Post-Closure Operations and Maintenance Plan

Olympic View Sanitary Landfill

September 12, 2012

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1. GENERAL

This Post-Closure Operations and Maintenance Plan (O&M Plan) for the Olympic View Sanitary Landfill (OVSL) describes the operations to be conducted during the post-closure care period and provides a plan to maintain the integrity of the various containment systems through periodic landfill inspection, maintenance, repair, monitoring, and reporting procedures. It has been prepared to address the post-closure care requirements for municipal solid waste landfills set forth in the State of Washington Solid Waste Regulations (WAC 173-351-500(2)) and satisfies Section VII.B.1. of Agreed Order No. DE 8462.

This Post Closure O&M Plan provides inspection and maintenance programs for the following:

- the final cover system;
- the surface water management system;
- leachate collection and disposal;
- landfill gas systems;
- environmental monitoring points; and
- site security.

The procedures described below require timely and accurate reporting of inspections, maintenance, and repair actions. Post-closure maintenance activities will be documented and made available to local, state, and federal regulatory agencies upon request.

This O&M Plan does not provide procedures for monitoring groundwater, surface water, or landfill gas as those programs are described in the Environmental Monitoring Plan (EMSI, 2009).

2. FINAL COVER INSPECTION AND MAINTENANCE

The primary purpose of the post-closure maintenance procedures described herein are to maintain the long-term integrity of the completed final cover while accommodating potential subsidence. This section provides maintenance scheduling and documentation procedures so that materials and maintenance practices are consistent with the final cover design. Deviations from the design of the final cover during maintenance of the final cover should be approved by a licensed Washington engineer so that the effects of these deviations with respect to the performance of the final cover may be evaluated and this Post-Closure O&M Plan may be modified, if necessary.

2.1 Final Cover

This section provides a description of the final cover design as a reference for post-closure inspection and maintenance activities. Subsequent sections present final cover post-closure maintenance inspection schedule procedures, maintenance and repair procedures, and equipment, labor, and material requirements.

The OVSL consists of three adjoining areas, the unlined Old Barney White Landfill (OBWL), a lined Phase I area located adjacent to the east side of the OBWL, and a lined Phase II area located adjacent to the north side of the Phase I area (Figure 1).

The OBWL is unlined and was initially closed and covered with 12-inches of low permeability silt overlain by 2-feet of native soil and topsoil in 1984/1985. The OBWL landfill cover was upgraded in 1991/1992 with an engineered final cover system to meet Washington State MFS for Solid Waste Handling (WAC 173-304). The final cover system consists of a 50 mil very low density polyethylene (VLDPE) flexible geomembrane, geocomposite drainage layer, and topsoil (see Figure 2). As part of the final cover system construction, a leachate toe drain system was installed along the perimeter of the Landfill (see Section 5.1 for additional information).

Closure of Phases I and II included construction of the final cover system consisting of the following layers (Figure 3):

- 12-inches of vegetative topsoil and cover soil.
- Geotextile fabric;
- 12-inch drainage layer;
- Geonet composite;
- 40-mil geomembrane; and
- 6-inch thick, low permeability soil.

2.2 Operations

As the final cover system consists of only passive components, there are no ongoing active

operations associated with the final cover system.

2.3 Inspection Schedule and Procedures

Routine inspections of the final cover system are conducted to identify areas requiring additional maintenance in order to minimize the effect and extent of the conditions listed below. Inspections of the final cover are performed to identify the presence of any of the following conditions:

- Sparse or distressed vegetation;
- Presence of or evidence of ponding of water on the surface of the landfill,
- Sags related to settlement and surface water drainage interruptions which may interfere with the controlled runoff of surface waters from the closed landfill surface;
- Surface erosion as a result of high runoff velocities associated with intense rains;
- Vertical and sub-vertical cracking of the vegetative layer as a result of landfill differential settlement;
- Local surficial slumping on slopes resulting from intense seasonal rainfall or seismic loading;
- Indications of the presence of vectors, or
- Unusual surface conditions.

Final cover inspections are performed in accordance with the following schedules:

- The vegetative layer of the landfill will be visually inspected on a quarterly basis and a quarterly report of findings will be prepared; and
- The vegetative layer of the landfill will be visually inspected following unusual events such as significant earthquakes, landfill fires, vehicle accidents, and major rainstorms, with a report of findings prepared and entered into the record following any such unusual event.
- Any surface cracking, ponding, surface drainage interruptions, or unusual surface conditions will be documented at the time they are observed. Deck and slope areas will be visually inspected quarterly and results of the inspection will be documented and included in the annual report. Deck and slope areas will be visually inspected following unusual events such as earthquakes, landfill fires, vehicle accidents, and unusually heavy rainstorms (storms exceeding 2 inches of precipitation in a 24-hour period). The results of the inspection(s) will be documented and included in the annual

report.

The results of the inspections are documented in the annual report.

Table 1 summarizes the final cover inspection and maintenance activities schedules.

2.4 Maintenance and Repair Procedures

It is anticipated that the 2-ft (0.6-m) thick vegetative erosion control layer will require periodic maintenance throughout the post-closure maintenance period. Maintenance of the vegetative cover is necessary to promote long-term erosion control and to protect the final cover. The conditions which may contribute to the need for maintenance of the vegetative erosion control layer correspond to those outlined above, and include both routine maintenance and event/condition based maintenance.

Routine maintenance of the vegetative layer will consist of the following:

- Periodic mowing/brush-hogging to prevent excess vegetative buildup and to control potential for growth of woody vegetation; and

- Periodic weed control to limit establishment and control growth of scotch broom or other invasive or woody plants;

Buildup of dry grasses, plants, and shrubs can lead to a fire hazard. The grasses on the decks and slopes should be mowed to eliminate the potential for fire. Periodic mowing will also assist in keeping unwanted vegetation (e.g., woody species or noxious weeds) from becoming established. In the event that despite periodic mowing noxious weeds or other undesirable vegetation are observed to be present on the landfill cover, such unwanted vegetation will either be removed by hand with appropriate hand tools or will be controlled through use of an appropriate herbicide.

Event or condition based maintenance will be performed in response to observation of any detrimental condition identified during performance of routine inspections or in response to elective intrusion into or through the vegetative erosion control layer associated with maintenance of the landfill gas (LFG) extraction system, leachate collection system, or the surface water management system.

Repairs to the vegetative erosion control layer will be performed in a manner consistent with the original vegetative erosion control layer construction procedures. Clean fill, taken from an existing on-site soil stockpile, if available, will be placed in loose lifts of 6 to 8 in. (150 to 200 mm) in thickness and compacted to re-establish grade to appropriate elevations, as necessary. Placement of vegetative erosion control soil lifts will be performed using a front-end loader, bulldozer, grader, compactor or other heavy equipment as appropriate given the size and depth of the area to be repaired.

Reseeding of the vegetated final cover will be performed as needed. Reseeding may be necessary if slope or deck reworking has occurred, or in the event that weed pulling has caused the death or sparseness of the native vegetation. The reseeding efforts should be consistent with the design criteria of the final closure revegetation program, as described in with the Final Closure CQA Plan (Golder Associates, Inc., 2003).

If it is suspected that the rodents are threatening the integrity of the vegetative erosion control layer or the final cover, eradication procedures should commence. A licensed pest control professional will be contracted to perform the necessary services.

Additional final cover maintenance activities may be necessary as a result of one of the following potential conditions:

- Settlement-related sags and surface water drainage interruptions, which interfere with the control of runoff of surface waters from the closed landfill surface;
- Surface erosion as a result of high runoff velocities associated with intense rains;
- Vertical and sub-vertical cracking of final cover soils as a result of differential settlement of landfill; and
- Local surficial sloughing on slopes resulting from intense seasonal rainfall or from seismic loading.

Final cover maintenance, repair and/or reconstruction activities will be conducted in a manner to maintain the integrity of the final cover system and to maintain the grades and positive surface water drainage flow regimes established during closure construction. Repair materials will be placed in a manner consistent with the original final cover construction procedures. Repair soil material will be of similar saturated hydraulic conductivity and grain size distribution to the existing cover soils. Repair procedures for the final cover system should be monitored and documented as outlined in the final cover Construction Quality Assurance (CQA) Plan (Golder Associates Inc., 2003).

Two of the most common conditions requiring maintenance or repair of the final cover are: (i) elective intrusion of the final cover and (ii) sags, ponds, drainage interruptions, or evidence of surface erosion. Maintenance procedures for these two conditions are provided below.

2.4.1 Elective Intrusion

Elective intrusive, such as installation of a vertical gas well, through the final cover will be avoided whenever possible. Where required, final cover excavation will be conducted in coordination with applicable regulations and consistent with the design of the installed cover.

If intrusion into the cover is necessary, the cover will be restored to match the existing cover

construction to the maximum extent possible. Specifically, low permeability soil will be replaced and compacted to match the existing low permeability soil layer over Phases I and II. The geomembrane layers over OBWL and Phases I and II will be replaced and all seams opened for the excavation and/or the edges and patches installed over the excavated areas welded in accordance with existing standards of practice at the time. The geocomposite drainage layer and the 12-inch drainage layer will be replaced. The geotextile fabric will be replaced over any excavations conducted in the Phase I and II areas. Lastly, the vegetative topsoil layer will be replaced and reseeded with native grasses.

2.4.2 Sags, Ponds, Drainage Interruptions, and Surface Erosion

Sags and ponds in the deck and slope areas of the final cover due to non- uniform displacement of the final cover system will be repaired as soon as practical. Repair activities may include removal of the affected vegetative soil layer, geomembrane, GCL, and geocomposite, reestablishment of the foundation layer, and replacement of the GCL, geomembrane, geocomposite, and vegetative soil layer to reestablish positive grades and surface water flow patterns established during final closure construction. Repairs will be documented as outlined in the final cover CQA Plan. In areas of surface water drainage interruption and erosion, reconstruction will be consistent with the materials and practices utilized in original construction.

3. SURFACE WATER MANAGEMENT SYSTEM INSPECTION AND MAINTENANCE

Storm water runoff from the Landfill is controlled by site grading, ditches, detention ponds, and multiple outfalls, all of which are within the Landfill property boundaries. There are three detention ponds on-site (Stormwater Detention Ponds A, B/C and D) for the collection and controlled release of stormwater from the site (Figure 4). Ultimately, clean surface water generated on the Landfill is discharged to the wetland areas to the north and west. The surface water system was designed to avoid adverse impacts to the wetland areas, and all drainage facilities at the Landfill have been engineered to accommodate a 25 year, 24 hour storm event.

3.1 Operations

As the surface water management system consists of passive components, there are no active operations associated with the surface water management system.

3.2 Inspection Schedule and Procedures

3.2.1 Bench Drains and Bench Channels

The final cover includes terraces and benches to interrupt overland flow and provide access to the surface of the final cover. Stormwater runoff from the landfill surface accumulates in drainage channels located on the uphill side of the benches and terrace and is subsequently routed off of the landfill surface through a series of letdown structures and channels. Inspection of the bench channels will be required periodically during the rainy season. Observations shall be made following a major storm (i.e., storms in excess of 2 inches of rainfall occurring over a 24-hour period) to assess the system integrity. Observed damage will be promptly repaired. Benches will also be inspected annually during the summer, and necessary repairs will be made prior to the rainy season. Bench inspections will include checking for erosional ruts, settlement cracks, and proper grading.

3.2.2 Downchutes and Culverts

Eight-inch (200 mm) diameter downchutes are used to convey collected surface water from bench ditches down slope to the perimeter surface water conveyance channel. Culverts crossing underneath access roads are comprised of either CMP or HDPE pipe. The partial exposure of the culverts provides some opportunity for visual inspection for the presence of separations, perforations, and/or leakage .The culvert system serves two functions: (i) conveyance of storm flow from the top deck and side slopes; and (ii) collection of runoff from the bench channels.

The frequency of HDPE downchute and culvert inspections are as follows:

- Annually to inspect for debris and sediment build-up and condition of the pipe; and

- After major storms and significant earthquakes (i.e., seismic events with a peak ground acceleration greater than 0.1 g at the site or with a moment magnitude greater than 3.0 occurring within 3.1 mi (5 km) of the OVSL) to help maintain proper performance of the drainage system.

After significant earthquakes, visual inspections of the HDPE downchutes will be conducted to identify any of the following deficiencies:

- joint separation;
- invert failure;
- structural failure;
- perforations; and
- presence of sediment and/or debris.

Access to the buried section of the HDPE downchute under each bench can be gained through the removable inlet grate. A down hole video inspection camera can then be lowered into this section and a visual inspection can be conducted if visual observations suggest that the subsurface portion of the down chute may be clogged or damaged. The pipe fittings at the upper end of the exposed portion of each HDPE downchute can also be removed for inspection and cleaning.

Visual inspections of the culverts will be conducted to identify any of the following deficiencies:

- joint separation;
- invert failure;
- structural failure;
- perforations; and
- presence of silt and/or debris.

Access to the buried section of the culvert under the road can be gained through the removable inlet grate. A downhole video inspection camera can be passed through this section and a visual inspection can be conducted if visual observations suggest that the subsurface portion of the down chute may be clogged or damaged. The pipe fittings at the upper end of the exposed portion of each culvert can also be removed for inspection and cleaning.

The frequency of culvert inspections is as follows:

- Annually to inspect for debris build-up; and

- After major storms and significant earthquakes (i.e., seismic events with a peak ground acceleration greater than 0.1 g at the site or with a moment magnitude greater than 3.0 occurring within 3.1 mi (5 km) of the OVSL) to help maintain proper performance of the drainage system.

An inspection report shall be prepared annually and included as part of the facility's annual report. The annual report shall include any periodic observation reports made after each major storm or significant earthquake and entered into the record. The report will include a detailed description and approximate location of deficiencies. Corrective measures taken to remedy each deficiency shall also be described in the annual report.

3.2.4 Conveyance Channels and Attenuation Basin

The two types of improved drainage structures along the perimeter of the OVSL are conveyance channels and the attenuation basin. The primary drainage structure consists of a conveyance channel located along the perimeter of the landfill to collect surface water run-off from the landfill. The channels consist of vee-ditches (ditches that have been constructed by excavating earth at approximately 45 degree slopes to create a generally v-shaped profile) that are primarily vegetated with native grass to reduce erosion or in areas of where higher water velocities or flows occur are lined with rip-rap or armored with modular concrete blocks.

The majority of site runoff is conveyed to Pond BC although some runoff from the Old Barney White portion of the landfill and the area around the leachate pond is conveyed to Pond D. Pond A was used during the period when the landfill was actively operated but is no longer used. Pond B/C is approximately one acre (42,344 square feet) in size while Pond D is less than 0.1 acres in size (1,606 square feet). The ponds are excavated into native materials and are unlined with erosion control structures at the inlet and outlets. The attenuation basin (Pond BC) includes a 15-inch (380 mm) corrugated metal pipe (CMP) downstream of a flow restrictor and a concrete emergency spillway.

The frequency of inspections of the drainage channels and attenuation basin are as follows:

- Annually to inspect for debris build-up and the condition of the system;

- After major storms and significant earthquakes (i.e., seismic events with a peak ground acceleration greater than 0.l g at the site or with a moment magnitude greater than 3.0 occurring within 3.1 mi (5 km) of the OVSL) to help maintain proper performance.

Visual inspections of the open channels and the attenuation basin will be conducted to identify any of the following deficiencies:

- surface cracking;
- settlement
- erosion rills
- sediment build-up;
- flow-line inversion;
- rip-rap displacement;
- soil and/or concrete spalling;
- turf reinforcement mat damage; and
- structural failure.

A written observation report shall be prepared for all inspections, included in the annual report, and shall be kept on file with the OVSL Landfill Supervisor.

Table 2 summarizes the stormwater management facilities inspection and maintenance activities schedules.

3.3 Maintenance Procedures

3.3.1 Bench and Vee-Ditch Maintenance

Bench maintenance will consist of bench regrading and revegetation and the repair of vee-ditches along the toe of the slopes. Regrading will be performed to remediate ponding and help maintain positive drainage into the bench inlet structures. A grader, dozer, and/or compactor will be utilized to regrade the bench slope or deck, repair erosional ruts and rills, and maintain the integrity and compaction of the final cover. In areas where landfill settlement adversely affects the bench grades, additional cover material will be placed, formed into Vee-ditches, compacted to re-establish positive surface water drainage, and revegetated to re-establish erosion control.

3.3.2 HDPE Downchute and Culvert Maintenance

Typical HDPE downchute and culvert corrective measures for deficiencies are:

Joint Separation

- use wider HDPE band couplers with mastic or pumped grout; and
- attach patches with self-drilling/self-tapping screws or welds.

Invert Failure

- replace piping; or
- rotate pipe 180 degrees and patch as required.

Structural Failure

- reinstall pipe anchor supports; and
- replace section of HDPE downchute or culvert.

Clogging by Silt/Debris

- use vacuum pumps to clear extensively clogged HDPE downchutes or culverts;
- use a waterjet spray to force debris out of the downchutes or culverts;
- for smaller amounts of debris, use a bucket line; or
- use a fire hose to flush out debris.

Perforations

- patch as required; or
- replace piping.

Small amounts of silt and debris may be removed by buckets or flushing with water. Extensive clogging may require either vacuum pump or waterjet spray.

A vacuum pump may be used to remove sediment from the HDPE downchutes or culverts and can be mounted on a vehicle. A 200- to 300-gallon (760- to 1,140-liter) holding tank and a vacuum pump that has a 4-in (100m) diameter flexible hose with a serrated metal end for breaking up caked sediment may be used for this purpose. This system can remove stones, leaves, litter, and sediment deposits. Normal working depth of such a system is up to 20 ft (6 m).

A waterjet spray can be used to clear debris from the HDPE downchute system or culverts. Waterjet equipment is usually mounted on a self-contained vehicle with a high- pressure pump and a 200- to 300-gallon (760- to 1,140-liter) water supply. A 3-in. (76-mm) flexible hose line with a metal nozzle that directs jets of water out in front is used to loosen debris in pipes or trenches. The nozzle can also emit umbrella-like jets of water at a reverse angle, which propels the nozzle forward as well as blasting debris backward. As the hose line is reeled in, the jetting action forces all debris downstream where it is removed by the vacuum pump equipment. The normal length of hose is approximately 200ft (60 m).

3.3.4 Conveyance Channel and Attenuation Basin Maintenance

For open channels and the attenuation basin, the following corrective measures can be taken for deficiencies identified during the inspection:

<u>Surface Cracking of concrete structures</u>
- installation of expansion/control joints; and
- placement of sealants such as epoxy resins, asphaltic material, thermoplastics or silicones.

<u>Settlement of concrete structures</u>
- grout injection;
- complete replacement with subgrade work.

<u>Erosion rills</u>
- regrading and revegetation;
- lining with rip-rap;
- placement or relocation of modular concrete blocks; and/or
- regrading

<u>Settlement of Channels</u>
- regrading

Sediment Buildup

- removal of sediment

Soil and/or Concrete Spalling

- sandblast affected area and resurface with epoxy or mortar;
- sawcut and remove affected area, dowel into existing undamaged section, and re-mortar; or
- remove loose spalled soils and replace and re-compact to original grades.

Turf Reinforcement Mat Damage

- remove damaged matting;
- reestablish channel subgrade soils as necessary;
- replace damaged. matting; and
- re-establish channel vegetation.

Flow-line Inversion

- clean out debris or sediment build-up from channels; and
- grade channel as shown on the construction drawings.

Rip-rap Displacement

- relocate rip-rap, as necessary;
- replace or add rip-rap, as necessary.

Structural Failure

- complete replacement with subgrade work.

4. LEACHATE COLLECTION SYSTEM INSPECTION AND MAINTENANCE

The leachate management system currently includes the collection systems beneath the Phase 1 and II cells, the Barney White toe drain, leachate risers, transmission line, Phase II pump station and force main, the leachate storage pond, and the truck loading station (Figure 5). The leachate is collected from under the placed refuse through a network of perforated piping, conveyed to the lagoon for storage in accordance with the operation procedures set forth in the site Development and Operations Plan. The collected leachate is hauled by truck to local wastewater treatment plant(s) for disposal.

4.1 Leachate Collection System

The Phase I and II leachate collection system consists of a 2-foot layer of gravel placed over the composite bottom liner system, with a series of perforated pipes in gravel-filled trenches. Eleven (11) leachate cleanouts are installed at the ends of the collection pipes for access and maintenance. Leachate drains by gravity to the west side of the landfill where it is collected in four sumps. Risers are connected to each sump. The risers are equipped with automatic electric explosion proof pumps equipped with level switches. When sufficient leachate accumulates in each sump, it triggers the pump operation and the leachate is then removed through piping to the leachate pond. Each pump has a totalizer so that flow can be recorded. In addition, a totalizer is located just upstream of the leachate pond. The configuration of the leachate collection system is shown in Figure 5

A below grade HDPE force main carries leachate from the pumps in the risers in Phases I and II to the leachate pond. The transmission line consists of a HDPE pipe that was inserted into a pipe that was formerly used for leachate transmission when the system was upgraded in 1997. Four leachate manholes (LM-1, LM-2, LM-3 and LM-4) exist along the transmission line for access to the line at different locations so that pipe sections can be isolated for inspection and maintenance.

In 1993, as part of the closure of the Barney White cell, a leachate toe drain was installed along the perimeter. A compacted, keyed berm of low permeability soil was constructed around the perimeter. The toe seep collection system collected leachate that formerly broke out on the landfill sideslopes. The toe seep collection system consists of gravel blanket beneath the clay soil cap. The gravel channels the leachate down the sideslopes to perforated collection pipes that drain to the leachate transmission pipe. The leachate from the toe seep collection system is discharged into Leachate Manhole LM-5, where it is then pumped into the leachate pond. A totalizing meter measures flow into the sump.

Leachate discharges into a double-lined and covered pond located west of the Barney White cell. The pond has a storage volume of about 3 million gallons. The pond liner consists of the following components listed in order from top to bottom:

- Geotextile cushion
- 80 mil HDPE membrane

- Geosynthetic clay line
- Geotextile filter
- Geonet (leak detection layer)
- 60 mil HDPE membrane
- Geosynthetic clay layer

The pond liner system was designed to withstand as much as 17 feet of head. About one foot of granular material was placed immediately above the geotextile cushion to protect the pond liner system. The pond is equipped with an aeration system, leachate pump out and totalizer system, and a floating cover with stormwater removal system. The pond liner system includes a geonet layer and an associated sump system that provide for leak detection, collection and removal.

Fluid is removed from the pond using an onsite pumping station that transfers fluid to tanker trucks for offsite disposal. A 12-inch overflow pipe with an invert elevation of 193.4 feet exists on the west side of the pond. In the event the pond level rises to near the top of the impoundment, the system is programmed to shut down the leachate pumps to prevent further accumulation and resultant overtopping of the pond. In the event of a failure of this shutdown mechanism, the overflow pipe would convey excess leachate volume from the pond to depressions (depressions resulting from excavation of former leachate ponds and removal of soil from the west soil borrow area) located to the east (downhill) of the leachate pond. If such an event were to happen, the Kitsap Public Health District and the Department of Ecology would be notified within 24 hours and a determination would be made with respect to the need for and potential scope of any cleanup actions that may be necessary.

The floating cover over the leachate pond is a Seaman Corporation's XR-5 geomembrane having a nominal thickness of 40 mils and rests upon and closely fits the pond liner slopes and bottom when empty. The cover is anchored around the perimeter with stainless steel battens and studs to a reinforced concrete curb having a minimum depth of 8 inches and a minimum width of 12 inches. The curb and/or the surrounding surface were constructed to prohibit surface runoff onto the floating cover.

The cover is weight-tensioned utilizing sand-filled tubes between foam floats to give the cover geometric definition and to facilitate personnel access virtually anywhere on the floating cover. The weights take out excess slack in the cover as the pond level rises and falls and provides rainwater-collection troughs to facilitate removal of rainwater.

Rainwater removal is accomplished with two 110-V pumps, each located in a floating sump. One pump sized to remove rainfall at an average rate of 1 inch/day (i.e., a 30-inch monthly rainfall) is deemed sufficient for rainfall removal; however, two such pumps are provided for 100% redundancy. A separate controller for each pump is provided at the top of slope to protect the pump from dry well, flow restrictions, overcurrent, overvoltage, undervoltage and rapid cycling. Discharge hoses from the pumps are 2-inch diameter and of suction-hose construction. Water discharged from the pumps is conveyed to a catch basin on the east side of the pond from whence it flows by gravity northerly via 4 inch diameter piping to detention pond D.

To ensure against inadvertent cover inflation, the floating cover is vented to release landfill gas

as well as air introduced by the aeration system installed beneath the cover. This is accomplished by a large floating vent directly above each air station and by a continuous perforated vent pipe around the top of slope with outlets to atmosphere at 20-foot intervals. The weight-tensioned design is of the double-wye trough configuration so as to ensure against inhibiting air flow to the top-of-slope vent pipe that would otherwise occur were a peripheral trough configuration to be utilized. Suitable water-tight penetrations are provided in the floating cover.

4.2 Operations

The leachate management system entails the following active operations:

- Pumping of leachate from the leachate risers and OBWL toe drain to the leachate pond; and
- Transfer of leachate from the leachate pond to tanker truckers for transport to an offsite publicly-owned treatment works (POTW) for disposal.

The leachate risers and OBWL toe drain sump are automatically operated using float controlled pumps installed in each riser/sump. In the event of a power loss or other type of failure, the programmable logic controller (PLC) triggers an auto-dialer to send a message to pre-assigned telephone numbers.

Transfer of leachate from the leachate pond to tanker trucks for off-site disposal is performed at the truck loading facility. Transfer of leachate from the pond for offsite disposal is initiated by the site manager or contractor based on the level of leachate accumulation within the leachate pond. The need for leachate transfer is a function of the level of leachate in the pond and the resultant remaining freeboard in the pond and the anticipated rates of leachate generation. Typically, the pond level is lowered during the early portion of summer months and little to no leachate transfer is required during the summer or fall periods. With the onset of winter precipitation, leachate extraction from the landfill increases resulting in an increase in the leachate level in the leachate pond triggering the need for a resumption of or more frequent leachate transfer to the offsite disposal facility.

4.3 Inspection and Maintenance

4.3.1 Phase I and II Leachate Cleanouts, Risers, Pumps and Force Main

The leachate cleanouts should be inspected quarterly for accessibility and above grade riser components are inspected to assess their condition and integrity. Access to below grade sections of the leachate cleanouts can be gained through removable access flange assemblies/caps or wellhead assembly. A down-hole video inspection camera can be passed into the leachate cleanout riser and a visual inspection can be conducted if the cause of any blockage cannot otherwise be determined.

The leachate risers should be inspected quarterly for accessibility and above-grade riser component condition and integrity. Access to below grade sections of the leachate risers can be gained through removable access blind flange assemblies. A down-hole video inspection camera can be passed into the leachate riser and a visual inspection can be conducted if needed.

Leachate extraction pumps are removed from the risers, inspected, cleaned, and required maintenance or replacement performed and the pumps are reinstalled (LR4 requires heavy lifting equipment) annually. During the pump removal and cleaning activities the electric wiring and discharge pipes and hoses should also be inspected and replaced, if needed. As leachate volume reduces in the future, inspection and maintenance frequency may be reduced.

The force main is monitored by comparing the volume of leachate from each riser to the total volume entering the pond. If substantial volume differences are noted, the line could be restricted or plugged. If it were plugged, the line can be cleaned. Leachate manholes and cleanouts along the transmission line allow for isolation of different sections of the pipe for inspection and maintenance. Totalizer instrumentation and control panel operation should be inspected and recalibrated for proper operation at each leachate riser pump station annually.

4.3.2 OBWL Toe Drain

Since the flow meter was installed in 2009 until the date of this plan, no flow from the OBWL toe drain has been observed. The OBWL toe drain is checked quarterly for the presence of flow. Should flow occur the pump in the sump should be checked annually to assure it will operate, and the flow meter inspected and verified for proper operation.

4.3.3 Leachate Pond

Leachate can accumulate in the pond until it reaches the invert elevation of the overfill pipe on the west side of the pond. Typically, the leachate level is maintained several feet below the invert level through transfer of leachate to tanker trucks for offsite disposal. In the event that the pond level rises to near the invert elevation of the overflow pipe, leachate is pumped from the pond at the truck load out and hauled to the wastewater treatment plants, as approved in the NPDES permit. The amount of leachate removed from the pond and hauled for disposal offsite is recorded on Discharge Monitoring Reports (DMRs).

Operation of the leachate transfer pumps and the integrity of the leachate transfer piping and hose are verified whenever leachate is pumped from the pond for offsite disposal.

4.3.4 Leachate Pond – Leak Detection System

The presence of fluid in the leak detection system is checked on a quarterly basis at a minimum. The presence of fluid in the leak detection system is determined by running the pump to remove any accumulated fluid. The presence and volume of fluid removed, if any, is recorded in accordance with the requirements of the Environmental Monitoring Plan.

Accumulation of some amounts of fluid within the leak detection system is to be expected as a result of condensation within the leak detection system and leakage through small (pinhole) defects in the liner (Kroener and Kroener, 2009, Peggs, 2009, EPA, 2002, EPA, 1999, and Giroud and Bonaparte, 1989). Regular monitoring of the amount of fluid that may accumulate in the leak detection system and subsequent removal of the accumulated fluid is performed to prevent accumulation of fluid within the leak detection system that could result in damage to the underlying liner.

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Previously, the amounts of fluid removed from the leak detection system were measured using a totalizing flow meter installed downstream of the pump. Review of the amounts of fluid removed from the leak detection system over the past few years indicates that the values are highly variable. Inspection of the pump and flow totalizer indicated that the pump removes both air and fluid and that totalizer values reflect both air and fluid discharged by the pump. Therefore, the historic values for the volumes of fluid removed from the leak detection system are unreliable. Consequently, the leak detection system pump system will be modified to include a small, volumetrically calibrated storage tank to allow for a more accurate, visual inspection and measurement of the actual volumes of fluid removed from the leak detection system. A preliminary design for the re-engineered leak detection system pumping system is included in Attachment C to this Post-Closure O&M Plan.

Once the re-configured leak detection pump system is installed (expected by the end of 2012), measurements of the amount of fluid removed from the leak detection system will initially be made weekly until such time as no fluid is removed during the weekly checks at which point the monitoring frequency will change to monthly, again until no fluid is removed on a monthly basis, at which point the frequency will change to quarterly. Once reliable measurements of the amounts of fluid removed from the leak detection system have been obtained for at least a one year period and no more than a two year period after re-configuration of the leak detection system pumping system, the resultant data will be evaluated to determine an appropriate equivalent daily volume, that would require a corrective action to be taken to insure that the leakage does not occur from the leachate pond to the environment. Development of an action level may be based on the magnitude and/or trends in the volumes of fluids removed from the leak detection system, EPA guidance (EPA, 1992) on possible Action Leakage Rates for ponds, or other factors. Development of an action level for the leak detection system will be performed in consultation with and subject to approval by the Department of Ecology and Kitsap Public Health District.

A response plan will also be prepared in conjunction with development of an action level. The response plan will describe the appropriate actions to be taken in the event that the volume of liquid removed from the leak detection system exceeds the action level. Possible response actions could include increasing the frequency of monitoring and removal of fluid from the leak detection system, lowering the fluid level in the leachate pond, emptying the pond and performing an inspection and/or testing of the pond liner, taking the leachate pond out of service on a temporary or permanent basis, or other actions as appropriate and necessary and as approved by the Department of Ecology and Kitsap Public Health District.

4.3.5 Leachate Pond Floating Cover

The floating cover on the leachate pond and the rain water removal and associated pipe/hose systems on the pond cover are inspected for surface buildup of debris such as gravel, rocks, dirt, leaves or vegetation material and verified for proper operation weekly. Repairs or replacement of any cover or rain water removal systems and associated components are performed on an as needed basis.

The pond cover cleaning and maintenance should be performed annually before the rainy season. This work includes removal of all gravel, rocks, dirt, leafs or vegetation material/debris. All sand bags on the pond side slopes are removed from their tie-down straps and cleaned of debris. A water truck is utilized while pond cover surface, sand bags and hose lines are hand scrub-brushed. A vacuum truck then removes liquid and debris from created low spot on the pond cover. In addition, the cover pumps and rain water diversion bags are adjusted and proper operation verified.

4.3.6 Leachate Pond Liner

Operation and monitoring of the leachate pond is subject to the operating standards for surface impoundments – WAC 173-350-33(4). Specifically, WAC 173-350-330(4)(b) requires regular inspections of the liners of surface impoundments at a frequency of at least once every five years unless an alternate schedule is approved by the jurisdictional health department. The presence of the floating cover restricts inspection of the pond liner to only those times when a need may arise to remove all or a portion of the pond cover. In the event that a portion of the pond cover does need to be removed, the underlying pond liner may be inspected. Determination of the need for inspection of the underlying pond liner would also be based on the amount of fluid produced by the leak detection system; specifically, liner inspection could be performed as one of the possible response actions in the event that the flow rate from the leak detection system exceeded the action level to be established as described above. The Department of Ecology and the Kitsap County Health Department will be notified in advance of any liner inspection and provided an opportunity to be present during such and inspection.

4.3.7 Truck Loading Station

The condition of the pumps, hoses and electrical connections at the truck loading station is inspected quarterly at a minimum. During periods when leachate is actively being removed from the pond for offsite disposal the frequency of inspections is increases to weekly. This inspection includes checking that the pumps are operational and checking the hoses for damage and leakage. In the event that a pump is found to not be operational, the pump will be removed and sent offsite for service and/or repair. During the interim period, the pumps on the tanker trucks will be used to remove leachate from the pond. In the event that leakage is observed from one of the hoses or associated connections, use of the suspected hose will be immediately terminated and the hose will be repaired or replaced.

Table 3 summarizes the leachate collection system inspection and maintenance activities schedules.

5. LANDFILL GAS COLLECTOR NETWORK INSPECTION AND MAINTENANCE

5.1 Landfill Gas Collector Network

The landfill gas collector network consists of vertical gas extraction wells. Leachate cleanouts may also be used to collect gas that is produced in the landfill (Figure 6). All extraction wells and points are connected to above and below grade HDPE lateral and main pipelines routed to the blower flare station. The blower flare station consists of two blowers, a condensate moisture separator vessel, and a utility flare with automatic ignition with associated air compressor, control panel, automatic and manual valves and an electric backup power generator.

The main gas collection pipelines are beneath the cover system adjacent to the footprint of the landfill. Condensate from the main piping systems gravity drains to 2 sump locations at the landfill gas flare station and is automatically pumped through a totalizer into the leachate pond.

5.2 Landfill gas system operations

Operation of the landfill gas extraction system entails operation of the gas extraction blowers, operation of the landfill gas flare, and balancing of the landfill gas extraction well field to optimize gas extraction. Operation of the landfill gas extraction system is performed in general accordance with the requirements set forth in the Final Closure and Post-Closure Maintenance Plan (Geosyntec Consultants, 2002) except that the leachate evaporator portion of the system is no longer in use. Balancing of the landfill gas extraction well field entails optimizing gas quality and gas flow to maintain gas quality to the flare, maximize gas extraction from the landfill, and minimize inflow of atmospheric air into the landfill.

5.3 Inspection Schedule and Procedures

The LFG collector network is inspected every time the well field is balanced and at a minimum at quarterly intervals. All extraction wellhead assemblies flex hoses, above grade pipes, condensate sumps/pumps, sampling ports, couplings, etc. should be visually inspected and deficiencies noted.

The blower flare station is inspected on a quarterly frequency at a minimum. The utility flare, gas blowers, air compressor, moisture separator, control panels, propane ignition system, automatic/manual valves and backup power generator are visually inspected, monitored/adjusted and proper operation verified.

Table 4 summarizes the landfill gas collection system inspection and maintenance activities schedules.

5.4 Maintenance and Repair Procedures

5.4.1 Landfill Gas Collector Network

Repairs to the collector network may be necessary to maintain proper function of the landfill gas extraction and control systems. These repairs may also necessitate intrusion into the final cover. Repairs to the gas extraction wells or conveyance piping that require intrusion into the final cover will include repairs to the landfill cover that will be initiated in a timely manner as soon as the repairs are made to the gas system components. Repairs will be monitored and documented.

Depending upon the extent of deterioration or damage, the collector network components will be either repaired or replaced promptly following detection of a problem. Repairs, including possible removal and replacement will be conducted in accordance with regulatory and/or industry standards. Removal and replacement may require the GCL to be peeled back to access the affected collector(s).

Equipment Requirements

Following is a summary list of the equipment that may be required to maintain and repair the landfill gas collector network:

- pressure gauges;
- LFG monitoring equipment;
- maintenance truck;
- backhoe or skip loader;
- electric high flow fan;
- electric generator; and
- polyethylene welding or electrofusion coupler equipment.

Material Requirements

The materials required for maintenance of the collector network include the following:

- polyethylene piping, valves, flex hose and fittings;
- geotextile or geosieve material;
- GCL; and
- geocomposite.

5.4.2 Landfill Gas Blower Flare Station

Repairs to the blower flare station may be necessary to maintain proper function of the landfill gas extraction and control systems. Repairs to the blower flare station components will be initiated in a timely manner. Repairs will be monitored and documented.

Depending upon the extent of deterioration or damage, the blower flare station components will be either repaired or replaced promptly following detection of a problem. Repairs, including removal and replacement of components will be conducted in accordance with regulatory and/or industry standards.

E*quipment Requirements*

Following is a summary list of the equipment that may be required to maintain and repair the blower flare station:

- pressure gauges;
- LFG monitoring equipment;
- maintenance truck;
- backhoe or skip loader;
- electric high flow fan;
- electric generator; and
- polyethylene welding or electrofusion coupler equipment.

Material Requirements

The materials required for maintenance and repair of the blower flare station include the following:

- polyethylene piping, stainless steel piping/fittings, valves, fittings;
- pumps, switches and level sensors;
- electric components and motors
- thermocouple elements
- Drive belts, bearings and grease/lubricants

Maintenance is performed on the blower flare station and collection network on a quarterly basis as follows:

- Condensate traps and sumps (including pumps, air supply lines, etc.) are checked and observed for proper operation. Repairs are performed on an as needed basis.

- The oil level for the air compressor is checked and filled (as needed), filters are inspected, cleaned, and replaced (as needed), and liquids are manually bled from system components (where applicable) in accordance with the manufacturer's specifications.

- The operations of the control system blowers, flame-arresters, flare (including burner head), well-field, condensate sumps/pumps, air compressor, chart recorder, backup generator and automatic alarm dialer are observed and checked for the following:

    - Proper operation
    - Accessibility

  - Vandalism
  - Malfunctions
  - Leaks
  - Check proper pneumatic pump operation
  - Maintain well monument identification tags and locks

- Housekeeping duties are performed as follows:

  - Debris/litter removal sweeping of concrete areas
  - Weed removal (interior/exterior of BFS)
  - Wipe off dirty piping/equipment
  - Clean-up spillage/leaks

- The active/inactive LFG blowers are rotated.

- LFG components including wellheads, control valves, flex hoses and piping systems are inspected and repaired.

- Condensate management systems including pumps, valves and piping are inspected and repaired as needed.

- The air compressor (including electric motor) is lubricated, coolant filled, filters are inspected, cleaned, and replaced (as needed), and drive belts are adjusted in accordance with the manufacturer's specifications.

- Changing the data recording media (e.g., temperature/flow).

- The flare UV scanner is observed for proper operation and cleaned in accordance with manufacturer's specifications.

- Proper operation of the automatic dialer system, alarm signal inputs (e.g., flame failure, etc.), and BFS controller set points are verified and re-programmed, if needed.

- All alarm signals (e.g., blower failure, flame failure, low/high temperature, liquid level sensors, etc.) are simulated for proper operation and notification. During alarm simulation activities (where applicable) the alarm sensing equipment is adjusted in accordance with the manufacturer's specifications.

- The LFG blower (and electrical motor) bearings are lubricated in accordance with the manufacturer's specifications.

- The air compressor oil and air filters are replaced in accordance with manufacturer's specifications.

- The flame arrester is inspected and cleaned as needed.

- Parametric devices used for continuous monitoring (e.g., flow and temperature) are calibrated in accordance with the Federal Greenhouse Gas Mandatory Reporting Regulation for Landfills (MRP).

A preventative maintenance plan for the flare is presented in Attachment B.

6. SECURITY MONITORING AND MAINTENANCE

Security fencing, security berms and access gates will be inspected quarterly to maintain site security. Any damage, breaks, or abnormalities, such as loose fence tension or malfunctioning gates and locks, will be repaired. Fence repairs will be performed as necessary to maintain site security.

Table 5 summarizes the site security inspection and maintenance activities schedule.

7. ENVIRONMENTAL MONITORING SYSTEMS INSPECTION AND MAINTENANCE

The environmental monitoring systems at the OVSL to be maintained during the post-closure period include the groundwater and LFG migration monitoring systems (Figure 7). The post-closure permit issued by the KCHD specifies monitoring requirements for surface water, groundwater, and gas migration. The details of the monitoring program are contained within the Environmental Monitoring Plan (EMSI, 2009) and the associated Sampling and Analysis Plan (SCS, 2009).

7.1 Groundwater Monitoring Network

A network of groundwater monitoring wells has been established around the landfill (Figure 7).

Inspection

The condition of the groundwater monitoring wells is inspected in conjunction with each groundwater monitoring event and includes inspection of the conditions of any roads or trails needed to access the monitoring wells, inspection of the condition of protective outer casing, locking mechanism, and lock, and inspection of the condition of the surface seal/well pad. Any conditions that may warrant action such as overgrowth of access roads, missing or broken locks or protective casing, or cracks or gaps in the surface seal will be noted on the field forms and identified in the quarterly or annual monitoring reports.

Maintenance Procedures

Repairs to the groundwater monitoring network may be necessary to maintain proper functioning of the wells. In the event that individual wells deteriorate beyond repair, that well will either be substituted by another equivalent well in the existing network, or be replaced by installation of a new well. The well that has been replaced will then be decommissioned in accordance with State requirements.

Equipment Requirements

The following is a summary list of the equipment that may be required to maintain and repair the groundwater monitoring system:

- auger or bucket drilling rig;
- driller's maintenance truck.
- backhoe or skip loader;
- gravel or bentonite grout; and
- welder.

7.2 Landfill Gas Monitoring System

Gas monitoring probes were installed at appropriate locations around the property (Figure 7). These wells are intended to detect subsurface horizontal gas migration.

Inspection

The condition of the landfill gas monitoring probes is inspected in conjunction with each soil gas monitoring event and includes inspection of the conditions of any roads or trails needed to access the monitoring probes, inspection of the condition of protective outer casing, locking mechanism, and lock, and inspection of the condition of the surface seal/well pad. Any conditions that may warrant action such as overgrowth of access roads, missing or broken locks or protective casing, or cracks or gaps in the surface seal will be noted on the field forms and identified in the quarterly or annual monitoring reports.

Maintenance Procedures

Repairs to the landfill gas monitoring network may be necessary to maintain proper functioning of the gas probes. In the event that individual probes deteriorate beyond repair, that probe will be replaced by installation of a new probe.

Equipment Requirements

The following is a summary list of the equipment that may be required to maintain and repair the LFG migration monitoring system:

- drilling rig;
- driller's maintenance truck;
- backhoe or skip loader; and
- gravel or bentonite grout.

Material Requirements

The materials that may be required for maintenance of the LFG migration monitoring system include the following:

- PVC piping and fittings;
- valve boxes or security monuments
- rubber stoppers and silicone tubing;
- silicone sealant; and
- gravel, concrete, and bentonite.

Table 6 summarizes the environmental monitoring inspection and maintenance activities schedules. Additional requirements are set forth in the Environmental Monitoring Plan (EMSI, 2009).

8. RESPONSIBLE ORGANIZATION AND CONTACT PERSON

This POST-CLOSURE PLAN will be implemented by WM of WA, the OVSL owner and operator. WM of WA will be responsible for post-closure maintenance at the OVSL. As of Nov. 2011, the responsible parties for the OVSL during the post-closure maintenance period are as follows:

Olympic View Sanitary Landfill		
Steve Richtel	Group Director	(303) 914-1434
Charles Luckie	Landfill Supervisor	(360) 415-2754

9. POST-CLOSURE LAND USE

During the post-closure care period, OVSL will be a non-irrigated open space. The site will be vegetated with native vegetation. This land use is consistent with the surrounding topography and zoned land uses, and complies with the deed restriction placed on the property.

10. REFERENCES

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Giroud, J. P. and Bonaparte, R., 1989, Leakage through Liners Constructed with Geomembranes – Part 1, Geomembrane Liners, Geotextiles and Geomembranes No. 8

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Peggs, Ian, D., 2009, Geomembrane Liner Action Leakage Rates: What is Practical and What is Not, Land and Water, July/August

SCS Engineers, 2009, Sampling and Analysis Plan, Olympic View Sanitary Landfill, December.

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_____, 1992, Notice of Final Rulemaking – Liners and Leak Detection Systems for Hazardous Waste Land Disposal Units, 40 CFR Parts 260, 264, 265, 270 and 271, Federal Register Vol. 57, No. 19, Wednesday January 29, 1992, p. 3462

Golder Associates, Inc., 2003, Construction Quality Assurance (CQA) Plan, Project Manual for the Construction of Phase I-North and Phase II Final Covers, April 4.

Geosyntec Consultants, 2002, Final Closure and Post-Closure Maintenance Plan, July.

Tables

Table 1: Final Cover System Inspection and Maintenance Activities

Item	Inspection and Maintenance Activity	Minimum Frequency			
		As Necessary	Annually	Quarterly	Weekly
Vegetation	Check for dead plants, sparse plant cover, erosion, etc. Re-seed bare areas promptly subject to planting seasons. Stabilize and repair problem areas with erosion control matting or other measures promplty and/or perform regrading to repair erosion as necessary.			**X**	
	Check for noxious weeds and remove or control as necessary; re-seed bare areas			**X**	
	Check for woody vegetation (large brush or trees) and remove as needed			**X**	
	Mow vegetation		**X**		
Cover Surface	Check for signs of burrowing rodents (piles of soil or holes) and level piles or fill holse as needed. Re-seed bare areas. If an extensive or persistent problem occurs, contact a rodent control specialist to develop and implement a control plan.			**X**	
	Check for areas of significant subsidence or differential settlement. If present, verify that the geomembrane is intact. Repair as needed and refill with similar cover system materials. Fill localized depressions with soil to promote drainage. Re-seed bare areas.			**X**	
	Check for erosion rills or gullies. If present, verify that the geomembrane is intact. Implement temporary erosion control measures (placement of hay bales, straw cover, erosion control matting, etc.) to stabilize area and implement permanent repairs as needed and refill with similar cover system materials. Fill localized depressions with soil to promote drainage. Re-seed bare areas. Inspect following major storm events.	**X**		**X**	
	If large-sliding or slumping of cover material has occurred and/or if geomembrane liner has been compromised, evaluate cause and develop plan for repair.	**X**			
Pipe Penetrations	Check geomembrane connections around pipe penetrations for evidence of undue stress and repair as needed.			**X**	

Table 2: Stormwater Management Facilities Inspection and Maintenance Activities

Item	Inspection and Maintenance Activity	Minimum Frequency			
		As Necessary	Annually	Quarterly	Weekly
Bench Drains and Bench Channels	Check for erosional ruts, settlement cracks and proper grading. Additional inspecitons shall be made following each major stor (i.e. storms in excess of 2 inches of rainfall occurring over a 24-hour period.	**X**	**X**		
Downchutes and Culverts	Inspect for debris and sediment buildup and condition of piping		**X**		
	Inspect HDPE downchutes for joint separation, invert failure, structural failure, perforations, and presence of sediment and debris after signficant earthquakes (i.e., siesmic events with a peak ground acceleration greater than 0.1 g at the site or with a moment magnitude greater than 3.0 occuring within 3.1 miles of the site).	**X**			
	Inspect culverts for joint separation, invert failure, structural failure, perforations, and presence of sediment and debris after major storms (see definitiion above) signficant earthquakes (see definitiion above).	**X**	**X**		
Conveyance Channels and Attenuation Basins	Inspect for debris and sediment buildup and condition of the system (surface cracking, settlement, erosion rills, flow-line inversion, rip-rap displacment, soil and/or concrete spalling, turf reinforment mat damage and structural failure). Conduct additional inspections after major storms or significant earthquakes (see definitions above)	**X**	**X**		

Table 3: Leachate Collection System Inspection and Maintenance Activities

Item	Inspection and Maintenance Activity	Minimum Frequency			
		As Necessary	Annually	Quarterly	Weekly
Leachate Cleanouts	Inspect for accessibility and condition and integrity of above grade riser components.			X	
Leachate Risers	Inspect for accessibility and condition and integrity of above grade riser components.			X	
Leachate Extraction Pumps	Remove leachate extraction pumps form risers and inspect, clean and perform required pump maintainence or replace pumps. Inspect and replace as necessary electrical wiring and discharge pipes and hoses during pump removal and cleaning.		X		
Leachate Flow Totalizers	Inspect instrumentation and control panel for each leachate extraction pump and for the discharge to the leachate pond and recalibrate totalizers for proper operation		X		
OBWL Toe Drain Sump	Check that sump pump is operational.		X		
Leachate Pond Leak Detection System	Check for the presence of fluid and remove any accumulated fluid. Frquency of checking and pumping should be increased based on the amount of fluid removed (see text)			X	
Leachate Pond Floating Cover	Inspect for accumulation of debris on cover.				X
	Verify operation of rain water removal pumps and associated piping and hoses			X	
	Wash and clean floating cover		X		
Inpsect pond liner	If all or a portion of the floating cover is removed, to the extent practicable and safe, inspect the condition of the pond liner	X			
Truck Loading Station	Inspect condition of pumps, hoses and electrical connections Note: inspection frequency increases during periods when leachate is actively being removed.			X	

4 Landfill Gas Collection System Inspection and Maintenance Activities

Item	Inspection and Maintenance Activity	Minimum Frequency			
		As Necessary	Annually	Quarterly	Weekly
Landfill Gas Collector Network	Visually inspect extraction wellhead assemblies, flex hoses, above grade pipes, condensate sumps/pumps, samping ports, couplings and other features. Additional inspections should be conducted whenever wellfield is balanced	**X**		**X**	
Blower Flare Station	Visually inspect, monitor/adjust, and verify proper operation of utility flare, gas blowers, air compressor, moisture separator, control panels, propane ignition system, automatic/manual valves, and backup power generator.			**X**	
Housekeeping Activities	Remove debris/litter by sweeping concrete areas. Remove weeds from interior and along exterior of blower/flare station. Wipe off dirty piping/equipment/ Cleanup spills/leaks	**X**			

5 Security Monitoring and Maintenance Activities

Item	Inspection and Maintenance Activity	Minimum Frequency			
		As Necessary	Annually	Quarterly	Weekly
Security Fencing	Inspect condition and repair as necessary.			**X**	
Security Berms	Inspect condition and repair as necessary.			**X**	
Access Gates and Locks	Inspect condition and repair as necessary.			**X**	

6 Environmental Monitoring Inspection and Maintenance Activities

Item	Inspection and Maintenance Activity	Minimum Frequency			
		As Necessary	Annually	Quarterly	Weekly
Groundwater monitoring wells	Inspect condition of access way, protective casing, locking mechanism and lock, wellhead and surface seal/wekk pad in conjunction with each monitoring event and repair as necessary.			**X**	
Landfill Gas Monitoirng Probes	Inspect condition of access way, protective casing, locking mechanism and lock, wellhead and surface seal/wekk pad in conjunction with each monitoring event and repair as necessary.			**X**	

Figures

EAST FORK UNION RIVER

UNION RIVER

STORMWATER DETENTION POND A

STORMWATER DETENTION POND B/C

WETLAND B

WETLAND C

WETLAND D

FORMER LEACHATE LAGOONS

DETENTION POND D

FORMER NORTH BORROW

PHASE II STAGE B3

PHASE II STAGE B1

PHASE II STAGE B2

PHASE II STAGE A

PHASE I STAGE B1

PHASE I STAGE A

PHASE I STAGE B

PHASE I STAGE C

BARNEY WHITE REGIONAL INFILTRATION/DETENTION FACILITY

TRANSFER STATION

TRUCK LOADOUT HUT

OLD BARNEY WHITE LANDFILL (UNLINED BOTTOM)

TRANSFER AND STORAGE WAREHOUSES

WEST BORROW

OLD PUMP STATION

LEACHATE AERATION LAGOON

FLARE FACILITY AND LEACHATE EVAPORATOR

TRIBUTARY 512

FORMER LEACHATE SPRAY IRRIGATION

SOUTH SLOPE WELL PUMP HOUSE

PORT OF BREMERTON WASTEWATER PONDS

SOUTH BORROW

LANDFILL DEVELOPMENT PHASE BOUNDARY

Plan Area

Property Line

KEY MAP

NO SCALE

NOTES:

1. Contour data based on topographic survey data supplied by Space Imaging LLC & Kitsap County GIS Aerial Imagery, June 2001.
2. Additional property to south (see Key Map).

N

600 0 600

SCALE IN FEET

Figure 1

Overall Site Plan

Olympic View Sanitary Landfill

EMSI Engineering Management Support, Inc.

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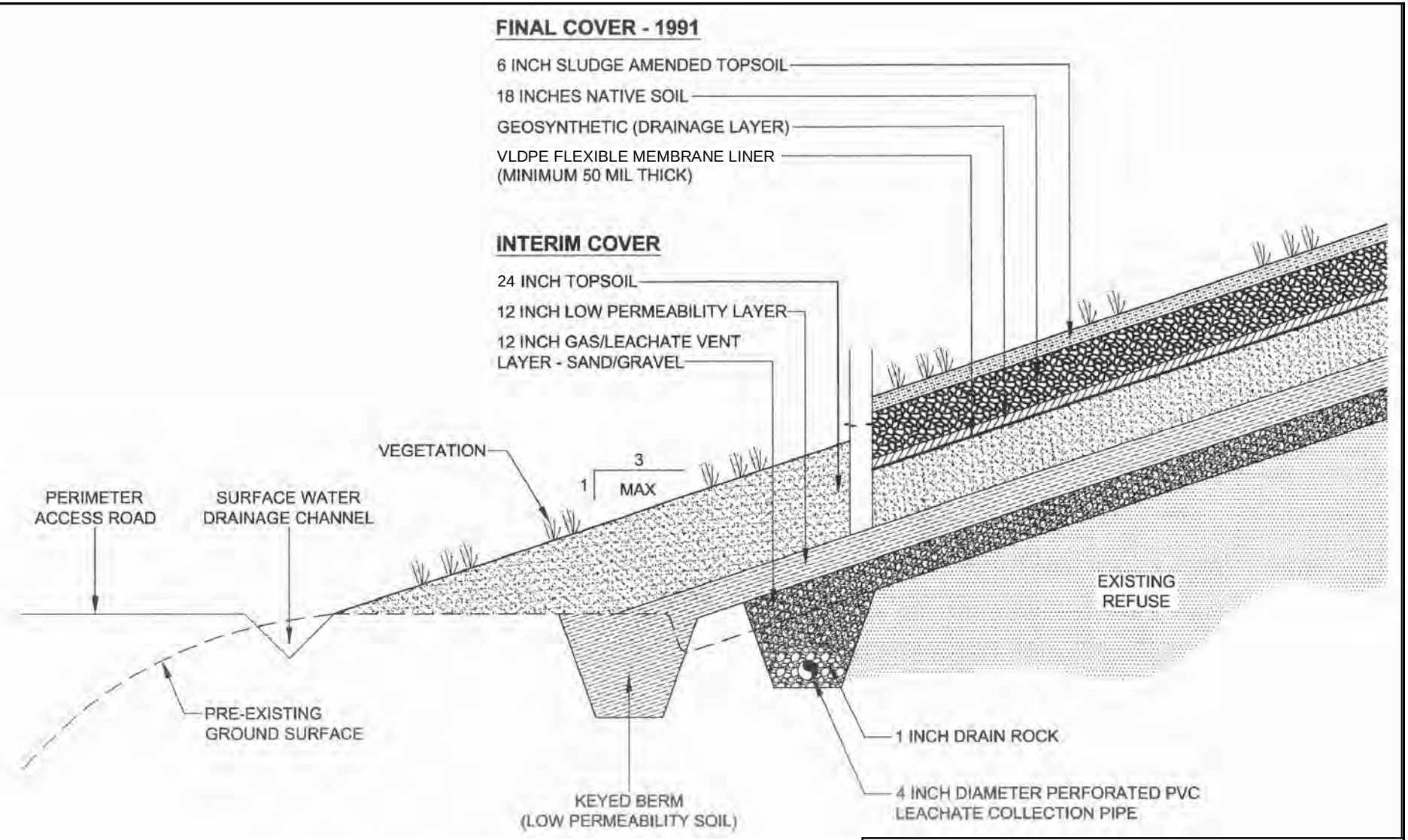

Figure 2

Old Barney White Landfill
Toe Seep Collection and Final Cover Systems

Olympic View Sanitary Landfill

Modified from: Parametrix 2007

NOT TO SCALE

EMSI Engineering Management Support, Inc.

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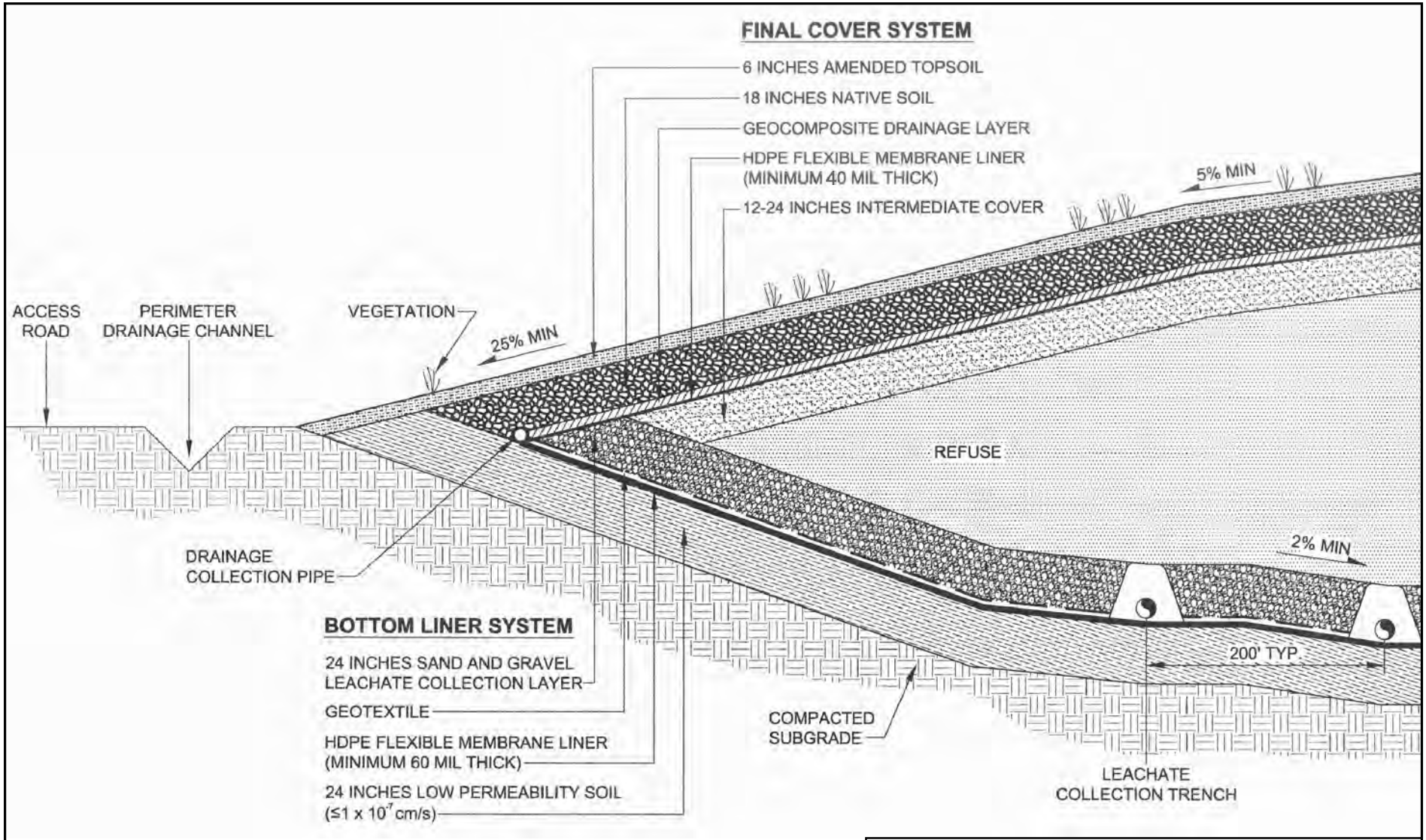


Figure 3

Typical Section of Phase I and II Final Cover, Bottom Liner, and Leachate Collection System

Olympic View Sanitary Landfill

Modified from: Parametrix 2007

NOT TO SCALE

EMSI Engineering Management Support, Inc.

UNION RIVER

STORMWATER DETENTION POND A

STORMWATER DETENTION POND B/C

OUTFALL B

WETLAND C

STORMWATER DETENTION POND D

WETLAND D

OUTFALL D

TRUCK LOADOUT HUT

OUTFALL F

OLD BARNEY WHITE LANDFILL (UNLINED BOTTOM)

WEST BORROW

OLD PUMP STATION

OUTFALL G

FLARE FACILITY

OUTFALL H

SOUTH SLOPE WELL PUMP HOUSE

SOUTH BORROW

BARNEY WHITE REGIONAL INFILTRATION/ DETENTION FACILITY

TRANSFER STATION

INDUSTRIAL PARK INFLOW POINT C

TRANSFER AND STORAGE WAREHOUSES

INDUSTRIAL PARK INFLOW POINT B

PORT OF BREMERTON WASTEWATER PONDS

INDUSTRIAL PARK DISCHARGE POINT A

LANDFILL DEVELOPMENT PHASE BOUNDARY

Property Line

Plan Area

KEY MAP

NO SCALE

N

800 0 800

SCALE IN FEET

LEGEND:

- MW-32 Monitoring Well or Piezometer
- MW-15 Decommissioned Monitoring Well or Piezometer
- SCOTT Offsite Private Well
- GP-15 Gas Probe
- GP-6 Decommissioned Gas Probe
- OUTFALL B Stormwater Monitoring Outfall
- Off-Site Point Discharge
- Downchutes
- Ditch
- Conveyance Channels
- Culverts
- Property Line
- Landfill Development Phase Boundary
- Stream
- Access Road
- Railroad

NOTES:

1. Contour data based on topographic survey data supplied by Space Imaging LLC & Kitsap County GIS Aerial Imagery, June 2001.
2. Additional property to south (see Key Map).

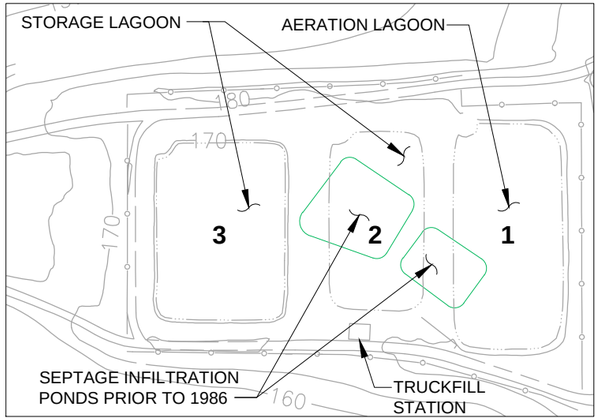
Figure 4

Surface Water Management Systems

Olympic View Sanitary Landfill

EMSI Engineering Management Support, Inc.

C:\USERS\FRED.CADD\APPDATA\LOCAL\TEMP\ACPUBLISH_5300\OVSL-PCP-FIG4-412.DWG-11X17 FIGURE 05/04/2012 2:29PM

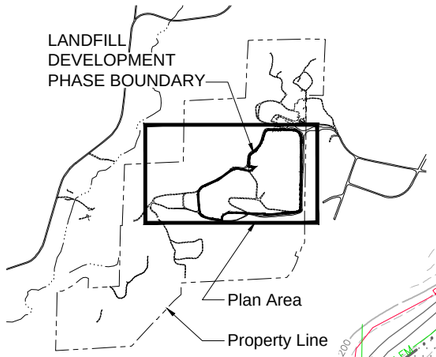


LEACHATE LAGOON AREA 1986 TO 1997

NOTES:

1. LeachateTransmission Pipe (LTP) was abandoned as part of the installation of Leachate Forcemain (LFM) HDPE system; however, the Leachate Toe Slope Collector System (LC) was connected to a new 2-inch HDPE pipe that was slipped with the LTP and leachate manholes and discharges at LM-5. As part of LFM and leachate manholes system, Leachate manholes (LM) No.1, 2, 3, and 4 were abandoned. Phase 1 Leachate was diverted around LM-1 to the new pump station.

2. Design Areas:
   - OLD - 20 Acres
   - PHASE I - 25 Acres
   - PHASE II - 20 Acres



KEY MAP

NO SCALE

LR-01
LR-02
LR-03
LR-04
ABANDONED LEACHATE PUMP STATION
LM-1
LM-2
LM-3
LM-4
LM-5
L-INF
LEACHATE TRANSMISSION PIPE 1
LEACHATE MANHOLE, TYP. 1
LEACHATE TOE SLOPE COLLECTOR
SEE INSET PLAN ABOVE FOR HISTORIC LEACHATE MANAGEMENT FACILITIES
LEACHATE AERATION LAGOON
TRUCKFILL STATION
PREVIOUS TRUCKFILL STATION
FLARE FACILITY SEE FIGURE 2-3
OLD BARNEY WHITE LANDFILL (UNLINED BOTTOM) [190]
PHASE II STAGE B3 [NA]
PHASE II STAGE B1 [NA]
PHASE II STAGE B2 [NA]
PHASE II STAGE A [187]
PHASE I STAGE BI [225]
PHASE I STAGE A [202]
PHASE I STAGE C [233]
PHASE I STAGE B [225]
LCO-1
LCO-2
LCO-3
LCO-4
LCO-5
LCO-6
LCO-7
LCO-8
LCO-9
LCO-10
LCO-11
PROPERTY LINE, TYP.
POWER LINE (TYP.)

LEGEND:

◎LM-5	Leachate Manhole
○LM-2	Decommissioned Leachate Manhole
• LCO-1	Leachate Cleanout
[202]	Approximate Bottom Elevation
P	Power Utility Vault
LC	Leachate Toe Slope Collection Pipe
LCP	Leachate Collection Pipe
LTP	Leachate Transmission Pipe (Decommissioned-In-Place)
LFM	Leachate Force Main Pipe
P	Underground Power Line
♦L-INF	Leachate Influent Monitoring Station and Flow Meter
◇ LR	Leachate Riser
	Landfill Development Phase Boundary
	Bottom Liner System

240 0 240
SCALE IN FEET

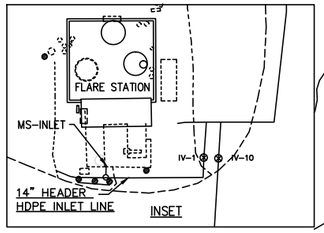
Figure 5
Leachate Management Systems
Olympic View Sanitary Landfill

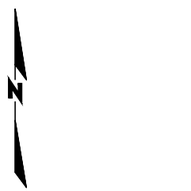
EMSI Engineering Management Support, Inc.

M:\CLIENTS\EMSI\WASTE-MAN-OVSL\10-11-POST-CLOSURE-PLAN\OVSL-POP-FIG5.DWG-LAYOUT1 04/30/2012 11:16AM

GENERAL NOTES

1. FIELD DATA, PROVIDED BY PARAMETRIX, INC. BREMERTON, WA. AND A.C.E., INC., GIG HARBOR, WA.
2. THE ENTIRE LANDFILL IS CLOSED AND CAPPED WITH COVER SYSTEM INCLUDING A GEOMEMBRANE COMPONENT.
3. ALL PIPING IS SDR-17.
4. ALL FITTINGS ARE SDR-11.
5. CONTROL VALVES ARE ASAHI TYPE-75 BUTTERFLY VALVES WITH MANUFACTURED VALVE EXTENSIONS.
6. HEADER PORTION BETWEEN LINE 7A AND LINE 7D WAS REPLACED WITH 370' OF 14" HDPE PIPE. VALVES ON 14" SOUTH HEADER, REPLACE PORTION TO LCO'S HAVE 4' STEM WITH ONE TRANSITION TUBE 4' TO EACH SIDE OF VALVE.
7. HC-7 OR HC-6 IS BELIEVED TO BE LCO-12 TO LEACHATE COLLECTION PIPE.





240 0 240

SCALE IN FEET

LEGEND

- Gas Extraction Well
- Abandoned Gas Extraction Well
- Horizontal Gas Collection Well
- Leachate Cleanout
- Gas Extraction Well Approximate Location (From SCS 8/2011)

Figure 6

Landfill Gas Collection Systems

Olympic View Sanitary Landfill

EMSI Engineering Management Support, Inc.

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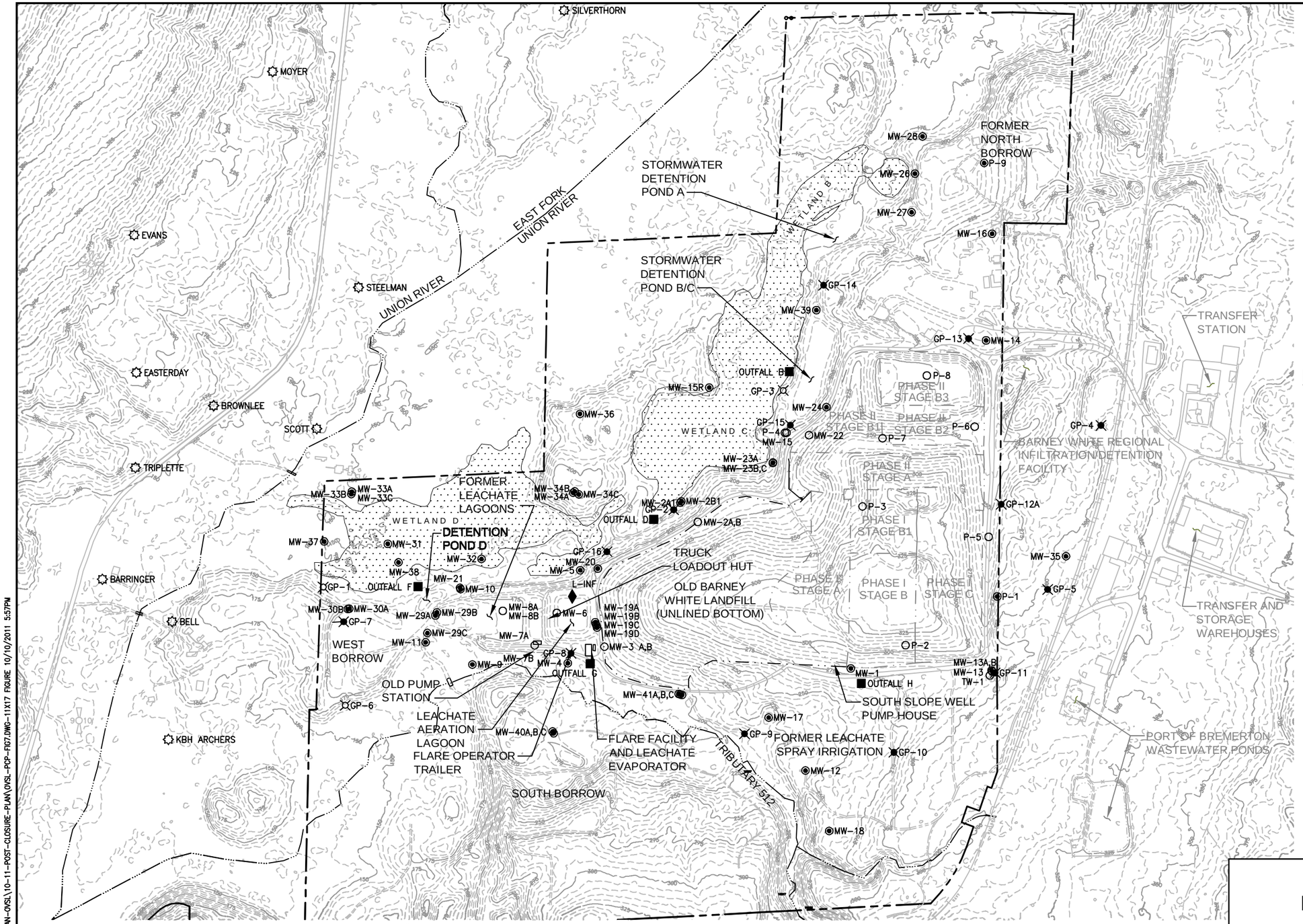
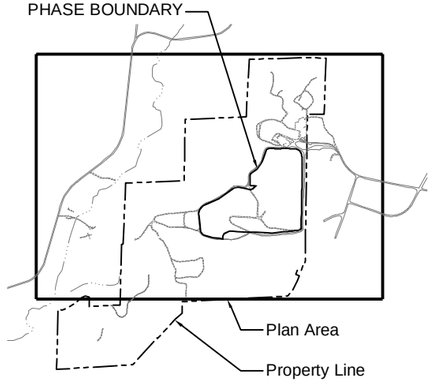


LANDFILL DEVELOPMENT PHASE BOUNDARY



KEY MAP

NO SCALE

NOTES:

1. Contour data based on topographic survey data supplied by Space Imaging LLC & Kitsap County GIS Aerial Imagery, June 2001.
2. Additional property to south (see Key Map).

LEGEND:

- MW-32 — Monitoring Well or Piezometer
- SCOTT — Offsite Private Well
- MW-15 — Decommissioned Monitoring Well or Piezometer
- L-INF — Leachate Influent Monitoring Station
- GP-15 — Gas Probe
- OUTFALL B — Stormwater Monitoring Outfall
- Property Line
- Landfill Development Phase Boundary
- Stream
- Access Road
- Railroad

Figure 7

Enviromental Monitoring Locations

Olympic View Sanitary Landfill

EMSI Engineering Management Support, Inc.

M:\CLIENTS\DEMSI\WASTE-MAN-OVSL\10-11-POST-CLOSURE-PLAN\OVSL-POP-FIG7.DWG-11X17 FIGURE 10/10/2011 5:57PM

Attachment A

Inspection Forms

ROUTINE ON-SITE O&M
WEEKLY FLARE INSPECTION FORM
OVSL - Olympic View Sanitary Landfill

WASTE MANAGEMENT, INC.

Technician: _____ Date: _____ Time: _____

KOP-103 (Knockout Pot)

PI-100 gauge reading (Vacuum) _____

Temperature at TI-100: _____

DP across screen HV-102): _____

Condensate level (KOP103): _____

After KOP-103, Prior to Blowers:

Temperature at TI-106 _____

Pressure at PI-106: _____
(inline vacuum)

Blower in Use (check which one):

108A (B-1): _____ Hours _____

108B (B-2): _____ Hours _____

SVX9000 Blower Readings:

Left arrow & Right arrow to cycle

Motor Voltage: _____

Motor Current: _____

Bearing Temp: _____

Post Blower Readings:

Temperature at TI-112: _____

Pressure at PI-112: _____

Condensate Pump(vault):

Visual inspection: _____

Bump Test: _____

GEM Reading at HV-112D:

CH4 (Methane) _____

CO2 _____

O2 _____

BAL _____

Flame Arrestor DP at DPI-113: _____

Propane Tanks: (check in use)

Tank "A": _____ PSI level: _____

Tank "B": _____ PSI level: _____

Gardner Denver Compressor: _____

PSI Level: _____ Hours: _____

Garder Denver Dryer System:

Tank P1 _____

Tank P2 _____

Check Valve performance: _____

Flare Control Panel Readings:

Opperating Temp (flare stack): _____

Instantaneous SCFM: _____

Inlet Vacuum (Pressure): _____

Flare Flow Total (Totalizer): _____

Weather Conditions: _____

Ambient Temperature: _____

Comments: _____

Khalfani Lee

WEEKLY ROUTINE ON-SITE O&M
PUMPS & TOTALIZER INSPECTION FORM
OVSL - Olympic View Sanitary Landfill

WASTE MANAGEMENT, INC.

Technician: _____ Date: _____ Time: _____

LR-01

Totalizer Reading _____

Hose & fittings visually inspected: _____

EPG computer online: _____

Audible or visual leaks: _____

LR-02

Totalizer Reading _____

Hose & fittings visually inspected: _____

EPG computer online: _____

Audible or visual leaks: _____

LR-03

Totalizer Reading _____

Hose & fittings visually inspected: _____

EPG computer online: _____

Audible or visual leaks: _____

LR-04

Totalizer Reading _____

Hose & fittings visually inspected: _____

Estimated Freeboard: _____

Audible or visual leaks: _____

Secondary Containment:

Totalizer Reading _____

Hose & fittings visually inspected: _____

Rainwater level: _____

Audible or visual leaks: _____

Load-out:

Totalizer Reading _____

Hose & fittings visually inspected: _____

L-Pond Freeboard: _____

Audible or visual leaks: _____

L-Pond:

Totalizer Reading _____

Hose & fittings visually inspected: _____

Audible or visual leaks: _____

Barney White:

Totalizer Reading _____

Hose & fittings visually inspected: _____

Audible or visual leaks: _____

Flare Pad:

Totalizer Reading _____

Hose & fittings visually inspected: _____

Audible or visual leaks: _____

Condensate:

Totalizer Reading _____

Hose & fittings visually inspected: _____

Audible or visual leaks: _____

Comments: _____

Khalfani Lee

OPERATION AND MAINTENANCE SITE INSPECTION REPORT
Monthly Cover Monitoring

WASTE MANAGEMENT, INC.

SITE NAME: ______________________
INSPECTION DATE: ______________________
TECHNICIAN: ______________________

COVER & VEGETATION	YES	NO	COMMENTS
Settling of cap			
Distinct areas of distressed vegetation			
Erosion on cap system			
Erosion on side slopes			
Ponding of water on cap			
Surface cracking			
Exposed waste			

REPAIR AREAS:

GPS Coordinates		Location Description	Date of Repair	COMMENTS
Northing	Easting			

ROUTINE ON-SITE O&M
MONTHLY FLARE INSPECTION FORM
OVSL - Olympic View Sanitary Landfill

WASTE MANAGEMENT, INC.

	January	February	March	April	May	June	July	August	September	October	November	December
Pneaumatics:												
Check supply lines for leakage, damage & wear												
Inspect pressure gauges for moisture												
Inspect pressure gauges for inconsistancies												
LFG Blower:												
Check vibrations levels												
Re-lubricate bearings per specification												
Inspect drive belts and flex coupling												
Re-lubricate motor bearings												
Piping:												
Check all valves for proper operation												
Inspect fittings for proper seal and connection												
Flame Arrester:												
Clean internal bank per spec.												
Check back pressure and clean bank assy.												
Flare assembly:												
Remove and clean ultra-violet scanner												
Check UV scanner for proper operation												
Check electrical enclosure for moisture												
Check pressure, vacuum & temp. gauges												
Check Thermocouple elements (visual)												
SIGN FOR COMPLETION												
Initial below completed month:Performed By												
Initial below completed month:Confirmed By												

Khalfani Lee

WASTE MANAGEMENT

Flare Station Inspection Checklist
(Quarterly, Semi-Annual & Annual Tasks)

Year: _____
Unit:_____

Instructions:
Inspector should initial in the day when acceptable
Leave blank if not implemented or not applicable.
Foot note in the day then indicate follow action below
Enter the completion date for each action item

Quarterly TASKS

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Check enclosed flare for holes, burn spots, peeling paint, etc.				
Check stack structural integrity, guy wires & flame shield				
Remove debris, brush/weeds from station area				
Verify maintenance on air compressors				
Blowers properly oil/greased & belts tightened				
Blower belts replaced as required & spares available				
Verify air compressor maintenance based loaded/unloaded ops hrs				
check ignition/flame check system for proper operation and maintenance.				
Verify the proper air dryer maintenance is performed				
Check electrical enclosure for moisture and damage				

FOLLOW UP ACTIONS:
(# above/date/action)

Semi-Annual TASKS

	1st Half	2nd Half
Verify proper flow meter calibration, per manufacturer		
Inspect totalizers joints and seals		
Clean flow meter probe		
Verify low & high shutdowns are met permit limits		
Check thermocouple elements		
Check solenoid manual override		
Clean pressure regulator vent		
Verify signage is present		
Verify proper operation of station lighting		
Verify proper operation of gauges & sight glasses		
Verify proper operation of tank vacuum regulators & equipment		
Check flare skid attachments, fittings and bolts.		
Verify dial out functions & properly programmed		
Check all flange gaskets for leakage		
Check wire connections for corrosion & tightness		

FOLLOW UP ACTIONS:
(# above/date/action)

Annual TASKS

Condensate Knock-out Pot	
Drain KO Pot if need be and clean Site glass.	
Inspect internal KO Pot coating, cover gasket & clean demister pad	
Retighten Cover Bolts	
LFG Blower	
Inspect Foundation & Correct deficiencies	
Check conditions of isolation pads	
Check blower motor alignment	
Clean ventilation openings of blower motor	
Check wire connection for corrosion & tightness	
Piping	
Retighten all flange bolt connections	
Check piping Alignment	
Flow Meter	
Calibrate Flow Meter (if not already done)	
Propane Pilot System	
Clean solenoid valve per specifications	
Flare Assembly	
Inspect igniter plug, lead-wire & connections	
Inspect condition of tip	
Align and retighten foundation bolts	
Tighten conduit connections	
Check wire connections for tightness and corrosion	
Check paint & touch-up/repaint	
Inspect Foundation & Correct deficiencies	

FOLLOW UP ACTIONS:

(# above/date/action)

Attachment B

Landfill Gas Blower/Flare Station

Preventative Maintenance Plan

PREVENTATIVE MAINTENANCE PLAN

OVSL Utility Flare Maintenance

An LFG Specialties utility flare and controller system requires very little maintenance. A few preventative maintenance steps should be taken, These steps include:

1. Periodically drain the flare stack, if not piped for continuous draining. The flare is equipped with a 2" diameter drain port at the base of the stack. Also, check the drain port for obstructions and clean out if necessary.

2. Maintain the finish on the package equipment by cleaning any scratches or chipping with a wire brush and repainting with touch-up paint supplied. Note: no maintenance is required on the stainless steel portion of the flare.

3. Inspect all wiring and connections for any wear and replace as necessary.

4. Inspect spark plug igniter for electrode wear and replace as necessary. Annually

5. Check pilot nozzle for obstructions and clean as necessary. Pilot nozzle is a small jet, which may require a fine wire, needle or brake cleaner to aid in cleaning.

6. Check all piping connections for tightness and leaks, replace gaskets as necessary and re-torque bolts.

7. Check skid and flare alignment, re-shim and level if necessary.

8. For maintenance directions on peripheral equipment, see manufacturer's instructions in back of this manual.

9. When blower is included in scope of supply:

a. Lubricate the blower and motor bearings as specified by manufacturer (see maintenance section below).

b. Check and adjust tension on drive belts when applicable.

c. The Manufacturers recommended lubricant for Grease lubed Blowers is

NLGI #2

OVSL Blower Maintenance

Lubrication requires that every six months or every six thousand hours of blower run time whichever comes first.

Be sure all appropriate lock out tag out procedures are applied for safety and with the equipment completely stopped:

- ☐ Remove the bearing covers and clean out all the existing grease by hand, using lint free cloth.
- ☐ While turning the blower shaft by hand, install fresh grease to force out (PURGE) old grease from behind the bearing, wipe off this old grease and fill the bearing cover with the remainder of the amount of grease specified by the appropriate manual for your specific blower and reinstall the bearing covers.
- ☐ Leave the drain plugs out and operate the blower for 30 to 60 minutes to get the grease and bearing to operating temperature and allow the grease to expand and drain out the excess, then the plugs may be reinstalled.

ELECTRIC MOTORS USED

Most Electric Motors require periodic lubrication. Motors can be ordered with sealed bearings that will not accept the addition of grease.

- ☐ DO NOT ASSUME THAT THE ABSENCE OF GREASE ZERKS ON YOUR MOTOR INDICATES SEALED BEARINGS.

- ☐ Be sure all appropriate lock out tag out procedures are enforced for safety.

COMPRESSOR MAINTENANCE

To obtain reliable and satisfactory service, this unit requires a consistent preventive maintenance schedule. Maintenance schedule pages are included in the back of this manual to aid in keeping the proper records.

DAILY MAINTENANCE

1. Check oil level of both compressor and engine if so equipped. Add quality lubricating oil as required.
2. Drain moisture from tank by opening tank drain valve located in bottom of tank. Do not open drain valve if tank pressure exceeds 25 PSIG.

WEEKLY MAINTENANCE

1. Clean dust and foreign matter from cylinder head, motor, fan blade, air lines, intercooler and tank.
2. Remove and clean intake air filters.
3. Check V-belts for tightness**.** The V-belts must be tight enough to transmit the necessary power to the compressor. Adjust the V-belts as follows:
   - Remove bolts and guard to access compressor drive.
   - Loosen mounting hardware which secures motor to base.
   - Slide motor within slots of baseplate to desired position.
   - Apply pressure with finger to one belt at midpoint span. Tension is correct if top of belt aligns with bottom of adjacent belt. Make further adjustments if necessary.
   - Check the alignment of pulleys. Adjust if necessary.
   - Tighten mounting hardware to secure motor on base.
   - Re-install guard and secure with bolts.

EVERY 90 DAYS OR 500 HOURS MAINTENANCE

1. Change crankcase oil. Use type and grade oil as specified in the section on "Compressor Oil Specifications".
2. Check entire system for air leakage around fittings, connections, and gaskets, using soap solution and brush.
3. Tighten nuts and cap screws as required.
4. Check and clean compressor valves, replace springs, discs and seats when worn or damaged.
5. Pull ring on all pressure relief valves to assure proper operation.

GENERAL MAINTENANCE ON COMPRESSOR

PRESSURE RELIEF VALVE: The pressure relief valve is an automatic pop valve. Each valve is properly adjusted for the maximum pressure permitted by tank specifications and working pressure of the unit on which it is installed. If it should pop, it will be necessary to drain all the air out of the tank in order to reseat properly. Do not readjust.

TANK DRAIN VALVE: Drain valve is located at bottom of tank. Open drain valve daily to drain condensation. Do not open drain valve if tank pressure exceeds 25 PSIG. The automatic tank drain equipped compressor requires draining manually once a week.

PRESSURE SWITCH: The pressure switch is automatic and will start compressor at low pressure and stop when the maximum pressure is reached. It is adjusted to start and stop compressor at the proper pressure for the unit on which it is installed. Do not readjust.

BELTS: Drive belts must be kept tight enough to prevent slipping. If belts slip or squeak, see V-belt maintenance in preceding section.

COMPRESSOR VALVES: If compressor fails to pump air or seems slow in filling up tank, disconnect unit from power source and remove valves and clean thoroughly, using compressed air and a soft wire brush. After cleaning exceptional care must be taken that all parts are replaced in exactly the same position and all joints must be tight or the compressor will not function properly. When all valves are replaced and connections tight, close hand valve at tank outlet for final test. Valve gaskets should be replaced each time valves are removed from pump.

CENTRIFUGAL UNLOADER AND UNLOADER PRESSURE RELEASE VALVE: The centrifugal unloader Is operated by two governor weights. It is totally enclosed and lubricated from the crankcase of the compressor. When compressor starts, the governor weights automatically open compressing the main spring, allowing the unloader pressure release valve to close. When the compressor stops, the main spring returns the governor weights to normal position opening the unloader pressure release valve and unloading the compressor. This prevents overloading the motor when starting. If air continues to escape through the governor or unloader pressure release valve while operating, this is an indication that the unloader pressure release valve is not closing tightly and may be held open by foreign substance which has lodged on the seat. In order to correct this, remove the governor release valve cap, giving access to unloader pressure release valve spring and ball. Clean thoroughly and return parts in the same order in which they were removed. Loose drive belts can also cause unloader to leak by preventing the compressor from reaching proper speed. (See "BELTS" above.)

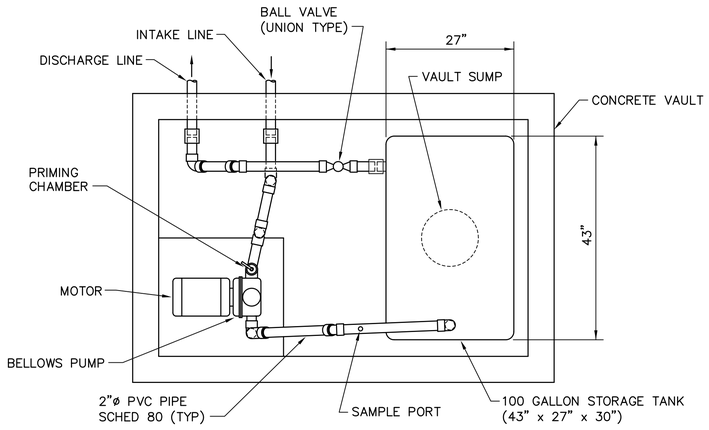
CHECK VALVE: The check valve closes when the compressor stops operating, preventing air from flowing out of the tank through the pressure release valve. After the compressor stops operating, if air continues to escape through the release valve, it is an indication that the check valve is leaking. This can be corrected by removing check valve and cleaning disc and seat. If check valve is worn badly, replace same.

THE INTERSTAGE PRESSURE RELIEF VALVE is provided to protect against interstage over pressure and is factory set for maximum pressure of 75 PSIG.

LUBRICATION OF COMPRESSOR: Fill crankcase to proper level as indicated by oil sight gauge. Keep crankcase filled as required by usage.

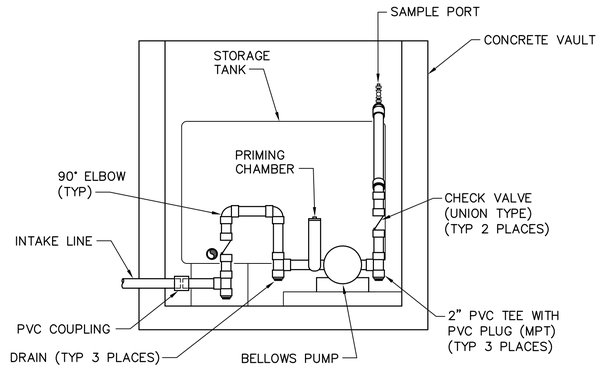
Attachment C

Preliminary Design – Reconfiguration of Leak Detection Pump System



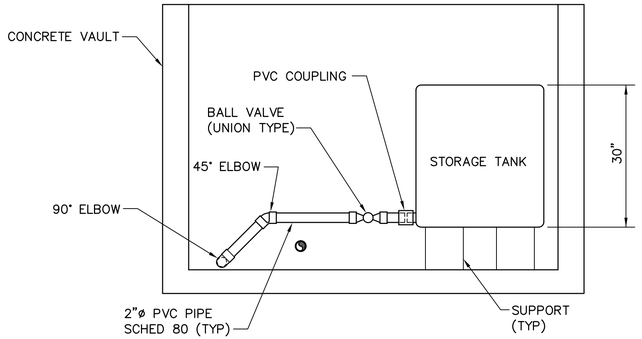
PLAN

SCALE: 3/4" = 1'-0"



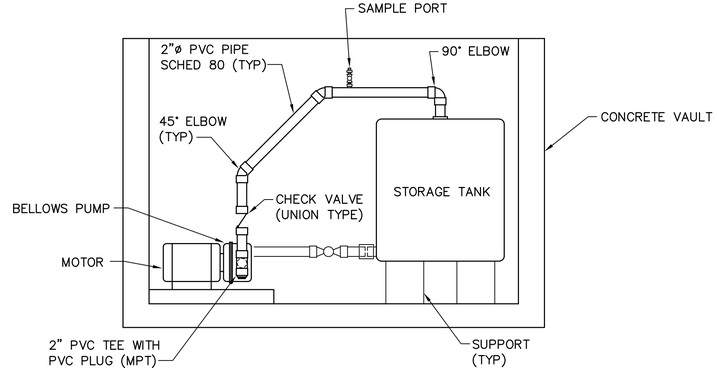
INTAKE LINE ELEVATION VIEW

SCALE: 3/4" = 1'-0"



TANK DISCHARGE PIPE ELEVATION

SCALE: 3/4" = 1'-0"



TANK INTAKE PIPE ELEVATION

SCALE: 3/4" = 1'-0"

NO.	REVISION	DATE
A	ISSUED FOR REVIEW	07/16/2012

SHEET TITLE
SECONDARY VAULT LP-LCD PUMP SYSTEM
PLAN AND ELEVATIONS

PROJECT TITLE
WASTE MANAGEMENT
OLYMPIC VIEW SANITARY LANDFILL
PORT ORCHARD, WASHINGTON

WASTE MANAGEMENT

SCS ENGINEERS
Environmental Consultants and Contractors
2405 140th Avenue NE, Suite 107
Bellevue, Washington 98005
(425) 746-4600 FAX: (425) 746-6747

PROJ. NO.	07207006.11	DWN. BY:	LEL
DSN. BY:	SH	CHK. BY:	SH
		APP. BY:	
		ACAD FILE:	FIGURE 1

DATE: JULY 2012

SCALE: AS SHOWN

FIGURE NO.

1