SEASONAL TEMPORARY OPERATIONS REDUCTION MANAGEMENT PLAN

Bremerton Auto Wrecking Landfill/Gorst Creek Restoration

1 Introduction

Landfill removal and stream restoration activities will not be completed by the start of the Fall rainy season, which is expected to begin around October 15, 2016. While some restoration activities may continue, such as vegetation planting, any landfill removal operations will be temporarily halted during the winter months. This will be undertaken to mitigate safety concerns for workers during wet conditions, to minimize impacts that may occur to surface water as a result of excavation and grading activities during wet conditions, and to reduce weather impacted delays. In order to prepare for winter operations, this Seasonal Temporary Operations Reduction Management Plan (STORM) has been prepared. The primary objectives of STORM are to allow for a quick and orderly remobilization in 2017 and mitigate unintended impact on the environment.

STORM has been divided into two distinct sections: Transition Phase and Winter Phase. The Transition Phase includes the steps to convert from standard daily operations to demobilization of the majority of site personnel. This phase will include implementing many of the best management practices (BMPs) identified in the site's Stormwater Pollution Prevention Plan (SWPPP) such as stabilizing slopes, revegetating bare soil areas, constructing the stream bypass and access roads, and securing the stockpile area. In addition, the transition phase will also include securing the site and preparing for temporary demobilization of heavy equipment and instruments. The Winter Phase includes monitoring and maintenance to ensure that the site is secure, BMPs are maintained, and the requirements of the SWPPP are met. A transition phase schedule and list of procurement items are included as attachments.

2 Transition Phase

The steps involved in preparing for winter operations include:

1. Stabilize any failure-prone or erosion-risk slopes, if present;
2. Control stormwater run-on;
3. Revegetate bare soil areas;
4. Construct a stable stream bypass through the landfill;
5. Construct landfill access roads for performing winter operations (monitoring and maintenance);
6. Securing the waste staging area and stockpiles;
7. Securing site access locations; and
8. Demobilize equipment, instruments, and personnel for the winter.

2.1 Stabilize Slopes

The site's geotechnical subcontractor will aid in identifying slopes that will require additional reinforcement for winter operations. The assessment will target high failure risk due to internal friction angle and compaction, and high erosion risk due to soil type and slope. These assessments will be made through the weekly visits by the geotechnical engineer. As the site begins the transition phase any additional materials needed due to this assessment will be identified and mobilized to the site.

2.2 Control Stormwater Run-on

Upon transition to winter operations, stormwater run-on will be addressed throughout the site. This includes the Gorst Creek parcel containing bare excavated slopes and landfill debris, the staging area, the command post, and haul roads.

On the Gorst Creek parcel, stormwater will be controlled from running down the channel slopes to the extent possible. The areas included in the Gorst Creek parcel are the northern slope which includes excavations extending onto the AAW property and the southern slope which includes the off-road truck haul roads and access to the staging area. Excavations on the AAW property will be backfilled and sloped to drain toward the AAW stormwater pond as they did prior to excavation occurring. The reconstructed stormwater pond will have an overflow spillway that drains to a channel toward Gorst Creek. The channel will be reinforced with erosion control mat and revegetated in accordance with Section 2.3. A temporary access road will be constructed on the Gorst Creek parcel for access to the bypass pumps; any precipitation hitting the access road will drain downslope toward Gorst Creek. This will result in northern slope runoff from only the precipitation that directly falls upon the Gorst Creek parcel. The majority of the northern slope area is expected to have been confirmed through sampling to meet cleanup objectives before winter operations commence. Check dams will be placed along any ditchlines at a spacing where the bottom of the upgradient check dam is equal to the top of the next downgradient check dam. The check dams will be constructed of 4-inch to 6-inch cobble. If slopes are too steep to maintain a stable ditch then a temporary piped slope drain will be used. The outlet of the pipe will be temporarily reinforced with concrete blocks obtained on site. The entire disturbed area of the northern slope have BMPs installed and be revegetated prior to demobilization in accordance with Section 2.3.

The southern slope is anticipated to contain landfill waste during the winter demobilization. Stormwater will be directed away from this area where possible by diversion berms. The diversion berms will direct potential run-on remaining vegetated areas. This will result in southern slope runoff from only the precipitation that directly falls upon it. These slope areas will not be sampled to confirm cleanup objectives in 2016 and some areas will contain landfill debris; however, they will have BMPs installed and be revegetated as described in the next section.

2.3 Revegetate Bare Soil Areas

Prior to the arrival of the wet season, all exposed slopes shall be stabilized with erosion control wattles and seeded with the restoration seed mix specified in the planting plan, which is provided on Sheet C-10 of the restoration design plan set. Prior to seeding, the soils should be amended as necessary based on agronomic testing, which may include fertilizers and lime for pH adjustment. Surface roughening will consist of tracking equipment over the soil to leave cleat imprints parallel to slope contours. Where natural gradient terraces are uncovered through the course of work then they shall be preserved to the extent possible. In addition, erosion control wattles should be placed along exposed native slope contours, spaced 20 feet apart prior to seeding. Ravine slopes will be stabilized with high performance flexible growth media (Flexterra Flexible Growth Medium (FGM)). Slopes can also be sparsely covered with available large woody debris (LWD) and slash removed during clearing operations. Non-native plants such as scotch broom shall be completely removed and disposed from the site and not used as slope cover.

Tree and shrub planting will be carried out per the planting plan on final ravine slopes where excavation activities are no longer required and post-excavation sampling has been performed and approved by the On-Scene Coordinator (OSC). It is anticipated that trees and shrubs may be planted on the northern slope during winter operations based on material availability.

The following table summarizes the estimated quantity of materials needed to stabilize the site.

Slope Stability Materials						
Item	**Unit Quantity**		**Quantity**		**Total**	
Erosion Control Wattles (9-inch dia.)	20	feet/wattle	3200	feet	160	wattles
Wattle stakes	5	stakes/wattle	160	wattles	800	stakes
Restoration Seed Mix	30	lbs/acre	4	acre	120	lbs
Flexterra FGM	1	application	4	acre	4	acre
Plants, Upland Forest Zone	Roughly 25% of the Upland Forest Zone plants specified (Sheet C-10)					

2.4 Stream Bypass

The stream will be conveyed around or through the site during the winter months. The system may consist of one or more methods described below, and should be able to convey the 100-year, 24-hour design storm event, at a minimum. The 100-year design storm is estimated to produce approximately 36.4 million gallons of stormwater in 24-hours with an instantaneous peak flow rate of 110.8 cubic feet per second (cfs).

2.4.1 Pump Bypass

The existing pump and piping system currently consists of two 8-inch submersible pumps and an 8-inch pipeline. Only one pump can be operated at a time based on the current configuration, and the other serves as a backup. Therefore, the capacity of the pumping system is approximately 1,500 gallons per minute (gpm), or 3 cfs. The existing system may be left in place as a contingency measure to help lower pooled water upstream of the landfill, which will create extra storage between storm events as well as minimize water contact with landfill debris. By minimizing contact, channeling of water through the waste will be decreased.

2.4.2 Overtop Channel

A temporary lined channel will be constructed across the top of the landfill to convey stream flows through the site for the winter months until final removal and restoration activities can be performed in 2017. The channel shall be capable of conveying the 100-year design storm with 6 inches of freeboard, resulting in a minimum 2-ft deep trapezoidal channel with a bottom width of 9-ft, grade of 0.01% (essentially flat, 0.05 foot drop over a 500 foot channel), and side slopes of 2:1 (15-ft top width). This will require a liner width of 23.4 feet. The channel shall be lined with a minimum 40-mil reinforced polyvinyl chloride (PVC) liner. All PVC liner materials shall run over 18 inches of berm before being keyed into an anchor trench at least 12 inches in depth with at least 6 inches of run out. Large pieces of recycled concrete will be used at seams to hold the liner in place; velocity through the channel will be 6.56 feet per second at the 0.01% slope.

2.4.3 Channel Intake

In this scenario, water will continue to flow through the underlying (flow restricted) culvert until its capacity is exceeded and a reservoir forms upstream of the landfill. If the reservoir depth exceeds the top of the excavated landfill elevation, water will enter the constructed open channel to be conveyed through the site. The upstream face of the landfill shall be lined with 40-mil reinforced PVC liner on all exposed surfaces that do not have adequate vegetation. In addition, these lined areas of the upstream face that lie at or below the elevation of the constructed channel shall be reinforced with riprap or recycled concrete to prevent erosion of the landfill slope due to fluctuating reservoir levels. Riprap shall contain a minimum median diameter (D50) of 10-inches.

2.4.4 Silt Fence

Silt fence should be installed adjacent to the edges of the bypass channel to keep sediment and landfill debris out of Gorst Creek. The channel is expected to be roughly 500 feet long, resulting in 1,000 linear

feet of silt fence. The silt fence and stakes shall be installed within the anchor trench and through the run out of the liner.

2.4.5 Channel Outfall

The channel will discharge at the downstream face of the landfill into Gorst Creek. The outfall will need to be channelized and then stabilized with riprap and/or concrete debris that has been recovered from the landfill. The outfall will discharge upstream of the existing trash screen and check dam constructed of sand bags below the landfill. The check dam will be covered with PVC liner and keyed into the adjoining slopes prior to winter operations. Concrete can be used to hold the material in place. Approximately 500 feet of additional silt fence will be needed to line the crest of the landfill prior to it dropping into the Gorst Creek channel. Trash screens within the Gorst Creek channel will be left in place for the winter months to prevent mobilized trash from flowing downstream. The channel bottom between the landfill face and the State Route 3 culvert has been cleaned of loose trash and debris.

Stream Bypass Channel Materials		
Item	**Total**	
Channel Geotextile - 40 ml PVC	12,000	sq. ft
LF Face Geotextile - 40 mil PVC	11,000	sq. ft
Silt Fence	1,500	ft

2.5 Construct Access Roads

Access roads will be constructed and maintained to allow for winter operations as described in Section 3.

2.6 Secure the Waste Staging Area

The waste containment berms will be covered with 10-mil reinforced polyethylene. Material will be left within the containment berms to allow for drainage of stormwater without ponding. Stormwater draining from the containment berms and the surrounding ground will sheet flow to the staging pad area's sediment ponds. These ponds were increased in size previously in order to accommodate anticipated winter precipitation. Areas of bare ground will be vegetated using the restoration seed mix and Flexterra FGM.

2.7 Securing the Command Post

Access to the truck haul route will be blocked so that it cannot be used by trespassers during the winter months. Other actions that may be taken to secure the command post will be decided on by on-site personnel prior to temporary demobilization.

2.8 Demobilize Equipment, Instruments, and Personnel

Once the site is secure, equipment, instruments, and personnel will be temporarily demobilized for the winter. All equipment that leaves the site needs to be decontaminated. An equipment decontamination pad will be constructed within the staging area for this purpose. Water will be directed back to the landfill surface.

3 Winter Phase

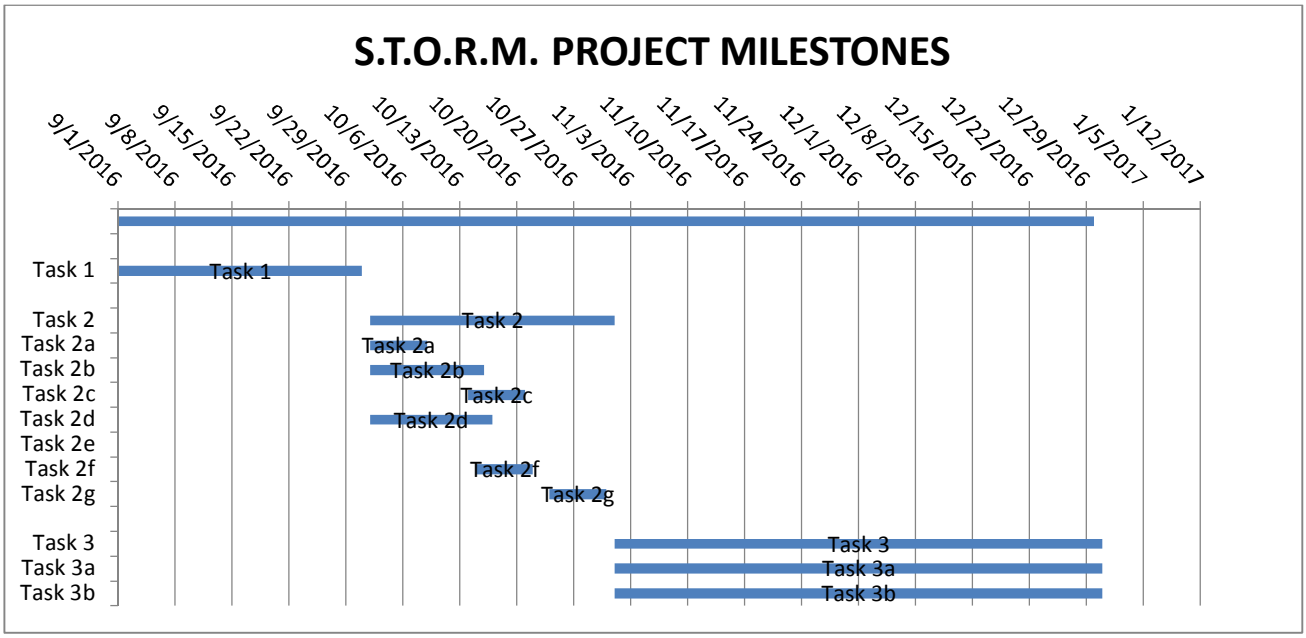
Winter operations will be effective as soon as the site is stabilized and equipment, instruments, and personnel have been temporarily demobilized. This will be timed to correspond with the beginning of the rainy season. For the purposes of this plan, the rainy season is defined as the first significant rainfall that arrives in fall of 2016, which typically occurs in early to mid-October. Due to the uncertainty of long-term weather forecasting and for planning purposes, slope stabilization and stream bypass measures should aim to be implemented by October 22.

3.1 Monitoring

Monitoring shall be conducted regularly throughout the wet season to ensure slopes are stable, best management practices (BMPs) are effective, the stream bypass is functioning, and ensure trash screens are in place and are minimally restricting stream flow. It is anticipated that site monitoring will be conducted at a minimum of once per week, and more frequently during periods of high precipitation. Monitoring will be conducted as required by the Stormwater Pollution Prevention Plan (SWPPP) developed for the Site.

3.2 Maintenance

It is anticipated that some maintenance will be required periodically throughout the wet season. Slopes may experience erosion that requires grading, re-seeding, and/or additional support mechanisms such as installation of erosion control blankets. BMPs such as silt fence and wattles may need to be repaired, replaced, or to have accumulated sediment removed. Trash screen may need to be cleaned or repaired.



Task #	Description	Start Date	Duration (Day)
	On-site Activities 9/1-12/31/2016	9/1/2016	120
Task 1	Complete Excavation	9/1/2016	30
Task 2	Transition Phase	10/2/2016	30
Task 2a	Stabilize Slopes	10/2/2016	7
Task 2b	Control Stormwater Run-on	10/2/2016	14
Task 2c	Revegetate Bare Soil	10/14/2016	7
Task 2d	Stream Bypass	10/2/2016	15
Task 2e	Construct Access Roads	7/1/2016	1
Task 2f	Secure Waste Staging Area	10/15/2016	7
Task 2g	Secure Command Post	10/24/2016	7
Task 3	Winter Operations	11/1/2016	60
Task 3a	Monitoring	11/1/2016	60
Task 3b	Maintainance	11/1/2016	60

2.2. CONSTRUCT AAW POND

2.5. CONSTRUCT ACCESS ROAD

2.3. AMEND SOIL, HYDROSEED, AND APPLY FLEXTERRA ON ALL EXPOSED SOILS.
TOTAL AREA = 5.6 ACRES

2.4. STABILIZE CHANNEL OUTFALL WITH LARGE ROCK AND CONCRETE

93'

2.4. INSTALL SILT FENCE ALONG EDGES OF CHANNEL AND TOP OF DOWNSTREAM FACE OF LANDFILL.

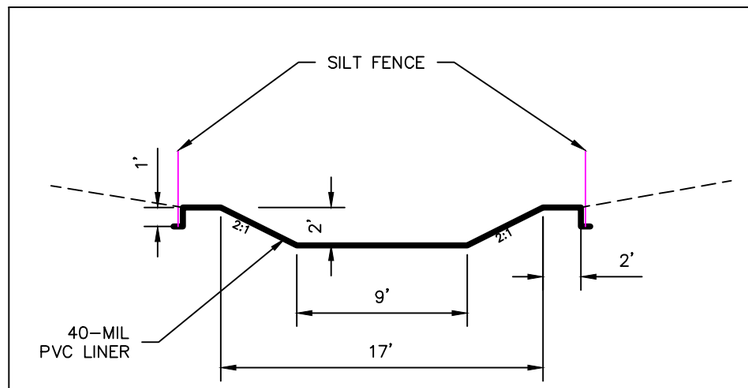
2.2. BACKFILL AAW EXCAVATION AREAS AND SLOPE ACCESS ROAD INTO AAW PROPERTY TO DIRECT DRAINAGE TO AAW POND. INSTALL CHAINLINK FENCE.

2.3. INSTALL WATTLES ON STEEP SLOPES (>3:1)
PLACE ROWS MIN. 20-FT APART.

2.4. CONSTRUCT PVC-LINED CONVEYANCE CHANNEL, MIN SLOPE = 0.001 FT/FT. (SEE CROSS-SECTION ABOVE).

2.4. OPTIONAL PUMP BYPASS

350 325 375 400 600'



CONVEYANCE CHANNEL CROSS-SECTION

80' 0 80' 160'
SCALE OF FEET

SIZE B
IF SHEET IS LESS THAN 11"X17" IT IS REDUCED PRINT- SCALE REDUCED ACCORDINGLY
ONE INCH

Symbol	Description	Date	Approved
A	DRAFT - FOR REVIEW	08-31-16	

Date: 8/31/2016
TDD No.: 15-08-0002
PAN No.: 1004530.0019.001.02
File name:
Plot date:
Designed by: —
Drawn by: TJC
Spec No.:
Reviewed by: —
Approved by:
Submitted for acceptance by:

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KITSAP COUNTY WASHINGTON
BREMERTON AUTO WRECKING LANDFILL
PORT ORCHARD, KITSAP COUNTY, WASHINGTON
S.T.O.R.M.
LANDFILL STABILIZATION FIGURE

Sheet reference number: 1
SHEET 1 OF 2