Location Restrictions

NAC 444.678 – General:

1. NAC 444.678 (1) The site design includes all-weather access to the landfill including an access road surfaced with aggregate. The rail unloading area will include paved areas and areas surfaced with aggregate to provide dust control and all-weather access.
2. NAC 444.678 (2) and (3) The landfill design includes containment systems, controls, and monitoring systems that will prevent uncontrolled migration of landfill gas, control leachate, and prevent degradation of groundwater.
3. NAC 444.678 (4) The site has soil available that is workable and compactable for use in covering the refuse.
4. NAC 444.678 (5) The disposal site also conforms with Humboldt County's land use planning.
5. NAC 444.678 (6) The nearest public highway (Interstate 80) is more than 30 miles from the site.
6. NAC 444.678 (9) The nearest surface water body is more than 14 miles from the site.

The landfill is located within 100-feet of the uppermost groundwater aquifer and must satisfy the requirements of NAC 444.678 Location restrictions: Generally. (NRS 444.560) The location of a Class I site must:

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9. *Unless approved by the solid waste management authority, not be within 1,000 feet of any surface water or 100 feet of the uppermost aquifer if the site is approved after September 2, 1992.*

Geotechnical Summary

The initial site characterization indicates that the site is underlain by interbedded sands, silts, and clays. Four soil sequences were identified throughout the site in all five borings and included an upper silty sand, an upper silty clay and clayey silt, a middle sand, and a lower clay and clayey silt. One boring extended to a depth of approximately 145 feet encountered a fifth soil sequence consisting of a lower sand and silty sand. The base of the landfill will be founded in the upper silty sand. Groundwater was first encountered in the middle sand layer at a depth of approximately 59 to 60 feet. The upper silty clay layer occurs between the base of the landfill and first occurrence of groundwater. Site characterization indicated that the soils are normally consolidated, the silty clays and silts are moderately compressible, and that the highly plastic clay at a depth of approximately 80 to 90 feet is highly compressible. Excessive settlement of the foundation could result in adverse drainage grades on the landfill. Due to the critical aspect of these geotechnical properties, additional geotechnical borings will be completed prior to the construction of the base containment system as follows:

- A minimum of six borings will be installed for each module (each module is approximately 55-acres in area). After the explorations are completed for the first one or two modules, the number of borings may be increased or decreased based on the variability of the observed subsurface conditions. For the five borings that were completed for the initial characterization, the soil conditions were relatively consistent.
- The borings will be installed to depths of at least 200 to 300 feet.
- The underlying silts and clays will be sampled for further consolidation testing.

Further geotechnical investigations and testing will be used to confirm the lithologic and geotechnical model. If investigation indicates differing conditions, the lithologic and geotechnical model will be updated and the landfill design modified. All design changes will be submitted the Nevada Department of Environmental Protection for review and approval prior to implementation.

Hydrogeology

The partially-consolidated to unconsolidated basin-fill deposits in Desert Valley comprise the primary water-bearing unit. The deposits generally function as a single, heterogeneous aquifer rather than one with defined, contiguous fine-grained aquitards layered between coarser-grained water-bearing units. Most shallow groundwater occurs in unconfined conditions, while groundwater found at depth below finer-grained deposits occurs in semi-confined conditions (Berger, 1995). Most groundwater recharge in the Desert Valley basin occurs as precipitation that falls on the mountains surrounding the basin. The primary mechanisms for recharge are for the rainfall or snowmelt to infiltrate exposed weathered and/or fractured bedrock or for the runoff to percolate through the coarsergrained alluvial fan deposits. With most recharge occurring at the higher elevations, groundwater at the eastern and western valley margins primarily flows from the higher elevations downgradient toward the center of the basin. Additional groundwater recharge does occur in the subsurface from the Quinn and Kings River Valleys located in the northern portion of the basin (Berger, 1995). A groundwater divide bisects the Desert Valley basin from east to west. The

location of the divide has been shown to migrate over time in response to changes in groundwater elevations, but has generally remained in the central to southern-central area of the basin located north of the Jungo Disposal Site.

Geotechnical Properties:

1. SPT blow counts (N-Values, uncorrected) in the sands above the water table range from approximately 16 to 20 per foot in the upper 5 to 10 feet and generally increase to 40 at a depth of 45 to 55 feet. Based on the blow-counts, the sands are considered to be dense.
2. The moisture content of the upper silty sand layer ranged from 12 to 18 percent. The dry density of the upper silty sand ranged from 92 to 106 pounds per cubic foot (pcf).
3. The dry density of the silty clays ranged from 86 to 89 pcf. The dry density of the highly plastic clay was measured to be 59 pcf in two samples.
4. The Plasticity Index of the silty clay (CL) layers ranged from 20 to 30. The Plasticity Index for the highly plastic clay (CH) was measured between 56 and 72.
5. Consolidation tests indicated that the soils are generally normally consolidated. In some cases, the soils might be slightly over-consolidated, which may be related to the recent regional decline in groundwater levels and the older groundwater declines that occurred after ancient Lake Lahontan dried up. The primary compression index (Cc) for the silty clay and silt (CL-ML) was measured to be 0.16 to 0.26 with an initial void ratio of 0.9 to 1.0. The primary compression index (Cc) for the highly plastic clay (CH) was measured to be 0.66 to 0.71 with an initial void ratio of approximately 1.87. The lowest coefficient of consolidation (Cv) values were generally measured at between 0.01 to 0.08 ft/day, which corresponded to the high plasticity clays and some of the low plasticity clays.
6. CU-triaxial shear strength tests measured effective stress strength parameters for the silty clays that can be defined by a friction angle of 26 to 27 degrees and cohesion of 1,500 to 2,100 psf. The measured effective stress strength parameters for the highly plastic clays can be defined by a friction angle of 19 to 21 degrees and cohesion of 800 to 975 psf.