiting transfer truck rigs. Loaded containers will be transported to the active cell where they will be tipped and returned for reloading when the flat cars have been emptied. Containers filled with special waste will be off-loaded to waiting transfer trucks and then transferred to designated disposal areas at the site for tipping, cover and/or compaction.

Additional loadchecking will take place at the Jungo Disposal Site. This includes an initial visual inspection of all incoming waste. Any suspect materials will be isolated from the waste mass. As needed, the materials may be pulled for sampling from the greater mass of commingled materials until lab certification has been returned to the loading station clearing way to determine their potential contamination potential. The suspect materials will be stored separate from the waste mass. Any materials requiring prior characterization must be documented appropriately prior to loading at the point of origin onto a rail car. The site will also select random incoming loads for more detailed inspection (see Sec. 5.8.2).

Quantities of incoming waste will be measured by weight. Materials arriving by rail will be weighed on certified scales at the point of origin and accompanied by a loaded container manifest indicating container contents and weight. For waste which is not received by rail and is not accompanied by a loaded container manifest (waste received by truck for example), incoming waste will be measured by weight through scales installed on-site. All scale records will be maintained on site (see Sec. 11.0).

5.1 Open burning of waste (NAC 444.640, NAC 444.6675)

Open burning of solid wastes is prohibited at the site, in accordance with NAC 444.640.

5.2 Construction and Demolition Debris (NAC 444.652)

The Jungo Disposal Site will accept construction and demolition (C&D) debris at the landfill. C&D debris will be delivered in segregated rail containers. Generally, C&D materials are recycled for reuse prior to transporting long distances. C&D debris transported to and disposed of at the Jungo Disposal Site will most likely consist of C&D residues (i.e. screenings) generated from recycling. C&D residues will be used as alternative daily cover or disposed of with the residential and commercial MSW. If delivered to the site, larger C&D debris will be track-walked with a dozer or a compactor to break down the material to allow a maximum 18-inch high lift of ADC.

NAC 444.652 states that "landfills that incorporate large quantities of C&D material of a combustible nature must be cross-sectioned into cells by compacted cover material to prevent the spread of accidental fires. Large quantities of C&D debris of a combustible nature are not anticipated. If combustible C&D debris comprises more than 25 percent of the total daily waste volume, the combustible C&D debris will be managed as follows:

- The combustible C&D debris will be temporarily stockpiled on site, but not on landfilled wastes. Individual stockpiles shall be a maximum of 10 feet high and measure no more than 150 feet by 150 feet in plan area. Stockpiles shall be located at least 200 feet apart to minimize fire hazard.

- The combustible C&D debris will be stockpiled until it can be used for ADC or it can be disposed of with other wastes such that it comprises less than 25 percent of the total waste volume. C&D debris will not be stockpiled for a period longer than 12-months.

As an alternative to stockpiling, the combustible C&D wastes may be disposed of within a cross-section cell that is covered by non-combustible cover material. If this approach is implemented, the Jungo Disposal Site will contact the Nevada Department of Environmental Protection to determine the location and dimensions of the cells for the combustible C&D wastes.

5.3 Medical Waste (NAC 444.646)

Untreated medical wastes will not be accepted at the Jungo Disposal Site. Untreated medical wastes are medical wastes that have not been properly sterilized through a process such as autoclaving.

5.4 Asbestos (NAC 444.971, NAC 444.974, NAC 444.975, NAC 444.976)

Asbestos will not be accepted at the Jungo Disposal Site.

5.5 Tires (NAC 444.648)

Waste tires will be delivered in segregated rail containers. Waste tires which are disposed of by land filling and which are not incorporated with other wastes in a landfill for which a permit has been issued by NDEP pursuant to NAC 444.6405 will be chipped, split or otherwise handled in a manner approved by NDEP. It is anticipated that waste tires will be chipped or split prior to delivery to the site. Tires that are delivered to the site that have not been chipped or split will be temporarily stockpiled until they are chipped or split and then disposed of or used as ADC. If a temporary waste tire stockpile is necessary, the stockpile will be located within the permitted landfill footprint, but outside of landfilled wastes. The maximum size of the temporary waste tire stockpile shall be 50 feet by 50 feet in area and reach a maximum height of 10 feet. Waste tires will not be stockpiled for a period longer than 12 months.

Chipped and screened tires may be used as an ADC at the landfill. This will involve mixing the chipped tires with cover soil prior to placement in order to reduce the volume of cover material utilized.

5.6 Liquid Waste Exclusion Program (NAC 444.692)

Excluding the small quantities of rinse water that might result from the unlikely and infrequent rinsing of containers on-site, liquid wastes will not be accepted at the landfill. As part of the waste acceptance and screening program described in Section 5.8, the site will also identify and exclude liquid wastes. The majority of the exclusion occurs at the source, but site personnel also will be trained to identify liquid wastes. Suspicious containers, such as drums, will be inspected and excluded if they contain liquid wastes. Wastes that appear excessively moist will be tested to determine whether they contain free liquids per a paint filter test (EPA Method 9095), Wastes that contain free liquids will not be disposed of at the Jungo Disposal Site.

5.7 Sewage Sludge and Septic Tank Pumpings, Commercial Grease Traps and Sand-Oil Separators (NAC 444.646, NAC 444.650, and NAC 444.654)

No sludges, including wastewater treatment sludge, water treatment sludge, raw sewage, septic tank pumpings, septic tanks, or grease trap wastes will be taken at the site. As required by 444.650oil soaked wastes may be disposed at a solid waste disposal landfill only if the Plan of Operations includes provisions for the handling and disposal of these wastes, and if the Plan is approved by the solid waste management authority. The Jungo Disposal Site will accept oil soaked wastes such as sand-oil separator waste. Provisions for the acceptance, handling, and disposal of oil soaked wastes in accordance with NAC 444.650, are outlined below.

Sand-oil separator wastes will be disposed in the lined landfill. Sand/oil separator materials must be analytically sampled at a certified laboratory before they are loaded at the originating transfer point to ensure they do not exceed regulated hazardous constituent levels. It will be the responsibility of the hauler to provide this documentation/manifest to operators at Jungo Disposal Site before the materials are accepted. Accordingly, such wastes will not be loaded and hauled to the site without demonstrating compliance with regulated hazardous constituent levels. Jungo Disposal Site will require the generator to provide certified analytical results that demonstrate compliance or absence of hazardous constituent

levels. As noted above, all wastes being loaded will also be screened to insure that neither hazardous waste nor PCB wastes will be transported to the Jungo Disposal Site.

5.8 Hazardous/PCB Waste Exclusion Program (NAC 444.6665)

The facility is not permitted nor designed for receipt of regulated quantities of hazardous waste or polychlorinated biphenyl (PCB) containing wastes. Pursuant to NAC 444.6665, the operator shall carry out a program which is designed to detect and prevent the receipt or disposal of regulated hazardous waste or PCB wastes. For the purposes of this provision, hazardous waste is defined as those wastes described in Title 40 of the Code of Federal Regulations (40 CFR) Part 261. The waste exclusion program must also be applied to PCB wastes as defined in 40 CFR Part 761.3. These procedures include pre-screening of incoming loads, random inspection of incoming loads, records maintenance, personnel training, hazardous waste handling, and notification of the solid waste management authority. Jungo Disposal Site will implement a series of internal procedures, outlined below, to satisfy this requirement. They will be implemented under the authority of on-site personnel.

5.8.1 Pre-screening of Incoming Loads

All containerized loads delivered to the site will have undergone inspection and waste exclusion screening prior to loading into the rail transport containers. Jungo Disposal Site will require that all points of origin for the containerized wastes employ a hazardous waste exclusion program. The programs must also be applied to PCB wastes and all regulated wastes noted herein.

This will include an initial visual inspection of all incoming waste. Any suspect materials will be isolated from the waste mass. As needed, the materials may be pulled for sampling to determine their contamination potential. The isolated materials will be stored separate from the greater mass of commingled materials until lab certification has been returned to the loading station clearing any suspect material. Any materials requiring prior characterization must be documented appropriately prior to loading at the point of origin onto a rail car.

5.8.2 Random Inspection of Incoming Loads

Site personnel will be trained and required to visually inspect all incoming loads at the working face to identify the nature of the waste intended for disposal. Any suspect materials will be isolated from the larger mass of co-mingled material. Maximum care will be exercised by trained site personnel in isolating the waste, conducting an initial investigation, gathering any needed sample for laboratory testing and temporarily isolating the materials from the waste face. Only upon receipt of certified laboratory clearance will the material be disposed. If lab results indicate the materials may be a regulated contaminant the materials will be properly stored and isolated with notification being forwarded to the solid waste management authority prior to arranging for appropriate handling and disposal.

Wastes that are suspected of being hazardous will be handled and stored as a hazardous waste until proven otherwise. If wastes temporarily stored at the site are determined to be hazardous, the operator will appropriately store the waste until it is removed from the site. If hazardous wastes are to be transported from the landfill, they will be stored at the landfill in accordance with the requirements of a hazardous waste generator, be manifested and transported by a licensed transporter and, disposed of at a permitted treatment, storage, or disposal (TSD) facility. JLII will use licensed, certified response personnel to handle these wastes. NDEP will be notified of the waste characterization of any rejected loads. NDEP will be contacted for guidance on instructions for proper disposal.

In addition, incoming loads will be randomly selected for more detailed inspection by landfill personnel trained to identify regulated hazardous or PCB wastes. Selected loads will be discharged near the active

disposal area, spread with a dozer and inspected for any prohibited wastes. Any prohibited waste will be rejected. Loads will undergo random loadchecking at a minimum of 5 containers per week.

5.8.3 Records Maintenance

A record of all loads inspected and those determined to be hazardous will be maintained in the operating record and made available to NDEP upon request. Inspection records will include the date and time waste loads were received and inspected, analyticals, observations made by landfill personnel, a description of rejected loads, and the rationale for rejection and a description of the ultimate disposal location.

These records will be kept on-site, in the Administrative office. A list of records kept on-site is listed in Sec. 11.0 of this Plan of Operations.

5.8.4 Training of Landfill Personnel

Landfill personnel will be trained in the identification of containers and labels used for hazardous and PCB wastes. Training for hazardous material screening procedures will address hazardous waste identification and handling, safety precautions, and record-keeping requirements. Documentation of personnel training will be included with the operating record for the landfill.

5.8.5 Handling Procedures for Hazardous or PCB Wastes

The General Manager and/or operators at the landfill will be responsible for the management of any hazardous and PCB wastes, which may be discovered in the waste stream. In the event that hazardous or PCB wastes are discovered following receipt at the landfill, site personnel will enact the following hazardous or PCB waste management program as defined in NAC 444.6665:

Loadchecking activities at the point of origin and at the Jungo Disposal Site are discussed in Section 5.0 and 5.8 of this Plan of Operations.

The Jungo General Manager/ operator will assume responsibility for managing the waste according to the plan and be responsible for transportation, storage, containment and disposal. Any incident will be logged in the operating record and reported to NDEP.

In summary, if primary load inspections indicate the presence of regulated quantities of hazardous or PCB wastes on incoming haul vehicles, the attendant will refuse to accept the load/ railcar and the appropriate regulatory agencies at the point of generation will be notified. If regulated quantities of hazardous or PCB wastes are identified during secondary, or random inspections, or at any other time, the Jungo General Manager/ operator will be notified, and appropriate steps taken to engage the services of licensed response professionals and to arrange for disposal at a fully licensed disposal facility.

According to 40 CFR 262.34, wastes determined to be hazardous may be stored at the Jungo Disposal Site for up to 90 days. Site personnel will perform the following tasks for all stored material:

- Place the waste in all purpose designated tanks or appropriate storage containers (typically 55-gallon containers); and
- Seal and clearly label storage containers with the date of packaging, the words "Hazardous Waste", the hazardous waste number assigned by the United States Environmental Protection Agency (EPA); and,
- Mark the name and telephone number of the emergency response coordinator on the container.

A fully licensed hazardous waste disposal company will be used to transport waste off-site and a provisional or one-time U.S. Environmental Protection Agency (EPA) identification number will be obtained. The waste will be packaged according to applicable Department of Transportation regulations, and the container will be properly transported and manifested to its point of destination. Proper chain of custody and manifest documents will be obtained from the hazardous materials disposal site in compliance with applicable Federal and State regulations.

In the event that PCB wastes are identified on-site, site personnel will store and ensure disposal of the waste in accordance with 40 CFR Part 761. In addition, manifest, pre-transport packaging, marking, placarding, labeling, and accumulation time will be in accordance with 40 CFR Part 262.10 through Part 262.34.

The following activities will occur:

- An EPA PCB identification number must be obtained;
- The PCB waste will be properly stored until being transported;
- The container will be properly marked with the words "Caution: Contains PCBs"; and,
- The container will be manifested for shipment to a permitted disposal landfill.

5.8.6 Notification

NDEP will be verbally notified within forty-eight hours or two business days if hazardous wastes are discovered in the waste stream delivered to the Jungo Disposal Site. A written report will be submitted to NDEP which identifies the date and time of discovery, type of material (if possible without analytical testing), probable point of loading, the quantity of material, and actions for the removal of the material from the area of discovery within 90 days. The record of notification will be entered into the operating record maintained at the landfill.

5.8.7 Waste Acceptance Program

The Jungo Disposal Site is not permitted for, nor will it allow the acceptance of any regulated hazardous waste, or other waste specifically excluded by applicable state and local permits, codes and regulations. During landfill operations, various waste streams will be evaluated for consideration of disposal that may or may not be specified within this operations plan. JLII will routinely evaluate these waste streams for consistency with its permits and applicable regulations, and which will not adversely affect facility operations.

6.0 CONTROL OF EXPLOSIVE GAS (NAC 444.667)

Operators of solid waste disposal facilities must ensure that the concentration of methane gas generated by the landfill does not exceed 25 percent of the lower explosive limit (LEL) for methane in landfill structures (excluding gas control or recovery system components), and 100 percent of the LEL for methane at the landfill property boundary. A gas-monitoring plan has been developed for the site and is included Appendix D. The following discussion addresses the immediate type and frequency of monitoring and the action plan in the event of an exceedance of maximum gas levels.

Monitoring probes will be installed near the first active cell. As the site develops, additional monitoring probes will be added. Each well will contain a screened interval placed at the depth and interval corresponding to the most permeable subsurface layer, and at least as deep as the waste mass. Gas migration will be monitored around the site perimeter in gas monitoring probes, closest to the disturbed area, and within any structures used for occupation by site or visiting personnel. Probes will be sampled for methane on a quarterly basis, and will continue to be monitored throughout the active life of the landfill and the post-closure period. Ambient air in structures used for occupation by site or visiting personnel will be monitored on an on-going basis through permanently installed monitors with alarms. Methane monitors will ensure that gas concentrations do not exceed 25 percent by volume of the LEL for methane with alarms alerting site employees to the situation. Perimeter gas monitoring probes will be monitored to ensure that gas concentrations do not exceed the 25 percent of the LEL. Quarterly monitoring reports will be prepared and entered into the operating record for the landfill and will be made available to NDEP upon request.

If gas is detected at levels which exceed the LEL for methane in perimeter monitoring probes, or 25 percent of the LEL in permanent landfill structures, action will be taken immediately to ensure protection of public health and safety, and NDEP will be notified in writing immediately. This may include the installation and use of flares. The levels of methane gas detected, and a description of the actions taken to protect public health and safety, will be entered into the operating record within seven days after detection. Within 60 days after detection, a plan for remediating the migration of methane gas in order to ensure the protection of public health and safety will be placed in the operating record and implemented. The plan will describe the nature and extent of the problem, as well as the remediation plan. NDEP will be notified when the plan has been implemented.

7.0 VECTOR CONTROLS (NAC 444.6678, NAC 444.694)

Vector control and prevention at the Jungo Disposal Site will be accomplished using techniques which provide for the protection of public health and safety and the environment in accordance with NAC 444.6678 and NAC 444.694. The daily application of cover material is the most effective technique used to control vectors; however, any highly putrescible waste accepted at the landfill will be placed in a separate trench or area and covered immediately. Waste disposal operations will occur when a trainload of waste containers is delivered to the site. Consequently, the Jungo Disposal Site will not operate on a set schedule. Instead, the site will operate when needed in order to unload a train within a period of time allotted by the Union Pacific Railroad to meet the terms of the transportation agreement with the railroad. It is anticipated that from the point of train arrival to waste placement, compaction and covering in the landfill will be approximately ten hours, if no extraordinary circumstance are encountered.

"Daily" application of cover material (i.e. during every 24 hour period), therefore, may not be appropriate. Alternatively, Jungo Disposal Site will apply cover material for vector control purposes whenever there is more than a 24-hour period between waste disposal operations. When applied, cover material will be a minimum of six inches thick. This is designed to minimize the exposure of wastes to potential disease vectors by reducing available air space, food sources, and nesting locations. If necessary, rodent populations may be controlled by the use of poisons, traps, smoke devices, or sonar techniques. Avian populations may be scared from the site with the use of noise cannons, falcon deterrents or other effective means.

Insect breeding areas may develop in and around stagnant water left from dust control activities or occasional rain showers and will be addressed as discovered. The uniform grading of fill surfaces and construction of a drainage control system will minimize the presence of standing water at the landfill. The accumulation of fluids in the waste mass is minimized by the restriction of liquid wastes accepted at the landfill. If insect infestations occur in spite of these measures, approved insecticidal sprays will be used.

Due to operational practices, such as the covering of the waste in the active area, working in an active area that is kept as narrow as possible while still allowing safe operations, and good housekeeping procedures, it is not anticipated that wildlife will access the active working face. In addition, the site will be surrounded by a perimeter fence that is a minimum of 4 feet high, and either of woven or mesh wire with not greater than 2 inch mesh on the bottom 2 feet and a maximum of 8 inch mesh on the top, with the bottom buried or placed tight to the ground, or a cyclone/chain link fence placed tight to the ground. The fences will be inspected and maintained to preclude wildlife access. During the first year of operations, a monitoring log will be kept onsite indicating, to the best of the operator or employee's ability, avian and terrestrial wildlife access near the active working face of the landfill. A copy of this monitoring log will be provided to the Nevada Department of Wildlife on a quarterly basis during that first year of operations.

8.0 OPERATION & MAINTENANCE (NAC 444.686)

The Jungo Disposal Site will be operated in a manner, which does not create odors, unsightliness, or other nuisances. The working face will be kept as narrow as possible while maintaining safe and efficient equipment operation. Bulky waste material which may provide for the harborage of rodents will not be used for the final surface of side slopes. Waste will be spread into layers not exceeding two feet in thickness prior to compaction, and compacted using dozers and/or compactors. The equipment will make a minimum of two passes over each waste layer. The perimeter boundary of the extent of waste placement will be at least 100 feet from the property boundary of the site.

Odors from landfill operations will be controlled through the placement of daily, intermediate and final cover. In addition, the narrow working face will act to minimize any odors. In the event that a highly odorous load is received, the odorous material may receive cover more frequently.

The Jungo Disposal Site will monitor for any impacts from weedy plants species as a result of operations. A Weed Management Plan is attached to this Plan of Operations as Appendix E.

Figure 5 presents the Landfill Base Grading Plan for the Jungo Site. **Figure 6** presents the Landfill Final Cover Grading Plan. The Report of Design (Volume I) details the liner and cover systems and also illustrates the proposed sequencing of construction.

9.0 COVER OF COMPACTED WASTE (NAC 444.688)

Cover material must be used to cover all solid waste at the end of each operating day as defined in NAC 444.688 or at more frequent intervals as necessary to control disease vectors, fires, odors, blowing litter, and scavenging. NAC 444.688 defines "operating day" to mean the portion of a day during which a site is accepting or managing solid waste.

Cover materials are anticipated to primarily consist of 6-inches of soil supplemented with ADC consisting of tarps. To the extent that the waste stream includes suitable materials for use as ADC, the JDS will use ADC materials to supplement the soil cover. In addition to tarps, ADC materials that may be used at the JDS include the following:

- ground construction and demolition wastes,
- auto shredder wastes,
- shredded tires,
- non-hazardous, contaminated soils

Prior to the implementation of the above ADC materials, a limited test section measuring no more than 50 feet by 100 feet in area shall be completed and observed for a period of 60 days. Daily observations shall be completed to verify the cover performance in regards to the control of vectors, fires, odors, and blowing litter. Based on these observations, proposed cover application protocols will be submitted to NDEP for review and approval. The protocols shall specifically address the minimum thickness of cover placement and identify conditions under which the cover will not be used, such as winds above a maximum threshold to prevent blowing litter.

With the exception of surfaces which have received a final cover in accordance with NAC 444.6891, surfaces which will not receive additional waste for a period of 90 days or more will be covered by an intermediate cover comprised of a minimum of 12 inches of compacted cover soil. The integrity of the cover will be maintained until filling is resumed or final cover is added. Cover will be routinely inspected. Erosion rills and cracks deeper than 3 inches and depressions that do not provide positive drainage will be repaired promptly. Cover will be uniformly graded to promote drainage of surface water with slopes having a grade of not less than three percent.

10.0 RUN-ON AND RUN-OFF CONTROL SYSTEM (NAC 444.6885); PROTECTION OF SURFACE WATERS FROM POLLUTANTS AND CONTAMINANTS (NAC 444.6887)

In accordance with NAC 444.6885, owners or operators of Class I municipal solid waste disposal facilities must design, construct, and maintain run-on and run-off drainage structures to control the peak discharge from a 24-hour, 25-year storm event. Hydraulic analyses of drainage areas and run-off patterns for the final closed surface of the landfill have been performed as part of the Report of Design included with this application. Based on the results of these analyses, run-on and run-off drainage control structures have been designed and sized to accommodate the flows resulting from a 24-hour, 25-year precipitation event. Drainage controls are shown on the site design plans within the Report of Design (Volume I).

The Hydrologic and Hydraulic Analysis that has been performed and is included as part of the Report of Design addresses culvert design, drainage ditches and hydrology analysis, satisfying NAC 444.6885 and NAC 444.6887, which states that run-off from the active portion of the landfill must not cause a discharge of pollutants or contaminants into waters of the State or waters of the United States. The active disposal area will be graded to prevent the run-off of contact waters into the site drainage system. Construction of the surface water control devices described in the Report of Design, in conjunction with dry waste management practices which prohibit the disposal of liquid wastes, along with the daily compaction of solid wastes, and the routine application of cover, will protect waters of the State from the discharge of pollutants or contaminants during landfill operation. The surface water drainage system will be monitored to ensure proper operation and effectiveness. Operational practices at the active face and the design of the site drainage system will be modified if it is determined that discharges from the site contain pollutants or contaminants, which may degrade waters of the State. The site was designed with appropriately designed drainage structures to control run-on and run-off.

11.0 OPERATING RECORDS (NAC 444.7025)

The following information will be recorded and maintained in the operating record for the Jungo Disposal Site:

- Records of inspections, personnel training, and procedures for notifications to NDEP relating to hazardous waste discovery;
- Results of gas monitoring activities, as well as any remediation plans and procedures;
- Any documentation relating to the design of the municipal solid waste landfill unit for the placement of leachate or gas condensate in the unit;
- Records of waste types and scale weights;
- Any demonstration, certification, finding, monitoring, testing or analytical data from the program for monitoring ground water;
- Plans for closure and postclosure and any monitoring, testing, or analytical data;
- Documentation of cost estimates and financial assurance; and
- Training program records will be entered into the personnel file for each participating employee.

The above operating records will be maintained on-site in the administration trailer and will be made available to NDEP upon request or at the time of inspection.

The Jungo Disposal Site has been designed with provisions for leachate collection and removal, ground water monitoring systems and gas well extraction and monitoring control systems. Documentation related to the construction and operation of these systems will be maintained in the operating record.

This Application for a Permit to Construct and Operate a Class I Municipal Solid Waste Disposal Landfill at the Jungo Disposal Site, Humboldt County, Nevada contains the Plan of Operations (including Monitoring Plan, Closure Plan, and Postclosure Plan) and Report of Design. These documents constitute the core of the operating record. Following approval and issuance of a permit to operate by NDEP, this operating plan will officially become the operating record for the landfill. The records of inspections, personnel training and hazardous waste, fire incidents and other notifications, as well as the results of gas monitoring and any monitoring required during closure or postclosure activities, will be entered into the operating record as the information is developed. Financial assurance documentation will be provided upon issuance of the Class I permit and made part of the operating record prior to first acceptance of waste. NDEP is hereby notified that these documents are included in the Jungo Disposal Site operating record.

Within 30 days of the end of each calendar year after permit issuance, the Jungo Disposal Site will provide in conjunction with any other reporting requirement, a summary of records placed in accordance with NAC 444.7025.

12.0 INTEGRATED SITEWIDE CONTINGENCY PLAN (NAC 444.684(4A-F))

NAC 444.684(4) requires the development of contingency plans to be implemented in the event of an emergency at the site. These plans must include an organized, coordinated, and technically and financially feasible course of action for response to fire or explosion, equipment breakdown, releases of toxic or hazardous material, gas, and failure of run-off containment systems. In addition, an alternative waste handling or disposal system must be developed in the event that the landfill becomes unable to accept waste because of an emergency.

An Integrated Sitewide Contingency Plan (ISCP) will be prepared and submitted to NDEP for review and approval at least 180 days prior to commencing disposal operations. Table 2 summarizes the minimum content requirements of the ISCP. Selected portions of the ISCP are discussed below.

12.1 Site Personnel Staffing and Training

The ISCP will include a list identifying each waste management-related position and a description of the job functions for each position. In addition, the ISCP will identify the requisite skill, education, qualifications and training requirements for each position.

The Jungo Disposal Site General Manager and/or Operations Manager will be responsible to ensure that all personnel and visitors have adequate personal protective equipment (PPE) to access the site. In addition the General Manager and/or Operations Manager will be responsible that all personnel are trained in fire suppression, key safety measures, and recognizing and handling procedures if hazardous and PCB wastes are encountered.

Landfill personnel will be trained in the identification of containers and labels used for hazardous and PCB wastes. Training for hazardous material screening procedures will address hazardous waste identification and handling, safety precautions, and record-keeping requirements.

At least two staff will be trained in basic safety, first aid, and CPR on an annual basis and will be onsite when operations are active. First aid kits will be maintained in the gatehouse and in landfill vehicles and equipment.

Training records of every employee will be kept in the operating records.

12.2 Fire Response

The fire control program for the Jungo Disposal Site will consist of provisions for fire prevention and fire suppression administered under the direct control and management of onsite personnel in accordance with the ISCP. Fire control at the site will consist of the following elements:

Fire extinguishers will be installed in the gatehouse, on each site vehicle, on each piece of equipment at the site, located at the un-loading station near the rail line, and in any structure. Extinguishers will be periodically checked and serviced to ensure that they function properly. All permanent structures on site will be inspected prior to start of operations for conformance with Uniform Building Code Regulations for fire prevention. Alterations, remodels, or expansions of structures on the site will be performed by licensed contractors and constructed in accordance with all applicable fire and safety regulations. All personnel at the site will be issued radio or other communications equipment, allowing them to report on any fire outbreak without delay.

Fire breaks will be maintained on the perimeter of the property. A soil stockpile will be kept near the active disposal area and will be used to smother burning or smoldering waste, if necessary. A minimum 3000-gallon water truck equipped with hoses that can be used in the event of a fire will be stationed on-

site at all times and maintained in proper working order. Water can be used to extinguish burning or smoldering waste as necessary.

If a fire breaks out, site personnel will call the appropriate fire response agency in accordance with the ISCP. Onsite personnel will assess the severity of the fire and determine whether the available equipment will be sufficient to fight the fire. Onsite landfill personnel will be trained to provide immediate fire suppression in the case of a small event (as a rule of thumb an area contained to 10 feet by 10 feet or less) at or near the active face. Staff will immediately determine if any potential health hazards exist, including toxic chemical fires. If no health hazards exist and the fire is manageable with on-site resources (as a rule of thumb an area contained to 10 feet by 10 feet or less), the onsite personnel should use fire extinguishers mounted on landfill vehicles, and cover soils stockpiled near the active face as a first line of defense to smother the burning or smoldering area. Water will only be applied to the active face if needed.

In the event of a larger fire, or an uncontrolled fire, or if health hazards exist that cannot be managed by onsite personnel, the personnel will evacuate the area and the appropriate fire response agency as indicated in the ISCP. The local fire response agency will be contacted and the equipment operator and support personnel will be withdrawn from the area. On arrival at the landfill, Fire Department personnel will assume responsibility for continued fire abatement activities from the General Manager on site.

In the event of a structure fire, extinguishers and a water truck will be utilized to control the fire. If the fire cannot be controlled, the appropriate fire response agency as indicated in the ISCP will be notified immediately.

Onsite staff will maintain records of fire training and any fire occurrences at the site, whether responded to by emergency personnel or not. These records will be entered into the operating record and will include the date and time the fire occurred, the location and suspected cause of fire, measures used to control the event, accidents or injuries sustained in suppressing the fire, and whether or not an emergency response team was required. An incident log will be kept up to date at the project site office, recording any incidence of fire that may occur at the site.

12.3 Personnel Safety

The landfill site will have a satellite telephone which will enable contact with the County Sheriff's office, the Fire Department, and the Humboldt County Road Department. At least two staff will be trained in basic safety, first aid, and CPR on an annual basis and will be onsite when operations are active. First aid kits will be maintained in the gatehouse and in landfill vehicles and equipment.

Depending on the severity of an injury, injured personnel may treat themselves, call an emergency response (EMR) team, or have an EMR team called for them. If an EMR team is called to the site, site personnel will complete an incident report form and record the date, time, type of injury, actions taken, response time of the emergency response service, and the time at which the individual was evacuated from the site, if required.

12.4 Landfill Shutdown

In the unlikely event of an emergency, which requires the short-term closure of the landfill, several options are available. Waste being delivered to the landfill will be off-loaded but not transported to the active disposal area. Waste containers will be stock piled until the emergency has been resolved. Delivery schedules to the landfill will be interrupted and no further waste will be delivered to the site until the situation is resolved. It is anticipated that waste cargo containers would not be stockpiled for any more than five (5) days. Based upon the graduated increase in volume to the maximum loading rate capacity of the Class I Landfill, the total volume stockpiled would be contingent upon the existing

loading rate at the time of landfill shutdown. A maximum stockpile of 5-days is anticipated based upon the longest time estimated to organize transportation and make transport and delivery allowances to an acceptable landfill.

12.5 Equipment Breakdown

In the event of an equipment breakdown, which cannot be addressed by landfill personnel, backup equipment is readily available from equipment suppliers in Reno or Elko. Breakdown of one piece of equipment will not significantly affect the site to properly manage the waste stream as an operation of this size will routinely employ several pieces of equipment at any one time. An onsite maintenance station will be maintained with an inventory of key spare parts.

12.6 Hazardous Materials Release

The Jungo General Manager and site trained staff will assume responsibility for managing any hazardous material release on the site. This will include calling a licensed emergency response contractor, immediate safety response, isolation, containerization if necessary, preparation for shipping to a certified laboratory, manifesting and notification of proper local and State authorities.

12.7 Leachate Release

The Ground Water Monitoring Plan provides the means for determining the presence of leachate below the liner system and to initiate corrective action in the event that leachate reaches ground water. The presence of leachate in the collection structures is a design function of a leachate collection and removal system (LCRS) and a lined waste management unit. The presence of leachate in a containment structure is expected and is the result of a system that is functioning as originally planned and designed. A copy of the Ground Water Monitoring Plan is included in Appendix D to this Plan of Operations.

13.0 MISCELLANEOUS REQUIREMENTS FOR OPERATION

Several miscellaneous operational requirements for a Class I solid waste disposal landfill are specified by NAC 444.690, 444.696, 444.698, 444.700, and 444.702. Procedures for compliance with these provisions at the Jungo Disposal Site are outlined below.

13.1 Signs

Signs posted at the landfill will convey specific information, including the name of the owner and operator of the site, hours of operation, and types of material accepted or excluded, and fees charged. Directional signs will be located throughout the site providing direction to the appropriate disposal areas. This site will not be open to the public.

13.2 Erosion and Dust Control

Completed portions of the landfill will be configured and maintained as described in the closure and postclosure plans. Construction of a graded and compacted final cover and subsequent re-vegetation will help prevent erosion, surface deterioration, and fugitive dust generation. A water truck will be available on-site for dust control and cover material compaction as needed and water will be applied as needed to the landfill access roads, haul roads, and borrow areas. A minimum 10,000-gallon water storage tank will be on-site to facilitate filling of the water truck.

13.3 Access Control

As required by NAC 444.698, access to the Jungo Disposal Site will be controlled as to time of day and those authorized to use the site. A site attendant will be on duty during operating hours to control access. A perimeter fence, specified in Section 7.0 of this Plan of Operations, will surround the current disposal area and a locking gate will be installed across the entrance road to the landfill. The fence and locking gate will prevent entry and illegal dumping by unauthorized vehicular traffic.

During inclement weather, on site equipment will be used to clear on-site access roads if required.

13.4 Personnel Facilities

A prefabricated administrative building will be available to site personnel. Portable toilets will be located onsite as needed. Bottled drinking water will be available in the administrative building. In addition, a satellite phone will be provided to the site attendant for outside communications.

13.5 Miscellaneous Requirements

NAC 444.702 mandates several additional operational requirements. The procedures, which will be employed to maintain compliance with these requirements, are described below.

- Scavenging - Scavenging will be prohibited in all areas of the landfill. This provision will be enforced through the use of access control measures and perimeter fencing.
- Salvaging – Salvaging will be prohibited.
- Daily Inspections - Site personnel will conduct daily site inspections for litter, scattered paper, and other lightweight debris. Recovered waste collected by site laborers will be returned to the disposal area for proper disposal.
- Measuring and Recording - Incoming waste will be weighed on certified scales at the point of origin.

- Approval of Operation - The operation of the Jungo Disposal Site will be considered as approved by the NDEP.
- Quarterly Reports - Reports of the quantity of solid waste received at the Jungo Disposal Site will be submitted to the NDEP on a quarterly basis. The reports will be submitted on a form supplied by NDEP.
- Topographic survey- The Jungo Disposal site will conduct a topographic survey, or other approved volumetric survey at least once every 5 years thereafter until the site is closed in accordance with NAC 444.6891, 444.6892 and 444.6893. Each such report will be submitted not later than 5 years after the date on which the immediately preceding report was submitted. The topographic survey will meet the requirement stated in NAC 444.702 (7a-f).

14.0 CLOSURE AND POSTCLOSURE AND FINANCIAL ASSURANCE (NAC 444.6891 THROUGH NAC 444.6897 AND NAC 444.685 THROUGH NAC 444.6859)

Closure and postclosure plans have been prepared for the Jungo Disposal Site and specify activities required for compliance with NAC 444.6891 through NAC 444.6897. These plans are included in **Appendix C** as required by NAC 444.6897. The closure and postclosure plans will be maintained with the site operating records at the Jungo Disposal Site administration trailer.

As discussed in the Closure Plan, the Jungo Disposal Site will complete closure in phases throughout the landfill development. For each closure phase, NDEP will be contacted to request a site visit and inspection to confirm partial closure and that financial assurances are no longer required for the closed area.

The Jungo Disposal Site will utilize a trust fund to demonstrate financial assurance for the Class I operation. NDEP will be notified upon placement and funding of the standby trust fund. Financial assurance estimates for closure and postclosure monitoring and maintenance are included in **Appendix C**.

15.0 MONITORING PLAN (NAC 444.683)

Environmental monitoring will be completed during landfill development and following closure and will include groundwater monitoring, leachate monitoring, and landfill gas monitoring. Surface water monitoring will not be completed because there is no nearby surface water body. However, storm water monitoring will be completed in accordance with NPDES requirements. Appendix D includes a monitoring plan that address groundwater, leachate, and landfill gas monitoring.

The monitoring plan focuses on detecting potential releases from the landfill. However, there are no nearby off-site groundwater wells that would be impacted by a release from the site. There are no municipal water wells within 10 miles of the site. The nearest groundwater well is used for agricultural purposes and is located more than one mile northeast of and upgradient from the landfill site.

TABLE 1
JUNGO DISPOSAL SITE JOB DESCRIPTIONS

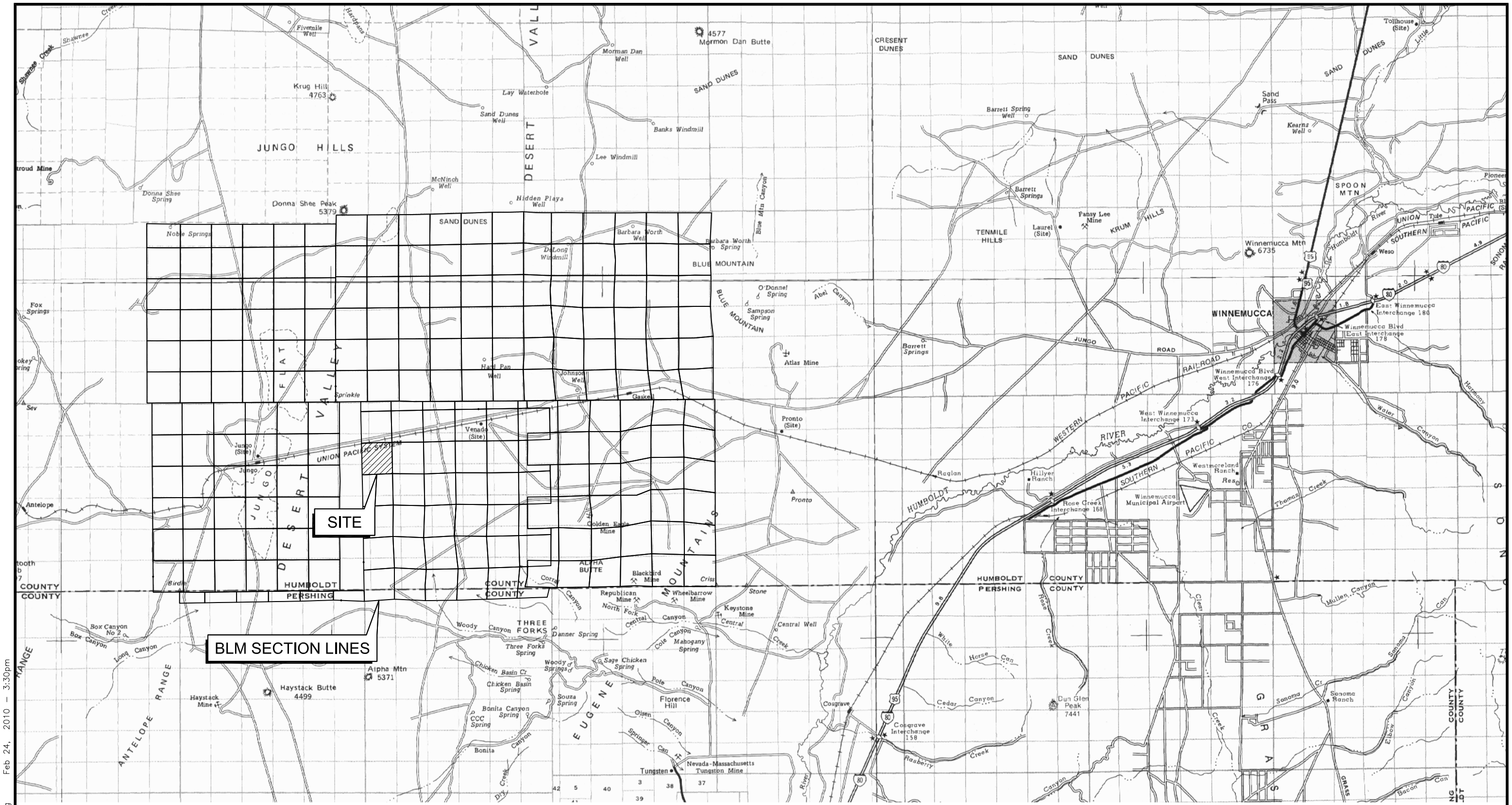
Job Title	Description
General Manager	Ensures Company provides ongoing positive customer service and maintains positive relationships with existing customer base, including but not limited to local agencies, city councils, etc. Represents Company in the business community and in regulatory matters to maintain goodwill and understanding of Company's waste management practices and financial requirements. Provides leadership to employees and promotes positive employee morale. Obtains and administers operating agreements, operating permits, and adequate rates. Controls operating costs, collections, and accounting, to ensure maximum return to the Company within a reasonable rate structure.
Landfill Manager	Directs, analyzes, develops and operates landfill disposal sites. Ensures compliance of health and safety programs. Provides functional guidance to landfill customers regarding use of landfills. Oversees and coordinates services of consultants and contractors. Provides supervision to laborers, equipment operators, and drivers in processing waste. Ensures compliance with policies and regulations. Oversees the grading of roads, levees, and dump areas in the landfill.
Equipment Operator 3 (Crane)	Operates overhead crane to lift, move, and position loads. Observes load hookup and determines safety of load. Manipulates or depresses crane controls, such as pedals, levers, and buttons, to regulate speed and direction of crane and hoist movement according to written, verbal, or signal instructions. Operates crane in a safe and efficient manner while strictly abiding by policies and procedures of state and local regulations. Performs daily routine safety and equipment operation checks including pre- and post-shift inspections on assigned equipment.
Equipment Operator 2	Operates heavy equipment in a safe and efficient manner while strictly abiding by policies and procedures of state and local regulations. Operates dozer, compactor, scraper, and loader. Performs daily routine safety and equipment operation checks including pre- and post-shift inspections on assigned equipment.
Driver / Lube Technician	*Driver* Drives a water truck for spraying water on road and other applicable areas for dust control. Sprays slopes as needed. Accountable for the efficient and effective operation of water truck and the consistent application of safety and operational procedures. Reports all accidents and/or safety violations to the appropriate authority and in a timely manner. Abides by company policies and procedures and state and local regulations.

TABLE 1
JUNGO DISPOSAL SITE JOB DESCRIPTIONS

	Lube Technician Performs lube oil filter services and performs vehicle inspections as required. Recommends tires, parts and services to supervisor as needed. Maintains equipment in good working condition. Maintains the work area in a safe, clean and organized manner.
Weighmaster	Provides recordkeeping and customer service at truck scales. Directs trucks to scale and records weights by category, while calculating and inspecting load. Performs data entry and records commodities on load brought in by trucks. Monitors truck radio, responding in case of emergency or problem. Reports all hazardous materials to supervisor for proper documentation and disposal.
Laborer/Loadchecker	Keeps landfill litter free and assists with other projects as needed. Directs incoming and outgoing tipping area traffic in a safe and efficient manner. Talks to customers and directs questions to proper person. Reports hazardous materials to supervisor for documentation and disposal.
Mechanic	Services, maintains, inspects and repairs equipment to assure safety and on-going operation. Works with drivers to determine necessary repairs. Assist management in purchase of new equipment or supplies.
Security Guard	Maintains security of building and premises in and outside of regular business hours. Inspects buildings and premises for security. Identifies employees or services persons entering and leaving premises.
Office Clerk	Performs clerical and administrative functions as directed, including answering phones and relaying information as appropriate.

TABLE 2
MINIMUM REQUIREMENTS FOR
INTEGRATED SITEWIDE CONTINGENCY PLAN

REQUIREMENT	MINIMUM CONTENTS
Facility Information	• Site location, address, and description including maps • Contact Information • Identification of internal and external resources • Identify responsible party for plan development and maintenance • Identify any potential impact receptors and resources
Emergency Response and Notification Requirements	• Initial response steps including assessment and internal and external notification procedures • Procedures for mobilization of resources • Mitigation actions • Evacuation procedures • Emergency medical treatment procedures • Procedures for site closure if necessary • Termination of response actions and follow-up actions
Employment Position Requirements	• List each waste management-related position at the facility • Identify the requisite skill, education, or other qualifications for each position • Describe the duties of facility personnel assigned to each position for each position • Task hazard descriptions and hazard analysis • List protective equipment to be used • Medical surveillance requirements
Training	• Describe the type and amount of training that will be given to each person/position • Documentation that all facility personnel has been given, and completed, all training and ongoing training or possesses the necessary job experience • Schedule and type of training exercises and drills
Establish a Sitewide Emergency Coordinator	• Authority and procedures to activate facility alarms or notification system for employee's onsite • Procedures to notify local authorities as necessary • Procedure to activate the Integrated Sitewide Contingency Plan • Complete any other actions necessary to secure the site and ensure the safety of personnel • Identify Alternative Coordinator
Response Coordination	• Familiarize police, fire departments, and emergency response teams with the layout of the facility, properties of solid waste handled at the facility and associated hazards, places where facility personnel would normally be working, entrances to roads inside the facility, and possible evacuation routes • Designate primary authority to specific departments for when more than one police and/or fire department respond to an emergency, and agreements with any others to provide support to the primary emergency authority • Familiarize local hospitals with the properties of wastes at the facility and the types of injuries or illnesses which could result from fires, explosions or releases at the facility • Document the refusal any authorities that decline to enter into such arrangements
Documentation and Record Keeping	• Location of records • Incident investigation and documentation • Training records • Incident evaluation and plan modification procedures



NOTE

1. MAP IMAGE OBTAINED FROM NEVADA DOT MAP ATLAS 30' SERIES (METRIC). DATE OF MAPS: 1980, 1987.

N
W E
S

3 0 3
SCALE MILES

Golder Associates
Sacramento, CA

SECTION 7, T35N, R33E
APN 05-411-07
SITE LOCATION MAP

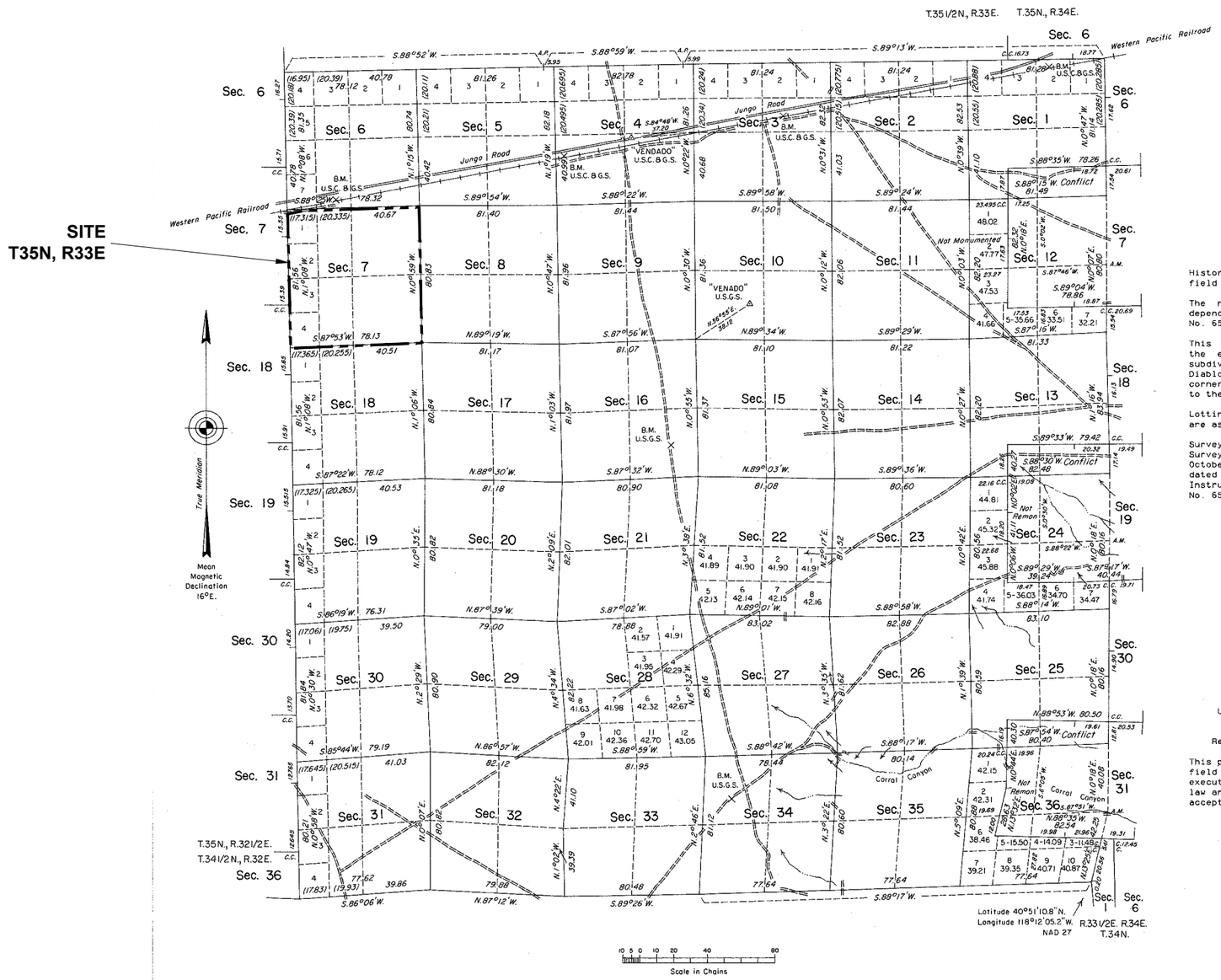
FIGURE 1

PROJECT No. 0637079 FILE No. Fig 1 – Site CADD JDR DATE 05/29/07

Drawing file: Fig 1 – Site Location.dwg Feb 24, 2010 – 3:30pm

TOWNSHIP 35 NORTH, RANGE 33 EAST, OF THE MOUNT DIABLO MERIDIAN, NEVADA

DEPENDENT RESURVEY



History of the earlier surveys is contained in the field notes.

The north boundary of T. 34 N., R. 33 E., was dependently resurveyed concurrently under Group No. 654.

This plat represents the dependent resurvey of the east, west and north boundaries and the subdivisional lines of T. 35 N., R. 33 E., Mount Diablo Meridian, Nevada, designed to restore the corners in their true original locations according to the best available evidence.

Lottings and areas, except as indicated hereon, are as shown on the plat approved January 3, 1876.

Survey executed by Ronald E. Williams, Cadastral Surveyor, beginning May 10, 1988, and completed October 21, 1988, under Special Instructions dated April 25, 1988, and Supplemental Special Instructions dated August 17, 1988, for Group No. 656, Nevada.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Reno, Nevada September 30, 1991

This plat is strictly conformable to the approved field notes, and the survey, having been correctly executed in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

For the Director

John D. Parrish

Chief Cadastral Surveyor, Nevada

NOTE

1. SURVEY INFORMATION OBTAINED FROM BLM NEVADA STATE OFFICE (http://www.nv.blm.gov/LandRecords/). DATE OF SURVEY: SEPTEMBER 30, 1991.

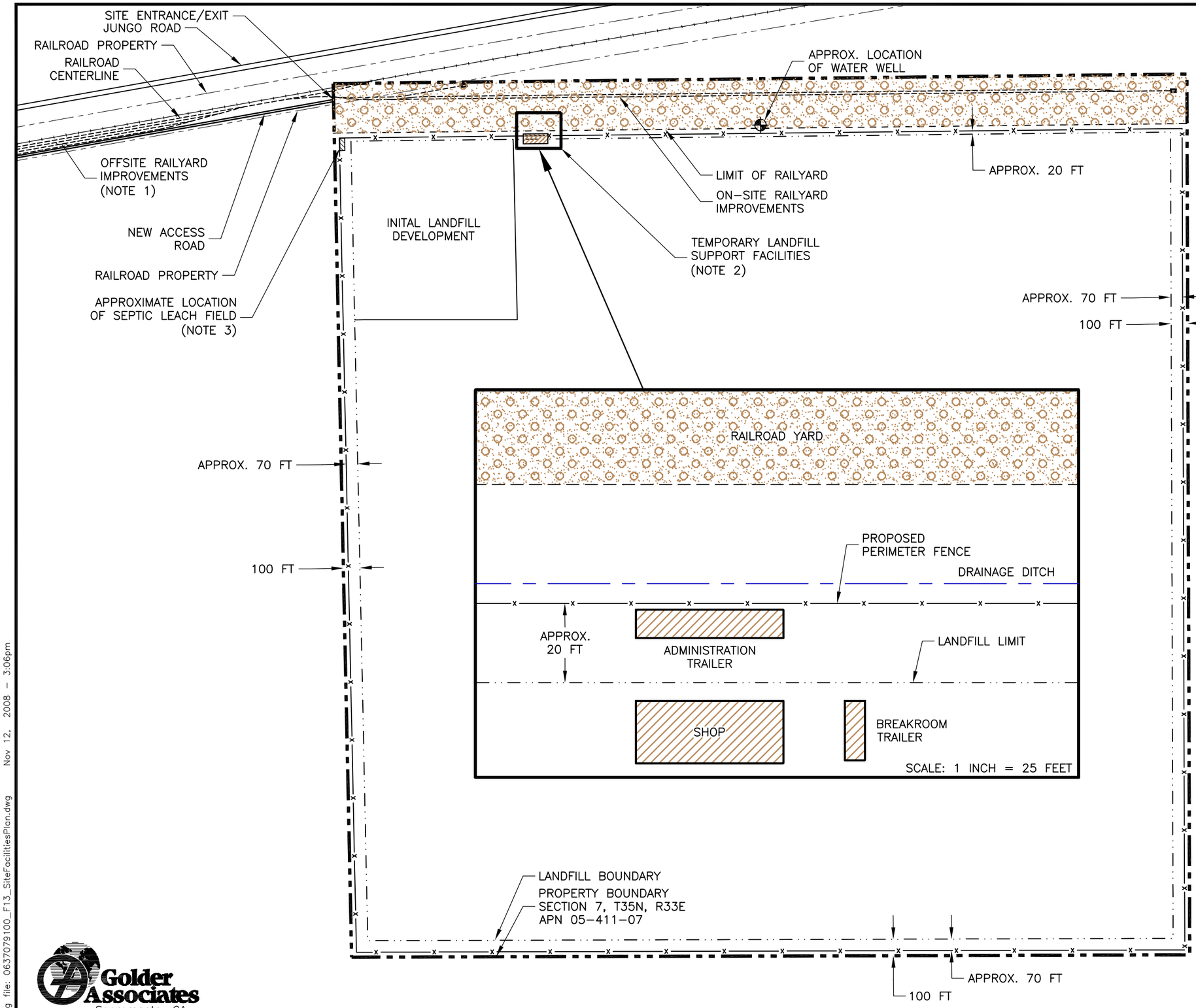
Golder Associates
Sacramento, CA

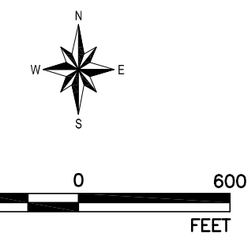
SITE PROPERTY MAP WITH TOWNSHIP AND RANGE

FIGURE 2

PROJECT No. 063-7079 FILE No. Fig 2 – T35 CADD JDR DATE 03/03/08

Drawing file: Fig 2 – T35NR33E.dwg Oct 26, 2011 – 11:29am





LEGEND

- PROPERTY BOUNDARY
- LANDFILL BOUNDARY
- PROPOSED PERIMETER FENCE

NOTES

1. OFF-SITE RAILYARD IMPROVEMENTS LOCATED ON UNION PACIFIC PROPERTY.
2. LANDFILL SUPPORT FACILITIES MAY BE MOVED WITHIN THE PROPERTY LIMITS AS THE SITE IS DEVELOPED.
3. PERCOLATION TESTS WILL BE COMPLETED TO DESIGN THE SEPTIC SYSTEM.

Golder Associates
Sacramento, CA

PROJECT No. 0637079 FILE No. 0637079100 CADD JDR DATE 11/11/08

Drawing file: 0637079100_F13_SiteFacilitiesPlan.dwg Nov 12, 2008 - 3:06pm

SITE FACILITIES PLAN

FIGURE 13

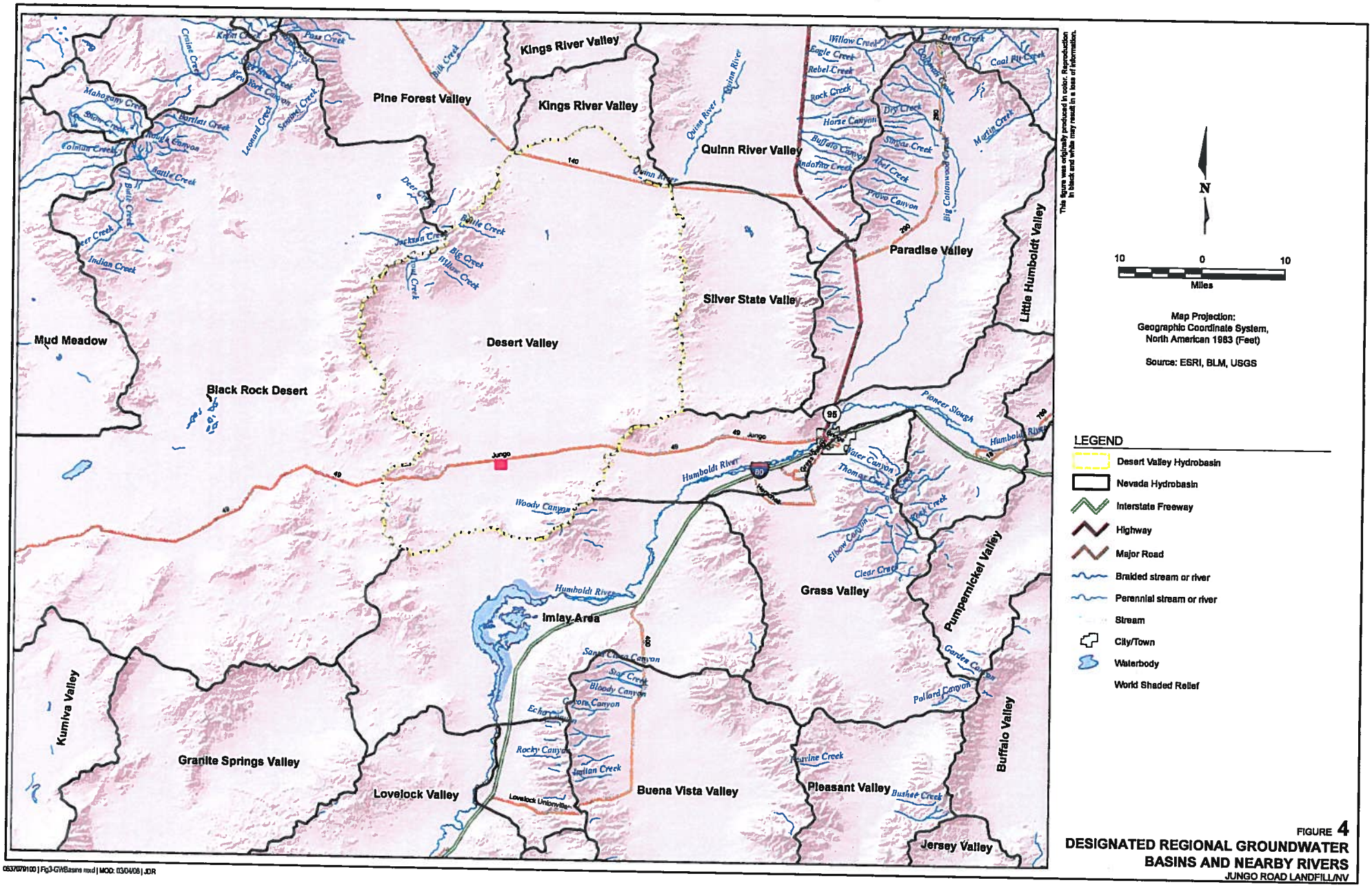
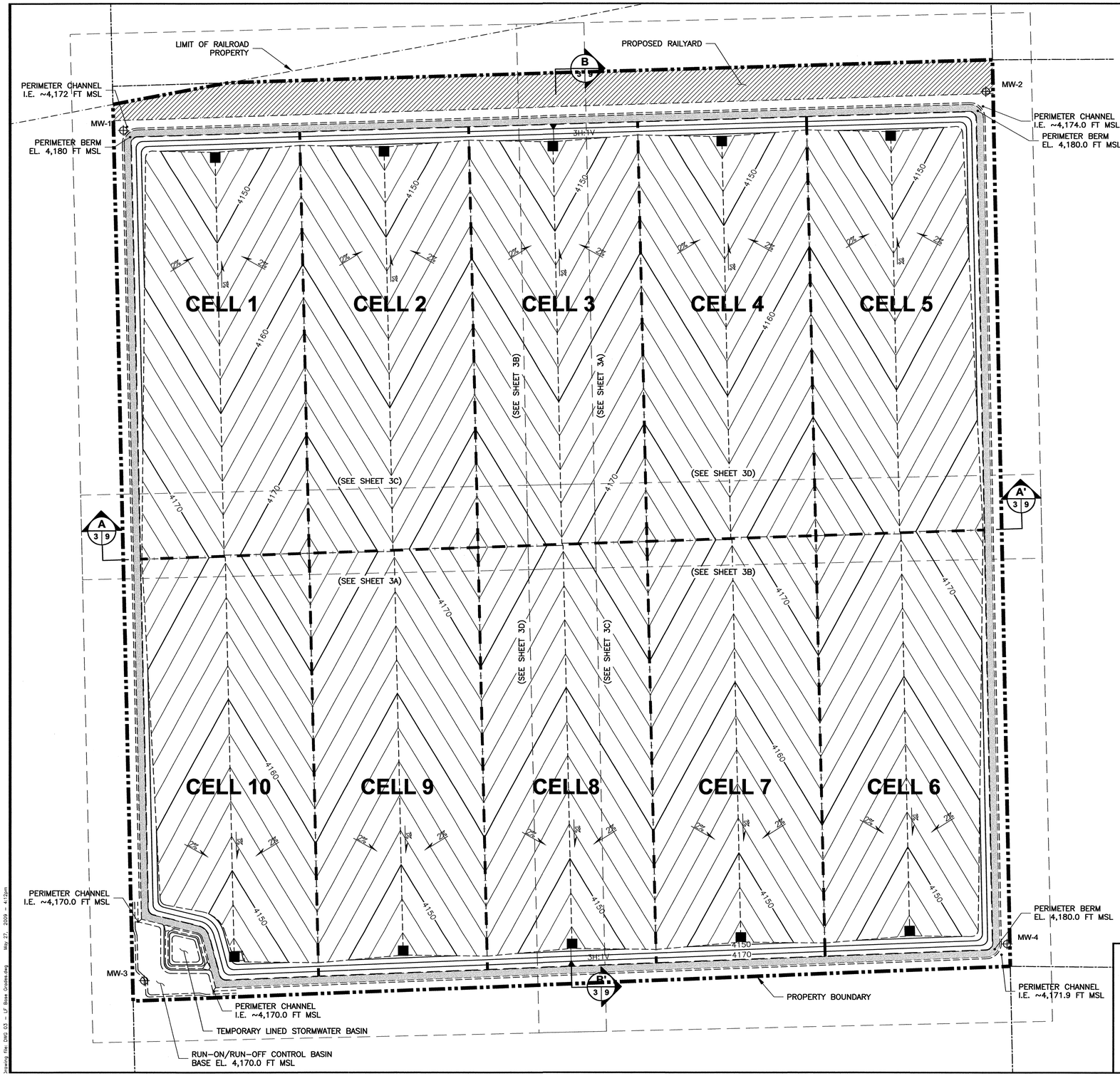
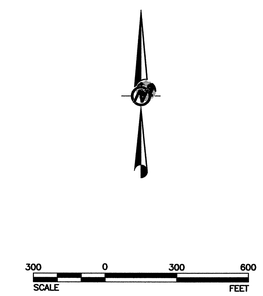


FIGURE 4
DESIGNATED REGIONAL GROUNDWATER BASINS AND NEARBY RIVERS
JUNGO ROAD LANDFILL/NV

Golder Associates

0537079100 | Fig3-GWBasins.mxd | MOD: 03/04/08 | JDR





LEGEND

- PROPERTY BOUNDARY
- LIMIT OF LANDFILL
- LIMIT OF LANDFILL CELL
- TOP OF PERIMETER BERM
- LEACHATE SUMP LOCATION
- MW-1 APPROXIMATE LOCATION OF MONITORING WELLS
- PROPOSED RAILYARD
- DETAIL/SECTION DESIGNATION
- DRAWING WHERE SECTION/DETAIL IS LOCATED
- DRAWING WHERE SECTION/DETAIL IS REFERENCED

NOTE

1. MINIMUM BASE GRADE IN SUMPS TO PROVIDE A MINIMUM OF 25 FEET OF SEPARATION BETWEEN REFUSE AND GROUNDWATER.

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
B	05/29/09	KGH	ADD RUN-ON/RUN-OFF CONTROL BASIN		KGH	REK
A	03/11/08	KDH	ISSUED FOR PERMITTING	DBS	KGH	REK

PROJECT

JUNGO ROAD LANDFILL
WINNEMUCCA, HUMBOLDT COUNTY, NEVADA

TITLE

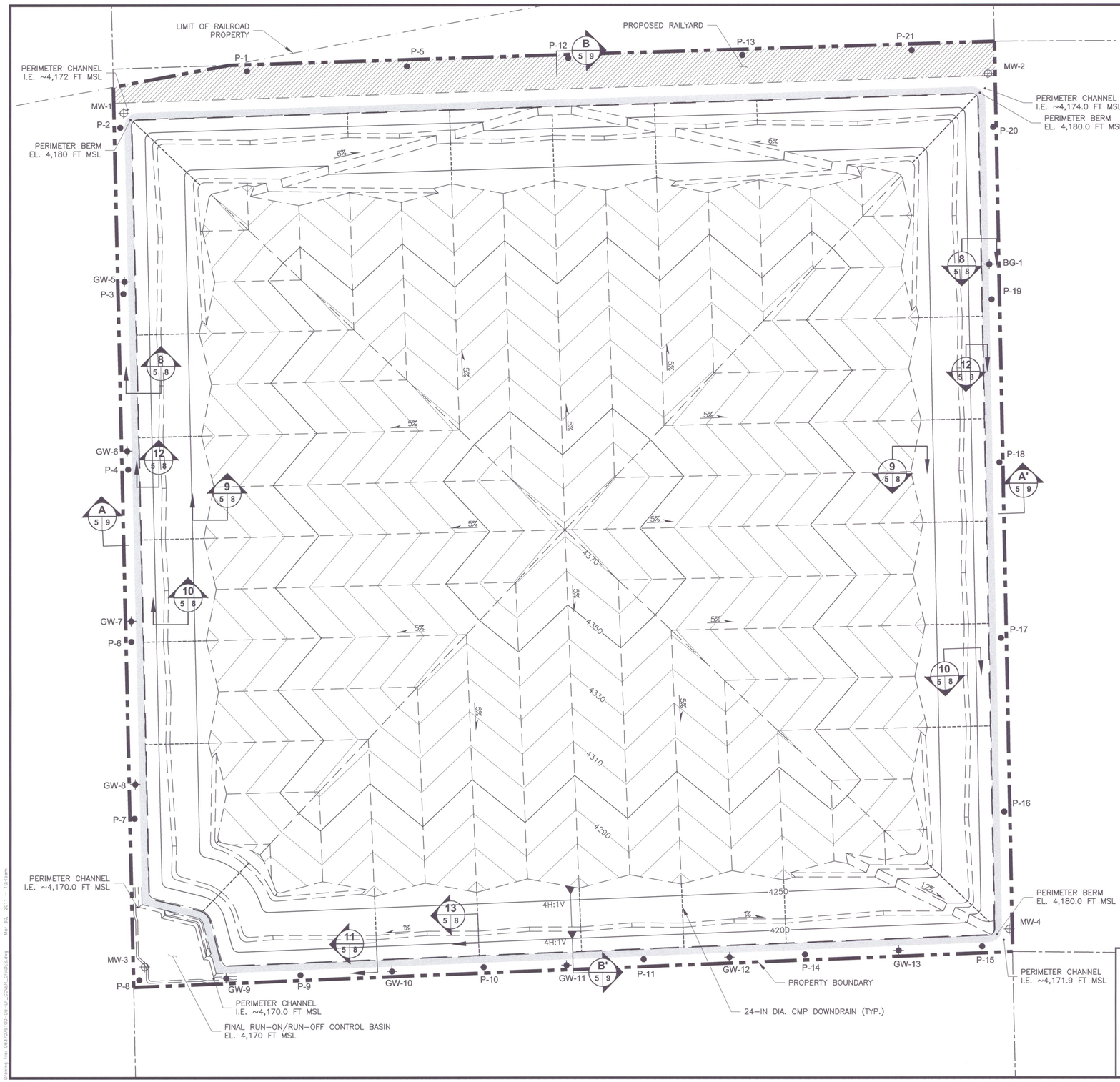
LANDFILL BASE GRADING PLAN

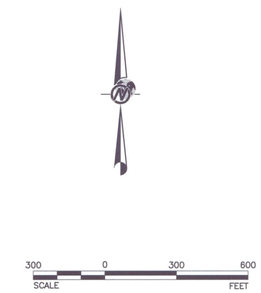
REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA
5/29/09
RICHARD E. KIEL
CIVIL
No. 08011

Golder Associates
Sacramento, CA

PROJECT No. 063-7079-100			FILE No. DWG 03 – LF Base Grades	
DESIGN	KGH	10/01/07	SCALE AS SHOWN	REV. B
CADD	JDR	03/05/08	3	
CHECK	KGH	03/06/08		
REVIEW	REK	03/08/08		

Drawing file: DWG 03 – LF Base Grades.dwg May 27, 2009 – 4:12pm





LEGEND

- PROPERTY BOUNDARY
- LIMIT OF LANDFILL
- TOP OF PERIMETER BERM
- CMP DOWNDRAIN
- MW-1 — APPROXIMATE LOCATION OF MONITORING WELLS
- P-16 — GAS PROBE AND LOCATION ID
- GW-13 — FINAL MONITORING WELL LOCAITON
- A / 3 6 — DETAIL/SECTION DESIGNATION; DRAWING WHERE SECTION/DETAIL IS LOCATED; DRAWING WHERE SECTION/DETAIL IS REFERENCED

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1	03/25/11	KGH	ADD GAS & GROUNDWATER MONITORING WELL LOCATIONS	RJS	KGH	REK
0	05/29/09	KGH	ADD RUN-ON/RUN-OFF BASIN	DBS	KGH	REK
A	03/11/08	KDH	ISSUED FOR PERMITTING	DBS	KGH	REK

PROJECT

JUNGO ROAD LANDFILL
WINNEMUCCA, HUMBOLDT COUNTY, NEVADA

TITLE

FINAL COVER GRADING PLAN

REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA
3-30-2011
RICHARD E. KIEL
CIVIL
No. 08011

Golder Associates
Sacramento, CA

PROJECT No. 063-7079-100			FILE No. DWG 05 - LF Cover Grades	
DESIGN	KGH	10/01/07	SCALE AS SHOWN	REV. D
CADD	JDR	03/05/08	5	
CHECK	KGH	03/06/08		
REVIEW	REK	03/08/08		

Drawing file: 0637079100-05-LF_COVER_GRADES.dwg Mar 30, 2011 - 10:45am

AGREEMENT OF TRUST

THIS AGREEMENT OF TRUST (the "Agreement") is entered into as of the 26th of March, 2008, by and between JUNGO LAND & INVESTMENTS, INC., a Nevada corporation (the "Grantor"), and UNION BANK OF CALIFORNIA, a national banking association (the "Trustee").

RECITALS

WHEREAS, the Nevada Division of Environmental Protection ("NDEP"), has established certain regulations applicable to the Grantor, requiring that an owner or operator of a Solid waste management facility shall provide assurance that funds will be available when needed for closure and/or post-closure care of the facility.

WHEREAS, the Grantor has elected to establish a trust to provide all or part of such financial assurance for the facilities identified herein.

WHEREAS, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this agreement, and the Trustee is willing to act as trustee.

AGREEMENT

NOW THEREFORE, the Grantor and the Trustee agree as follows:

1. **Definitions**. As used in this Agreement:

(a) The term "Grantor" means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.

(b) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee.

(c) The term "Beneficiary" means NDEP or its designee.

2. **Identification of Facilities and Cost Estimates**. This Agreement pertains to the facility and cost estimate identified on attached Schedule A.

3. **Establishment of Fund**. The Grantor and the Trustee hereby establish a trust fund (the "Fund") for the benefit of NDEP. The Grantor and the Trustee intend that no third party have access to the Fund except as herein provided. The Fund is established initially without funding, which is not required until waste is placed in the landfill. Any property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty

to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by NDEP.

4. **Payment for Closure and Post-Closure Care.** The Trustee shall make payments from the Fund as the NDEP Administrator shall direct, in writing, to provide for the payment of the costs of closure and/or post-closure care of the facilities covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by the NDEP Administrator from the Fund for closure and post-closure expenditures in such amounts as the NDEP Administrator shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as the NDEP Administrator specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

5. **Payments Comprising the Fund.** Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee.

6. **Trustee Management.** The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge its duties with respect to the trust fund solely in the interest of the Beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

(a) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a–2.(a), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State government;

(b) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal or State government; and

(c) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

Notwithstanding the foregoing, the Trustee is permitted to invest and reinvest the principal and income of the Fund in BlackRock Provident Cash Management Shares T-Fund and the Grantor shall execute and deliver to the Trustee the Trustee's standard disclosure and directive.

7. **Commingling and Investment.** The Trustee is expressly authorized in its discretion:

(a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is

eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and,

(b) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a–1 et seq., including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

8. **Express Powers of Trustee.** Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;

(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depositary even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depositary with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

(d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal or State government; and,

(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

9. **Taxes and Expenses.** All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

10. **Annual Valuation.** The Trustee shall annually, at least 30 days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the NDEP Administrator a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days prior to the anniversary date of establishment of the Fund. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and the NDEP Administrator shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

11. **Advice of Counsel.** The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

12. **Trustee Compensation.** The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

13. **Successor Trustee.** The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the NDEP Administrator, and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

14. **Instructions to the Trustee.** All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendment to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with orders, requests, and instructions which the Trustee in good faith believes have been executed on behalf of the Grantor by one or more of the persons designated on Exhibit A or any amendments thereto. All orders, requests, and instructions by the NDEP Administrator to the Trustee shall be in writing, signed by the NDEP Administrators of the Regions in which the facilities are located, or their designees, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions which the Trustee in good faith believes to have been executed and delivered by such persons. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or NDEP hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or NDEP, except as provided for herein.

15. **Notice of Nonpayment**. The Trustee shall notify the Grantor and the appropriate NDEP Administrator, by certified mail within 10 days following the expiration of the 30-day period after the anniversary of the establishment of the Trust, if no payment is received from the Grantor during that period. After the pay-in period is completed, the Trustee shall not be required to send a notice of nonpayment.

16. **Amendment of Agreement**. This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and the appropriate NDEP Administrator, or by the Trustee and the appropriate NDEP Administrator if the Grantor ceases to exist.

17. **Irrevocability and Termination**. Subject to the right of the parties to amend this Agreement as provided in Section 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and the NDEP Administrator, or by the Trustee and the NDEP Administrator, if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

18. **Immunity and Indemnification**. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or the NDEP Administrator issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

19. **Choice of Law**. This Agreement shall be administered, construed, and enforced according to the laws of the State of Nevada.

20. **Interpretation**. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed by their respective officers duly authorized as of the date first above written: The parties below certify that this Agreement is being executed in accordance with the requirements of Section 444.685 of the Nevada Administrative Code.

"Grantor"	**"Trustee"**
JUNGO LAND & INVESTMENTS, INC., a Nevada corporation	**UNION BANK OF CALIFORNIA, a national banking association**
By: Mark B. Lomeli	**By:**
Its: SVP & CFO	**Its:** Vice President

CALIFORNIA ALL PURPOSE ACKNOWLEDGMENT

STATE OF CALIFORNIA,)
COUNTY OF San Francisco

On March 27, 2008 before me, Stephanie Santiago Notary Public, personally appeared Douglas Schlafer who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/~~are~~ subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in his/~~her/their~~ authorized capacity(~~ies~~), and that by his/~~her/their~~ signature(s) on the instrument the person(~~s~~), or the entity upon behalf of which the person(s), acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

STEPHANIE SANTIAGO
Commission # 1499384
Notary Public - California
San Francisco County
My Comm. Expires Aug 6, 2008

Stephanie Santiago

Stephanie Santiago

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of California
County of San Francisco }

On March 26, 2008 (Date) before me, Roxanne L. Frye (Here Insert Name and Title of the Officer),
personally appeared Mark R Lomele (Name(s) of Signer(s)),

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

ROXANNE L. FRYE
Commission # 1757003
Notary Public - California
San Francisco County
My Comm. Expires Aug 11, 2011

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Roxanne L Frye (Signature of Notary Public)

Place Notary Seal Above

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached Document

Title or Type of Document: Agreement of Trust
Document Date: March 26, 2008 Number of Pages: 6
Signer(s) Other Than Named Above: Union Bank of California

Capacity(ies) Claimed by Signer(s)

Signer's Name: Mark R Lomele
☐ Individual
☒ Corporate Officer — Title(s): Sr. VP + CFO
☐ Partner — ☐ Limited ☐ General
☐ Attorney in Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other:
Signer Is Representing: Juneau Land & Investments Inc

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

Signer's Name:
☐ Individual
☐ Corporate Officer — Title(s):
☐ Partner — ☐ Limited ☐ General
☐ Attorney in Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other:
Signer Is Representing:

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

© 2007 National Notary Association • 9350 De Soto Ave., P.O. Box 2402 • Chatsworth, CA 91313-2402 • www.NationalNotary.org Item #5907 Reorder Call Toll-Free 1-800-876-6827

APPLICATION FOR A PERMIT TO CONSTRUCT AND OPERATE A CLASS I LANDFILL FACILITY
JUNGO DISPOSAL SITE

Humboldt County, Nevada

CLOSURE AND POSTCLOSURE MONITORING AND MAINTENANCE PLAN

Revision 2

Prepared For

Jungo Land and Investments, Inc.

Prepared by
Golder Associates Inc.
1000 Enterprise Way, Suite 190
Roseville, CA 95678
(916) 786-2424

April 2011

063-7079-200

TABLE OF CONTENTS

Section **Page**

1.0 INTRODUCTION 1
2.0 CLOSURE PLAN 1
2.1 Final Cover System 1
2.2 Postclosure Land Use 2
2.3 Environmental Monitoring and Controls 2
2.4 Closure Activities 2
2.4.1 Phased Closure 2
2.4.2 Site Security, Dismantling and Structure Removal 3
2.4.3 Final Cover Construction 3
2.5 Closure Cost Estimate 3
3.0 POSTCLOSURE PLAN 5
3.1 Monitoring and Sampling Activities 5
3.2 Operating Activities 5
3.3 Postclosure Inspection and Maintenance Activities 6
3.4 Cost Estimate 7

TABLES

Table 1 Closure Cost Estimate
Table 2 Postclosure Cost Estimate

1.0 INTRODUCTION

This Closure and Postclosure Monitoring and Maintenance Plan describe the closure and post closure requirements for the Jungo Disposal Site. In addition, closure and postclosure cost estimates are prepared to support the financial assurance funding estimates. Section 2 presents the Closure Plan. Section 3 presents the Postclosure Monitoring Maintenance Plan.

2.0 CLOSURE PLAN

At closure the Jungo Disposal Site Landfill will measure approximately 560-acres in area and contain approximately 57.1 million tons (104 mcy) of refuse. The maximum side-slope inclination is 4H:1V (horizontal to vertical); the maximum elevation is 4,375 feet mean sea level (msl), or approximately 200 feet above the surrounding ground surface. The top deck of the landfill will be graded at 5 percent to accommodate postclosure settlements and maintain positive drainage.

In accordance with NAC 444.6892, JLII will provide notice to the solid waste authority of the intent to close the landfill within 15 days of initiating closure. Landfill closure activities will begin within 30 days of the receipt of the final refuse shipment. Landfill closure will be completed within 180 days of the date closure activities are initiated, unless the solid waste management authority grants a schedule extension (NAC 444.6892.3).

2.1 Final Cover System

A final cover system will be constructed over the waste at the Jungo Disposal Site as part of the closure activities. The primary functions of the final cover system are to:

- Isolate the waste from the environment;
- Control odors, vectors and litter;
- Control surface water infiltration into the landfill;
- Control erosion and run-on (if any), and convey run-off to the surface water management system; and
- Control landfill gas.

The prescriptive cover system (NAC 444.6891) requires a minimum 6-inch thick erosion layer underlain by minimum 18-inch thick infiltration layer. In addition, the permeability of the cover shall be equal to or less than $1x10^{-5}$ cm/s or less than the permeability of any component of the bottom liner, whichever is less.

The final cover system for the Jungo Disposal Site consists of the following components:

- A minimum 2-foot thick vegetative soil layer;
- A geocomposite drainage layer;
- A 60-mil HDPE geomembrane layer (textured on both sides); and
- A one-foot thick foundation layer.

The Jungo Cover System uses a vegetated, 2-foot thick erosion layer in place of the minimum 6-inch thick erosion layer. In addition, a geocomposite drainage layer, 60-mil HDPE geomembrane and a one-foot thick foundation layer are substituted for the minimum 18-inch thick infiltration layer. These

modifications are necessary to result in a cover system that is no more permeable than the bottom liner in accordance with NAC 444.6891(a) (i.e. install low-permeability geomembrane component) and to establish an erosion resistant layer over the geomembrane layer that is capable of supporting the growth of native plants per NAC 444.6891(b).

The site will have a landfill gas collection system fully installed prior to closure. Therefore, closure construction requirements for the landfill gas collection system are limited to activities integrating the landfill gas extraction wells and piping into the closure cover design. Integration of gas controls with a closure cover system is routinely completed and standard conceptual design details are included in ***Volume II***.

At closure, drainage will be conveyed along the top deck and intermediate slope benches to down-drains located along the sides of the landfill. The down-drain pipes will be fitted with diffuser tees at the discharge ends to dissipate high velocity hydraulic energy before discharging to the perimeter channels. Run-off will then be conveyed off-site where it will eventually collect in shallow depressions until it evaporates or infiltrates into the underlying soils similar to the existing surface water conditions in the site vicinity. ***Appendix J*** of the ***Report of Design (Volume I)*** presents conceptual drainage calculations to verify that the above conceptual drainage facilities are designed to accommodate a 25-year, 24-hour precipitation event as required by NAC 444.6885.

2.2 Postclosure Land Use

The postclosure end use of the site will be undeveloped open space, which is consistent with surrounding terrain and land uses. The site is planned to be maintained as secured non-irrigated open space and the closed landfill will be designed to reduce health and safety impacts with proper site security fencing and access control.

After closure, JLII will record a notation on the deed that the land has been used as a landfill and that the land is restricted to prevent disturbance of the final cover, liner system, or other containment controls unless necessary to comply with the requirements of NAC 444.570 to 444.7499. JLII will notify NDEP of the completion of the deed notion.

2.3 Environmental Monitoring and Controls

Environmental monitoring and controls will consist of leachate monitoring, groundwater monitoring and landfill gas monitoring. The leachate sumps, groundwater monitoring network, and landfill gas monitoring network will be installed as the site is developed, and therefore, they will be fully installed prior to the closure of the last landfill cell. No additional environmental monitoring and control systems will be installed at closure. However, these systems will be operated and maintained as discussed in Section 3.

2.4 Closure Activities

2.4.1 Phased Closure

Closure will be completed in phases as the site is developed. Generally, closure activities will occur in areas where the final grades have been achieved for a period of at least 5 years. This will allow the largest waste settlements to occur prior to closure, and therefore, reduce postclosure settlement impacts. Based on this phased closure approach, the maximum extent of closure at any point in time is estimated to be 205-acres or less.

For each closure phase, NDEP will be contacted and will review and approve the partial closure as it is completed.

2.4.2 Site Security, Dismantling and Structure Removal

JLII will provide site security upon closure. Site security will include:

- Proper signs posted at all points of access;
- Access will be controlled by locked gates at all access points around the perimeter; and
- Fencing will be maintained around the entire site.

The operating facilities (office and maintenance shop) and operating equipment will be removed from the site at the time the final phase of closure is completed.

2.4.3 Final Cover Construction

A final cover will be constructed as part of the closure activities. The final cover, as described in Section 2.1, is a prescriptive composite cover system. Prior to completing closure construction, construction plans, technical specifications, and a construction quality assurance plan will be prepared and submitted to the Nevada Department of Environmental Protection (NDEP) for review.

Construction Quality Assurance (CQA) will be completed during the closure activities to ensure that the construction complies with the closure design plans and specifications. Following closure construction, a closure certification report will be prepared and submitted to provide documentation that the closure activities were completed in accordance with the design plans and applicable federal and state regulations. A Nevada registered civil engineer will supervise CQA activities and certify the closure report.

Typical CQA activities will include, but are not limited to the following:

- Verifying the materials, thickness and compaction of the foundation layer;
- Observation and inspection of the geosynthetic materials for conformance with the engineering plans and specifications;
- Conformance testing of soil and geosynthetic materials;
- Documentation of construction procedures, and identification and resolution of construction problems; and
- Preparation of a CQA report providing documentation that the closure activities and construction complied with the project plans and specifications.

2.5 Closure Cost Estimate

Table 1 summarizes the closure cost estimate representing the maximum closure costs at any point during site development. Key cost assumptions include:

- Environmental controls are installed prior to closure; and
- The maximum extent of closure at any point in time is 205-acres or less, including the first phase of closure

Closure funding will be based on the proportion of the volume of waste disposed to the final refuse volume. In addition, the closure funding will be established prior to the construction of each phase of the base liner system.

3.0 POSTCLOSURE PLAN

JLII will implement postclosure monitoring and maintenance of Jungo Disposal Site, which will be performed for a period of 30 years following closure. Postclosure activities will consist of the following:

- Groundwater, leachate, surface water, and landfill gas monitoring;
- Operation of leachate collection and disposal controls and the landfill gas collection and disposal system; and
- Inspection and repair of the final cover system and other environmental controls.

These postclosure activities are described in further detail in Sections 3.1 through 3.3. Section 3.4 summarizes the postclosure monitoring and maintenance cost estimate.

Prior to implementing final closure, the Jungo Disposal Site emergency response plan will be updated and include JLII emergency contact information, local emergency contact information, and NDEP emergency contacts. Written notification of unusual incidents or occurrences observed during inspections will be provided to NDEP regarding such events as; vandalism, fires, explosions, earthquakes, surface drainage problems; and other incidents involving or potentially threatening waste releases.

3.1 Monitoring and Sampling Activities

Monitoring and sampling activities include leachate, groundwater, and landfill gas. Sampling and analysis of groundwater and gas will be performed on a semi-annual basis. Leachate monitoring at the sumps will be performed at least semi-annually. If necessary, more frequent monitoring of leachate will be completed to ensure leachate is managed to prevent accumulation of leachate to a depth of more than one foot on the liner system.

If after 5 years of closure, there are no reported groundwater releases or accumulation of leachate, the monitoring frequency will be reduced to annual. If after 10 years of closure, there continues to be no groundwater release or leachate accumulation, the monitoring frequency will be further reduced to every other year.

Based on the landfill design, the groundwater monitoring plan (Appendix D), and landfill gas monitoring plan (Appendix D), the monitoring system will include the following:

- 10 Leachate Sumps;
- 14 Permanent Groundwater Monitoring Wells and 4 Interim Groundwater Wells; and
- 21 Landfill Gas Monitoring Probes.

Postclosure groundwater monitoring and landfill gas monitoring will follow the procedures described in Appendix D, except that the frequency will be reduced from a quarterly basis to a semi-annual basis.

3.2 Operating Activities

A landfill gas extraction and disposal system will be operated until landfill gas generation rates no longer support the gas extraction and disposal system. For cost estimating purposes, it is assumed that landfill gas will be collected and disposed of using a series of landfill gas flares. Landfills generate

methane gas, which in many cases can be used to generate electricity. JLII will investigate the feasibility of such Waste-To-Energy (WTE) uses during operations. However, until WTE is determined to be feasible for the Jungo Disposal Site, a flare disposal system is conservatively assumed in the postclosure monitoring and maintenance cost estimate.

Leachate will be monitored at the sumps, and if liquids pond to depths of about 6-inches or more, they will be extracted. If necessary, an approximately 0.5-acre, double-lined (HDPE geomembrane) evaporation pond will be constructed on north side of the landfill to accommodate leachate. The pond also will be used to dispose and evaporate landfill gas condensate.

An evaporation pond may not be required. Due to the arid environment, a very limited amount of leachate (or no leachate) is expected to be generated during operations, when leachate generation rates are the greatest. A study by the U.S. Environmental Protection Agency (USEPA, 2002) indicates that leachate generation in landfills typically reduces to 10 percent of the leachate generation rate during operations after about 4 years following closure. Within 10 years following closure, leachate generation rates are near zero. Therefore, leachate generation should be negligible for the Jungo Disposal Site following closure.

The site will implement closure in phases and JLII will be able to monitor the impact of closure on leachate generation rates during the site development. This will allow JLII to refine the leachate disposal needs prior to the closure of the last cell.

3.3 Postclosure Inspection and Maintenance Activities

Postclosure inspection and maintenance activities will include the final cover, the site drainage system, environmental controls, and security system as described below.

In the first 5 years, when most settlement is predicted to occur, the final cover will be inspected semi-annually and annual topographic surveys completed to confirm that the final cover continues to function as an infiltration barrier and meets required grades. If the final cover meets grades after 5 years, the inspection frequency will be reduced to every other year with a topographic survey completed every four years.

Visual inspections will be performed by qualified personnel to verify the integrity of the final cover. The cover will be inspected for signs of settlement and subsidence, erosion, cracking or other items that could adversely affect the integrity and effectiveness of the final cover. Items requiring corrective action will be repaired as soon as feasible.

Some minor differential settlement is expected at every landfill. Minor settlement can create relatively small depressions on a landfill surface where water will pond. At the Jungo Disposal Site, repair of such depressions will be completed in one of the following ways:

- Small depressions (less than 10 feet by 10 feet in plan area and which do not drain) will be filled with soil to promote positive surface drainage.
- Larger depressions (greater than 10 feet by 10 feet in plan area) will be excavated to remove the cover system components above the foundation layer. Additional foundation soils will be added as necessary to establish suitable drainage grades. The overlying cover components will be replaced using the existing cover materials or new materials as may be necessary. The replaced materials will be constructed in compliance with the original closure engineering plans, specifications, and CQA plan.

Appendix I (Report of Design, Volume I) presents the results of settlement analyses that were completed to evaluate the effects of postclosure settlement on the final cover grades. The results of these analyses indicated that the proposed grades are sufficient to accommodate the anticipated post-closure settlement and still provide adequate drainage. In addition, because the phased closure approach will be generally implemented in areas of the landfill where final grades have been established for at least five (5) years, postclosure settlement impacts on the final cover should be limited.

Additional inspection activities include:

- The vegetative cover will be inspected for signs of erosion, degradation, and areas that lack vegetative growth. Items requiring corrective action will be repaired as soon as feasible. The postclosure maintenance costs provided in Section 3.4 assume that reseeding will be completed for an average of 25 acres per year.
- The surface drainage controls will be inspected annually for evidence of damage, excessive erosion, settlement, and obstruction by debris. The effectiveness of the surface water drainage ditches will be maintained by keeping the ditches, down-drains, and culverts clear of debris, excess soils and excess vegetation. Repairs to the structures will be made if the inspections reveal excessive damage to the ditches, down-drains and culverts. In addition, regrading will be performed as necessary to maintain positive drainage.
- As part of the periodic sampling program, the groundwater wells, leachate riser pipes, and landfill gas probes will be inspected for damage. Well heads, locks, caps, sampling ports and/or tubes that appear damaged or excessively worn will be identified and replaced.
- All locks, gates, signs, and fences will be inspected on an annual basis. Any damage to the security system due to vandalism, trespassing, or natural wear and tear will be immediately repaired and/or replaced. Signs will be repainted or replaced on an as-needed basis to maintain their visibility.

3.4 Cost Estimate

Table 2 presents a 30-year postclosure maintenance cost estimate for Jungo Disposal Site. JLII will establish a postclosure maintenance fund prior to developing landfill disposal modules. The postclosure maintenance costs and fund are reviewed and updated annually.

The current cost estimate for postclosure maintenance of the Jungo Disposal Site is based upon information presented in this report and includes an area of approximately 350-acres, which is the largest area of the landfill under the 30-year postclosure area at one time. The following key assumptions were made in compiling these estimates:

- Environmental monitoring costs are based on the projected number of sampling points and testing described in the monitoring plan (Section 3) with semi-annual monitoring by a third party.
- On average, about 20-acres of the cover will require reseeding each year;
- Inspections are completed annually;
- Landfill gas operation and maintenance will occur throughout the entire 30-year postclosure period.

As indicated in ***Table 2***, the projected annual postclosure maintenance cost is approximately $417,000/year.

TABLE 1
CLOSURE COST ESTIMATE

INITIAL 25-ACRE CELL

Item	Unit	Unit Cost	Quantity	Total
1. Final Soil Cover[1]				
a. Foundation Layer	cy	$ 3.00	41,000	$ 123,000
b. Vegetative Layer	cy	$ 3.00	82,000	$ 246,000
2. Geosynthetic Layers[1]				
a. Geomembrane (60 mil HDPE)	sf	$ 0.70	1,100,000	$ 770,000
b. Geocomposite drainage layer	sf	$ 0.70	1,100,000	$ 770,000
3. Design/CQA				
a. Design, plans, specifications	ls	$ 50,000	1	$ 50,000
b. CQA	acre	$ 5,000	25.3	$ 126,263
4. Revegetation	acre	$ 1,000	25.3	$ 25,253
5. Gas Control		$ -	-	$ -
6. Drainage Structures				
a. CMP and drop inlets	lf	$ 25	800	$ 20,000
b. V-ditches	lf	$ 2	800	$ 1,600
7. Closure Survey, Settlement Monuments	ls	$ 2,500	1	$ 2,500
			Total	$ 2,134,615

Notes

1. Cover Profile - 1 Ft Foundation L; Geomembrane, Geocomposite, 2 Ft Vegetative Layer.
2. Active gas control not required for initial cell.

MAXIMUM PROJECTED CLOSURE AREA - 205 ACRES

Item	Unit	Unit Cost	Quantity	Total
1. Final Soil Cover[1]				
a. Foundation Layer	cy	$ 3.00	330,733	$ 992,200
b. Vegetative Layer	cy	$ 3.00	661,467	$ 1,984,400
2. Geosynthetic Layers[1]				
a. Geomembrane (60 mil HDPE)	sf	$ 0.50	8,929,800	$ 4,464,900
b. Geocomposite drainage layer	sf	$ 0.58	8,929,800	$ 5,179,284
3. Design/CQA				
a. Design, plans, specifications	ls	$ 100,000	1	$ 100,000
b. CQA	acre	$ 5,000	205.0	$ 1,025,000
4. Revegetation	acre	$ 1,000	205.0	$ 205,000
5. Gas Control				
LFG Control System	/ac	$ 15,000	205.0	$ 3,075,000
Flare and upgrades	ea	$1,000,000	1.0	$ 1,000,000
6. Drainage Structures				
a. CMP and drop inlets	lf	$ 25	7,000	$ 175,000
b. V-ditches	lf	$ 2	20,000	$ 40,000
7. Closure Survey, Settlement Monuments	ls	$ 10,000	1	$ 10,000
			Total	$ 18,250,784

Notes

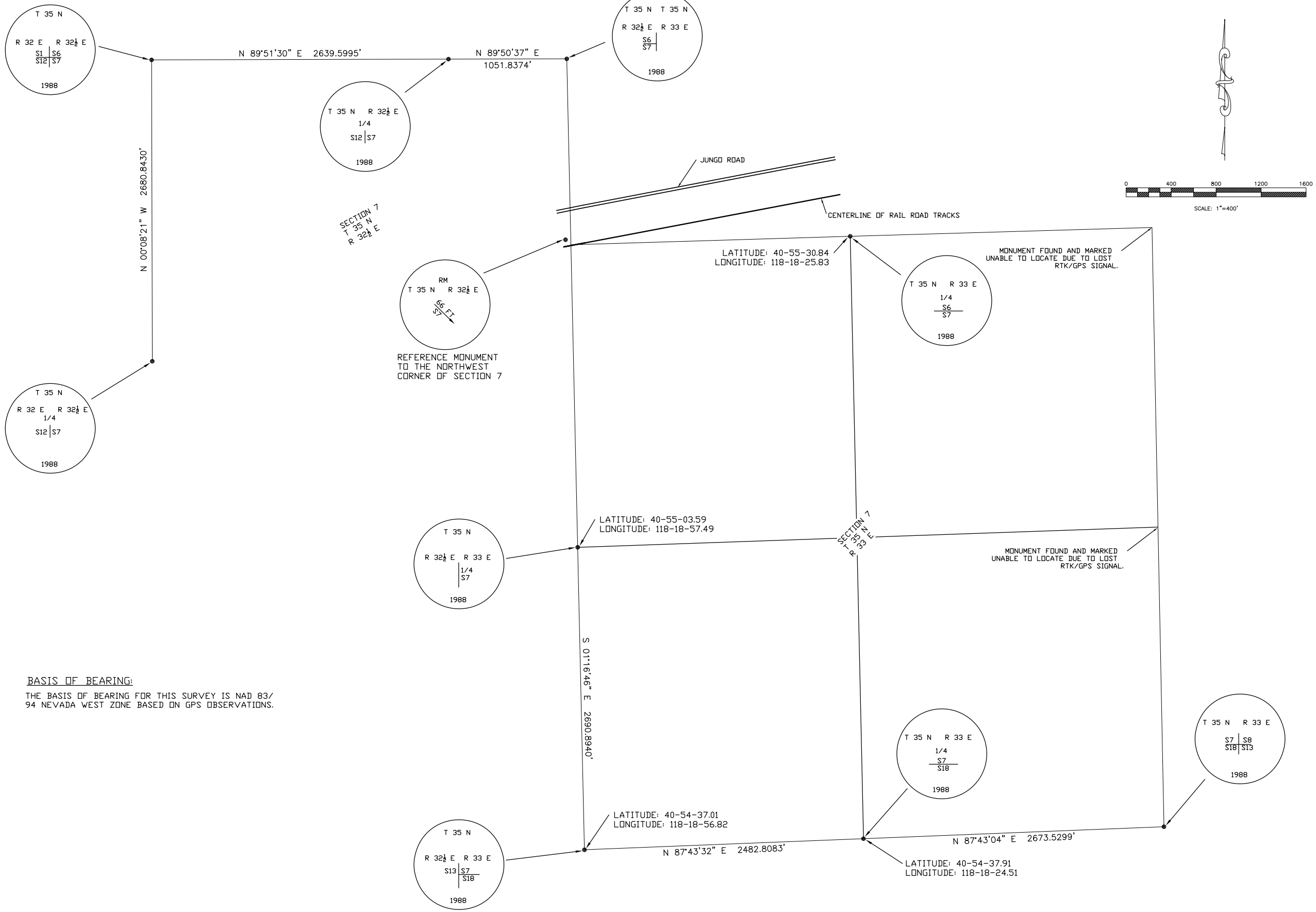
1. Cover Profile - 1 Ft Foundation L; Clay, Geomembrane, Geocomposite, 2 Ft Vegetative Layer.
2. Includes additional flare installed for closure. Other flares assumed to be installed during operations.

TABLE 2
POST-CLOSURE MONITORING AND MAINTENANCE COST ESTIMATE

Item	Unit	Unit Cost	Annual Quantity	Total
1. Vegetation Maintenance	acre	$ 250	55.0	$ 13,750
2. Leachate - Sampling and Testing, O&M	annually	$ 5,000	1	$ 5,000
3. Landfill Gas Monitoring/Maintenance	annually	$ 215,000	1	$ 215,000
5. Groundwater Monitoring/Maintenance	annually	$ 50,000	1	$ 50,000
6. Surface Water Monitoring/Maintenance	annually	$ 5,000	1	$ 5,000
7. Drainage/Cover Maintenance	annually	$ 125,000	1	$ 125,000
8. Security Maintenance	annually	$ 1,000	1	$ 1,000
9. Inspections	annually	$ 2,000	1	$ 2,000
				$ -
			Total Annual Cost	$ 416,750
			Annual Cost/acre	$ 738
			Total Annual Cost x 30 yrs	$12,502,500

Notes

1. Postclosure costs are projected at full build-out.



BASIS OF BEARING:

THE BASIS OF BEARING FOR THIS SURVEY IS NAD 83/ 94 NEVADA WEST ZONE BASED ON GPS OBSERVATIONS.

REVISION NO.	DATE	REVISION DESCRIPTION	CHECKED	APPROVED

SCALE: 1"=NTS
DRAWN BY: CDC
DESIGN BY: ——
CHECKED BY: CDC
DATE: 12-04-2006
JOB NO: 2000948

SURVEY
FOR
GOLDER ASSOCIATES

BOUNDARY
OF
SECTION 7, T. 35 N., R. 33 E.

SIERRA SURVEYING, INC.
655 HOLCOMB AVENUE
RENO, NEVADA 89502
TELEPHONE: (775) 828-5004
FAX: (775) 337-0313

SHEET 1 of 1

APPLICATION FOR A PERMIT TO CONSTRUCT AND OPERATE A CLASS I LANDFILL FACILITY

MONITORING PLAN

REVISION 3

JUNGO DISPOSAL SITE
Humboldt County, Nevada

Submitted To: Jungo Land and Investments, Inc.

Submitted By: Golder Associates Inc.
1000 Enterprise Way, Suite 190
Roseville, Ca 95678
916-786-2424

Golder Associates Inc.

Kris Johnson
Senior Consultant, P.G.

Ken Haskell
Principal/Practice Leader

March 2011

063-7079-100

A world of capabilities delivered locally

Golder Associates

Table of Contents

1.0 INTRODUCTION 1
1.1 Location and Setting 1
1.2 Monitoring Program 1
2.0 GROUNDWATER MONITORING NETWORK 3
2.1 Groundwater Monitoring Network Expansion 3
3.0 WATER SAMPLING PROCEDURES 5
3.1.1 Sample Collection 5
3.1.1.1 Equipment Cleaning 5
3.1.1.2 Well Purging 6
3.1.1.3 Well Sampling 6
3.1.2 Sample Preservation and Shipment 7
3.1.3 Sample Documentation 7
3.1.3.1 Water Sample Field Data Sheets 7
3.1.3.2 Labels 8
3.1.3.3 Sampling and Analysis Chain-of-Custody Record 8
3.1.4 Field Quality Assurance Procedures 8
3.1.5 Monitoring Frequency 9
3.1.6 Groundwater Level and Total Depth Survey 9
4.0 LABORATORY ANALYTICAL PROCEDURES 10
4.1.1 Water Quality Parameters 10
4.2 Methods 10
4.3 Quality Assurance 10
4.4 Data Evaluation 11
4.4.1 Data Review and Validation 11
4.4.2 Statistical Analysis 12
5.0 DETECTION MONITORING 13
5.1.1 Assessment Monitoring and Corrective Measures 13
6.0 LANDFILL GAS MONITORING 15
7.0 LEACHATE MONITORING 16

List of Tables

Table 1 Monitoring Well Construction Details
Table 2 Monitoring Parameters and Methods

List of Figures

Figure 1 Site Groundwater Contour Map
Figure 2 Groundwater Monitoring Network
Figure 3 Landfill Gas Monitoring Network
Figure 4 Landfill Gas Monitoring Probe Detail

1.0 INTRODUCTION

Environmental monitoring will be completed during the development of the Jungo Disposal Site and following closure. Environmental monitoring will include groundwater monitoring, leachate monitoring, and landfill gas monitoring. Surface water monitoring will not be completed because there is no nearby surface water body. However, storm water monitoring will be completed in accordance with NPDES requirements.

1.1 Location and Setting

The proposed Facility is located in the southern portion of Desert Valley, south of the groundwater divide that bisects the valley. The regional groundwater flow direction in the vicinity of the site has been documented to be toward the southwest (Berger, 1995), which is consistent with recent data collected from the site. In the five exploratory borings drilled at the site in January 2007, groundwater was encountered at a depth of approximately 60 feet below ground surface (4,105 to 4,115 ft MSL). No perched saturated zones were encountered above this depth. The thickness of the first-encountered water-bearing zone ranged from approximately 10 to 30 feet. Groundwater was found to occur most frequently in sand and silty sand/sandy silt units.

1.2 Monitoring Program

The monitoring plan focuses on detecting potential releases from the landfill. However, there are no nearby off-site groundwater wells that would be impacted by a release from the site. There are no municipal water wells within 10 miles of the site. The nearest groundwater well is used for agricultural purposes and is located more than one mile northeast of and upgradient from the landfill site.

This monitoring plan complies with the requirements of the Nevada Administrative Code (NAC) Chapter 444 Section 683 and the Code of Federal Regulations (40 CFR), Parts 258.51 and 258.53. The protocols outlined in this monitoring plan will serve as the basis for implementing the Facility's groundwater detection monitoring program, and for any subsequent assessment or corrective action monitoring, should it be required. This plan is designed to be protective of human health and the environment. As additional data is obtained through future site investigations and routine monitoring, or if changes in regional groundwater conditions are identified, it may be appropriate to revise and/or update this plan to ensure that it provides an effective and efficient means of monitoring groundwater quality in the vicinity of the disposal Facility.

The sampling and laboratory procedures proposed for groundwater monitoring at the Facility to ensure monitoring results representative of background and downgradient water quality are detailed in this plan. Included with these procedures are the required monitoring parameters, frequency of monitoring, and QC specifications for both field and laboratory activities. The proposed methods for data verification and statistical evaluation also are described.

The monitoring program will consist of three phases:

- Phase 1 – Initial Detection Groundwater Monitoring
- Phase 2 – Leachate Monitoring
- Phase 3 – Re-evaluation of the initial Phase 1 detection monitoring parameters

Phase 1 will be the initial groundwater monitoring program for the site. Monitoring wells will be sampled for 12 consecutive quarters for an alternative parameter list established under NAC 444.7487. Phase 1 will also include biennial sampling of groundwater monitoring wells for parameters listed in *Appendix II to Part 258 – List of Hazardous Inorganic and Organic Constituents*. Within 180 days of the conclusion of the 12 quarters of monitoring, statistical analysis required by NAC 444.7485 will be submitted.

Phase 2 monitoring includes sampling/monitoring of the landfill leachate sumps to determine the most appropriate detection monitoring parameters. Once leachate is detected in a leachate collection sump, the leachate will be sampled for 12 consecutive quarters for the parameters listed in *Appendix II to Part 258 – List of Hazardous Inorganic and Organic Constituents* and *Appendix A to Part 423 – Priority Pollutants List*. Within 180 days of the conclusion of the 12 quarters of leachate monitoring, an evaluation of the consistently detected compounds will be submitted, and a list of reliable groundwater detection parameters will be provided for inclusion into the Detection Monitoring Program.

Phase 3 involves submitting a re-evaluation of the initial Phase 1 monitoring parameters after 8 quarters of groundwater monitoring.

2.0 GROUNDWATER MONITORING NETWORK

This groundwater monitoring plan includes a description of the existing groundwater monitoring network (wells MW-1 through MW-4) as well as the conceptual expansion of the groundwater monitoring network as the area of waste placement extends laterally from the northeastern corner of the Facility.

A description of the current groundwater monitoring network and its appropriateness is provided in this section. Establishment of this initial monitoring network has been based on research of the Desert Valley basin hydrogeology and field investigations conducted at the site. The strategy for augmenting the network to maintain its effectiveness as the Facility expands over time is discussed.

Four of the five exploratory borings completed at the site were converted to groundwater monitoring wells, which comprise the current monitoring network (MW-1 through MW-4). The wells are located at the four corners of the site boundaries. Based on hydrogeologic conditions observed at the site, the wells were constructed to monitor appropriate locations and depths and to yield representative groundwater samples from the uppermost aquifer. A summary of well construction details is provided in ***Table 1.*** The well network and direction of groundwater flow are shown in ***Figure 1***.

Samples collected from these wells, prior to construction of the Facility, are providing background groundwater quality data, both upgradient of the proposed Facility site and at the boundary of the waste unit. Once waste placement commences, well MW-2 will be designated as a hydraulically-upgradient background well based on the groundwater flow direction determined from the field investigation (Section 2.1.5.2 Report of Design). Wells MW-1, MW-3, and MW-4 will be designated as detection monitoring wells, as they are located adjacent to the downgradient boundaries of the waste management unit. To provide for both pooled data (i.e. two sets of background data) and additional spatial information for integration into the background data, an additional background monitoring well will be installed along the northeastern (upgradient) Facility boundary (see well location BG-1 on ***Figure 2***). This additional background well will be installed at least one year prior to waste placement to allow for the completion of at least 4 separate sampling and testing events to establish background water quality conditions.

The interim groundwater monitoring system is established in accordance with NAC 444.7483. As required, the system at the proposed Facility currently consists of a sufficient number of wells installed at appropriate locations and depths to yield samples of groundwater from the uppermost aquifer. Details of the site hydrogeological setting, including lithology and stratigraphy of the basin deposits, estimates of hydraulic conductivity and effective porosities, and the direction / velocity of groundwater have been described in Section 2.1 of the Report of Design.

2.1 Groundwater Monitoring Network Expansion

As the waste modules at the Facility are filled over time, the monitoring network will be expanded to maintain the effectiveness of the monitoring program. The proposed waste fill sequence plan specifies

initial waste placement in the northeastern corner, with subsequent cell construction and filling occurring from the northeastern corner toward the southwestern corner. Cell construction also will occur toward the west to allow for stable and efficient waste filling, though the primary direction of waste placement will proceed toward the south.

Initially, prior to the placement of waste at the landfill, four groundwater monitoring wells will be installed along the downgradient edge of the northeastern quarter of the landfill (***Figure 2***). The northwestern two wells (GW-1 and GW-2) will be installed downgradient of the two initial landfill leachate sumps, and the two southern wells (GW-3 and GW-4) will be installed at a similar well spacing downgradient of the remainder of the northeastern portion of the landfill. These wells will be located within the future landfill footprint and will be properly abandoned prior to landfill construction at each location. Based on the current development plan, the two northwestern wells and the western-most southern well (GW-1, GW-2, and GW-3) will be active for at least the first 25 years of landfill operation. The fourth well (GW-4) is located within the 10 year to 25 year landfill footprint, and will likely need to be destroyed during that time. After 25 years, the need for additional interim monitoring wells can be assessed as the landfill development proceeds.

As additional landfill cells are constructed to the south and west of the initial wells, groundwater monitoring wells will be installed along the southern and western boundary, directly adjacent to and downgradient of the waste modules (wells G-5 through G-13 on ***Figure 2***). These wells will comprise the final monitoring well network for the Facility, and will be installed incrementally to provide coverage downgradient of the additional landfill cells. A well spacing of approximately 950 feet is proposed as shown on ***Figure 2***. Monitoring wells along the southern boundary of the Facility will be installed directly downgradient of the leachate sumps. A leachate sump is the most likely location for landfill leakage, due to the flow of leachate toward the sump and the accumulation of leachate in the sump.

3.0 WATER SAMPLING PROCEDURES

An accurate representation of background and downgradient water quality will be obtained from the samples from the monitoring wells which were installed in accordance with NAC 444.7483. The methods and procedures for groundwater sampling are described below. These procedures for groundwater sampling are designed to provide consistent and reproducible results and ensure that the overall objectives of the monitoring program are achieved. As required by NAC 444.7484 (1), documentation for the sampling and analytical program is hereby placed in the operating record, and includes procedures and techniques for: 1) sample collection, preservation, and shipment; b) analytical procedures; c) chain-of-custody control; and d) quality assurance (QA) and quality control (QC). The following documents have been used as guidelines for the development of these procedures:

- Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities (EPA-530/SW-611, August 1977)
- RCRA Groundwater Monitoring Technical Enforcement Guidance Document (OSWER 9950.1, September 1986)
- Standard Guide for Sampling Groundwater Monitoring Wells (ASTM, D 4448-85a)
- Standard Practice for Decontamination of Field Equipment Used at Non-radioactive Waste Sites (ASTM, D 5088-90)
- Standard Test Method for Determining Subsurface Liquid Levels in a Borehole or Monitoring Well (Observation Well) (ASTM, D 4750-87)
- Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (EPA SW-846, Base Manual [3rd edition, November 1986], through Update III [June 1997]).

Pursuant to requirements of NAC 444.7484 (subsections 2 and 3) the procedures outlined below are appropriate for groundwater sampling and will accurately measure all required constituents. These procedures are considered protective of human health and the environment.

3.1 Sample Collection

Sample collection procedures include equipment cleaning, well purging, and sampling are described in the following sections.

3.1.1 Equipment Cleaning

Before the sampling event, all equipment that is placed in the well or comes in contact with groundwater is disassembled and cleaned thoroughly with detergent water, and then steam cleaned or rinsed with de-ionized water. Any parts that may absorb contaminants, such as plastic pump valves, bladders, etc., are cleaned or replaced.

For electric submersible pumps used for purging wells, all external pump surfaces and the discharge tube are steam cleaned prior to lowering the pump into the well casing. An aqueous solution of Liquinox (phosphate-free detergent), followed by de-ionized water, is then run through the pump and discharge

tubing to clean internal surfaces. Water is prevented from draining back though the pump by an in-line check valve located immediately above the pump.

3.1.2 Well Purging

Before sampling, standing water in the casing and sand pack is purged from the monitoring well using either a positive displacement polyvinyl chloride (PVC) hand pump, a portable or dedicated electric submersible pump, a PVC or polyethylene bailer, a centrifugal pump, a dedicated pneumatic bladder pump, or a peristaltic pump. Field measurements for pH, specific conductance, turbidity, and temperature are recorded at casing volume intervals during purging on water sample field data sheets. The field measurements are used as indicator parameters to determine when a representative sample can be taken. Purging is generally performed until stabilization (± 10 percent variation) of the indicator parameters takes place. If a well dries during purging, it will be allowed to recharge for up to 24 hours; samples will be collected as soon as sufficient volume is available. If a well does not recharge sufficiently within 24 hours, the well will be considered dry for that sampling event.

Once detection monitoring commences, all purge water will be containerized on site pending analytical results. Purge water will then be disposed of in accordance with applicable local, state, and federal regulatory requirements.

3.1.3 Well Sampling

Groundwater samples are collected using a Teflon bailer, an individually sealed disposable polyethylene bailer, a dedicated electric submersible or pneumatic bladder pump, or in-line through a peristaltic pump with clean tubing. Wells are sampled in progression from "clean wells" to wells yielding poorer-quality water. The purpose of this procedure is to reduce the potential for cross contamination of wells by purging or sampling equipment.

Clean glass bottles of at least 40 milliliters volume fitted with Teflon-lined septa are used to collect samples for volatile organic analyses. These bottles are completely filled to prevent air from remaining in the bottle. A positive meniscus forms when the bottle is completely full. A convex Teflon®-lined septum is placed over the positive meniscus to eliminate air. After capping, the bottles are inverted and tapped to verify that they do not contain air bubbles. The sample containers for other parameters are filled, filtered as required, and capped.

If dissolved concentrations of metals are required, appropriate field filtration techniques are used. When using a bailer for sampling, a transfer vessel is filled with sample and fitted with a disposable 0.45-micron acrylic copolymer filter. Air pressure is applied to the transfer vessel forcing the sample through the filter; the filtrate is then directed into the appropriate containers. If a pump is used for sampling, the filter is placed in-line at the end of the discharge tubing and the filtrate directed into the appropriate containers. Each filter is used once and discarded.

3.2 Sample Preservation and Shipment

Sample containers and preservatives vary with each type of analytical parameter. Container types and materials are selected to be non-reactive with the particular analytical parameter tested. Sample preservatives used are consistent with regulatory guidelines and specified analytical methods.

All sample containers are labeled immediately following collection. Samples are kept cool with blue ice until received by the laboratory. At the time of sampling, each sample is logged on a chain-of-custody record, which accompanies the samples to the laboratory. Water samples are transported from the site by the sampler to a state-certified laboratory facility or to a secure interim shipping location.

Upon receipt of the samples by laboratory personnel, the chain-of-custody record is signed and released, and a unique sample identification number is assigned to each sample container. This number is recorded on the chain-of-custody record and is used to identify the sample in all subsequent internal chain-of-custody and analytical records. The manager of the subcontracted laboratory ensures that the holding times for requested analyses are not exceeded.

3.3 Sample Documentation

The following procedures are used during sampling and analysis to provide chain of custody control during sample handling from collection through storage. Sample documentation includes the use of the following:

- Water sample field data sheets to document sampling activities in the field
- Labels to identify individual samples
- Chain-of-custody record sheets for documenting possession and transfer of samples

3.3.1 Water Sample Field Data Sheets

In the field, the sampler records the following information on a water sample field data sheet:

- Location
- Project number
- Client name
- Sample ID
- Name of sampler
- Regulatory agency
- Date and time
- Pertinent well data (e.g., casing diameter, depth to water, well depth)
- Calculated and actual purge volumes
- Purging equipment used
- Sampling equipment used

- Appearance of sample (e.g., color, turbidity, sediment)
- Results of field analyses (e.g., temperature, pH, specific conductance)
- Purge water containment
- General remarks, including well accessibility and integrity

The sampler signs the field data sheets.

3.3.2 Labels

Sample labels contain the following information:

- Project number
- Sample ID (e.g., well designation)
- Sampler's initials
- Date and time of collection
- Type of preservative used

3.3.3 Sampling and Analysis Chain-of-Custody Record

The sampling and analysis chain-of-custody record, initiated at the time of sampling, contains, but is not limited to, the well number, sample type, analytical request, date of sampling, and the name of the sampler. The record sheet is signed and dated by the sampler when transferring the samples. Custody transfers are recorded for each individual sample. The number of custodians in the chain of possession is kept to a minimum. A copy of the final sampling and analysis chain-of-custody record is returned to the sampling contractor with the laboratory analytical report.

3.4 Field Quality Assurance Procedures

The objectives of the field program are to generate monitoring data of the highest possible quality and to ensure that these data are defensible during review. In general, QA/QC protocols are based on published USEPA guidelines. Field QA/QC is further ensured by training requirements for all field technicians.

Field QA procedures are specified for each sampling event. Field QA typically includes documenting field instrument calibration, and collecting and analyzing trip blanks, field blanks, equipment blanks, and duplicate samples. The analysis of trip, field, and equipment blanks, prepared with organic-free water, are used to detect contamination introduced through sampling procedures, external field conditions, sample transportation, container preparation, sample storage, and the analytical process.

Trip blanks are prepared at the same time and location as the sample containers for a particular sampling event. Trip blanks accompany the containers to and from that event, but at no time are they opened or exposed to the atmosphere. Typically, one trip blank for volatile organic parameters will be included per sampling event.

Field blanks are prepared in the field so they are exposed to the ambient atmosphere at a specified monitoring point during sample collection to determine the influence of the external field conditions on sample integrity. Equipment blanks are prepared in the field to ensure that sampling equipment does not cross-contaminate water samples. Organic-free water is run through the properly cleaned or unused (if disposable) sampling equipment, collected and analyzed. One field blank or equipment blank for volatile organic parameters will typically be included per sampling event.

Duplicate samples are collected to assess sampling and analytical precision. For each sampling event including more than six wells, duplicate monitoring well samples will typically be collected at a frequency of 10 percent. Where possible, field duplicates are collected at sampling points known or suspected to contain chemical constituents of interest. Duplicates are packed and shipped blind to the laboratory for analysis with the samples from that particular event.

3.5 Monitoring Frequency

During the initial Phase 1 and Phase 2 monitoring periods, groundwater monitoring wells and leachate sumps will be sampled quarterly for 12 continuous quarters. After the initial 12 quarters of monitoring, the sampling frequency may be modified to a semi-annual schedule, if warranted (NAC 444.7488).

3.6 Groundwater Level and Total Depth Survey

Before each sampling event, the static water level will be measured in appropriate monitoring wells and piezometers. The water-level gauging will occur within a period of time short enough to avoid potential temporal variations in groundwater elevation. The monitoring wells are purged and sampled for chemical constituents after measuring water levels.

The water level in the wells and piezometers is measured with an electric sounder with cable markings stamped at 0.01-foot increments. The water level is measured by lowering the sensor into the monitoring well. A low current circuit is completed when the sensor contacts the water, which serves as an electrolyte. The current is amplified which activates an indicator light and audible buzzer, thus signaling when water has been contacted. A sensitivity control compensates for very saline or conductive water. The electric sounder is decontaminated by rinsing with a detergent solution then de-ionized water after each use. Depth to water is recorded to the nearest 0.01 foot on a water level data sheet. The groundwater elevation at the monitoring well is calculated by subtracting the measured depth to water from the surveyed elevation of the top of the well casing.

Total well depth is measured in monitoring wells scheduled for sampling by lowering a probe to the bottom of the well and recording the depth. Total well depth, used to calculate purge volumes and to determine whether the well screen is partially obstructed by silt, is typically recorded to the nearest 0.1 foot on the water level data sheet.

4.0 LABORATORY ANALYTICAL PROCEDURES

The monitoring parameters and methods for analysis are detailed in this section.

4.1 Water Quality Parameters

Phase 1 groundwater monitoring parameters, as specified by NDEP per NAC 444.7487, are presented in ***Table 2***. The recommended analytical method for these constituents is included in the table. Biennial monitoring parameters Phase 2 leachate parameters include *Appendix II to Part 258 – List of Hazardous Inorganic and Organic Constituents.*

As allowed by Section 7487, the list of routine constituents may be re-evaluated after a period of time to determine if any of these constituents should be removed from the list, should it become apparent that they are not reasonably expected to be in or derived from the waste units. This re-evaluation will occur after 8 quarters of groundwater monitoring (Phase 3) and 12 quarters of leachate monitoring (Phase 2).

4.2 Methods

Water samples collected for compliance monitoring will be analyzed by a Nevada state-certified laboratory. Samples will be analyzed in accordance with accepted and approved analytical procedures. The analytical procedures shall have detection and/or reporting limits that are sufficiently protective and of human health and the environment. The following publications are the primary references for analytical procedures:

- Methods for Chemical Analysis of Water and Wastes (EPA 600/4-79-020, Revised March 1983)
- Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater (EPA-600/4-82-057, July 1982)
- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WPCF, 17th edition, 1989
- Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (EPA SW-846, 3rd edition, November 1986)

4.3 Quality Assurance

Laboratory QA procedures are employed to ensure that results are accurate, precise, and complete so that the overall objectives of the monitoring program are achieved. Laboratory-specific procedures are included in the laboratory's QA manual, including the use of method blanks, surrogate spikes, laboratory control samples (and duplicates), and matrix spikes (and duplicates).

Method blanks are analyzed daily to assess the effect of the laboratory environment on the analytical results. Method blanks are performed for each parameter analyzed and are expected to be clean. The presence of the subject compound or analyte at a significant level indicates the potential for sample contamination.

Each sample analyzed for organic parameters contains surrogate spike compounds. The surrogate recovery is used to determine if the analytical instruments are operating within limits. Surrogate recoveries are compared to control limits established and updated by the laboratory based on its historical operation.

Laboratory control samples (LCS) and LCS duplicates are prepared and analyzed for each batch of samples to evaluate the accuracy and precision of the methods. A known amount of the subject analyte is spiked into a clean water sample; analysis for the subject analyte subsequently is conducted to assess the method accuracy. The recovery of the subject analyte must be within QC limits. If the LCS recovery does not pass, re-analysis of all samples in the batch should occur. A duplicate LCS is prepared and analyzed to assess the method precision.

Matrix spikes are analyzed at a frequency of approximately 10 percent. Matrix spike results are evaluated to determine whether the sample matrix is interfering with the laboratory analysis and provide a measure of the accuracy of the analytical data. Matrix spike recoveries are compared to control limits established and updated by the laboratory based on its historical operation.

Matrix spike duplicates are analyzed at a frequency of approximately 10 percent. Spike duplicate results are evaluated to determine the reproducibility (precision) of the analytical method. Reproducibility values are compared to control limits established and updated by the laboratory based on its historical operation.

Laboratory QC data will be reported with the analytical results. The review of QC data is an integral step in the data verification process and may identify potential laboratory errors or biases affecting the data.

4.4 Data Evaluation

The following activities are required to evaluate groundwater data collected from the monitoring network.

4.4.1 Data Review and Validation

Prior to entering data into the facility database and prior to conducting statistical evaluations, all analytical reports will be reviewed to verify that the reports are complete and correct. The use of proper QC measures should be verified. Any QC issues that occur and have the potential to affect the analytical results for site samples should be further evaluated prior to data acceptance. Re-testing may be a necessary step in data validation should a result appear suspect based on accompanying laboratory QC results or other data comparison.

The following steps can be part of the quality control process to ensure that the laboratory data is acceptable and that the proper sample analyses were run.

- Review the analytical results of field blanks to evaluate the adequacy of the equipment decontamination procedures and the possibility of cross-contamination.

- Review the analytical results of trip blanks to evaluate the possibility for contamination from the laboratory-prepared sample containers or the sample transport containers.
- Review the analytical results of laboratory blanks to evaluate the possibility of contamination caused by the analytical procedures.
- Qualify the sample data, as appropriate, if contaminants are detected in field or laboratory blanks.
- Review the sampling, extraction, and analysis dates to confirm that extraction and analyses were completed within the recommended EPA holding times.
- Note appropriate data qualifiers if holding times were exceeded.
- Calculate relative percent difference (RPD) for field duplicates.
- Implement appropriate corrective action if significant quality assurance problems are encountered.

4.4.2 Statistical Analysis

As required by NAC 444.7485, a statistical method will be used in the evaluation of groundwater monitoring data for each hazardous constituent. The amended Federal and State regulations provide a variety of statistical methods that may be used to evaluate water quality data. Selection of the most appropriate comparative methodology and data analysis cannot be performed until adequate background and monitoring information has been obtained. Therefore, the actual method used will be based on a review of the data set prior to the time that the statistical analysis is to be performed. Performance standards of the selected procedure will be in accordance with NAC 444.7485.

The number of samples collected to establish background data concerning the quality of groundwater will be consistent with the requirements of the selected statistical procedure. To establish a data set that will adequately characterize the background range of concentrations of constituents, a minimum of four sample sets are recommended to be collected from each well prior to placement of waste at the facility; however, certain statistical procedures may require eight data sets for the calculations. Sampling of the current monitoring network has occurred four times.

5.0 DETECTION MONITORING

Detection monitoring is required at all Class I waste management units. The detection monitoring program for the proposed Facility will follow the requirements of NAC 444.7488. Comparisons of detection monitoring results to established background values will occur with each semi-annual monitoring event in order to determine whether a statistically significant increase in constituent concentrations has occurred in accordance with NAC 444.7485.

Prior to the determination of a statistically significant release, the quality control procedures discussed in section 4.4 – Data Evaluation, will be reviewed for the constituent in question. Laboratory analytical results are uploaded into a database using electronic data files provided by the laboratory. The database upload includes error checking and data validation prior to input. The potential errors are flagged and can be corrected before the data enters the database. The historical data from each monitoring point can be a powerful data quality check. Analytical results that are outside of historical ranges can be evaluated for potential laboratory or sampling error. If data is outside of historical range and appears to be anomalous, the potential source of the anomaly will be investigated: the laboratory is contacted to verify the result and/or the other sample results are reviewed to determine if a sampling error occurred. In addition, outlier tests are performed on the data prior to statistical evaluations.

In the event a constituent in the monitoring program demonstrates a statistically significant increase, the following actions shall occur per NAC 444.7489.

Within 14 days of the finding, the landfill will place a notice in the operating record. The notice will indicate which constituents have shown increases. NDEP also will be notified of this action.

If the increase cannot be demonstrated to result from a source other than the waste units, an assessment monitoring program shall be established within 90 days. The assessment monitoring program will be established in accordance with NAC 444.749 and will include at a minimum, sampling for all Appendix II constituents.

Should the landfill determine that the increase is not a result of a release from the waste unit, but rather another source (e.g. natural variation, sampling or laboratory error) then a report documenting such must be placed in the operating record within 90 days.

Results of the semi-annual detection monitoring program will be submitted semi-annually to the required agencies in an acceptable format.

5.1 Assessment Monitoring and Corrective Measures

An assessment monitoring program is established to evaluate an indication of an increase of one or more monitored constituents. Should an assessment program be necessary, it will be initiated per NAC

444.749. If results of the assessment monitoring indicate one or more Appendix II constituents are present at a statistically significant level above the standard for the protection of groundwater, the actions required under subsection 3 of NAC 444.749 will be taken. As required, an assessment of corrective action measures will be initiated within 90 days.

6.0 LANDFILL GAS MONITORING

Landfill gas migration from the landfill is unlikely due to the presence of a low-permeability composite liner system and the use of an extraction system to collect and remove gas from the landfill. Perimeter subsurface landfill gas monitoring and indoor structure monitoring will be conducted to verify adequate control of landfill gas.

Perimeter landfill gas monitoring will consist of quarterly sampling and testing of gas probes located at the landfill property boundary. The probes will be spaced at maximum 1,000-foot intervals resulting in a total of 21 perimeter probes as shown in ***Figure 3.*** Each landfill gas probe will consist of two nested probes located in the upper silty sands at depths of approximately 30 feet and 15 feet with each probe containing a 5 to 10-foot long screen (***Figure 4***). The underlying silty clay layer, which is described in Section 2.1.4.2 of the Report of Design, should inhibit downward migration of landfill gas in the unlikely event that gas migrates from the landfill. Indoor air monitoring in the office and shop structures also will be conducted quarterly.

The concentrations of combustible gas (as methane), oxygen, carbon dioxide, and the barometric pressure will be measured using appropriate field instrumentation. Prior to use, all field instrumentation will be calibrated properly according to the manufacturer's recommendations. A minimum of one probe casing volume will be purged using the instrument's sample pump. Meter readings will be allowed to stabilize for 30 seconds before recording the gas concentrations. Landfill gas monitoring will be conducted to verify that explosive gas content does not exceed the lower explosive limit (LEL), equivalent to 5 percent methane by volume, at the perimeter boundary. Structure monitoring will be conducted to verify that concentrations remain below the allowable upper limit of 25 percent of the LEL, equivalent to 1.25 percent methane by volume.

In the event methane is detected at a concentration greater than 5 percent by volume in the perimeter probes, or greater than 1.25 percent by volume in a landfill structure, steps will be taken to protect human health and the source of the methane will be investigated. Corrective measures will be implemented to reduce methane concentrations to acceptable levels.

7.0 LEACHATE MONITORING

Leachate quantities will be recorded on a weekly basis for each leachate sump and secondary leachate sump. If leachate is detected in a previously dry primary or secondary leachate sump, the leachate will be sampled and analytical testing will be completed as described above.

The leachate samples will be collected as follows:

- One leachate sample will be collected per primary and secondary sump.
- For a given primary sump, if the secondary sump remains dry and the detected constituents and constituent concentrations in the primary sump remain relatively consistent for 5 annual sampling events, then future sampling frequencies may be reduced and/or eliminated.

TABLES

Table 1
Monitoring Well Construction Details

Well Designation	Ground Surface Elevation	Well TOC Elevation	Borehole Diameter	Well Casing Diameter	Total Depth of Boring	Well Casing Length	Screened Interval	Sand Pack Interval	First Encountered Water	Depth to Water (4/7/07)	Geologic Unit Monitored
	(Ft-MSL)	*(Ft-MSL)*	*(inches)*	*(inches)*	*(Ft-BGS)*	*(feet)*	*(Ft-BGS)*	*(Ft-BGS)*	*(Ft-BGS)*	*(from TOC)*	
MW-1	4,175.26	4,177.78	8	2	103	83	59 - 79	55 - 84	60	62.45	Sand, Silty sand/Sandy silt
MW-2	4,175.23	4,177.74	8	2	102	83	60 - 80	55 - 80	68	61.29	Sand, Silty sand/Sandy silt
MW-3	4,174.84	4,177.04	8	2	103	80	66 - 76	64 - 88	60	62.53	Silty clay/Clayey silt
MW-4	4,176.96	4,179.15	8	2	102	83	60 - 80	58 - 90.5	60	63.18	Sand

Notes:

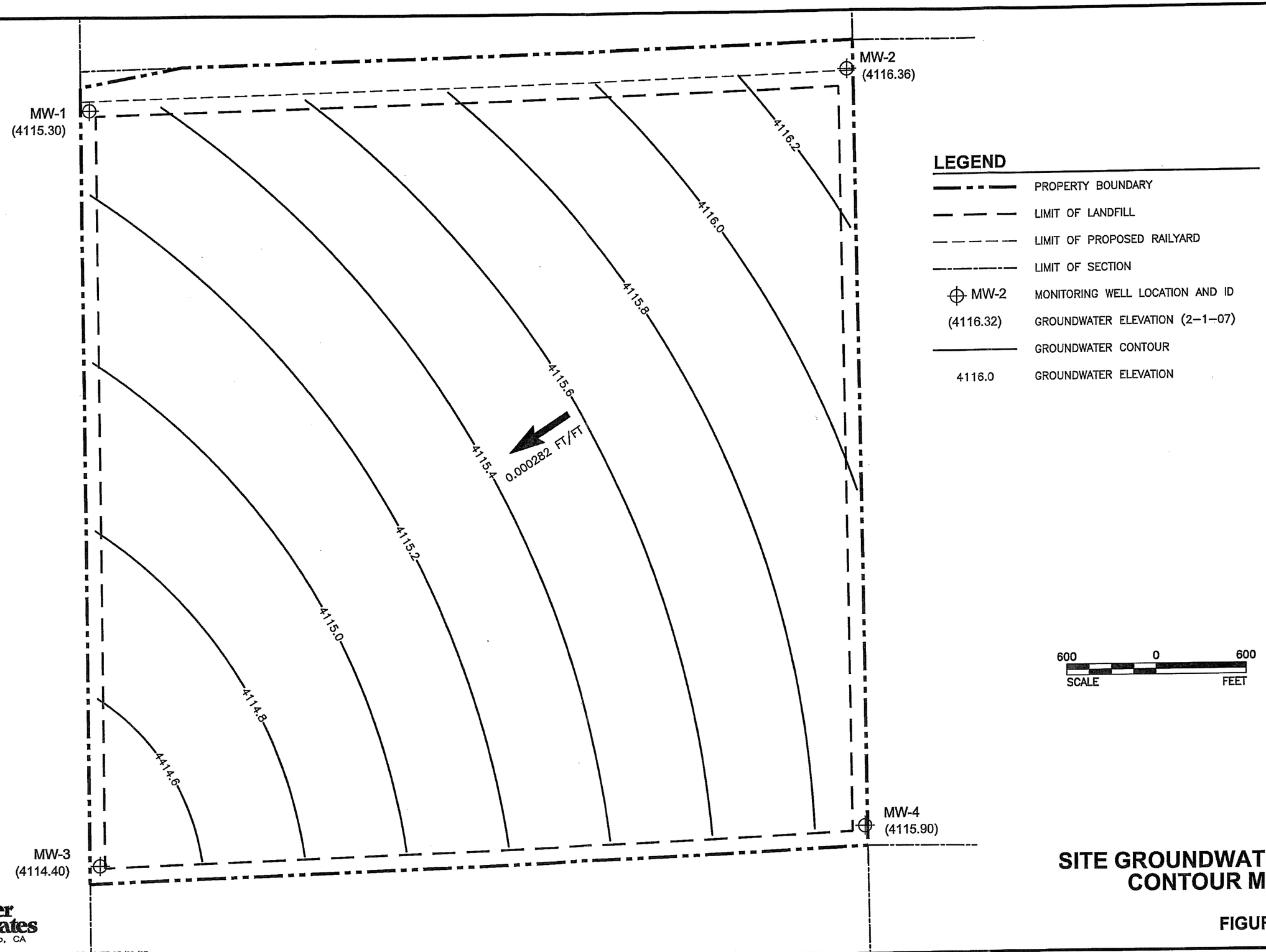
Ft-MSL - Feet, mean sea level
Ft-BGS - Feet, below ground surface
TOC - Top of well casing

Table 2
Monitoring Parameters and Methods

Sample Designation Sampling Date	Recommended Method
Field Parameters	
pH	field
Specific Conductance	field
Phase 1 Parameters	
Total Organic Carbon (TOC)	EPA 415
Total Organic Halides (TOX)	EPA 9020
Chloride	EPA 300
Nitrate/Nitrite as N	EPA 353
Sulfate	EPA 300
Total Kjeldahl Nitrogen	EPA 351
Chemical Oxygen Demand (COD)	EPA 410
Biennial Phase 1 Parameters [1]	
Volatile Organic Compounds	EPA 8260
Semi-volatile Organic Compounds	EPA 8270
PCBs	EPA 8082
Organophosphorus Pesticides	EPA 8141
Chlorinated Herbicides	EPA 8151
Antimony	EPA 6010
Arsenic	EPA 6010
Asbestos	EPA 600
Beryllium	EPA 6010
Cadmium	EPA 6010
Chromium	EPA 6010
Copper	EPA 6010
Cyanide, total	EPA 9010
Lead	EPA 6010
Mercury	EPA 7470
Nickel	EPA 6010
Selenium	EPA 6010
Silver	EPA 6010
Thallium	EPA 6010
Zinc	EPA 6010
Phase 2 Parameters [2]	
Volatile Organic Compounds	EPA 8260
Semi-volatile Organic Compounds	EPA 8270
PCBs	EPA 8082
Organophosphorus Pesticides	EPA 8141
Chlorinated Herbicides	EPA 8151
Antimony	EPA 6010
Arsenic	EPA 6010
Barium	EPA 6010
Beryllium	EPA 6010
Cadmium	EPA 6010
Chromium	EPA 6010
Cobalt	EPA 6010
Copper	EPA 6010
Lead	EPA 6010
Mercury	EPA 7470
Nickel	EPA 6010
Selenium	EPA 6010
Silver	EPA 6010
Tin	EPA 6010
Thallium	EPA 6010
Vanadium	EPA 6010
Zinc	EPA 6010

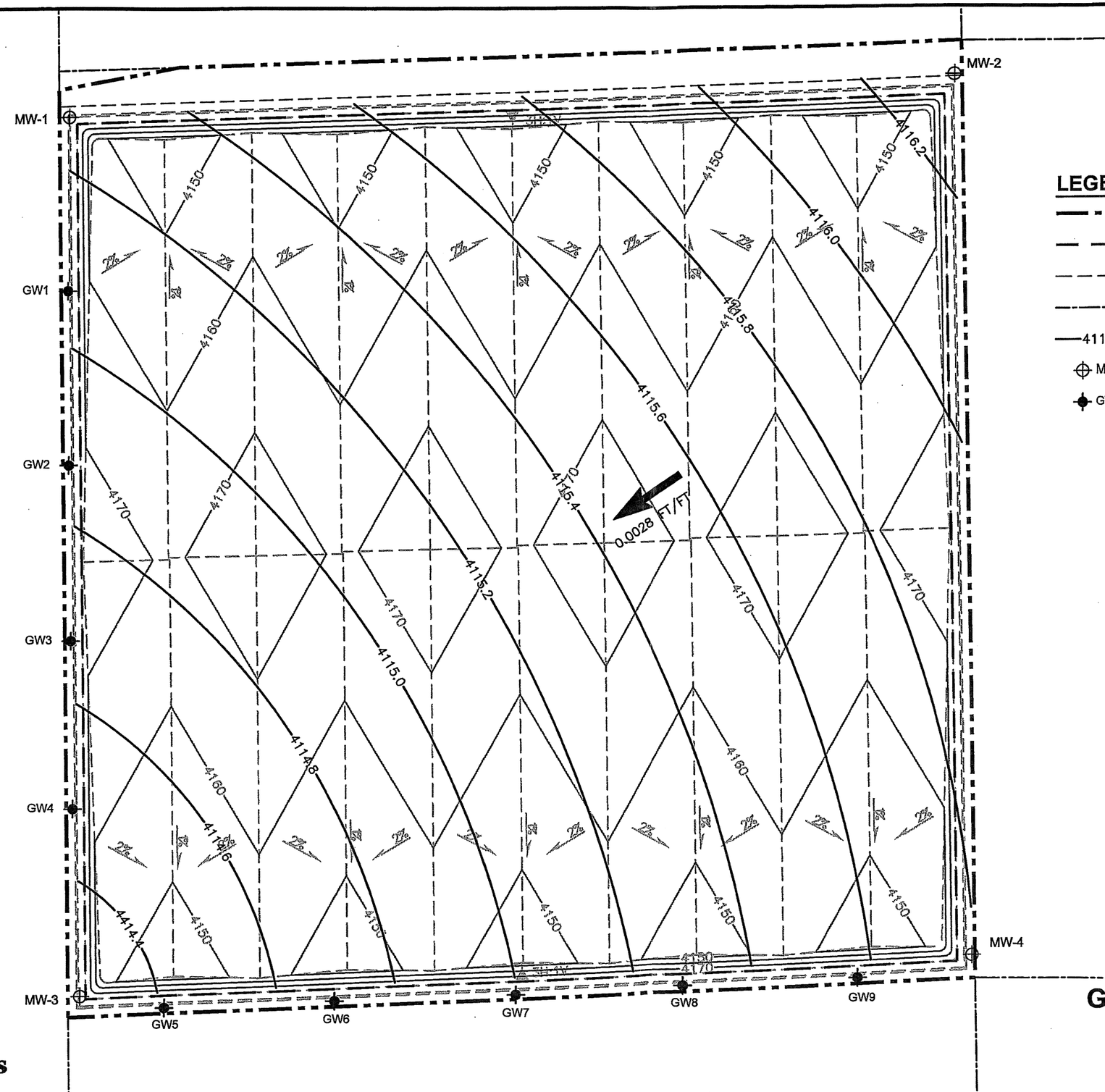
1. Appendix A to Part 423 - Priority Pollutants List.
2. Appendix II to Part 258 - List of Hazardous Inorganic and Organic Constituents

FIGURES



SITE GROUNDWATER CONTOUR MAP

FIGURE 1



LEGEND

- PROPERTY BOUNDARY
- LIMIT OF LANDFILL
- LIMIT OF PROPOSED RAILYARD
- LIMIT OF SECTION
- 4116.0 GROUNDWATER ELEVATION
- MW-2 EXISTING MONITORING WELL LOCATION
- GW1 POTENTIAL MONITORING WELL LOCATION

600 0 600
SCALE FEET

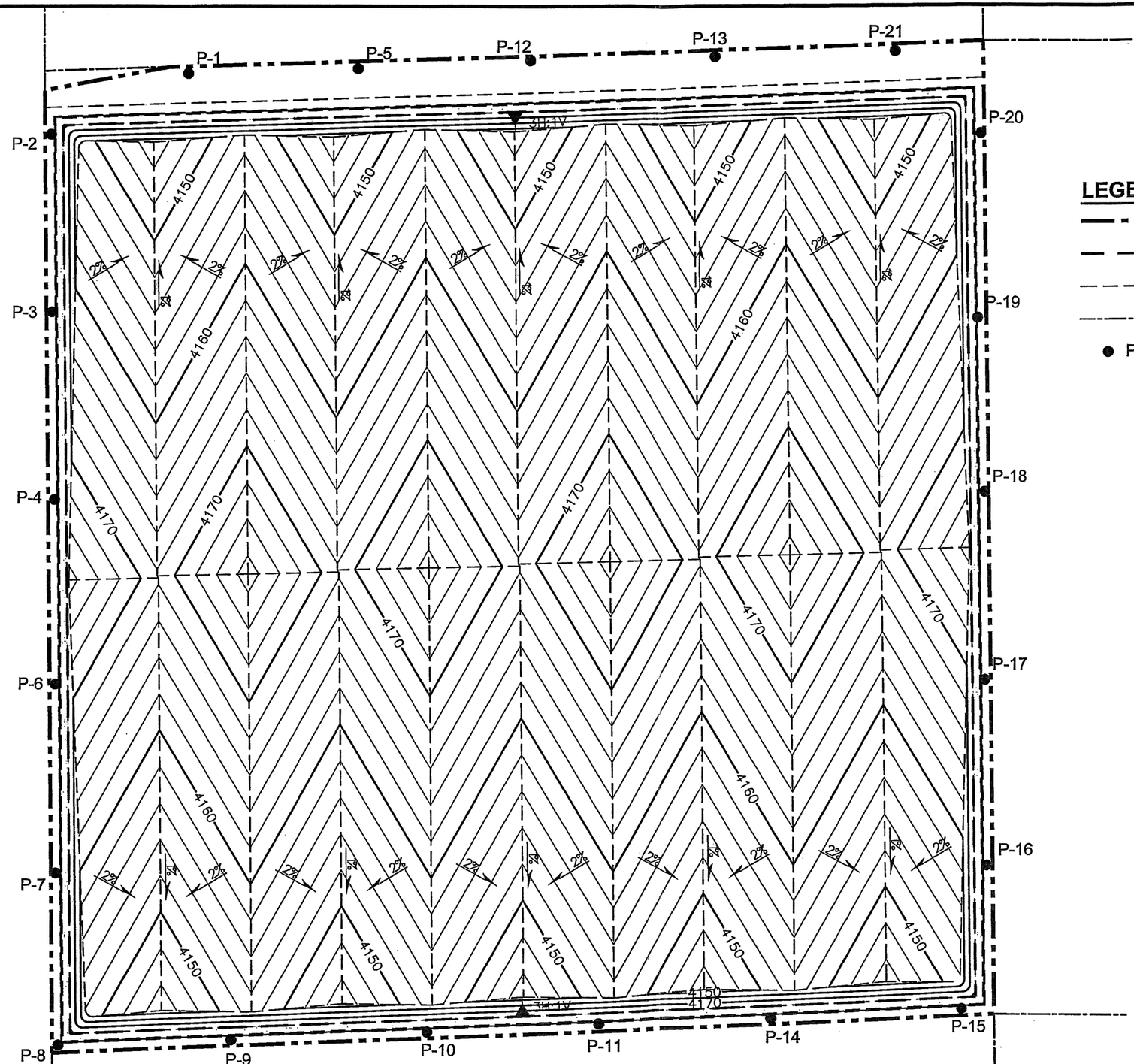
Golder Associates
Sacramento, CA

GROUNDWATER MONITORING NETWORK

FIGURE 2

PROJECT No. 063-7079 FILE No. Fig 13 - C CADD JDR DATE 05/29/07

Drawing file: 0637079100_F2_GW Mon Net.dwg Dec 19, 2008 - 4:28pm



LEGEND

- PROPERTY BOUNDARY
- LIMIT OF LANDFILL
- LIMIT OF PROPOSED RAILYARD
- LIMIT OF SECTION
- P-1 GAS PROBE LOCATION AND ID

600 0 600
SCALE FEET

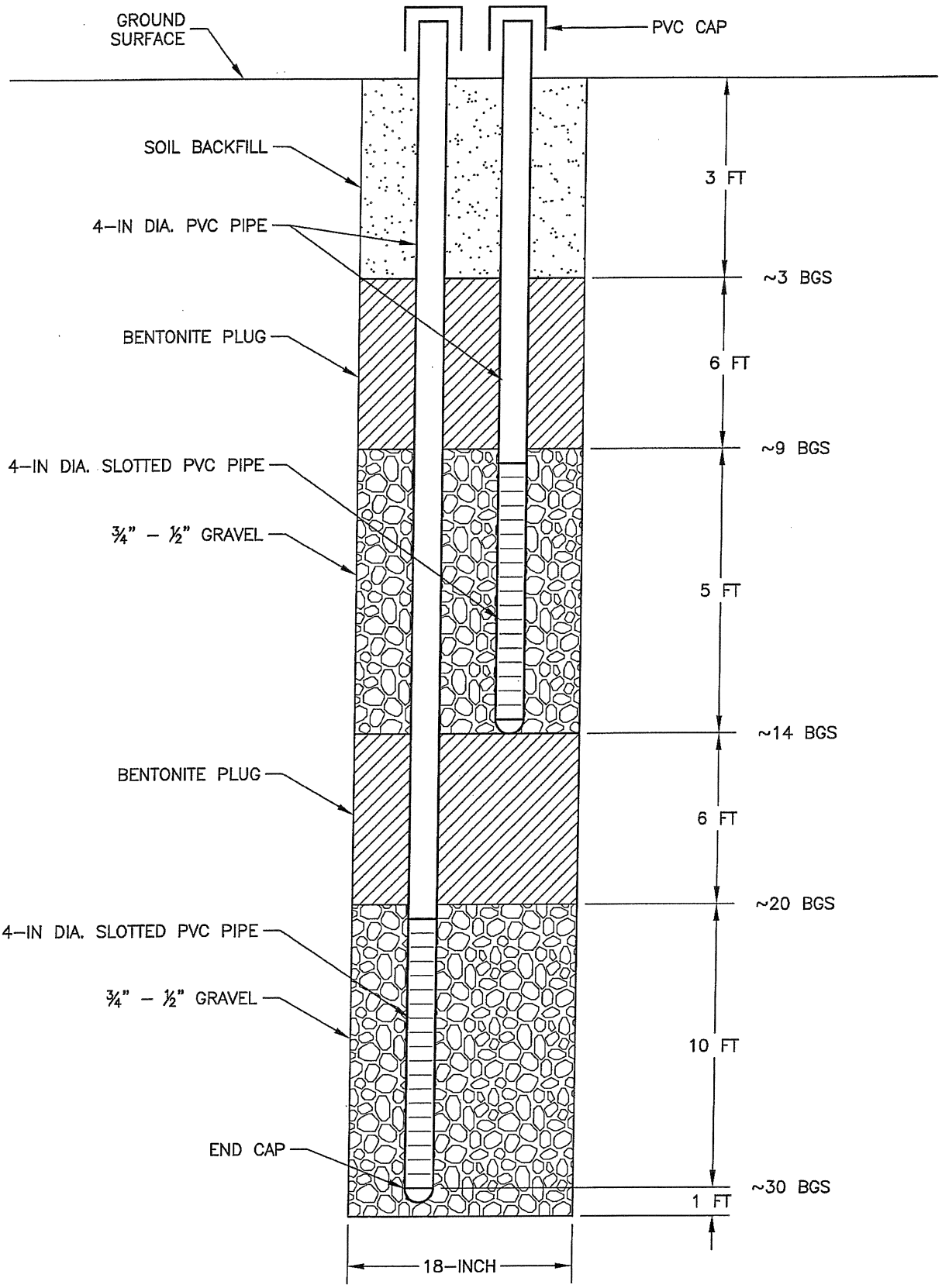
LANDFILL GAS MONITORING NETWORK

FIGURE 3

Golder Associates
Sacramento, CA

PROJECT No. 063-7079 FILE No. Fig 11 – Ba CADD JDR DATE 05/29/07

Drawing file: 0637079100_F3_LF Gas Mon Net.dwg Dec 19, 2008 – 4:31pm



LANDFILL GAS MONITORING PROBE DETAIL

Golder Associates
Sacramento, CA

FIGURE 4

PROJECT No. 0637079 FILE No. Fig 15 – LF CADD JDR DATE 05/30/07

Drawing file: 0637079100_F4_LF Gas Mon Probe.dwg Dec 19, 2008 – 4:34pm

GROUNDWATER PROTECTION EVALUATION PLAN

GROUNDWATER PROTECTION EVALUATION PLAN

Proposed Jungo Disposal Site

Revision 1

Submitted To: Jungo Land and Investments, Inc.
50 California Street, 24th Floor
San Francisco, CA 94111

Submitted By: Golder Associates Inc.
1000 Enterprise Way
Suite 190
Roseville, CA 95678 USA

Distribution: 2 Copies – Recology
1 Copy – NDEP

Date: July 27, 2011

Project No. 063-7079-100

A world of capabilities delivered locally

Golder Associates

Table of Contents

1.0 INTRODUCTION 1
2.0 ENVIRONMENTAL CONTROLS 2
2.1 Prescriptive Landfill Construction Standard 2
2.2 Proposed JDS Landfill Construction Design 2
2.3 Evaluation of Double Liner System Leachate Leakage Control Efficiency 4
3.0 INTERIM GROUNDWATER MONITORING PROGRAM 6
3.1 Site Geology 6
3.2 Site Hydrogeology 7
3.3 Initial Landfill Development 7
3.4 Interim Groundwater Monitoring Wells 8
4.0 LANDFILL PERFORMANCE REVIEW 10
5.0 CLOSING 11
6.0 REFERENCES 12

List of Figures

Figure 1 – Proposed Liner System
Figure 2 – Proposed Monitoring Well Locations
Figure 3 – Angled Boring Cross Section

Appendices

Appendix A– Landfill Performance Review Report Outline

1.0 INTRODUCTION

Golder Associates Inc. (Golder) is submitting this Groundwater Protection Evaluation Plan for the Jungo Disposal Site located in Humboldt County California. The Jungo Disposal Site (JDS) is a proposed Class I Landfill located in the Desert Valley Basin approximately 30 miles west of Winnemucca, Nevada. The landfill is located on a 634-acre parcel that consists of Section 7 of Township 35N (T35N), Range 33E (R33E). The landfill has a disposal footprint that will encompass 562-acres with an estimated life of approximately 95 years.

Golder, on behalf of Jungo Land and Investments, Inc. (JLII), has prepared and submitted a Report of Design (April 2010), Plan of Operations (May 2009) including a Monitoring Plan (updated April 2010), and Design Drawings (May 2009, revised April 2010) for the development of the Jungo Disposal Site.

As described in the Report of Design (April 2010), the site is underlain by a thick sequence of alluvial sediments. Groundwater occurs at a depth of approximately 60 feet below ground surface (bgs) and approximately 25 feet below the base of the liner system at its closest point.

Section 444.678(9) of the Nevada Administrative Code (NAC) states that Class I sites shall not be located within 100 feet of the uppermost aquifer unless approved by the solid waste management authority (Nevada Division of Environmental Protection (NDEP)). NDEP can approve landfills with less than 100 feet of separation between wastes and groundwater if NDEP considers the proposed environmental controls appropriate for preventing contamination of groundwater.

The JDS design provides environmental controls that fulfill the prescriptive requirements and incorporates a monitoring system that will provide an early, effective evaluation of the design. The purpose of this plan is to provide a means to assess the performance of the JDS environmental controls, and if necessary, implement design changes to ensure protection of groundwater quality.

The objectives of this plan are to demonstrate how JDS will:

- Provide early confirmation during the initial site operations that the constructed liner system is adequately preventing migration of waste constituents to groundwater
- Evaluate the effectiveness of the liner system and implement modifications as may be appropriate to provide adequate groundwater protection through the operational life and postclosure period of the landfill

The following sections of this report present (1) a comparison of the prescriptive landfill liner system and the proposed liner system for the JDS, (2) the additional environmental controls proposed for the JDS that will reduce the potential for leakage from the landfill, (3) an evaluation of the efficiency of the double liner system to control leachate leakage, and (4) an interim groundwater monitoring system capable of early detection of landfill leakage.

2.0 ENVIRONMENTAL CONTROLS

The JDS will be constructed with a lining system and environmental controls appropriate to ensure protection of groundwater quality. The lining system and environmental controls will be more robust than the prescriptive landfill construction standards. The following provides a summary of the prescriptive construction standard and the proposed JDS construction and environmental controls.

2.1 Prescriptive Landfill Construction Standard

The prescriptive standard (NAC Section 444.681) for landfill liner construction includes a composite liner and a system for the collection of leachate which is designed and constructed to maintain less than a 30-centimeter depth of leachate over the liner. The composite liner must have an upper component consisting of a flexible membrane liner of at least 30 mils (60 mils if comprised of high density polyethylene) and a lower component consisting of a layer of compacted soil that is at least 2 feet with a hydraulic conductivity of no more than $1x10^{-7}$ centimeters per second (cm/s).

2.2 Proposed JDS Landfill Construction Design

The JDS is designed with more robust, additional environmental controls compared to the minimum prescriptive standard. The additional environmental controls provide for additional waste containment layers, reduced potential for leakage, more efficient leachate controls limiting leachate accumulation on the liner, and early and more efficient landfill gas controls.

The environmental controls for the Jungo Disposal Site (JDS) consist of the following elements:

- A **double-liner system** with primary and secondary leachate collection
- A **high capacity leachate collection and removal system** (LCRS) on top of a composite liner system. The high capacity system will limit maximum leachate build-up to a fraction of an inch and thereby reduce the leakage potential of leachate.
- **Additional gas control system piping** that will be incorporated in the LCRS system. This allows the potential to develop a vacuum on top of the liner to minimize the potential for the migration of landfill gas through the liner.
- **Early operation of landfill gas controls**. Early operation means that landfill gas controls will be operated once landfill gas is generated in sufficient volumes for collection and disposal instead of waiting for the landfill gas generation to reach air emissions thresholds, which is the typical standard of practice..
- **An operations soil layer** to protect the liner system from damage due to equipment or sharp debris in the refuse.

In addition to the environmental controls listed above, an interim groundwater monitoring system will be installed that will allow for early detection of any leakage to groundwater below the site.

The double-liner system is comprised of the following components from top to bottom on the floor of the landfill (see Figure 1):

- 2-foot thick operations soil layer;

- 1-foot thick gravel blanket for the primary LCRS with a permeability of 1 cm/s or greater;
- central leachate collection piping within each module to provide redundant leachate removal capacity;
- 16-oz geotextile cushion;
- 60-mil high-density polyethylene (HDPE) primary geomembrane;
- 2-foot thick compacted low-permeability soil liner with a permeability (k) less than or equal to $1x10^{-7}$ cm/s;
- A secondary geocomposite drainage layer for the secondary LCRS; and
- A 60-mil high-density polyethylene (HDPE) secondary geomembrane

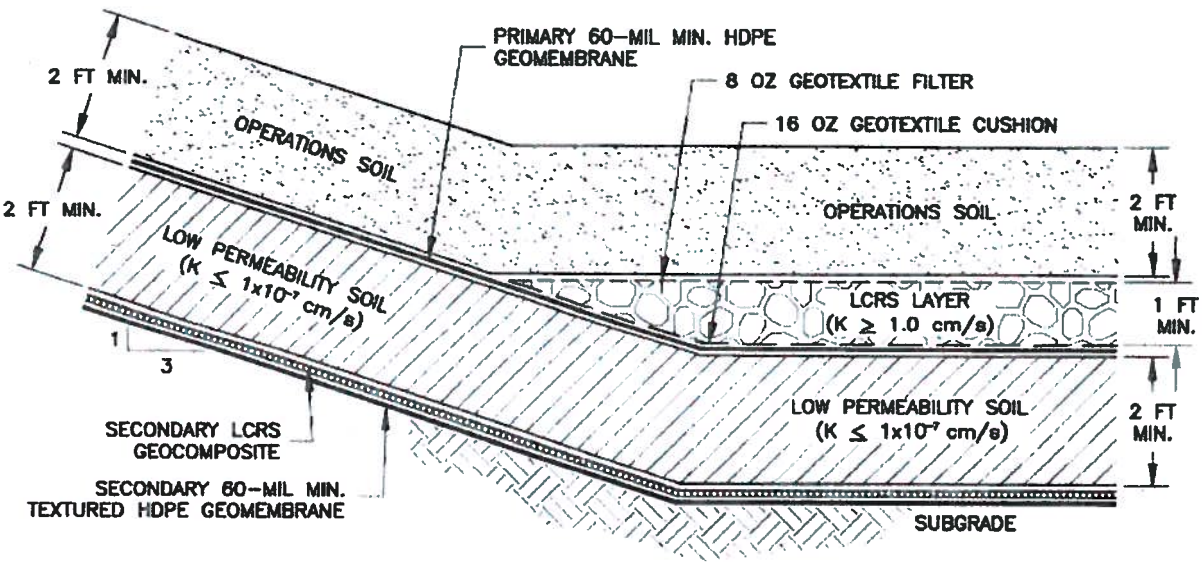


Figure 1 - Proposed Landfill Liner System Detail

On the side-slopes, the base liner system is comprised of the following components from top to bottom:

- 2-foot thick operations soil layer;
- Geocomposite drainage layer (geonet with geotextile heat-bonded to both sides) for the LCRS;
- 60-mil HDPE primary geomembrane;
- 2-foot thick compacted low-permeability soil liner ($k \leq 1x10^{-7}$ cm/s).
- A secondary geocomposite drainage layer for the secondary LCRS; and
- A 60-mil high-density polyethylene (HDPE) secondary geomembrane

In predicting the ability of the proposed environmental controls to protect groundwater, the following factors were considered:

- The threat to groundwater resulting from the generation of landfill gas and leachate. In dry climates, such as the Jungo Disposal Site, landfill gas generally poses the more significant threat than leachate due to limited leachate volumes that are generated. Golder's experience suggests that landfill sites with an average annual rainfall of less than 10-inches/year can expect to produce an average of less than 20 gallons/acre/day (gpad) of leachate. The JDS receives approximately 8 inches of annual precipitation.
- Upon closure, the final cover becomes another containment system that further minimizes the potential for leachate to impact groundwater. Bonaparte et al. (2002) show that landfills closed with low-permeability cover systems, as proposed for the JDS, reduce leachate generation to approximately 10 percent of the operational leachate generation rate within 4 years following closure. Within 9 years, the leachate generation rate is negligible.
- Landfill gas controls can be modified relatively easily to enhance gas collection and control if necessary by adding more collection wells or adjusting vacuum pressures for individual wells.
- The leakage potential through a geomembrane defect in a composite liner is approximately proportional to the depth of leachate over the geomembrane defect (Giroud, 1997). The proposed high capacity leachate collection system minimizes leachate depth on the liner, and therefore, minimizes leakage potential.

2.3 Evaluation of Double Liner System Leachate Leakage Control Efficiency

Although Golder considers landfill gas to be of primary concern with respect to groundwater quality impacts, the potential of leachate migration is often perceived to be the primary concern. Golder's modeling of potential leakage through a single, composite clay liner predicted no measurable leakage through that liner system (Report of Design, 2010). Therefore, similar modeling of leakage potential through the proposed double liner system also would be negligible.

The above leachate leakage modeling results are a reasonable performance expectation for the Jungo Disposal Site. However, the modeling relies on a number of assumptions including the quality of the liner installation. Measurements of liquids collected in secondary leachate collection systems provide another point of comparison of how modern landfill liners actually perform. Bonaparte et al. (2002) present measured leakage rates for primary liners at 187 double-lined cells located at 54 landfills in the United States. This study quantified the leakage performance of the liner systems in terms of efficiencies. Efficiency was defined as the volume of liquids collected in the primary LCRS divided by the total of the liquids collected in the primary LCRS and secondary LCRS layers. An efficiency of 100 percent represents no leakage.

Single geomembrane liners (no underlying clay layer) were observed to have an average efficiency of 90 percent. The determination of the efficiency of single, geomembrane/clay composite liners (CCLs) was not definitive due to consolidation of the clay liner. Clay consolidation "squeezes" water from clay due to increased normal stresses imposed by the overlying wastes. The presence of the relatively impermeable geomembrane at the top of the clay liner means that clay consolidation water is released to the underlying secondary collection layer and therefore masks any potential leakage volumes.

Although the efficiencies of CCLs were not definitive, the performance of CCLs is expected to be comparable to that of composite geomembrane/geosynthetic clay liners (GCLs). An average efficiency of 99.96% was measured for 28 cells constructed with composite GCLs, which are generally considered to be an equivalent alternative liner system to CCLs. Composite GCLs simply substitute a manufactured, approximately 1/4-inch thick layer of bentonite bounded by geotextiles in place of a two-foot thick compacted clay soil. GCLs are installed relatively dry and do not release pore water during consolidation allowing for a more accurate estimate of the liner efficiency. As an initial estimate, Golder considers it reasonable to assume that a single, composite CCL liner will have a similar average efficiency of 99.96%.

Although leakage through a full double liner was not measured, a reasonable estimate for the JDS double liner system can be made by combining the estimated efficiency of a single-composite liner (99.96%) with that of a single geomembrane liner system (90%). The resulting combined efficiency of the JDS liner system is expected to be on the order of 99.996 percent. Assuming an average leachate production rate of 20 gpad for JDS, the resulting leakage potential is less than 0.0008 gpad, which is effectively a negligible rate.

The implementation of enhanced CQA measures, such geoelectric leak surveys, will result in above average liner performance and provide a means for ensuring that the constructed liner system performs as intended.

3.0 INTERIM GROUNDWATER MONITORING PROGRAM

An interim groundwater monitoring program to provide early groundwater detection monitoring during the initial 10 years of landfill operation is presented below. The interim program includes the installation of groundwater monitoring wells directly below the proposed landfill leachate sumps (Figure 2). The installation of monitoring wells directly below the initial leachate sumps will provide monitoring points capable of detecting a leachate release from the landfill within a reasonable amount of time (the initial 10-year operation of the landfill). The following sections review the site conditions, geology and hydrogeology, and the proposed interim monitoring well locations and construction.

3.1 Site Geology

An initial site characterization program was completed to evaluate the site-specific geologic and hydrogeologic conditions. This initial characterization program consisted of the completion of five borings to depths of 100 to 145 feet below ground surface (bgs).

The five borings were completed using hollow-stem auger drilling methods under the observation of a Golder engineer who logged the soil samples and recorded groundwater conditions. Soil samples were classified in accordance with Golder technical procedures and the Unified Soil Classification System. The four borings located near the corners of the property were converted into groundwater monitoring wells (MW-1 through MW-4). The boring completed in the middle of the site was abandoned by backfilling the boring annulus with a cement-bentonite grout.

The site is underlain by interbedded sands, silts, and clays. Five primary soil sequences were identified. Figure 2 illustrates the subsurface lithology to a depth of 100 to 145 feet bgs, which is summarized below:

- **Upper Silty Sands**. The uppermost soils are predominately silty fine sands with occasional thin lenses of silt. These soils occur at the ground surface and extend to depths of approximately 35 to 40 feet bgs.
- **Upper Silty Clays and Clayey Silts**. A 10- to 18-foot thick layer of primarily silty clay and clayey silt underlies the uppermost silty sands.
- **Middle Sand and Silty Sand**. At a depth of 55 to 60 feet bgs, the borings encountered predominately sands that are interbedded with silty sands and thin lenses of silts and silty clays. This soil zone was observed to be 18 to 30 feet thick.
- **Lower Clay and Clayey Silt**. A 12- to 20-foot thick clay layer was first encountered at a depth of 70 to 80 feet bgs. The upper portion of this layer is generally comprised of highly plastic and compressible clay, while the lower portion consists of low to moderately plastic clay.
- **Lower Sand and Silty Sand**. The deepest boring penetrated the lower clay and clayey silt zone at a depth of 115 feet and encountered interbedded sands, silty sands, and thin lenses of silt to the full depth of the boring at 145 feet.

3.2 Site Hydrogeology

Groundwater was first encountered in the 18 to 30-feet thick middle sand/silty sand layer at a depth of approximately 60 feet below ground surface. The overlying 10- to 18-feet thick upper silty clay to clayey silt layer occurs between the base of the landfill and the sand/silty sand water-bearing zone.

Quarterly depth-to-water measurements have been taken in the site wells since their installation in January 2007. These measurements indicate that groundwater occurs at elevations similar to those recorded in the initial soil borings. Therefore, first-encountered groundwater occurs under unconfined, water-table conditions, consistent with the regional hydrogeologic model.

Regional studies have shown water levels in the basin have decreased, and in the area of the site have declined approximately 10 feet over the past 30 years. Current depth to groundwater at the site is approximately 60 feet bgs. Therefore, assuming a return to 1975 groundwater levels, the highest anticipated groundwater levels at the site are estimated to be approximately 50 feet bgs.

Based on groundwater elevations measured in the site wells, groundwater flows toward the southwest, consistent with the regional groundwater flow direction (Berger, 1995). The gradient is estimated to be 0.0003.

Rising head slug tests were conducted in each site well to determine the hydraulic conductivity of the middle sand and silty sand layer. With these data, hydraulic conductivities were calculated for each well. The geometric mean of the four individual well hydraulic conductivities was calculated to be 1.2×10^{-4} centimeters per second (cm/sec). The estimated effective porosity of the sand to silty sand is 0.30. The groundwater flow velocity calculated using the above parameters is less than 1 foot per year.

The four groundwater monitoring wells, which comprise the current monitoring network (MW-1 through MW-4), are located at the four corners of the site boundaries. Groundwater samples collected from these wells, prior to construction of the Facility, are providing background groundwater quality data, both upgradient of the proposed Facility site and at the downgradient boundary of the site. Once waste placement commences, well MW-2 will be designated as a hydraulically-upgradient background well.

3.3 Initial Landfill Development

The initial landfill module development includes module 5 (located in the northeast corner of the site and the adjacent northern portion of module 4. The modules will be constructed in phases, starting with the northern portion of module 5, followed by the northern portion of module 4. Module construction will then proceed to the south in module 5 and then module 4.

The landfill liner system design includes a high capacity (high permeability), blanket LCRS that is designed to collect leachate while minimizing leachate head build-up on the liner. The maximum leachate head on the liner is estimated to be only a fraction of one-inch. The leakage potential of a liner system is

reduced by decreasing the potential head build-up on the liner system. The modules are graded to drain toward the north, with leachate collected within each module conveyed to a 2-foot deep, gravel filled sump measuring approximately 40 feet by 40 feet in plan area. Liquids will be extracted from each sump through a riser pipe using either submersible pumps or a pneumatic pump system. The leachate sumps for modules 4 and 5 are located along the northern module boundary (Figure 2). There will be one leachate sump per module.

3.4 Interim Groundwater Monitoring Wells

A leachate sump is the most likely location for landfill leakage, due to the flow of leachate toward the sump and the accumulation of leachate in the sump. Locating groundwater monitoring wells downgradient of each leachate sump is the proposed groundwater monitoring approach for the site (Plan of Operations, Appendix D (April 2010)). The downgradient western edge of the initial landfill modules is approximately 600 feet downgradient of the leachate sumps. Given the relatively slow groundwater flow velocity (less than 1 foot per year), a substantial amount of time could pass before leakage from one of these sumps reached a groundwater monitoring well placed at the downgradient edge of the initial modules.

To minimize the time required for a potential leak from the initial landfill module leachate sumps to be detected, interim groundwater monitoring wells will be installed as close as possible to the leachate sumps. The interim groundwater monitoring wells will be installed in angled boreholes below and immediately downgradient of the sumps for modules 4 and 5 (see Figure 2 for proposed well locations). The borings for each well will be drilled using rotary drilling equipment inclined at approximately 30 degrees from horizontal. The borings will extend to a length of approximately 150 feet and will terminate at a depth of approximately 10 vertical feet below the groundwater table (see Figure 3 for cross section showing proposed well construction). The monitoring wells will be constructed with 2- or 4-inch diameter flush-threaded PVC pipe, with 20 feet of machine-slotted well screen and a threaded end cap at the bottom. Well centralizers will be placed at 10- to 20-foot intervals to maintain the well casing off the sides of the boreholes. Sand filter pack will be placed adjacent to the well screens and extend up the lower 30 feet of the borehole. A 5-foot thick bentonite seal will be placed above the sand pack and hydrated with clean water. The remaining portion of the borehole will be filled with cement grout. A locking protective well box will be installed in concrete at the ground surface and a cap will be placed at the upper end of the well casing.

The monitoring wells may be installed to match the phased module development; the first well will be installed adjacent to the leachate sump for module 5 and prior to waste placement within the module. The second well may be installed at the same time, or later, when module 4 is constructed.

The monitoring wells will be sampled on a semi-annual schedule as described in the Monitoring Plan (Plan of Operations, Appendix D). The analytical results will be evaluated and reported as described in the Monitoring Plan.

4.0 LANDFILL PERFORMANCE REVIEW

Two comprehensive landfill performance reviews will be completed to confirm the existing landfill design and operations plans, and if necessary, make appropriate changes to ensure protection of groundwater. The performance reviews will occur at the end of the construction sequences shown in Drawings 11 and 12 of Volume II, which correspond to the development sequences that are currently estimated to occur after 10 and 25 years of operations, respectively.

The landfill performance review at the completion of each development sequence will be summarized in a report submitted to NDEP for review and approval. Appendix A presents the minimum report outline, which will address the following:

- Review the landfill operational practices and training programs
- Review the landfill design
- Review the environmental monitoring program including groundwater, landfill gas, and surface water
- Review the base settlement monitoring program
- Evaluate the environmental and base settlement monitoring data to determine the effectiveness of landfill design, landfill operational practices, and the monitoring programs to adequately protect groundwater
- Provide recommendations regarding whether changes to the landfill design, landfill operational practices, and/or monitoring programs are warranted. Depending on the results of the evaluations, these recommendations may include more stringent environmental controls or reduced environmental controls, or changes to monitoring programs to modify the frequency, type, location and/or length of monitoring.

Changes to the landfill design, landfill operational practices, and/or monitoring programs would be completed only after receiving NDEP approval.

The monitoring programs will be ongoing throughout operations of the landfill. In the event that the monitoring programs indicate that the landfill wastes are impacting groundwater prior to the completion of the above landfill performance reviews (or following the completion of the landfill performance reviews). JLII will complete an evaluation of the source of the impacts and implement appropriate corrective actions with consultation and approval by NDEP. Depending on the results of the evaluation, corrective actions could include, but not be limited to, improved landfill gas collection, enhanced liner design for future cells, and/or early closure of a portion of the landfill.

5.0 CLOSING

The proposed Jungo Disposal Site liner system, enhanced leachate controls, and landfill gas collection approach significantly exceed the minimum controls necessary to ensure groundwater protection from wastes. These environmental controls are designed to prevent releases from the landfill, thereby protecting underlying groundwater. In addition to these preventative engineered controls, an interim groundwater monitoring plan is proposed to provide an early evaluation of the performance of the landfill environmental controls. This interim program, which provides an early evaluation of landfill environmental controls creates a mechanism for evaluation and potential subsequent revision of the landfill construction design. Should any design revisions be needed, they would be implemented over the remaining life of the landfill.

Sincerely,

GOLDER ASSOCIATES INC.

Kris H. Johnson

Kris Johnson
Senior Consultant

Kenneth G. Haskell

Kenneth G. Haskell
Practice Leader/Principal

6.0 REFERENCES

Bonaparte, R., Daniel, D., and Koerner, R., 2002. *Assessment and Recommendations for Improving the Performance of Waste Containment Systems*. CR-821448-01-0, Environmental Protection Agency, Washington, D.C., pp 5-9, 5-31 and 5-32; and Appendix E140-141.

Forget B, Rollin A.L., Jacquelin T., 2005. "Impacts and Limitations of Quality Assurance on Geomembrane Integrity : Statistical Study Based on a Decade of Leak Location Surveys." Proceedings NAGS 2005/GRI-19, Dec. Las Vegas.

Giroud, J.P., 1997. "Equations for Calculating the Rate of Liquid Migration Through Composite Liners Due To Geomembrane Defects, *Geosynthetics International*, Vol. 4, Nos. 3-4, pp. 335-348.

Golder Associates Inc., April 2010, Application for a Permit to Construct and Operate a Class I Landfill Facility, Jungo Disposal Site, Humboldt County, Nevada, Report of Design, Volume I.

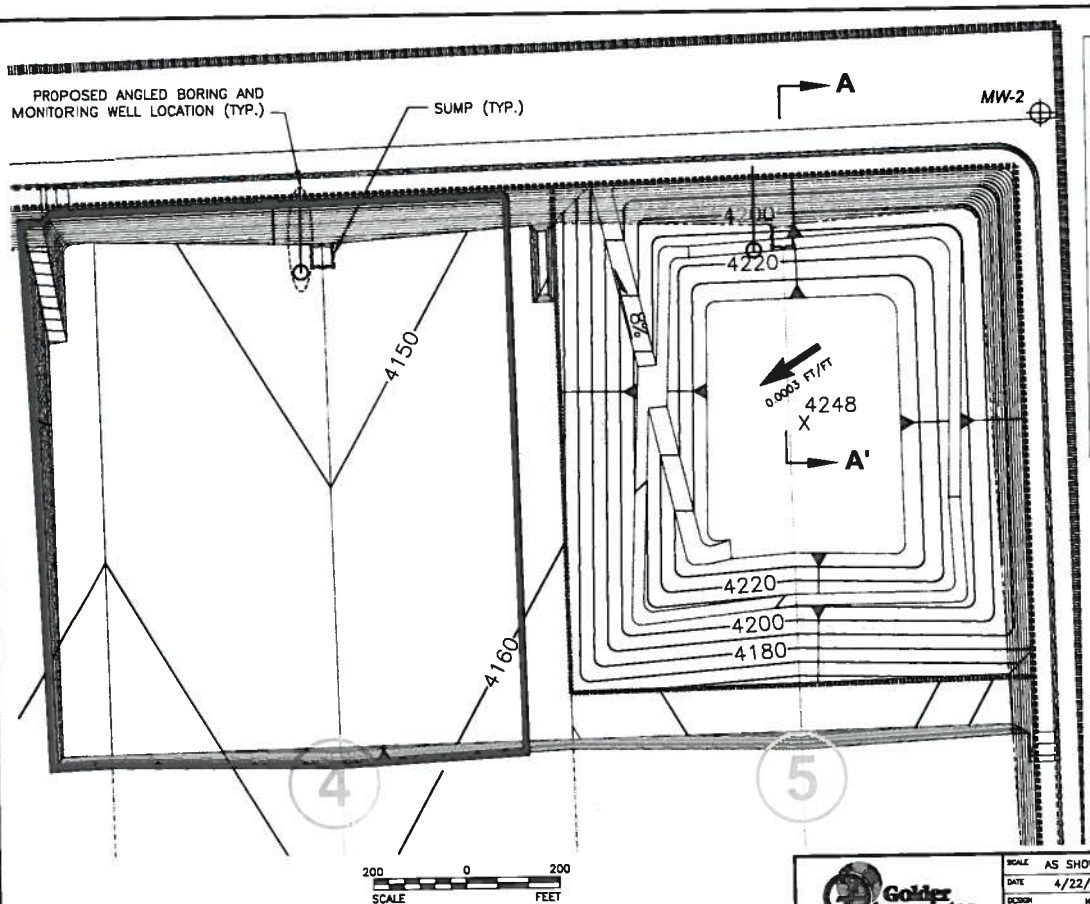
Golder Associates Inc., May 2009 (portions revised April 2010), Application for a Permit to Construct and Operate a Class I Landfill Facility, Jungo Disposal Site, Humboldt County, Nevada, Design Plans, Volume II

Golder Associates Inc., May 2009 (portions revised April 2010), Application for a Permit to Construct and Operate a Class I Landfill Facility, Jungo Disposal Site, Humboldt County, Nevada, Plan of Operations, Volume III

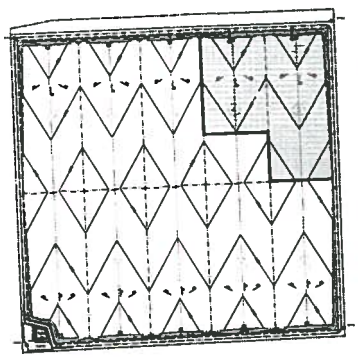
J.P. Giroud and R. Bonaparte, 1989. "Leakage Through Liners Constructed with Geomembranes, Part I", Geomembrane Liners, Geotextiles and Geomembranes, 8, 1: 27-67.

Marcotte M., Rollin A.L. and Charpentier C., 2009. "The Importance of Liner Thickness and CQA Implementation in Landfills," Geosynthetics 2009, February 25-27 2009, Salt Lake City, Utah.

FIGURES



LOCATION MAP



1500 0 1500
SCALE FEET

0.0003 FT/FT APPROXIMATE DIRECTION OF GROUNDWATER FLOW SHOWING GRADIENT

EXISTING MONITORING WELL

Golder Associates
Sunnyvale, California

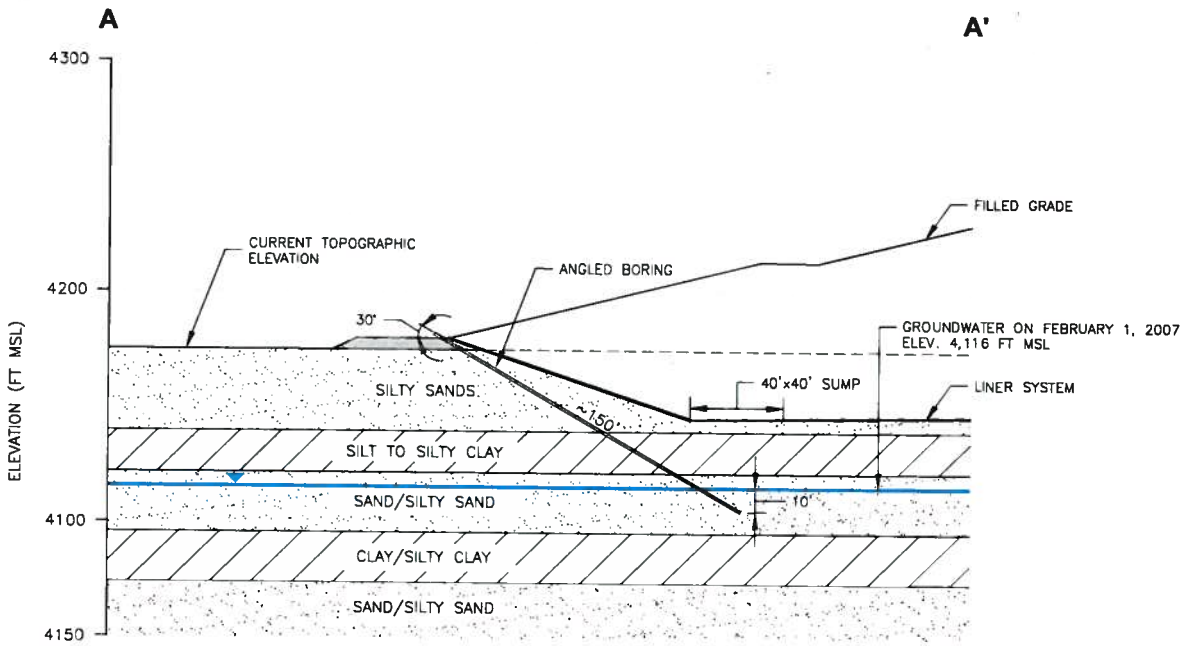
SCALE	AS SHOWN
DATE	4/22/10
DESIGN	KHJ
CADD	KMM
CHECK	KHJ
REVIEW	
FILE No.	063-7079-100
PROJECT No.	063-7079-100
REV.	0

TITLE: **PROPOSED MONITORING WELL LOCATIONS**

JUNGO ROAD - WINNEMUCA, NV

FIGURE 2

Drawing File: Angled Boring Locations.dwg Apr 28, 2010 - 3:28pm



40 0 40
SCALE FEET

Golder Associates
Sunnyvale, California

SCALE	AS SHOWN
DATE	4/22/10
DESIGN	KHJ
CADD	KMM
CHECK	KHJ
REVIEW	
FILE No.	063-7079-100
PROJECT No.	063-7079-100
REV.	0

TITLE
CROSS SECTION OF ANGLED BORING

JUNGO ROAD - WINNEMUCCA, NV

FIGURE 3

Drawing: Fig. Angle bore X-Section Apr 28, 2010 - 3:23pm

APPENDIX A
LANDFILL PERFORMANCE REVIEW REPORT OUTLINE

APPENDIX A

LANDFILL PERFORMANCE REVIEW REPORT OUTLINE

1. Introduction
   - 1.1 Overview
   - 1.2 Purpose and Objectives

2. Review of Operational Practices That Provide Additional Groundwater Protection
   - 2.1 Waste Screening
   - 2.2 Waste Handling and Placement
   - 2.3 Waste Cover Materials
   - 2.4 Training Programs

3. Environmental Monitoring Program
   - 3.1 Review of Environmental Monitoring Program
   - 3.2 Review of Environmental Monitoring Data
     - 3.2.1 Interim Downgradient Groundwater Wells
     - 3.3.2 Interim Groundwater Wells Below Sump
     - 3.3.3 Perimeter Groundwater Wells
     - 3.3.4 Landfill Gas Monitoring
     - 3.3.5 Surface Water Monitoring
     - 3.3.6 Leachate Monitoring
   - 3.3 Compare Actual Leachate Generation Rates vs Predicted Leachate Rates
   - 3.4 Conclusions
   - 3.5 Recommendations

4. Settlement Monitoring Program
   - 4.1 Review of Monitoring Program
   - 4.2 Review of Monitoring Data
   - 4.3 Compare Actual Settlement vs Predicted Settlement
   - 4.4 Conclusions
   - 4.5 Recommendations

5. Overall Design Confirmation
   - 5.1 Effectiveness of Overall Landfill Design and Operation
   - 5.2 Recommended Changes to the Design and Operation
   - 5.3 Recommended Changes to Monitoring Programs