

April 20, 2017

RE: Operation and Maintenance Plan for Environmental Waste Solutions, LLC during Bankruptcy

On April 18, 2017, Environmental Waste Solutions, LLC filed for Chapter 7 bankruptcy. The Department has been in communication with the appointed trustee and currently has access to the site in order to ensure proper operation and maintenance and to secure the site to protect human health and the environment. The Department and the trustee are coordinating so that these services continue. Division of Solid Waste Management (Division) staff members are on site and the Department has contracted for the provision of the operational and maintenance services identified herein. This Operation and Maintenance Plan (Plan) has been composed by the Division to serve only as an outline for staff and contractors as they continue operation and maintenance activities at the site. The Division reserves the right to edit this Plan as necessary.

This facility is a Class II landfill that accepts industrial wastes in two separate cells. One cell of the landfill (Phase II-Cell I and Phase III-Cell 1) is permitted to accept only aluminum processing waste. The other cell of the landfill (Phase IV-Cell 1) accepts other approved industrial wastes and construction and demolition (C&D) wastes.

Listed below are the O&M considerations that need to be addressed in the near term:

- Leachate from the Industrial and C & D Waste Cell (Phase IV-Cell I)
 - Perform analysis on the leachate prior to disposal.
 - Treatment system needs to be brought back on line.
 - Totes of solids, which are currently located in the secondary containment, need to be taken out of the containment.
 - Pump leachate out of the cell to keep the head level down.

- Leachate from the Aluminum Processing Waste Cells (Phase II-Cell I and Phase III-Cell I)
 - Continue removing leachate from the cell.
 - Perform analysis on the leachate if a new disposal facility is required; if disposal of the leachate continues to the previous disposal facility, analysis may not be required.

- Gas system
 - Maintain system operation.
 - Maintain cap integrity.
 - Maintain or replace perimeter ammonia monitors at the site.

Listed below are the systems currently in-place at the facility and O&M considerations to keep them functional:

1) **Gas collection and treatment system (Present in Phase II-Cell I and Phase III-Cell I only)**

The gas management system for the landfill is primarily installed in the “Black Mountain” (Phase II-Cell 1) area. The facility is referred to as “Black Mountain” since part of the waste has been covered with a black, temporary, synthetic cap. Other parts of Phase II–Cell I have been covered with a green, synthetic, turf product. Gas management infrastructure has also been installed in Phase III-Cell 1; however, the extent, location, and functionality of the system in this area are not fully understood or documented (as-built drawings). Only an earthen cap exists in this cell. Aerial Photograph 1 provides an overview of the entire facility.

The gas management system consists of a number of shallow (near surface) gas collectors that are perforated through the synthetic cap(s). The shallow collectors are connected to small diameter (2, 3, and 4-inch) high density polyethylene (HDPE) piping that conveys the gas captured under the cap to an ammonia gas treatment system (acid based gas extraction / scrubber system). As mentioned above, there may also be some vertical or horizontal trench collectors installed in the Phase III-Cell 1 area that are capturing gas and conveying it to the same treatment system. Aerial Photograph 2 provides a closer view of the synthetic caps and the gas treatment building.

O&M Considerations

• **Gas Treatment System** - The nameplate on the system stated that the unit was built in 2003 by Product Recovery Management (PRM) located in Butner, North Carolina. The nameplate states that the system is a PT/SVE system. Vacuum to the gas collectors is developed by a small blower contained in the treatment building. Treated gas is pulled through the system and vented to atmosphere using another small blower. Both blowers have electric motors. An O&M Manual is not available for this unit; however, the manufacturer should be contacted since this unit is a lease. Perhaps the manufacturer can provide O&M services, or at least provide an O&M manual so a third party could operate the system. In discussions with the EWS Operations Manager, it is unlikely the system was functioning properly before EWS filed for bankruptcy. Based on observing the unit, and without the benefit of an O&M Manual, the following is recommended:

- Grease blower / motor bearings
- Ensure stable, vibration free operation of blowers
- Restart blowers / motors after malfunctions
- Check all fittings for tightness and ensure bolts have not vibrated loose
- Replenish spent chemicals (acid)
- Replenish water used for system operation (stored in 500-gallon tank inside building)
- Ensure system is functioning and not leaking
- Perform other activities presented in O&M Manual
- Establish testing protocol to determine if system is functioning properly

• **Gas System Piping if the system is incorporated into a permanent closure system** – Gas system piping consists of HDPE pipe of differing sizes (2, 3, and 4, inch) connected with PVC fittings. These dissimilar materials will not effectively fuse with glues. HDPE pipe should be fused with heat (butt fuse or electrofusion couplers). The EWS Operations Manager for the facility was driving screws in the PVC fittings to mechanically join the pipes in an effort to keep the piping functional.

- Ensure that piping has not pulled apart and/or is leaking.
- Ensure all header and lateral connections to gas collectors are tight and collectors are functioning properly.
- Correct pipe sags so that condensation does not block gas flow to the treatment system.
- Install valves on gas collectors so that vacuum can be more evenly distributed throughout the system. Measure vacuum at these valves to document vacuum is appropriately distributed.
- Remove PVC fittings and replace with butt-fused HDPE fittings.

• **Synthetic Cap(s)** – As presented above, a black polyethylene scrim cap and a synthetic turf cap are both present and provide a seal on part of the aluminum processing waste to prevent odors and maximize the effectiveness of the gas collection system. The scrim has reached the recommended life in an exposed environment per the manufacturer’s specifications. As the material continues to breakdown it tends to tear easily. Tires and rope are used as ballast to prevent wind lift of the scrim.

- Repair rips, tears, holes, created by further breakdown of the material, storms, animals, etc. Manufacturer recommended products (vapor tape) must be used to make scrim membrane repairs.
- Gas collector membrane boots were observed to be damaged during the last facility inspection. Boots must be sealed, and maintained so that leaking around the collector does not occur.
- The synthetic turf product uses a sand ballast to hold the material in place, prevent wind lift, and enhance the shedding of storm water. Sand must be replaced on a regular frequency.
- Rips, tears, and holes in the synthetic turf product must be repaired as identified using manufacturer’s recommended repair products and techniques.
- Tires and rope must be maintained so that proper ballast, and spacing of that ballast, keeps the membrane in contact with the landfill.

• **Install / Upkeep of Earthen Cap** – Areas not capped with synthetic materials (part of the Phase III – Cell I aluminum processing waste cell, and all of Phase IV-Cell I industrial / C&D waste cell), have an earthen cap placed to prevent water infiltration and prevent fugitive gas emissions. On-site soils used for this earthen cap are very permeable and are mainly comprised of sandy silt with a minimal amount of clay and high amounts of chert. These soils are easily eroded and constant maintenance is recommended to repair erosion rills and gullies after storm events.

- As an interim measure to prevent water infiltration and fugitive emissions, clay could be purchased from a nearby source. Clay should be compacted to at least one foot in

thickness to shed storm water and minimize fugitive emissions. Clay placement and consistent maintenance should be ensured until a permanent cap can be applied during closure.

2) Leachate Collection System – Aluminum Processing Waste Cells

Leachate generated in Phase II-Cell I and Phase III- Cell I (aluminum processing waste cells) is collected in a cell floor sump and conveyed via gravity to two large diameter HDPE leachate collection vessels located on the south side of the facility. The vessels are connected via HDPD piping, with the low-point vessel being located near the leachate pump building. A pneumatic diaphragm pump is used to pump leachate out of the vessel and into an awaiting tanker truck for off-site disposal. This leachate is segregated from the leachate generated in Phase IV-Cell I (Industrial / C&D waste cell) and is not pre-treated before disposal. Aerial Photograph 3 provides a more close-up view of the leachate pump building, leachate vessels, and truck staging area for load-out.

O&M Considerations

• **Compressors / Leachate Pump** – The pneumatic diaphragm pump used to transfer leachate from the storage vessel to tanker trucks requires compressed air to operate.

- Compressor oil levels must be maintained, and changed on a regular frequency.
- Compressor air filters must be checked and changed on a regular frequency.
- Diaphragm pump should be maintained per manufacturer's specification. Wear parts (seals and diaphragm) will require replacement on regular frequencies.

• **Leachate Transfer / Transport and Disposal (T&D) Coordination** – Leachate is pumped from the landfill into tanker trucks that transport the liquid for off-site disposal. This effort should be coordinated to ensure timely removal of leachate so that liner head levels are not exceeded. On-site personnel must provide tanker drivers access to the property and leachate pump house.

- Currently, there is no reliable method to determine leachate head levels above the landfill liner in the Phase II-Cell I and Phase III-Cell I aluminum processing waste disposal areas. A pressure transducer should be installed in the landfill liner sump(s), and a measurement of the leachate head displayed. This transducer will require periodic cleaning and calibration to ensure accuracy.

• **Leachate Load-Out Observation / Clean-Up** – The area where tanker trucks pull up to off-load leachate is a gravel parking area next to the leachate pump house. There is no containment, or any way to prevent overflows, or leaking during loading from impacting the environment. Load-out must be observed from start to finish ensuring leaking / overflows do not occur. Immediate clean-up must take place if leaking / overflows do occur. At a minimum, a berm should be installed in this area to prevent any accidental spills or overflows.

3) Leachate Collection System – Industrial and C&D Waste Cell

Leachate generated in the Phase IV-Cell I Industrial and C&D waste cell is collected in a cell floor sump and is conveyed via sump pump to a large, glass lined steel, liquid storage tank (primary leachate storage tank). This tank is installed in a concrete containment. Because this leachate contains elevated levels of cadmium and other metals, the leachate is pre-treated before is it shipped off-site for disposal.

10,000 gallon batches of leachate are transferred from the primary leachate storage tank to a smaller polyethylene tank. In this polyethylene tank, chemicals are added to adjust the pH to promote precipitation of solids. The pre-treated liquid in the polyethylene tank are transferred to a plate press for final solids removal. The liquids from the press are collected and pumped to an awaiting tanker truck for off-site disposal. The solids are removed from the press and are being stored on-site, in used 275-gallon polyethylene totes.

This entire operation is currently taking place inside the leachate tank containment area. The totes used to store solids generated by the filter press are removed from the containment once full. They are stored in a covered area near the containment (this area does not have containment). In discussion with the current leachate system operator for this unit, batch pre-treatment and solids removal with the plate press are a full 8 hours per day / 5 to 6 days per week job.

O&M Considerations

• ***Industrial / C&D Cell Sump Pumps*** – The industrial / C&D waste cell has sump risers present with pumps installed.

- Pumps will have to be pulled, cleaned, and maintained on a regular frequency.
- Pump electrical panel will need to be checked to ensure proper operation (fuses, relays, storm resets, etc.).
- Force main from cell risers to primary leachate tank to be cleaned and jetted on a regular frequency.
- If the current liquid level transducer is not functional, or accurate, the unit will need to be cleaned and calibrated on a regular frequency to assure accuracy of leachate head measurements.

• ***Leachate Tank Containment*** – The leachate tank containment has a sump where storm water or leachate can accumulate prior to removal.

- If storm water accumulates, it should be pumped outside of the containment (if containment is free and clear of contaminated material). If leachate leaks, the liquid should be pumped back to the primary leachate tank. It is recommended that currently, all liquid be pumped back to the primary leachate tank since the filter press is being operated in the containment and leachate leaks and solids are present on the containment floor.
- Overflows must be cleaned up immediately.
- Press solids must be removed from the containment on a regular frequency to preserve the storage capacity of the containment system.

• **Leachate Tanks** – Both glass lined steel and polyethylene tanks are present in the containment system.

- The glass lined steel leachate tank requires maintenance of level detectors, if installed.
- Ensure all fittings and seals are tight and valves are exercised on a regular frequency.
- Solids in primary leachate tank need to be removed on a regular frequency.
- Freeboard in primary leachate tank must be maintained.

• **Leachate pre-treatment** – Pre-treatment of leachate to precipitate solids and remove cadmium and other metals is performed in a batch process. Chemicals are added at differing points of the process to increase and decrease pH.

- Coordination of chemicals must be made to ensure availability so treatment does not become stalled.
- Plant operator must be available to batch transfer liquid to the polyethylene tank from the primary storage tank. A gasoline pump is used to perform this transfer.
- Operator required to add chemicals and measure pH to ensure proper treatment.
- Operator required to use pumps to remove treated leachate from polyethylene tanks and feed the material to the plate press for filtering.

• **Filter press** – Operate and maintain plate filter press per manufacturers specifications.

- Remove pressed solids from the containment area and store in covered area until disposal option is identified.
- Treated leachate (after solids removal via press) is pumped directly to an empty tanker truck. This effort will need to be coordinated so that liquid is removed for T&D on a regular frequency (preventing greater than freeboard storage in primary tank, and possible overflow).

4) Storm Water Management – Sedimentation Ponds

Storm water at the facility is collected in two storm water ponds. Aerial Photographs 1 and 2 show the locations of these ponds.

O&M Considerations

• **Sediment Pond Maintenance** - Based on conversations with EWS Operations Manager, it is unknown when the ponds were last cleaned of sediment; therefore, the available capacity of the ponds is not known either. Ponds need to be periodically measured to determine the amount of sediment they contain. Sediment should be removed and placed in/on the landfill once dried.

5) Groundwater Monitoring System

Ground water at the facility is monitored on a quarterly frequency. Chlorides have been detected in the ground water in recent sampling events.

O&M Considerations

- ***Monitoring well integrity checks*** – Ensure ground water monitoring wells are tightly capped, locks are present and functioning, and all protective casings and bollards are in good condition. Concrete drainage pads should be checked periodically for cracking and degradation. If pad damage is present, it should be repaired immediately.

Based on available information, and without the guidance of some system O&M Manuals, it appears that at least two full time employees will be required to operate and maintain the systems presented above. One of the full-time operators will be dedicated to the Industrial / C&D Cell leachate pre-treatment system. This system should be operated by personnel who understand the technical aspects of the system. A second full-time operator will be required to coordinate and perform all of the other activities at the site to ensure the systems are functional and maintained.