SCS ENGINEERS

Transmittal

Midlothian, VA

PROJECT:	Bristol, LF EVOH Cover, Bristol LF, VA 02218208.16	DATE:	3/20/2023
SUBJECT:	Response to VDEQ EVOH Comments - #588 Landfill	TRANSMITTAL ID:	00002
PURPOSE:	For your review and comment	VIA:	Info Exchange

FROM

NAME	COMPANY	EMAIL	PHONE
Thomas Williams Midlothian, VA	SCS Engineers	TWilliams@scsengineers.com	+1-804-486-1916

TO

NAME	COMPANY	EMAIL	PHONE
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Daniel Scott Southwest Regional Office 355 Deadmore Street Abingdon VA 24210 United States	Virginia Department of Environmental Quality	daniel.scott@deq.virginia.gov	727-676-4866
Erin Malone 1650 Arch Street Philadelphia PA 19103 United States	Environmental Protection Agency	malone.erin@epa.gov	
Erin Willard 1650 Arch Street Philadelphia PA 19103 United States	Environmental Protection Agency	willard.erinm@epa.gov	+1-215-814-2152
Jacob Chandler 2515 Valley Drive Bristol VA 24201 United States	Bristol, VA, City of	jacob.chandler@bristolva.org	+1-276-645-2316
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Transmittal

DATE: 3/20/2023
TRANSMITTAL ID: 00002

NAME	COMPANY	EMAIL	PHONE
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Susan Blalock United States	Virginia Department of Environmental Quality	susan.blalock@deq.virginia.gov	
Tom Lock PA	SCS Engineers	TLock@scsengineers.com	+1-717-671-1497

REMARKS:

Good afternoon,

Please see the response-to-comments letter and documents concerning the SWP#588 Interim EVOH Cover System. The letter and documents are available for download at the links below.

Regards,

Thomas

Transmittal

DATE: 3/20/2023
TRANSMITTAL ID: 00002

DESCRIPTION OF CONTENTS

QTY	DATED	TITLE	NOTES
1	3/20/2023	Response to EVOH Comments v1.0.pdf	
1	3/20/2023	Bristol ISWMF Operations Manual v1.0 03-20-23.pdf	
1	3/20/2023	Monitoring Maintenance and Repair Plan (Copy).pdf	
1	3/16/2023	Stormwater Basin - Settlement Estimate Due to Water v1.0.pdf	

COPIES:

Thomas Williams (SCS Engineers)
Ryan Mahon (SCS Engineers)

March 20, 2023
File No. 02218208.16

Mr. Daniel P. Scott, PE
Solid Waste Permits
Land Protection & Revitalization
VA DEQ – Southwest Regional Office
355-A Deadmore Street
Abingdon, Virginia 24210

Subject: Response to Comments – Interim EVOH Cover System Deployment Plan
Solid Waste Permit No. 588
Bristol Integrated Solid Waste Management Facility – Bristol, Virginia

Dear Mr. Scott:

On behalf of the City of Bristol, Virginia (the City), SCS Engineers (SCS) is submitting the following response to comments received in your letter dated February 17, 2023 regarding the Bristol SWP#588 landfill EVOH Cover System. Additionally, SCS received a question forwarded by the Virginia Department of Environmental Quality (VDEQ) from an interested member of the public via email and has included a response in this letter.

VDEQ's numbered comments are listed below in italics, followed by SCS' response.

Comment 1*: The Specifications acknowledge and address the need for low pressure equipment for installation of the Interim Cover. Please discuss the intended method of access and potential equipment usage that will be required for installation, repair, and maintenance of gas collection systems (gas and condensates), stormwater removal systems, and cover subsidence impacts.*

Response 1: A light-duty access road is planned for access to the western side of the quarry. The access road will start at the existing quarry entrance and turn southwards, heading towards the southern end of the quarry. A second branch of the access road is planned to allow access to the basin's stormwater pump. The light-duty access road will be constructed atop the EVOH geomembrane, using a geotextile or geocomposite between the geomembrane and overlying road subbase. The geotextile or geocomposite will designed to provide appropriate puncture protection of the EVOH geomembrane.

Outside of the access road, the intention is to rely upon lightweight open cab utility vehicles and similar equipment for site access. These utility vehicles will be used for repair and maintenance of landfill systems.

The Operations Manual and Monitoring, Maintenance, and Repair Plan will be updated prior to deployment to address intended method of access and potential equipment usage required for

installation, inspection, repair, and maintenance of the cover systems, leachate and gas collection systems, sidewall odor mitigation systems, and stormwater management systems. The locations of access roads for larger equipment will be depicted in the Stormwater Management plan that will be submitted on or before April 30, 2023.

Comment 2: The submission, based on the design plan sections and the above equipment access considerations, assumes the completion of the Sidewall Odor Management System prior to installation of the Interim Cover. Please discuss the impacts on the intended project schedule.

Response 2: As outlined in the Consent Decree between the City and VDEQ, construction of the Sidewall Odor Mitigation System and the large diameter dual-phase extraction wells are expected to be complete in June of 2023. Implementing the large scale grading activities required prior to placement of the EVOH concurrently with other construction projects will be difficult to do safely. The general anticipated sequence of remediation events is:

- Complete construction of the Sidewall Odor Mitigation System
- Complete construction of the landfill gas collection system expansion including the large diameter dual-phase extraction wells
- Re-grade the surface layer, and the waste as necessary, to manage stormwater
- Obtain VDEQ concurrence on sufficiency of landfill gas wells
- Install EVOH cover system

The City intends to install the EVOH cover system within 60 days of completing remedial actions. Grading activities are currently anticipated to be the last remedial action. The City intends at a minimum to install the EVOH within 12 months of the effective date of the consent decree.

Comment 3: The submittal does not discuss or address the impacts of the currently observed settlement/subsidence on anchoring or elongation of the EVOH interim cover system. Additional consideration should be given to the potentially greater settlement which may result due to the retention pond load and heat retention which may occur due to the Interim Cover and the insulating volume of the stormwater.

Response 3: The 40 mil LLDPE EVOH geomembrane was selected in part due to its elongation potential. The manufacturer of a candidate product reports a tensile elongation at break greater than 500%. The considerable resilience of the geomembrane will help mitigate the effects of settlement and subsidence on both anchoring of the geomembrane and elongation.

Settlement due to the retention pond load was estimated as shown in the attached calculation spreadsheets. The initial excavation of the pond will relieve pressure on underlying waste. To be conservative, a scenario in which the pressure relief due to excavation was ignored was considered. Using the depth of stormwater resulting from the 100 year storm, approximately 2.5 feet of additional settlement was estimated along the base of the retention pond. This additional settlement

corresponds to a 2% elongation along the pond width. Considering the specified 500% break elongation, the geomembrane is considered adequate to handle the greater pond settlement.

The EVOH geomembrane will be inspected on a periodic basis after installation. This inspection will include observations for elongation or other damage associated with settlements. Repairs will be made as needed based on the outcomes of the inspections. The inspection procedure is described in the Operations Manual and Monitoring, Maintenance, and Repair Plan.

Comment 4: The submittal does not discuss or address any of the stormwater volume calculations, assumptions or design, showing only the proposed extent of the retention area and maximum depth. Please discuss perimeter run-on control measures. Does the design take into account the undeveloped shelf on the southern end of the quarry?

Response 4: The stormwater volume calculations, assumptions, design, and control measures will be addressed by the stormwater management plan, which is currently in progress. The stormwater management plan will be submitted to VDEQ on or before April 30, 2023. SCS is designing a stormwater pumping system to remove water from the retention pond, pumping it northwards and ultimately out of the quarry. SCS is evaluating perimeter run-on control measures, including stormwater diversion berms and drainage swales. However, run-on control measures may be significantly limited by the quarry sidewall topography and the natural slope of top areas adjacent to the sidewalls.

Comment 5: The stormwater pumping rates, time for the volume weight to be retained over the waste (and impact on subsidence\settlement due to this sustained load), allowable rate and volume to be received by Bristol Virginia Utilities (BVU), and routing around (or through) the planned pretreatment should also be discussed. If the stormwater is alternately intended to be discharged under VPDES permit VAR050053 has the Water Division been contacted and this option discussed?

Response 5: The stormwater pumping system design will be addressed by the stormwater management plan, which is currently in progress and will be submitted on or before April 30, 2023. The stormwater is intended to be discharged under the VPDES permit VAR050053. The Water Division will be contacted following completion of the stormwater management plan.

Comment 6: The submittal does not discuss or address the estimates of the gas produced and handled by the well heads or provide a description of the proposed conveyance and handling\processing of the captured gas other than providing a connection point to withdraw gas.

Response 6: An expansion of the SWP #588 landfill gas collection system is currently in progress. The gas collection strip stub-up pipes will tie-in to landfill gas header pipes which are being installed. The construction drawings for the interim EVOH cover system will incorporate the current expansion project and include LFG system changes necessary to install the cover system. Relatively low rates of gas flow (≤ 10 scfm) are expected from the collection strips based on previous project experience with shallow gas collection strips underneath exposed geomembranes.

Comment 7: Please discuss the intended steps for addressing potential membrane 'bubbling' due to differential settling creating localized gas accumulation high spots.

Response 7: The Sidewall Odor Mitigation System and proposed landfill gas collection strips will reduce the potential for membrane bubbling due to gas accumulation. If membrane bubbling does occur in localized gas accumulation high spots, an appropriate repair option will be selected.

One potential repair method includes cutting back the geomembrane at the location of gas accumulation. A geosynthetic or shallow, small diameter horizontal collector pipe would then be installed. The pipe or geosynthetic will be placed so as to tie-in to the nearest gas collection strip. Alternatively, a stub-up pipe with wellhead may be installed at the location to provide a new vacuum source.

Comment 8: Evaluate elongation and stresses on the gas well head boot connection to the cover. Subsidence and cover elongation/migration with a generally rigid wellhead/boot configuration could result in gas removal system damage.

Response 8: The well head boot connections will be constructed using the LLDPE EVOH geomembrane. The resilience of the geomembrane will allow for some subsidence and cover elongation without gas removal system damage. The boot connections will be inspected on a regular basis, in accordance with the Operations Manual and Monitoring, Maintenance, and Repair Plan. Pipe penetrations will also be subject to regular surface emissions monitoring to identify any defects in the boot connections that may not be visible. Repairs to the boot connections will be completed in accordance with the Plan. If there is any apparent damage to the gas removal system, the damaged features will be inspected and repaired appropriately to restore their functionality.

Comment 9: Please discuss the criteria for Wind Defender inclusion or exclusion, since shown as optional.

Response 9: The decision for Wind Defender inclusion or exclusion will be based on a comparison of potential wind speeds against the anticipated weight of remediation system infrastructure (gas collection, liquids collections, and roadways) on top of the interim EVOH cover system. If Wind Defender is excluded, wind uplift calculations will be provided to VDEQ demonstrating the lack of need for the wind screen.

Comment 10: Please provide updates to the facility's operations manual which addresses maintenance, inspection, safety and operational issues associated with maintenance of the landfill after installation of the EVOH cover system.

Response 10: An updated operations manual is attached. The Monitoring, Maintenance, and Repair Plan has been incorporated by reference into the operations manual to address maintenance, inspection, and operational issues associated with the EVOH cover system. Additional revisions were made to the operations manual to address safety issues.

Citizen Comment: *I understand that in Bridgeton, the EVOH geomembrane used on top of their similar landfill was a layered HDPE-EVOH-HDPE product. I understand that here in Bristol, they are looking to procure a layered LLDPE-EVOH-LLDPE geomembrane. Is there a reason for the difference in materials here, as concerns LLDPE vs HDPE layers? Also, has anyone explored whether the LLDPE will hold up to the landfill surface temperatures, given that some of those temperature probe borehole measurements were quite high near the surface? I assume the geomembrane will absorb a considerable amount of heat. I also assume that the LLDPE/EVOH geomembrane material was recommended prior to these temperature measurements.*

Just wanted to raise the concern. I'd hate for the city to invest in a product for the long-term cover that is going to break down within a few months of installation.

Response: The LLDPE is a more flexible and resilient polyethylene that will accommodate deformations associated with settlement better than HDPE while also being less prone to puncture. Additionally, the HDPE and LLDPE version of the EVOH geomembrane generally are rated for similar static use temperatures. One candidate LLDPE product is rated by the manufacturer for a maximum static use temperature of 180°F, which is significantly greater than the anticipated surface temperatures. The LLDPE geomembrane is believed to have more than adequate available service life at any reasonable surface temperature for use as an interim cover.

Based on temperatures measured by thermocouples placed near the landfill surface, ambient temperatures are not any higher that those measured in the area surrounding the landfill. Further the City intends to utilize a geomembrane that is a green or gray color to reduce heat impacts to the material.

If you have any questions or require additional information, please contact either of the undersigned.

Sincerely,

Charles J. Warren, PE
Project Manager
SCS Engineers

Thomas R. Williams
Project Engineer
SCS Engineers

CJW/TRW

cc: Randall Eads, City of Bristol
Mike Martin, City of Bristol
Joey Lamie, City of Bristol
Jake Chandler, City of Bristol
Jeff Hurst, VDEQ
Crystal Bazyk, VDEQ
Stacy Bowers, VDEQ
Daniel Scott, VDEQ

Encl. Revised Operations Manual
Monitoring, Maintenance, and Repair Plan (Copy)
Stormwater Basin Settlement Estimation

SCS ENGINEERS

Environmental Consultants & Contractors
15521 Midlothian Turnpike
Suite 305
Midlothian, VA 23113-7313
804 378-7440 FAX 804 378-7433
www.scsengineers.com

JOB NO.	02218208.16 - SWP #588 EVOH Cover System		
SUBJECT	Basin Settlement Due to Stormwater		
SHEET NO.	1	OF	5
CALCULATED BY	TRW	DATE	3/9/2023
CHECKED BY	CJW	DATE	3/16/2023

Estimated Waste Properties

Υ_{DRY} = 37.00 lbs / ft³ - Dry Density - a = 0.35 -

M_C = 25% - Moisture Content -

G = 1.75 - Specific Gravity - Waste

e_0 = ((G * 62.4 lbs / ft³) / Υ_{DRY}) - 1

e_0 = ((1.75 * 62.4 lbs / ft³) / 37.00 lbs / ft³) - 1

e_0 = (109.20 lbs / ft³ / 37.00 lbs / ft³) - 1

e_0 = 2.95 - 1

e_0 = 1.95

Υw = M_C * Υ_{DRY} + Υ_{DRY}

Υw = 25% * 37.00 lbs / ft³ + 37.00 lbs / ft³

Υw = 9.25 lbs / ft³ + 37.00 lbs / ft³

Υw = 46.25 lbs / ft³

C_C = a * (e_0)

C_C = 0.35 * (1.95)

C_C = 0.68

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JOB NO.	02218208.16 - SWP #588 EVOH Cover System		
SUBJECT	Basin Settlement Due to Stormwater		
SHEET NO.	2	OF	5
CALCULATED BY	TRW	DATE	3/9/2023
CHECKED BY	CJW	DATE	3/16/2023

Subgrade Properties

Based on historical documentation, the 588 quarry landfill liner system was installed on a rock subgrade. The rock subgrade is assumed to be effectively unyielding.

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JOB NO.	02218208.16 - SWP #588 EVOH Cover System		
SUBJECT	Basin Settlement Due to Stormwater		
SHEET NO.	3	OF	5
CALCULATED BY	TRW	DATE	3/9/2023
CHECKED BY	CJW	DATE	3/16/2023

Waste Settlment - With Rebound Scenario (Waste Rebounds after EVOH Installation)

P_i = 3,025 lbs / ft² - initial stress in middle of layer (geostatic)

ΔP = -33 lbs / ft² - increase in stress (new loading at middle of layer)

e_0 = 1.95 - original void ratio

H = 130.8 ft - compressible layer thickness

C_C = 0.7 - compressibility index

γw = 46 lbs / ft³ - waste density

He = 14.2 ft - thickness of excavated waste

γe = 46.3 lbs / ft³ - density of excavated waste

H_w = 10.0 ft - assumed basin water depth

γ_w = 62 lbs / ft³ - water density

$P_i = \gamma w * (H / 2)$

P_i = 46 lbs / ft³ * (131 ft / 2)

P_i = 46 lbs / ft³ * (65 ft)

P_i = 3,024.8 lbs / ft²

P_i = 3,024.8 lbs / ft²

$\Delta P = (\gamma w * Hw) - (\gamma e * He)$

ΔP = 62 lbs / ft³ * 10 ft - (46 lbs / ft³ * 14 ft)

ΔP = (624 lbs / ft²) - (657 lbs / ft²)

ΔP = -33 lbs / ft²

$\Delta H_{L2} = ((H) * (C_C) / (1 + e_0)) * \log (1 + \Delta P / P_i)$

ΔH_{L2} = ((130.8 ft) * (0.7) / (1 + 2.0)) * log (1 + -33 lbs / ft² / 3,025 lbs / ft²)

ΔH_{L2} = ((130.8 ft) * (0.7) / (1 + 2.0)) * log (1 + -0.01)

ΔH_{L2} = ((130.8 ft) * (0.7) / (1 + 2.0)) * log (0.99)

ΔH_{L2} = ((130.8 ft) * (0.7) / (1 + 2.0)) * -0.005

ΔH_{L2} = ((130.8 ft) * (0.7) / (3.0)) * -0.005

ΔH_{L2} = (89.3 ft / 3.0) * -0.005

ΔH_{L2} = (30.3 ft) * -0.005

ΔH_{L2} = -0.14 ft

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JOB NO.	02218208.16 - SWP #588 EVOH Cover System		
SUBJECT	Basin Settlement Due to Stormwater		
SHEET NO.	4	OF	5
CALCULATED BY	TRW	DATE	3/9/2023
CHECKED BY	CJW	DATE	3/16/2023

Waste Settlement - No Rebound Scenario (Waste rebounds prior to EVOH installation)

P_i = 3,029 lbs / ft² - initial stress in middle of layer (geostatic)

ΔP = 624 lbs / ft² - increase in stress (new loading at middle of layer)

e_0 = 1.95 - original void ratio

H = 131.0 ft - compressible layer thickness

C_C = 0.7 - compressibility index

γw = 46 lbs / ft³ - waste density

H_w = 10.0 ft - assumed basin water depth

γ_w = 62 lbs / ft³ - water density

P_i = γw * (H / 2)

P_i = 46 lbs / ft³ * (131 ft / 2)

P_i = 46 lbs / ft³ * (66 ft)

P_i = 3,029.4 lbs / ft²

P_i = 3,029.4 lbs / ft²

ΔP = (γw * Hw)

ΔP = 62 lbs / ft³ * 10 ft

ΔP = (624 lbs / ft²)

ΔP = 624 lbs / ft²

ΔH_{L2} = ((H) * (C_C) / (1 + e_0)) * log (1 + ΔP / P_i)

ΔH_{L2} = ((131.0 ft) * (0.7) / (1 + 2.0)) * log (1 + 624 lbs / ft² / 3,029 lbs / ft²)

ΔH_{L2} = ((131.0 ft) * (0.7) / (1 + 2.0)) * log (1 + 0.2)

ΔH_{L2} = ((131.0 ft) * (0.7) / (1 + 2.0)) * log (1.2)

ΔH_{L2} = ((131.0 ft) * (0.7) / (1 + 2.0)) * 0.08

ΔH_{L2} = ((131.0 ft) * (0.7) / (3.0)) * 0.08

ΔH_{L2} = (89.5 ft / 3.0) * 0.08

ΔH_{L2} = (30.3 ft) * 0.08

ΔH_{L2} = 2.47 ft

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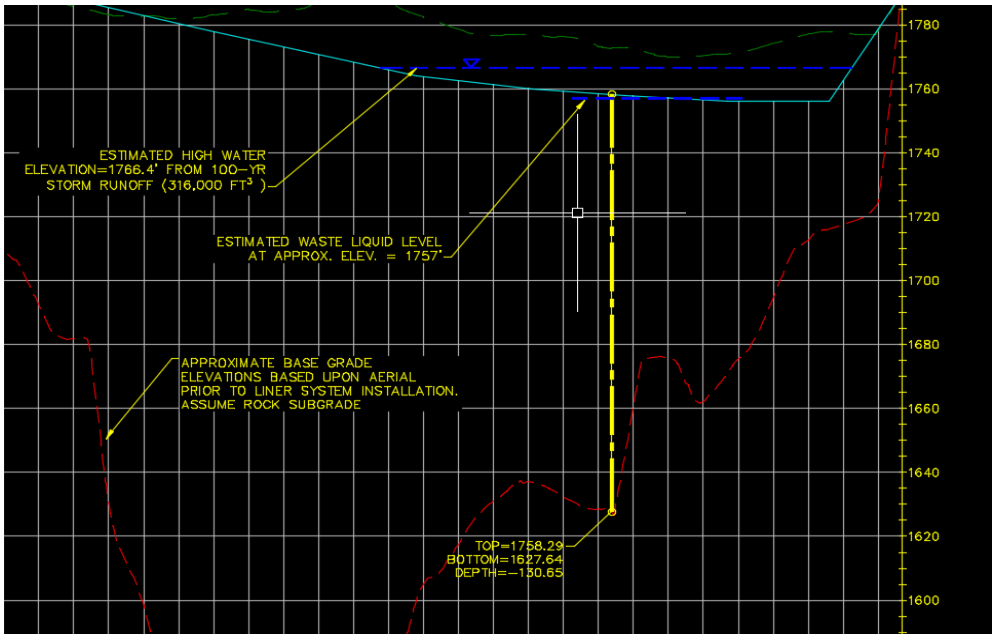
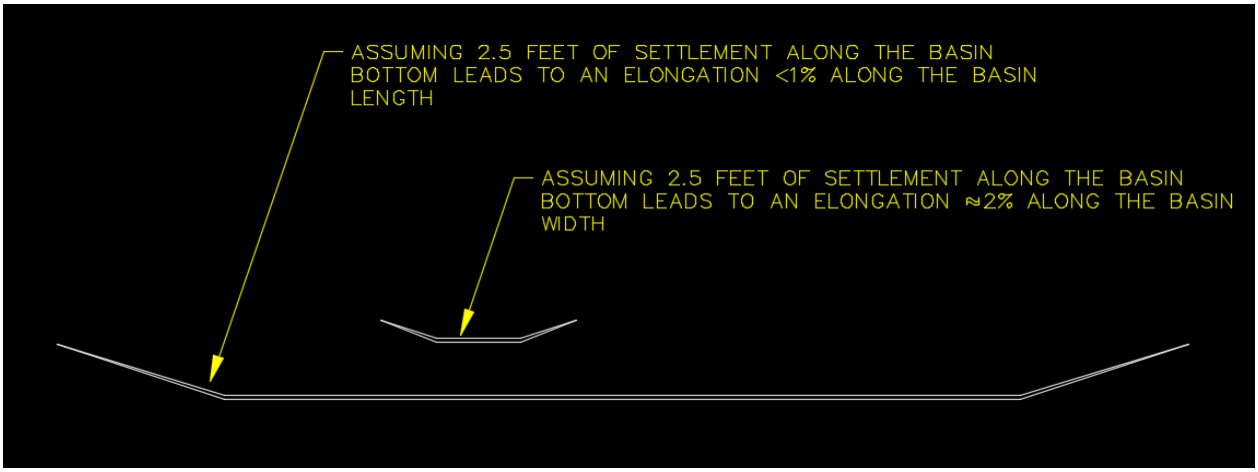
JOB NO.	02218208.16 - SWP #588 EVOH Cover System		
SUBJECT	Basin Settlement Due to Stormwater		
SHEET NO.	5	OF	5
CALCULATED BY	TRW	DATE	3/9/2023
CHECKED BY	CJW	DATE	3/16/2023

Cross Section for Reference:





City of Bristol Integrated Solid Waste Management Facility Operations Manual

For Solid Waste Permitted Facilities:

SWP #498

SWP #588

With Reference to Operations Plans for:

PBR #116

PBR #121

PBR #525

City of Bristol Solid Waste Disposal Division
2655 Valley Dr.
Bristol, Virginia 24201

Revision Prepared by:

SCS ENGINEERS

Original dated September 22, 1994

Revised July 28, 1995
Revised October 26, 2000
Revised July 2007
Revised February 5, 2014
Revised September 15, 2022
Revised March 20, 2023

CERTIFICATION STATEMENT

Operations Manual

Bristol Integrated Solid Waste Management Facility

Solid Waste Permits #498 and #588

The Operations Manual for the Facility is comprised of the following documents:

- Operations Plan
- Inspection Plan
- Health & Safety Plan
- Unauthorized Waste Control Plan
- Emergency Contingency Plan

These documents have been reviewed and modified as necessary to verify consistency with current operations.

Certification:

I certify that this document and all attachments were prepared under my direction or supervision and that the documents conform to the standards of the Virginia Solid Waste Management Regulations as outlined in 9VAC20-81-485.B.

Responsible Facility Official:

_____	_____
(Printed Name)	*(Title)*
_____	_____
(Signature)	*(Date)*

Table of Contents

Section Page

Appendices

Attachments

1.0 INTRODUCTION

This Operations Manual (Manual) describes the operational requirements for the Bristol Integrated Solid Waste Management Facility (ISWMF), located in Bristol, Virginia. The Manual is intended to describe, in detail, the operational methods by which the design, construction, and operations are implemented throughout the life of the ISWMF's two landfills which have not completed closure. As of the date of this document revision, the active Quarry Landfill (SWP #588) and the older, inactive landfill (SWP #498) have not yet entered their respective post-closure care periods. The future anticipated status of the SWP #588 Quarry Landfill remains uncertain due to various factors, and the SWP #498 Landfill's official closure design is currently underway.

The individual Operations Plans for the three Permit-by-Rule (PBR) solid waste facilities, each located at the ISWMF, are attached to this Manual as companion documents for reference as listed below:

Attachment A – City of Bristol Tire Processing Facility Operations Plan (PBR #116)

Attachment B – City of Bristol Baling Facility/Transfer Station Operations Plan (PBR #121)

Attachment C – City of Bristol Yard Waste Composting Facility (PBR #525)

Additionally, the SWP #588 Quarry Landfill's Monitoring, Maintenance, and Repair Plan is attached to this Manual as a companion document for reference. The document establishes a long-term plan for monitoring, maintaining, and repair/upgrade for the landfill cover, leachate and gas collection system, sidewall odor mitigation system, and the stormwater management controls for the City of Bristol Integrated Solid Waste Management Facility Solid Waste Permit #588 Landfill.

Attachment D – Monitoring, Maintenance, and Repair Plan (SWP #588)

The Bristol Quarry Landfill and closed landfills are designed and operated such that the facility is in compliance with the Virginia Solid Waste Management Regulations (VSWMR).

This document is a revision to the electronic version of the Operations Manual prepared on behalf of the City by Joyce Engineering, Inc. (JEI) dated July 2007, (in accordance with the VSWMR, Amendment 1, 9 VAC 20-80-10, et. seq.). The document has since been revised to reflect current operating conditions and maintain compliance with applicable regulations.

2.0 SERVICE INFORMATION

The Quarry Landfill currently serves the City of Bristol, various area communities and several counties in the Bristol region. The geographic area served represents an area with a population of approximately 500,000 people. The facility also serves various commercial and institutional entities in the Bristol, Virginia, area and other individual enterprises within practical driving distance of the ISWMF. Waste is collected and transported to the facility by private operators, local governments, the City of Bristol, and various other commercial/industrial haulers. In compliance with a preliminary federal injunction issued by the United States District Court for the Western District of Virginia in the case of The City of Bristol, Tennessee v. The City of Bristol, Virginia (issued on June 14, 2022), the City will, at minimum for an indeterminate period of time, cease to accept waste for landfilling at the ISWMF by September 9, 2022 and will cease all landfill disposal activities by September 12, 2022.

2.1 SITE ACCESS

The Facility is secured by an entrance gate and fencing around the ISWMF. For safety purposes, there is additional fencing around the outer rim of the Quarry Landfill. The two sets of primary

fencing consist of a 6-foot perimeter cyclone fence and gates at appropriate ingress and egress points around the property and an 8-foot cyclone fence at the rim of the quarry. The scale house serves as the control point for the ingress and egress of all construction, refuse hauling, and other outside vehicles. At night, and whenever the landfill is closed, the gate is closed and secured with a lock.

2.2 AGENCIES SERVED AND WASTE HANDLING

The Landfill is permitted to receive industrial, residential, and other nonhazardous waste from within the City of Bristol and elsewhere in southwest Virginia and beyond. Any industrial wastes classified as special wastes will require approval by VDEQ prior to acceptance at the Facility. The City of Bristol retains the right to accept or reject any waste approved by the VDEQ. Likewise, any waste that categorically is acceptable but creates operational problems may be rejected.

In accordance with the Quarry Landfill permit and the Virginia Solid Waste Management Regulations, the Landfill may accept the following wastes:

a. Agricultural waste
b. Ashes and air pollution control (APC) residues that are not classified as hazardous waste. Incinerator and APC residues should be incorporated into the working face and covered at such intervals as necessary to prevent the material from becoming airborne.
c. Commercial waste
d. Compost
e. Construction waste
f. Debris
g. Demolition waste
h. Discarded material
i. Garbage
j. Household waste
k. Industrial waste meeting all VDEQ criteria.
l. Inert waste
m. Institutional waste except regulated medical waste (RMW) as specified in the Regulated Medical Waste Management Regulations (9 VAC 20-120).
n. Municipal solid waste (MSW)
o. Putrescible waste. Occasional animal carcasses may be disposed of within a sanitary landfill. Large quantities (over 20 cy) of animal carcasses may be received with prior notification of VDEQ. When large numbers of carcasses are received, they shall be placed in a separate area within the disposal unit and provided with a cover of compacted soil or other suitable material.
p. Refuse
q. Residential waste
r. Rubbish
s. Scrap metal
t. Sludges. Water treatment plant sludges containing no free liquid and stabilized, digested or heat-treated wastewater treatment plant sludges containing no free liquid may be placed on the working face along with municipal solid wastes and covered with soil or municipal solid wastes. The quantities accepted should be determined by operational conditions encountered at the working face. A maximum ratio of one ton of sludge per five tons of solid waste per day will be considered. Generation of leachate will be a basis for restriction of sludge disposal at such existing facilities.

u. Trash
v. White goods. If all white goods area free of chlorofluorocarbons and PCBs prior to placements on the working face.
w. Non-regulated hazardous wastes and treated rendered non-hazardous by specific approval only.
x. Special wastes as approved by director
y. Non-hazardous waste oil that has been adequately absorbed in the course of a site cleanup and passes the paint filter test.
z. Cat. I and II non-friable asbestos containing material (ACM) in accordance with 9 VAC 20-1-620.
aa. Petroleum-contaminated soils that have been treated to comply with the requirements of 9 VAC 20-81-660.
bb. Vegetative waste and yard waste

Under the VSWMR, the following wastes may not be accepted at the Landfill. (9VAC20-81-140.B.4)

a. Free liquids.

(1) Bulk or noncontainerized liquid waste, unless:

(a) The waste is household waste; or

(b) The waste is gas condensate derived from that landfill;

(c) The waste is leachate derived from that landfill and the landfill is designed with a composite liner and leachate collection system as described in 9VAC20-81-130 J 1 a and 9VAC20-81-130 L; or (2) Containers holding liquid waste, unless:
(a) The container is a small container similar in size to that normally found in household waste;

(b) The container is designed to hold liquids for use other than storage; or

(c) The waste is household waste.

b. Regulated hazardous wastes as defined by the Virginia Hazardous Waste Management Regulations (9VAC20-60).
c. Solid wastes, residues, or soils containing more than 1.0 ppb (parts per billion) TEF (dioxins).

d. Solid wastes, residues, or soils containing 50.0 ppm (parts per million) or more of PCB's except as allowed under the provisions of 9VAC20-81-630.
e. Sludges that have not been dewatered.

f. Contaminated soil unless approved by the department in accordance with the requirements of 9VAC20-81-610 or 9VAC20-81-660.
g. Regulated medical waste as specified in the Regulated Medical Waste Management Regulations (9VAC20-120).

2.3 CONTROL OF UNAUTHORIZED WASTES

The Quarry Landfill and Transfer Station share an Unauthorized Waste Control Plan. The procedures for inspections and action plan for unauthorized waste is given below.

2.3.1 Unauthorized Waste Self-Inspections

ISWMF personnel (Personnel) will randomly inspect incoming trucks for unauthorized waste in accordance with 9 VAC 20-80-250.C.1. These self-inspections will be performed on incoming vehicles to the scale house so that unauthorized waste may be intercepted prior to it being unloaded on either the Transfer Station tipping floor or at the Landfill working face. Vehicles will be inspected randomly, but not less than two (2) trucks per month or 1.0% of the number of incoming loads of waste, whichever is greater. Personnel will avoid inspecting the same vehicles each month. In addition, any vehicle that enters the ISWMF deemed suspicious in nature by Facility Personnel will be inspected. The ISWMF will post signage indicating the types of waste that will not be accepted at the Landfill. See **Appendix A** for a truck inspection form.

2.3.2 Plan of Action

a. Unauthorized waste still on truck.

Should ISWMF personnel find unauthorized waste on a truck prior to the truck unloading at the Transfer Station or Landfill the personnel will not allow the truck to unload.

b. Unauthorized waste found after truck has unloaded at the Transfer Station.

If unauthorized waste is not intercepted prior to unloading and has been unloaded onto the floor of the transfer station building, Personnel will immediately secure the area of the Transfer Station that has been contaminated. The contaminated area will be secured to minimize health threats to Facility Personnel, customers, and others in the immediate vicinity and to prevent release into the environment. Once the area has been secured, all staff will be notified that unauthorized was found and the hauler/generator will be advised of the situation. The Facility will then notify the VDEQ that unauthorized waste has been identified at the site. The hauler/generator will be required to use a contractor qualified to handle and transport the unauthorized waste to an approved disposal facility. The contractor will then package and haul the unauthorized waste to an approved facility for disposal. Once the unauthorized waste has been removed, the area will be disinfected to ensure all contaminants have been removed. The incident will be documented with the Date, Time of Arrival, Driver's Name, Company, Truck Number, License Plate Number, Origin, Cleanup Contractor, Waste Destination, description of waste, approximate quantity by either weight or volume, and the names of all individuals involved. Records will be maintained at the Facility for at least 3 years.

c. Unauthorized waste found after truck has unloaded at the Landfill.

If unauthorized waste is not intercepted prior to unloading nor after being unloaded onto the floor of the transfer station building and transferred (if applicable), and is discovered upon disposal at the Landfill working face, Personnel will immediately secure the area of the working face that has been contaminated. The contaminated area will be secured to minimize health threats to Facility Personnel, customers, and others in the immediate vicinity and to prevent a release into the environment. Once the area has been secured, all staff will

be notified that unauthorized was found and the hauler/generator will be advised of the situation. The Facility will then notify the VDEQ that unauthorized waste has been identified at the site. The hauler/generator will be required to use a contractor qualified to handle and transport the unauthorized waste to an approved disposal facility. The contractor will then package and haul the unauthorized waste to an approved facility. Once the unauthorized waste has been removed, the area will be disinfected to ensure all contaminants have been removed. The incident will be documented with the Date, Time of Arrival, Driver's Name, Company, Truck Number, License Plate Number, Origin, Cleanup Contractor, Waste Destination, description of waste, approximate quantity by either weight or volume, and the names of all individuals involved. Records will be maintained at the facility for at least 3 years.

d. Training

ISWMF personnel will be trained in the recognition, removal procedures, and the reporting of unauthorized waste. Every six (6) months, the Landfill Supervisor will conduct a refresher course to ensure that all Personnel are familiar with the proper procedures to follow if unauthorized waste is identified at the Facility. Also, all new employees will be required to be trained prior to working at the Facility. Training will consist of performing truck inspections, recognizing suspicious trucks, containment of unauthorized waste, managing contractors certified to package and haul unauthorized wastes, and implementing proper decontamination, disposal, and documentation procedures.

e. Notification

The City of Bristol will notify the VDEQ Director orally within 24 hours and will be followed by a written report within five days if a regulated hazardous waste, PCB waste, RMW, or other unauthorized waste is discovered at the Facility. The written report will include a description of the event, the cause of the event, the time and date of the event, and the actions taken to respond to the event.

2.4 LANDFILL DESIGN CAPACITY

Based on historical waste generation rates, the Quarry Landfill closure year is estimated to be in approximately 2042. However, the actual Landfill life is dependent upon various unknown factors, including the duration of the cessation of acceptance of waste commencing September 12, 2022.

Closure for SWP #498 is anticipated to be during or before the first quarter of 2024. However, the actual closure date is dependent upon various unknown factors, including the status of landfill mining activities previously being conducted at the SWP #498 landfill.

3.0 PERSONNEL

Landfill operations are managed by the City of Bristol and operated under the direct supervision of City of Bristol Personnel, including the City Public Works Director and the Facility Manager.

3.1 PUBLIC WORKS DIRECTOR

While day-to-day operations are managed at a subordinate level, the City of Bristol Director of Public Works will, at all times, have authority to stop operations and to take whatever course of actions are deemed necessary and appropriate to protect the public health, safety and welfare. Other authorities

deemed applicable to the Public Works Director include the ability to reject loads, to stop construction and other contractor activities, to dismiss employees engaged in operations at the Facility (including the Facility Manager and subordinate operation managers), and to take whatever other actions may be required to operate the Facility in compliance with the Facility permits and this Manual.

All personnel are under the direction of the Bristol Department of Public Works Director. The Director of Public Works has overall responsibility for the landfill while the Landfill Facility Manager handles daily operations.

3.2 FACILITY MANAGER

The duty of the Facility Manager includes the development and maintenance of a variety of recordkeeping systems including, but not limited to, the following information:

- Total volume of waste accepted (weekly manifest)
- Total weight of waste accepted (weekly manifest)
- List of customers and types of waste accepted
- Leachate pumping volumes, quality, and recirculation performance (if appropriate)
- Pumping rates and volume from gradient control system
- Groundwater monitoring
- Gas monitoring
- Surface water monitoring
- Weather monitoring
- Construction documentation and management

The compiled information is disseminated as necessary to satisfy operating permits and reporting requirements.

The daily operations at the ISWMF are performed by a staff of approximately 15 to 20 persons. Personnel organization and numbers will depend on the volumes of waste accepted, the waste placement procedures, the ongoing construction activity, and the phase of Landfill or environmental controls development.

Other Facility Personnel include an Assistance Facility Manager, Scale Operator, Equipment Operators/Laborers (Multiple), Secretary/Office Manager, Environmental & Safety Officer, and Environmental Technician, Full-time engineering technicians, engineers, surveyors, and other outside parties are also commonly available at the Facility, particularly during Landfill monitoring or construction activities.

3.3 TRAINING

The City of Bristol has implemented a continuing education program to provide training to employees involved in the daily operation of the Landfill, which includes:

First Aid: Initial training and annual updates

CPR: Initial training and annual updates

SWANA Operator Training: Initial certification and updates as courses and different subject matter certifications are offered.

Employees will also be required to familiarize themselves with the Facility Permits, Operations Manual, design plans and other pertinent Landfill documents. As the employee training is an ongoing process employees will be offered, as available, classes to both increase their skill levels and polish their existing skills. New employees assigned to the Landfill will receive training as indicated above as soon as practical.

4.0 SITE PREPARATION

4.1 SPECIFICATIONS

Specifications have been prepared for the development and maintenance of the project and site. These specifications are included as Appendix A to Part B Basis of Design Report.

4.2 QUALITY CONTROL

The development, construction, and operation of the Quarry Landfill facility is under the direction of the Facility Manager. However, to document that the Facility is constructed in accordance with the engineering plans and specifications, an independent Quality Assurance/Quality Control (QA/QC) Officer will be on-site to perform construction quality assurance (CQA) documentation. During construction, full-time representatives of the QA/QC Officer are on-site to test and document through field measurements, photographs, and written reports that the in-field conditions comply with the design plans, specifications and engineering report.

The construction QA/QC program documents that the Facility is constructed in substantial conformance with the project plans and specifications approved by the VDEQ.

A daily report is prepared during construction by the QA/QC Officer so that out of compliance issues can be addressed in a timely manner. Monthly and annual reports are also prepared to facilitate review of documentation. A CQA report is prepared following construction of major Facility components such as major liner modifications or extensions, gas system expansions, and other major capital projects. This report summarizes the construction activity and testing results. This documentation is submitted to the City and others required by the Facility permits. Construction is in accordance with the design plans and specifications approved in the Facility's permit.

The QA/QC Officer monitors the construction activity on a full-time basis to have full knowledge of the project activities. The QA/QC Officer also maintains records of the construction and prepares as-built drawings and documentation to address the operating permit requirements. The City also maintains all records of communications with contractors and outside vendors supplying materials for the project. To the extent possible, the project manager coordinates other site visits and inspections with other agencies having jurisdiction at the property.

All construction staking activities are performed under the supervision of a Registered Land Surveyor. All construction staking is performed utilizing conventional construction layout practices. Site control is provided via permanent site control points established on the facility site, as shown on Sheet OP-IA. All site control points are tied into the State Plane Coordinate System as well as the site project coordinate system. During construction the survey crew established grade stakes and obtained locations and elevations of as-built features. The surveyor's report to the QA/QC Officer, who has authority to halt construction or operation, if necessary.

Recordkeeping is a critical aspect of the long-term and efficient operation of the facility. Records are compiled and maintained in the administrative offices under the control of the Facility Manager. Compiled records are used to guide the development of new operating plans and contingency response plans.

4.3 TIMETABLES

4.3.1 Quarry Landfill

The timetable for subsequent construction activities for the sidewall liner is dependent upon the closure status of the landfill and, if it resumes waste acceptance in the future, the refuse filling rate. Regardless of landfill life, Phases III and IV will be completed following final waste placement and a thirty-year post-closure care (PCC) period will extend a minimum of thirty years beyond the closure of Phase IV.

4.3.2 Closed Landfill

The closed landfill is classified as a House Bill (HB) 1205 landfill and as such must cease waste management activities on or before December 31, 2020, and close in accordance with the applicable regulations. However, in the 2020 permit amendment, the City revised its mining approach for the SWP #498 landfill to continue past the December 31, 2020 deadline for an additional 10-year period. In accordance with the 2023 Consent Decree between the City and VDEQ, a new permit amendment is underway to implement a revised closure design for immediate installation. Mining activities have ceased at the SWP #498 landfill, and the landfill will be closed in accordance with the amended Closure Plan.

4.3.1 Other Facilities

Timetables for the three PBR facilities (Tire Processing Facility PBR #116, Baling Facility/Transfer Station PBR #121, and Composting Area PBR #525) are presented in their respective Operations Plans.

5.0 OPERATIONAL CONDITIONS

5.1 HOURS OF OPERATION

The ISWMF is operated during normal daylight hours. Typically, these will be between 7:00 a.m. and 4:00 p.m., Monday through Friday, although occasional modifications to these hours may be required due to seasonal, climatic, and unusual circumstances. Placement of daily cover at the end of each day requires an additional 1 to 1.5 hours after waste placement (or mining, as applicable) has ceased. Public access to the Facility is allowed only when an attendant is on duty and only during daylight hours.

5.2 TRAFFIC ROUTING

5.2.1 Access Road

Primary site roadways used for incoming waste consist of 24-foot wide bituminous pavements. This pavement minimizes tire blowouts, improves sweeping and spray cleaning, and minimizes mud tracking. All primary site roads are posted with the site-wide mandatory 20 mph speed limit.

All other roadways on-site consist of compacted gravel surfaces. These roadways are graded periodically to maintain safe access to all parts of the ISWMF's operation. Dust is controlled through the use of water trucks, when necessary. The access road into the Quarry Landfill is posted with a mandatory 10 mph speed limit:

The bituminous pavement areas are structurally designed for a 9-ton axle load and 50 vehicles per day. To minimize internal traffic congestion, particularly at the scale house, queuing lanes allow vehicles to quickly and easily queue away from the main road right-of-way. A variety of road maintenance equipment is devoted to keeping the roads free of mud and debris. This equipment includes the following as needed: a rotating hydraulic broom, a vacuum truck, a spray cleaner/water truck, and a front-end loader. This equipment is made available from other Public Works Divisions.

Guardrails and guard posts are provided along high embankment areas and adjacent to the Quarry Landfill. Such rails and posts are also placed in areas such as near cleanout rise pipes, close to monitoring wells, and next to sensitive instrumentation for protection. Continuous maintenance of roadways, ditches, and landscaping is accomplished with the use of ground crews. The ground crews are responsible for all maintenance activities including dust control and roadway sweeping mentioned previously. Dust and mud, as well as isolated loose refuse and debris, are collected through the use of power brooms and front-end loaders or other collection vehicles. Roadside shoulders and ditches are mowed regularly during Spring through Fall.

Ditches are maintained to provide drainage in accordance with the stormwater management plan. Sediment accumulation in ditches are removed and ditches reformed when surface water runoff flows are affected. Similarly, where severe erosion has occurred, ditches are reconstructed and the causes for the erosion remedied. Surface water detention ponds are periodically cleaned of sediment, as necessary, to maintain design grades.

Entranceways, berms, and other facilities are landscaped to provide an aesthetic appearance. Disturbed areas are re-vegetated as soon as possible following disturbance.

5.2.2 Control of Vehicular Traffic

All construction, material disposal, and other outside traffic accesses the site via the west entrance. Vehicles hauling waste (including waste or recovered soil mined from the Closed Landfill) proceed to the scale house, located immediately west of the Baling Facility/Transfer Station. Vehicles transferring waste at the Transfer Station are weighed in at the scale house, registered by the office personnel and allowed to proceed to either the Transfer Station tipping floor or directly to the Landfill working face, where the loads are inspected.

Construction traffic accesses the site through the same west entrance and proceeds to the area the City has designated.

All traffic is two-way and roadways are provided with appropriate signage and markings to facilitate safe ingress and egress.

The scale house operator directs each vehicle entering the property to the appropriate area: directly to the working face of the landfill, the baling facility tipping floor, SWP #498 Landfill, tire processing facility, white goods/scrap metal management pad, composting area, or other designated areas.

Traffic control signs are provided to direct traffic along the planned traffic routes. Parking for employees is west of the Transfer Station or at the scale house. Visitors are directed to park at the scale house parking area.

5.2.3 Signage

Signs are posted along the ISWMF to instruct the disposition of waste. Signs are also posted at the site entrance indicating the name of the Facility and the license number. The entrance signs also state the types of waste which are accepted at the ISWMF. A bold-faced sign stating: "No hazardous waste accepted, including hazardous, hospital, liquid waste, or asbestos" is posted.

5.2.4 Inclement Weather

The on-site main access road is paved and is designed as an all-weather road up to the Transfer Station and Quarry Landfill entrance. Temporary access roads and the main access road into the Quarry Landfill are constructed of gravel or other acceptable road building materials. These materials are stockpiled for use and regarding, as needed. Temporary access roads into the Quarry Landfill are incorporated into the Landfill as filling proceeds. Roads are maintained for all weather use. Drainage facilities and measures are provided so that disposal operations can continue during periods of inclement weather. These measures include the utilization of temporary berms and curbs to drain and direct precipitation and runoff within the operational area. When possible, wet weather operations are directed to higher elevations with better access. Vehicles used to transport personnel, equipment, waste, or other materials into the Landfill are equipped with all-weather tires, or have access to them.

Wet weather may also increase the volume of collected leachate. Available leachate storage is carefully monitored during these periods, with special arrangements for increased handling and disposal provided if necessary.

During periods of windy weather, the volume of blowing litter may have a tendency to increase. Litter is controlled as close to the working face as possible using portable litter screens positioned downwind from the face. These screens are cleaned on a periodic basis and moved as necessary to collect blowing litter. At the Baling Facility/Transfer Station the tipping floor is covered and enclosed; therefore, no blowing litter out of the building is expected. During the along transportation routes and other areas of the landfill, but Employees pick up loose refuse found along the Facility roadways.

5.2.5 Power Shutdown

During periods of power shutdown, emergency power is provided to critical operations. The critical operations are wired for emergency power hookups using a portable generator which is available on-site.

5.2.6 Temporary Shutdowns

The (at a minimum) temporary shutdown/cessation of waste acceptance on September 12, 2022, should not have a significant operation regulatory impact. This extended period of shutdown will require placement of intermediate cover (IC) on the working face and throughout the Quarry Landfill surface to achieve the required depth of cover soil (6 inches in addition to the minimum required depth of daily cover). Furthermore, a prolonged shutdown may require a permit modification or revision to the closure and PCC plan to reflect the impact of a prolonged shutdown. Continuity of maintenance operations as discussed in this Manual are maintained to during all shutdowns.

5.3 WASTE HANDLING

5.3.1 Types of Wastes

The Bristol Quarry Landfill is designed to accept MSW, commercial waste, and some industrial waste from local industries. The Facility does not accept bulk liquids, hazardous, radioactive, infectious or medical hospital wastes, or asbestos wastes.

Following is a discussion of specific waste types and the waste stream. Comments are included, where applicable, regarding disposition of these materials.

Agricultural Waste: Accepted.

Putrescible Waste: Occasional animal carcasses are disposed of within the Landfill.

Scrap Metal: Scrap metal is separated and stored at the white goods/scrap metal management pad area until collected by a commercial recycling contractor.

Construction and Demolition Debris (CDD) Waste: Accepted.

Non- Regulated Hazardous Waste: Not Accepted.

Special Wastes: Accepted by specific approval only. See Section 5.3.10.

Bulk or Non-containerized Liquid Waste: Not accepted unless the waste is household waste or the waste is leachate or LFG condensate derived from the Facility.

Container Holding Liquid Waste: Not accepted unless the container is similarly small in size to those normally found in residential households, or the container is designed to hold liquids other than for storage, or the waste is household waste.

Regulated Hazardous Wastes: Not accepted.

Solid Wastes, Residues, or Soils Containing More than 1.0 ppb of Dioxins: Not accepted.

Solid Waste, Residues, or Soils Containing 50 ppm or More of PCBs: Not accepted.

Unstabilized Sewage Sludge, or Sludges that Have Not Been Dewatered: Not accepted.

Pesticide Containers: Not accepted unless triple-rinsed and crushed.

MSW and construction and demolition debris were both disposed in the SWP #498 Landfill. It is anticipated that both types of waste will be excavated during ongoing mining operations. These wastes will be transferred for off-site disposal or disposed in the Quarry Landfill.

5.3.2 Litter Control

As the waste is delivered to the disposal area, prompt compaction will be the first method to control wind-blown litter. If necessary, soil cover will be periodically placed on the compacted working face throughout particularly windy days. In addition, CDD can be used on top of lightweight waste material instead of soil until the end of the day. Temporary fences will be constructed as needed to intercept blowing litter. Consolidated litter which may not be immediately contained will be picked up weekly by Landfill personnel.

Temporary litter screening is used at the active working face when filling. Litter is controlled around the perimeter of the facility by fencing, where necessary.

5.3.3 Dust, Odor and Vector Control

Roads will be sprayed with water or other environmentally suitable dust suppressant to mitigate dust during dry and windy weather. At the end of each working day, 6 inches of soil as daily cover (or an appropriate thickness of an alternate daily cover) will be placed over the waste disposed of that day to control odors and vectors. If an area does not receive another lift of waste within 30 days, at least 12 inches of soil (6 inches of daily cover and 6 inches of IC) will be placed. Erosion of the soil cover due to wind and precipitation will be corrected as weather and seasonal conditions permit.

Dust on the site, particularly on unpaved access roads, is controlled through the use of a water truck which will apply uniform water spray in a controlled and periodic manner.

On-site mobile equipment is equipped with 5 to 20-lb. fire extinguishers to handle small isolated fires. Larger fire extinguishers are provided at the Transfer Station to handle fires that may develop as a result of sources of ignition within the refuse brought on site. The Scale house and Transfer Station areas serve as checkpoints for fire hazards in incoming waste loads. If any smoldering is noted, the vehicle will be directed to a clear area away from potential sources of combustion and the fire will be extinguished using smothering, fire extinguishers, water, and/or other means of suppression.

For spontaneous, small isolated fires which may develop within the Transfer Station or Landfill, at a working surface, or elsewhere, the smoldering material will be buried and/or smothered by other means. The load of material will be kept buried until the fire is extinguished.

Fire control incidents unrelated to the Landfill operations will be handled by various on-site fire control facilities and/or the City's fire protection district. The City's Fire Department will provide firefighting equipment and other resources to assist in extinguishing any fires that may develop.

On-site fire protection facilities include maintaining adequate soil stockpiles in the vicinity of the working face which be used to provide firewalls if required. Construction-related firefighting procedures are routinely reviewed with site personnel. Should a fire occur at the Landfill, the application of additional compacted cover will be utilized to cut off the flow of oxygen to the burning area. If this is not adequate to contain the fire, the affected area will be thoroughly wetted, excavated and wetted again. Outside firefighting equipment will be used on an as-needed basis.

5.3.4 Placement of Waste in State Waters

No waste at the Facility is placed in state waters or any other surface waters or groundwater. In addition, no such waste is allowed to enter such waters. The means and methods of preventing this are as follows:

- The site is operated to maintain a groundwater level below the allowable uplift liner pressure.
- Surface water accumulations are directed to stormwater management and storage facilities which are periodically inspected, cleaned, and maintained in accordance with the Facility's permits.

5.3.5 Open Burning

Open burning is prohibited in areas where solid wastes have been disposed and in areas being used for active disposal.

5.3.6 Salvaging

Salvaging within the Landfill area property is not practical and is prohibited. Limited salvaging activities on the transfer Station tipping floor such as recovery of large pieces of scrap metal or inert debris that may be impractical to load in a transfer trailer may be conducted as necessary.

5.3.7 Filling Operations

The Quarry Landfill was anticipated to be filled in sequential phases: Phase I North end filling to approximate elevation 1720; Phase II South end filling to approximate elevation 1720; future planned Phase III South end filling to proposed final grades; and future planned Phase IV North end filling to proposed final grades. The projected life for these phases, at the original projected 400 tons per day filling rate, was 3, 7, 21 and 9 years, respectively.

Refuse filling should be achieved in layers of approximately 2 feet thickness and compacted by compactors to achieve a suitable waste fill densities. Four to six passes, or as many as may be specified by the lead Landfill Operator, shall immediately be made with the compaction equipment upon placement of each 2-foot layer of refuse. Refuse fill shall be built up in compacted layers to form lifts of appropriate thickness during each working day in order to avoid formation of an excessively large working face and wasting of cover material.

Bales or other approved buffer materials are placed to maintain the stability and integrity of the sidewall liner system. Broken bales and loose waste are filled with sloping areas prior to daily cover placement. Waste bales will only be placed along the perimeter of the Quarry Landfill walls at a minimum of four feet from the sidewall liner and, when placed, will be neatly stacked. The four-foot zone between the stacked bales and the sidewall liner is called the buffer zone. After a row of stacked bales is established along the sidewall, the four-foot wide buffer zone is backfilled with a granular soil or alternate approved material and compacted using a vibratory compactor.

After the row of stacked bales is established, the daily filling operation essentially consists of spreading and compacting loose waste. The landfill working face size ranges from 50 to 100 feet long and advances laterally at the rate of roughly 20 to 50 feet per day.

5.3.8 Mining Operations

The overall goal was to mine the SWP #498 Landfill to generally meet the grades illustrated in the closure drawings. Mining typically moved from West to East in order to maintain positive drainage to perimeter stormwater berms and other and contact water controls. Mining operations have ceased.

5.3.9 Daily Cleanup

Any blowing litter outside the Quarry Landfill area is picked up daily and properly disposed. Perimeter fences are cleaned as needed. Landfill equipment is cleaned of litter and mud on an as-needed basis, or at a minimum of once per week.

5.3.10 Handling of Special Wastes

Special wastes are defined by VDEQ as "solid wastes that are difficult to handle, require special precautions because of hazardous properties or the nature of the waste creates waste management problems in normal operations". These are wastes that must be handled differently than just dumping at the work face and pushing into the daily cell as follows:

- Friable asbestos material and Regulated Asbestos Containing Material (ACM) are not accepted. Category I and Category II non-friable ACM as defined in 40 CFR Part 61, Subpart M may be accepted and placed within the Landfill following notification of the Landfill operator. Such materials would be covered with soil and/or waste.
- Small animal carcasses shall be disposed of in the Landfill. They shall be placed into a small pit dug into the working face and covered immediately with the excavated waste.
- Tires are accepted at the Tire Processing Facility under PBR #116. Tires will be handled by the procedures per that facility's Operations Plan (refer to Attachment A).
- Bulk deliveries of lead acid batteries are not accepted. Lead acid batteries are removed from the incoming MSW stream on the tipping floor of the Transfer Station where feasible (see the handling procedures per the Transfer Station facility's Operations Plan in Attachment B). The batteries are then placed in designated containers and picked up for recycling/disposal by an contracted vendor.
- Soil contaminated with petroleum products are not accepted at the Quarry Landfill.
- Drums shall be empty, opened on both ends, cleaned, and crushed before being disposed of in the landfill.
- White goods (refrigerators, stoves, washers, and other appliances) are separated and stored at the white goods/scrap metal management pad for collection by a contracted commercial recycling vendor
- Water and wastewater treatment plant sludges containing no free liquids and wastewater treatment plant sludges which are digested, heat treated, or otherwise stabilized and contain no free liquids, may be accepted at the Facility and placed within the Landfill if operating conditions allow. Such materials are covered with soil and/or waste. The quantity of stabilized sludge which would be accepted would be determined by operational considerations, but at no more than one ton of sludge per five tons of solid waste per day. Sludges accepted are also required to meet the requirements of the City of Bristol Industrial Wastewater Permit No. 013 (see **Appendix B**).

5.4 EQUIPMENT

Sufficient numbers and types of properly maintained equipment are available to service Facility operations in accordance with this Operations Manual. Equipment is to be maintained in good working order and in a condition so as to remain capable of efficiently performing the required tasks. Both light and heavy pieces of equipment are required throughout the sites to perform tasks such as servicing machinery, transferring personnel and materials, maintaining site infrastructure, collecting litter, etc. Pumps and portable generators are used throughout the operation to control surface water, manage liquids and provide temporary power when needed. Mobile equipment is equipped with rollover protection and backup beepers.

If a piece of equipment breaks down, or an additional piece of equipment is required to accomplish a specific activity, substitute equipment is available within 24 hours from area equipment vendors and/or construction companies.

The scale used at the scale house is a permanently installed system capable of weighing variously sized vehicles ranging from personal vehicles to tractor trailer rigs and is capable of weighing vehicles up to 200,000 lbs. Digital readouts, a tabular records database, and other computerized data collection capabilities are included in the City's scale records management software.

5.4.1 Baling Equipment

The City's former baling operation produced up to 40 tons of baled waste per hour, per baler. At this rate, two balers were sufficient while accounting for allowances for mechanical downtime, broken wires, new wire spooling, waste mixing on the tipping floor, and personnel breaks. The bales were sized at 55" x 46" x 39", utilized tied with 11-gauge steel wire, and required about 6 ties each. Bales weighed approximately 3,000 pounds each. Although the general infrastructure for baling waste is still in place, the City no longer bales waste prior to landfilling and is considering reconfiguration of the Baling Facility/Transfer Station for outside transfer. See the Operations Plan for the Transfer Station (**Attachment B**) for more information regarding baling operations.

5.5 COMPACTION AND COVER

5.5.1 Daily Cover

At the end of each working day, daily cover is applied to the active working face. Daily cover operations generally consist of the use of geosynthetic (Fill Cover 200™, or equivalent), soil, or other approved alternate daily cover (ADC). The geosynthetic is draped from the top bench down the Landfill face, including all vertical faces where possible. The geosynthetic is anchored by tires or other weighted material.

The placement of daily cover serves several purposes, including the reduction of hazards and nuisances associated with fire, birds, rodents, and insects. The daily cover may consist of a variety of different types. These may include geosynthetic cover (e.g. Fill Cover 200™), 6 inches of compacted soil, Posi-Shell, or other approved ADC to control odor and litter. If utilized, the geosynthetic cover is placed at the end of each working day and is removed the beginning of the following working day so that waste placement at the working face may continue.

Daily cover consisting of 6 inches of compacted soil or other approved ADC is placed in those areas where use of the geosynthetic is impractical due to working face configuration, weather conditions, or other conditions resulting in an enhanced difficulty for placement activities.

At least three days of the geosynthetic and/or soil material (calculated at the average use and rate) is maintained at the Facility and is readily available at all times.

5.5.2 Compaction

The slope on the working face should be in the range of 3:1 to 4:1 for a loader. When a crawler tractor is used, greatest compaction occurs when the machine can climb the slope, shredding the waste as it climbs. When a landfill compactor is used, the slopes should be flattened to the order of 4:1 to 5:1 to take advantage of the weight of the machine for greater compaction.

The waste should be spread into layers not more than 2 feet thick. The equipment should make four to six passes on each layer to achieve proper compaction. Beyond this number, the additional compaction benefit is usually outweighed by the operating expenses. Large bulky items should be crushed with the loader bucket before being worked into the base of the working face. Each load and each layer should be properly compacted before the next layer is applied.

5.5.1 Intermediate Cover

Intermediate cover will consist of 6 inches of soil applied to the 6 inches of required daily cover, or 12 inches of soil total. This will be applied whenever another lift of waste will not be placed for more than 30 days. Also, IC will be applied to areas which exhibit erosion, cracking, or settlement. The need for IC in this case will be evaluated by the Facility Manager on at least a weekly basis.

All areas which receive IC are monitored and observed on a periodic basis, but not less than weekly, to confirm that coverage is maintained. Additional cover material is placed in those areas where IC is noted to be cracked, eroded, or uneven, in order to maintain the integrity of the IC system.

IC is sloped to provide adequate drainage and to prevent significant ponding or pooling of water on the Landfill. If IC is required on a vertical face, landfilling is stair stepped at approximately two horizontal increments to one vertical increment to achieve a smooth slope and transition. The source of IC is borrow area located to the North and West of the Quarry Landfill or offsite.

Temporary seeding is recommended if the IC area is not used within 30 days from placement. IC is placed in areas which are not actively in use for more than 30 days. IC is sloped to provide adequate drainage and prevent significant ponding or pooling of water on the Landfill. When IC is required on a vertical face, placement is in a stair-stepped manner at approximately a two horizontal to one vertical slope to create a smooth transition.

5.5.1 Final Cover

Final cover is placed over the finished fill after fill operations are completed or after one of the following conditions apply:

(1) An additional lift of solid waste is not to be applied within one year.

(2) Any area of a Landfill attains final elevation and within 90 days after such elevation is achieved.

(3) A landfill's permit is terminated for any reason, and within 90 days of such denial or termination.

Final cover consists of 18 inches of material with permeability no greater than 1x10^-5 cm/sec, a synthetic membrane, a geocomposite, and a minimum of 24 inches of soil to support a vegetative growth. Placement of final cover should be monitored to ensure adequate compaction is achieved

and to confirm the correct material is used and placed to the specified depths. Placement of final cover will be in accordance with an approved Closure Plan developed as a separate document.

Quarry Landfill

Because of the method of operation and the overlay of one phase on another, internal slopes which may not receive waste for an extended period of time will be covered with additional soil if warranted and permanently seeded.

As implied in SWP #588, an alternative IC consisting of a geosynthetic (such as Fill Cover 200™ or Amoco Propex 2002), Posi-Shell, tire chips and soil, foams, geomembranes, or equivalent, could be used in select areas. Before any alternate ICs are used, the City will obtain approval from VDEQ.

Closed Landfill

A final cover system will be constructed in accordance with the latest revision of the closure drawings and Closure Plan.

5.5.2 Vegetative Cover

A topsoil (vegetative) cover will be placed over the final cover to support vegetative growth and help stabilize all sloped areas against erosion. The final vegetative layer will be placed as soon as possible after placement of the final cover to reduce desiccation, cracking, freezing, or other damage to the low permeability layer. Vegetative cover will be placed within four months after placement of the final cover, dependent on seasonal conditions or other unknown factors.

Woody trees, bushes and other vegetation will be removed at the location of major new facilities to facilitate construction and operations at their locations. Adjacent areas and other areas surrounding the Quarry Landfill will be protected with fencing and/ or signage. In order to provide suitable buffer and screening measures, landscaping and vegetation management will be performed at select areas around the Facility including but not limited to:

- Soil borrow area
- Facility entrance
- Baling Facility/Transfer Station
- Composting area
- Scale house
- Quarry Landfill rim
- Sedimentation ponds
- Facility roadways
- Monitoring wells/probes located outside the waste management boundaries
- Aggregate material stockpiles

5.5.3 Stockpiles

Excavated daily soils from the SWP #498 landfill that are not demonstrably coal combustion byproducts (CCB) may be stockpiled within the limits of waste for use as ADC or IC.

6.0 SAFETY

The following is the Safety Plan developed for the Quarry Landfill. This plan describes measures that are taken to protect facility personnel and visitors from injury during the construction and operation of the Landfill, the Baling Facility/Transfer Station, and ancillary operations. All employees are also required to adhere to the City of Bristol, Virginia, Health and Safety Plan.

6.1 GENERAL

The Facility operator is a Certified Waste Management Facility Operator, as required by Statutes Title 54.1, Chapter 22.1 of the Code of Virginia.

Operating personnel must demonstrate, by training or experience, sufficient knowledge of the rules and regulations of the Commonwealth of Virginia and USEPA to satisfy the Facility Manager that the Facility is operated in accordance with its permits. All site personnel are trained in the following subject areas:

- General site safety
- Equipment operation and maintenance (as appropriate based on position)
- Operations procedures described in this Manual
- Construction techniques
- Nuisance controls
- Hazardous or unacceptable waste identification

Confined space entry and lock-out/tag-out procedures have been developed and are enforced for applicable areas and equipment. Appropriate personnel are retrained every two years in order to maintain certifications.

6.2 OSHA HEALTH AND SAFETY

Employee training shall be designed to ensure that all employees understand and are aware of the hazards to which they may be exposed as well as the proper methods for avoiding such hazards.

For purposes of the Landfill and other work to be undertaken at the Facility, hazard training is conducted before commencement of work duties.

Verification of training records are kept a minimum of three years and the same requirement is requested of subcontracted personnel. Documentation of site safety briefings and routine safety meetings is recorded and also kept a minimum of three years. Trainings shall cover the following for the various task assignments at a minimum:

6.2.1 Entering and Leaving the Quarry; Transportation; Communications

The instruction shall include the procedures for entering and leaving the Quarry Landfill; the check-in and checkout sign-in system; the procedures for operating and riding conveyance equipment; the controls for the transportation of personnel and materials; the communication systems, warning signals and directional signs; and the Emergency/Contingency Plan (**Appendix C**).

6.2.2 Introduction to the Work Environment

The instruction shall include a visit and tour of the Facility operation. The method of landfilling or other site activities involved in the employee's duties shall be observed and explained.

6.2.3 Quarry Map: Escape ways; Emergency Evacuation

The instruction shall include a review of an updated quarry map; the escape way system; the escape, firefighting and emergency evacuation plans in effect.

6.2.4 Hazard Recognition and Avoidance/Health Hazards and Gas Explosion Potential

The instruction shall include an explanation of the health hazards; biological, physical, and chemical that can occur in a landfill environment and the control plan. Methane, hydrogen sulfide and oxygen deficiency detection/monitoring and hazards shall also be explained. Health and safety standards, safety rules and safe working procedures shall be provided and explained. Electrical hazards will be specifically discussed as well as instruction in the prevention of accidents and accident reporting procedures.

6.2.5 First Aid

The course shall include instruction in first aid methods.

6.2.6 Equipment and Machine Operators

All operators shall be instructed in the safe operating procedures applicable to new or modified. Machines or equipment to be put into operation at the Landfill. Any person who controls or directs haulage operations shall receive and complete training courses in safe haulage procedures related to the haulage system, firefighting procedures, and emergency evacuation procedures in effect.

6.3 RESTRICTED ACCESS

All visitors to the site that require access to the active filling area are required to attend a safety briefing given by a representative of the Landfill. Each visitor is required to sign an indemnification/release to gain unsupervised entry to the Landfill or Baling Facility/Transfer Station.

High wall, banks, benches, and terrain sloping into the working areas shall need to be examined particularly noting conditions after rain, freeze, or thaw, before men work in such areas. Overhanging highwalls and banks shall be taken down and other unsafe ground conditions shall be corrected promptly, or the area posted "Danger Falling Rocks" and barricaded as an exclusion zone to Personnel and outside parties.

Potentially hazardous walls shall be scaled before any other work is performed below. When scaling of highwalls is necessary to correct conditions that are hazardous to persons in the area, a safe means shall be provided for performing such work.

Whenever it becomes necessary for safety to remove dangerous materials such as loose rock or vegetative debris from highwalls, the material shall be approached from a safe direction only by trained and properly-equipped personnel and the material removed from a safe location.

Employees and contractors, other than those specifically trained/contracted and necessary to correct the unsafe conditions, shall not work near or under dangerous high wall or banks. They shall not work between high wall or spoil bank and near any such equipment that may hinder escape from falls or slides.

Until corrective work is completed or until the hazard is removed, the area shall be posted with a warning against entry. When left unattended, a barrier shall be installed to impede unauthorized entry. High wall and banks adjoining travel-ways shall be examined at least weekly or more often if changing conditions warrant.

In places where persons work or travel in performing their assigned tasks, loose or unconsolidated material shall be removed or access to these areas restricted whenever it creates a potential hazard to persons below.

Refer to 30 CFR Part 56.3203 Rock fixtures for discussion of rock bolts and accessories addressed in ASTM F432-83 "Standard Specification for Roof and Rock Bolts and Accessories."

6.4 PROTECTIVE CLOTHING

6.4.1 Eye and Face Protection

Eye and face protection shall be provided when machines or operations present potential eye or face injury. Eye and face protective equipment shall meet the requirements of ANSI Z87.1-198 I, "Practice for Occupational and Educational Eye and Face protection. Eye and face protection shall be provided when machines or operations present potential eye or face injury. Eye and face protective equipment shall meet the requirements of ANSI Z87.1-198 I, "Practice for Occupational and Educational Eye and Face protection."

6.4.2 Hearing Protection

When engineering or administrative controls fail to reduce sound levels to below 90 dBA ear protective devices shall be provided and used.

6.4.3 Head Protection

Head protective equipment (helmets) shall be worn in areas where there is a possible danger of head injuries from impact, flying or falling objects, or electrical shock and bums. Helmets for protection against impact and penetration of falling and flying objects shall meet the requirements of ANSI Z89.

The employer shall be responsible for resuming the wearing of appropriate personal equipment in all operations where there is exposure to hazardous conditions or where the need is indicated for using such equipment to reduce the hazard to the employees. Lifelines, safety belts, and lanyard shall be used only for employee safeguarding.

6.4.4 Hand and Foot Protection

Gloves shall be provided and selected based on the hazards involved in performing the specific tasks. Exposure of contaminants of concern may occur through direct contact via the skin with raw materials or contaminated materials, water, or leachate. One should expect to find a very mixed population of bacteria, multi celled microorganisms, including pathogens in the landfill environment. Although many of the organisms are harmless to humans, it should reasonably be expected that some will not be harmless. Anyone working with the landfill materials who has a cut or break in the skin shall wear protective clothing and nitrite t or neoprene gloves. Safety-Toe footwear shall be selected from the American National Standard Z41.1-1967 Classification requirements for Safety-toe footwear.

6.4.5 General Body Protection

Coveralls shall be acquired in materials treated to resist liquids, fire and dirt.

6.5 EQUIPMENT STANDARDS

Safety nets shall be provided when workplaces are more than 25 feet above the surface and where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines, or safety belts are impractical.

The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use and dismantling by conventional means of reaching the worksite, such as personnel hoist, ladder, aerial lift, elevating work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

6.5.1 Hoists, Material and Personnel

Rated load capacities, recommended operating speeds, and special hazard warnings or instructions shall be posted on cars and platforms. Refer to Subpart R-Personnel Hoisting 30CFR MSHA. Hoistway entrances of material hoists shall be protected by substantial full width gales or bars. Hoistway doors or gates of personnel hoist shall be not less than 6 feet 6 inches high and be protected with mechanical locks which cannot be operated from the landing side and are accessible only to persons on the car. Overhead protective coverings shall be provided on the top of the hoist cage or platform. All material hoists shall conform to the requirements of ANSI AI0 .5-1969, Safety Requirements for Material Hoists.

6.5.2 Rappelling

Rappelling shall be conducted only by personnel who have received instruction and certification in industrial rope practices and can pass competency tests in rappelling, belaying, anchor points, knots etc. Double safety line and buddy system shall be used if this method is to be employed.

No employee shall be assigned, allowed, or be required to perform work alone in any area where hazardous conditions exist that would endanger his safety unless he can communicate with others or can be heard or can be seen.

6.5.3 Mobile Diesel Powered Equipment

Safe operation of mobile diesel-powered equipment involves consideration of possible hazards, namely the following:

(1) toxic or objectionable gases discharged in the exhaust of the engine,

(2) ignition of flammable atmospheres by the engine or by electrical equipment,

(3) fire hazards presented by the engine fuel oil and by combustible material that might come in contact with the equipment; and,

(4) mechanical hazards.

Each of these areas shall be monitored and considered in the safe operation training for the operators.

Cab windows shall be of safety glass or equivalent, in good condition and kept clean. Mobile equipment shall be equipped with adequate brakes, and all trucks shall be equipped with parking brakes. Mobile equipment shall be provided with audible warning devices. Lights shall be provided on both ends when required.

Guard nets or other suitable protection shall be provided where tramways pass over roadways, walkways or structures.

Mobile haulage equipment shall be inspected by a competent person before such equipment is placed in operation.

Rollover Protective Structures applies to all the materials handling equipment used in the quarry.

6.6 OTHER POTENTIAL HAZARDS

6.6.1 Construction on Slopes

Hazards from above and below due to falling material shall be controlled when work is conducted on slopes. Barricades shall be in place to the extent that debris can fall in any given work area and personnel excluded from this zone. Where possible, persons should not stand within 50 ft. of the quarry wall unless required by a specific work task, or protected by equipment or structures.

6.6.2 Access Roads

Operation of vehicles accessing the Landfill is the primary safety issue associated with the direct-haul system. Operationally, the existing Quarry Landfill access road will be modified to permit the new traffic pattern. The remaining circuitous quarry access will be eliminated. All landfills must have safety regulations for commercial trucks entering and exiting the landfill. The new access road is not different in grade and/or length than access to typical landfills located throughout the Commonwealth.

6.6.3 Interim EVOH Cover System (Exposed Geomembrane)

For the duration of the interim EVOH cover system, the SWP #588 quarry will be covered by an exposed geosynthetic material (geomembrane and, potentially, overlying wind screen). The exposed geosynthetic will present a tripping hazard. Personnel accessing the exposed cover will wear appropriate footwear for traction on the exposed geosynthetic surface. Care will be exercised to prevent damage to the exposed geosynthetics. The use of lightweight utility vehicles upon the exposed geosynthetics will be considered and approved in advance. Utility vehicles and other equipment will not be used in areas with excessive slope.

The exposed geosynthetics should be expected to warm significantly under direct sunlight. Black geomembranes are known to reach temperatures as high as 170°F under direct sunlight. Green geosynthetics have been specified to reduce this warming effect, but personnel shall still exercise caution on warm, sunny days. Personnel shall wear adequate footwear to withstand the geosynthetic temperatures. Additionally, personnel may experience elevated ambient temperatures when working atop the exposed geomembrane. Standard precautions against excessive heat will be taken. Personnel should consume adequate fluids, be aware of any heat illness symptoms, work shorter shifts, and take frequent breaks as needed.

6.7 EMERGENCY/CONTINGENCY PLAN

The Emergency/Contingency Plan is intended to describe emergency responses and guidelines. A copy of this plan is included in **Appendix C** of this Operations Manual.

6.8 FIRE CONTROL PLAN

It is possible that fires may develop at the Facility. For such situations the site is widely equipped to handle small, isolated fires. Larger fires will be addressed through the use of professional firefighting equipment or the use of off-site municipal firefighting resources.

On-site mobile equipment is equipped with 5 to 20-pound fire extinguishers to handle small isolated fires. Larger fire extinguishers are provided at the Transfer Station to handle fires which may develop as a result of smoldering loads of refuse brought to the site. The initial checkpoint for this type of load is made at the Scale house and subsequently (in many cases) the Transfer Station or Quarry Landfill working face where loads are observed. If smoldering is noted, the fire will be extinguished using fire extinguishers and/or water. If fires are noted within waste transportation vehicles, attempts will initially be made to extinguish the fires through smothering. If smothering is ineffective, the load will be directed to a safe area and extinguished with water or other approved fire suppressant.

For spontaneous, small isolated fires which may develop within the Landfill, at a working surface, or elsewhere, the smoldering material will be buried and smothered or otherwise suppressed. The load of material will be kept buried until the fire is extinguished.

Fire control incidents unrelated to the Landfill operations will be handled by various on-site fire control facilities and/or the City of Bristol fire protection district. The City provides the following:

Fire Station #1 - Main Station

- **Ladder #1** – 2018 Pierce 105' heavy duty aerial ladder with 2000 GPM pump & 500-gallon onboard water tank
- Haz-Mat 1 – 1997 Spartan Heavy Duty hazardous materials response unit, 5-man cab with interior office for communications with VDEM & internet to research chemicals
- **Medic Unit #1** – 2018 Braun Ambulance – Advanced life Support Level
- **Battalion Chief 1** – 2018 Chevrolet 1-ton truck with slide out command/radio console
- **Chief 1** – 2016 Chevy Tahoe – Command unit
- **Fire Marshal 1*** –2015 Chevy Tahoe fire code enforcement/fire investigation vehicle
- Tow Vehicle – 2008 GMC 1-ton dually

Fire Station #2:

- **Engine # 2** – 2019 Pierce pumper with 2,000 GPM pump & 750 gallons of water on-board
- Medic Unit # 2 (Reserve ambulance) –2010 International - Advanced life Support Level
- Hazardous Materials Leak and Spill Trailer (various equipment to handle spills)

Fire Station # 3

- **Engine #3** – 2012 Pierce Pumper with 1500 GPM pump & 750-gallon onboard water tank
- Tower Ladder #3 – 2008 Suthphin 100' aerial tower with bucket 2,000 GPM pump & 500-gallon water tank on-board
- Heavy-Technical Rescue Equipment Trailer – Various heavy rescue equipment/supplies

Units designated in bold print are staffed 24/7 or *Monday through Friday.

On-site fire protection facilities include maintaining adequate soil stockpiles in the vicinity of the working face, an 4,500-gallon water tank, and a variety of foams; seven 55 gallon drums of 3M Alcohol Resistant AFFF, eight 55 gallon drums 3M AFFF Lite Water ATC Plus, and seven 55 gallon Artic drums Fire Class A/B (3 of these drums are on a trailer with a drop tank). Foam will only be used as a last resort option when the threat to life and the environment outweighs the impact of using foam. While daily cover utilized in the Landfill filling operations is typically a geosynthetic, the soil stockpiles are used to provide effective fire barriers where such situations require. Construction-related firefighting procedures are routinely reviewed with site personnel. Should a fire occur at the

Landfill, the application of additional compacted cover will be utilized to cut off the flow of oxygen to the burning area. If this is not adequate to contain the fire, the affected area will be thoroughly wetted, excavated and wetted again.

Additional, detailed fire prevention and firefighting information and response data is documented in Appendix I, Fire Prevention and Response Plan, of the Public Works Health and Safety Plan.

6.9 COMMUNICATIONS SYSTEM

An on-site communications system has been installed to facilitate exchange of information during normal operating practices and during emergency situations. Two-way radio communication has been provided on all mobile equipment stationed at major working area to provide rapid communication between the scale house, the maintenance area, the Baling Building/Transfer Station, the filling face, and the leachate handling facilities. In addition, phone service has been provided in all permanent structures and, at least one cellular phone available at all major Facility areas.

Access to all radio communications is clearly defined and rules regarding use of the systems established.

7.0 INSPECTION PLAN

Inspections are to be performed to assure proper facility operation and compliance with the regulations. The following Inspection Plan establishes a minimum standard and is developed in accordance with 9VAC20-81-485.A.2 of the VSWMR toward meeting the operational requirements of 9VAC20-81-140.

The SWP #588 landfill inspections will be completed in accordance with the SWP #588 Monitoring, Maintenance, and Repair Plan (Attachment D). The Plan provides long-term plan guidance for monitoring, maintaining, and repair/upgrade for the landfill cover, leachate and gas collection system, sidewall odor mitigation system, and the stormwater management controls.

7.1 OVERALL FACILITY

Inspections are divided into three (3) specific parts:

- those performed during the active life of the Landfill,
- those performed during the active life as well as during closure and PCC period, and,
- those performed during the closure and PCC period.

Inspections will be coordinated through the Facility Manager (see **Appendix D** for the standard inspection form). It will be the Facility Manager's responsibility to ensure that the inspections are carried out according to the schedule and guidelines set forth in the Operation Manual and the Closure Plan. Inspections shall be performed by an individual duly trained and competent in the specified task. A photographic record of all deficiencies and/or items that needed repair will be kept after completion of an inspection, the inspector will promptly complete and deliver to the Landfill Manager a written inspection report outlining the general condition, deficiencies, and preventative and/or corrective measures to be undertaken. The Landfill Manager will review each inspection report when received and begin processing the paper work necessary to alleviate any deficiencies. These inspection reports will be stored in a dedicated location in the Landfill office and will be backed up electronically at least once per month.

There are certain areas of the ISWMF that may be subject to spills. These areas include the transfer station, the leachate loading area, and the Posi-shell mixing area. Should a spill occur at the Landfill, all effort will be made to clean up the site. All areas where a spill may occur have secondary containment, and spills should not pose a threat to the environment.

Areas that may be affected by a breakdown of equipment include the Landfill working face; Tire Processing Facility; Composting area; leachate, condensate, gradient water, or other liquids pumps and other handling equipment; LFG Collection and Control System; Maintenance Building; Scale house; and the Transfer Station building. The Facility has adequate equipment at the working face to continue working at the working face under minor breakdowns. Should the City need additional equipment, the City will contact the contractor listed in the emergency contingency plan. The City also has back-up pumps in case of a breakdown at a pump station. In addition, the City has adequate equipment at the Transfer Station building to continue operations should it have issues with transfer/baling equipment.

7.1.1 Security

Security inspections will be carried out during the active life of the Landfill as well as during the Closure and PCC period. The Landfill is secured as detailed in Section 2.1. Entrances into the site are secured by a locked gate across the existing access road into the ISWMF. At closure a sign will be erected at the entrance gates stating that the Facility is permanently closed and no longer capable of receiving waste materials and, the location of the nearest transfer or disposal facility. In addition, the Facility Operator shall place a public notice in the local newspaper notifying all users of the Landfill's impending closure and outlining where waste can be disposed in the future.

Inspections will be conducted weekly during the active life of the Landfill(s) and at least twice annually after closure to insure that the gates and signs are in good repair and no alternate access is being used by vandals. Repairs will be made as necessary in a timely fashion.

7.1.2 Erosion Damage

Establishment of a vegetative layer and the design of drainage systems with non-erosive velocities and cover, where necessary, should prevent significant damage to the cover resulting from stormwater and wind erosive action. Erosion inspections will occur on at least a quarterly basis and after each major storm event during the entire active life and the initial PCC period to insure proper establishment of the vegetative cover and the immediate correction of observed damage. Once the vegetative layer has been established and, the opportunity for erosion is mitigated, inspections will be conducted at least twice annually and after major storm events.

7.1.3 Cover, Settlement, Subsidence and Displacement

Depressions that develop due to uneven Landfill settlement will be filled with additional suitable cover (cap) material, and replanted with vegetative cover to assure positive drainage from Landfill surface. Inspection of the depressed areas will be conducted prior to repairs to confirm the integrity of the drainage layer and cap. If the integrity of the cover system has been breached, the damaged area and/or layer will be repaired in conformance with the specifications for the particular component damaged. Inspections will be conducted at least quarterly during the active life and modified to twice annually during the PCC period for the Landfill. Repairs will begin as soon as possible after discovery of necessary remedial repair.

7.1.4 Vegetative Cover Condition

The design and implementation of the Closure Plan is based on the premise that the post closure maintenance must be minimized. By the same token, the City recognizes that the integrity of the final cover must be protected in order to enhance the local environment and to continue to reap the full benefits of a good closure. The establishment of the initial vegetative layer will require adherence to the seeding specification outlined in contract specifications, "Surface/Vegetative Cover."

To facilitate continued proper development of the vegetative layer (i.e. to obtain the desired grass density) soil samples will be taken and tested for P, K, N approximately one (1) year after planting with additional fertilizer and/or lime applied to correct any nutrient deficiency. The area will be mowed twice annually during the entire life of the Facility and as part of each mowing, the area will be inspected for rodents, burrowing animals, areas void of vegetation and other problems associated with the vegetative cover or that impact the integrity of the cover system. If a concern is observed, it shall be properly documented in the inspection report and corrective measures implemented. In addition to the inspections conducted during mowing operations, the area will be inspected once annually during the non-growing season (November through April). This will allow the inspector to observe conditions that exist and cannot be readily detected during the growing season.

7.1.5 Integrity of Run-On and Run-Off Control Measures

Inspections of run-on/run-off controls will be conducted weekly during the active life of the Landfill and twice annually during the PCC life of the Landfill and after every major storm event to insure integrity of run-off control devices. Conveyance will be maintained as a part of the program for vegetative cover, repairing erosion damage observed.

7.1.6 Gas Collection and Control System

The Landfill Gas Management Plan developed for this site addresses the venting, collection, and control of decomposition gases necessary to protect the Landfill cap and to prevent migration into structures within the ISWMF or beyond the Facility boundary. Refer to the "Landfill Gas Management Plan", dated July 29, 2021.

7.1.7 Groundwater Monitoring System

Groundwater monitoring wells within the system will be inspected prior to sample collection. The frequency of monitoring well inspections will directly correlate with the groundwater monitoring phase required by the VDEQ. Wells will be secured by lock and key and appropriately marked to reduce the chance of accidental damage. If the VDEQ allows the City to increase the timeframe between samples to a point where samples are not collected at least twice annually then, Facility Personnel will visually inspect the wells the number of times required to bring the minimum number of inspections to twice annually. Should existing groundwater monitoring wells become damaged or contaminated from outside sources, they will be grouted to their full height to within 1 foot of surface grades and the Closure Plan record will be revised. At that time and, with the approval of the VDEQ, a replacement well will be installed per the current regulations.

7.1.8 Benchmark Integrity

Benchmarks will be visually inspected annually to confirm that they are intact and have not been damaged.

7.1.9 Leachate Collection and Disposal

The leachate collection system is buried under the refuse. An inspection for proper operation of the sump and side slope riser system will be made periodically based on permit requirements. The inspector will confirm that the riser is secure and not damaged and test pump in sump to assure the system is not blocked or damaged. Any damaged areas will be promptly repaired.

The leachate removal system includes the side slope riser, pumps, lateral up riser, manholes and force main to the storage lagoon. Pumps and laterals will be inspected on a monthly basis to confirm normal operation. Additional inspection, preventive maintenance, and checking of the electrical components will be performed in a manner and frequency in accordance with manufacturer's recommendations. The leachate manholes will be inspected weekly to verify integrity of the forcemain. After closure, manholes will be inspected at least quarterly. Any leachate which has leaked into the manhole will be removed and returned to the removal system.

In addition, a sample of leachate shall be collected at least biannually, analyzed, and the systems flow rate recorded to track compliance with standards set by the receiving wastewater treatment plant.

7.1.10 Intermediate Cover

The IC will be inspected as needed, but no less than once weekly. The IC should be additionally inspected after heavy rain storms to ensure the integrity of the IC has not been jeopardized. Should low spots or major erosion be found in the IC layer, they will be repaired promptly. Additionally, should the IC not receive additional waste for 30 days, it will be stabilized through seeding or other methods to prevent erosion.

7.1.11 Scale House

The scales and scale house will be inspected at least quarterly to ensure they are functioning properly. The scale will be checked for calibration to ensure proper records of incoming waste are kept in accordance with state regulations.

7.1.12 Communication Equipment

All communication equipment will be checked at least monthly to ensure they are functioning properly. Communication equipment includes radios, phones, and the leachate pump station automatic dialer. Proper functioning communication equipment will ensure safety at the site. Should anything be found to be malfunctioning, it will be repaired or replaced.

7.1.13 Access Roads

All interior access roads will be inspected at least monthly to ensure they are passable under all weather conditions. All weather gravel access roads will be inspected at least monthly to ensure an adequate gravel base exists. New gravel will be applied to gravel access roads when needed.

7.1.14 Equipment

Inspections of equipment used at the Facility vary in frequency depending on the inspection performed. Daily inspections will include the following:

- Checking all fluid levels.

- Visual before and after operation checking in, under and around the equipment to look for leaks, operational damage, vandalism, or missing components.
- Cleaning tracks/rollers of mud and debris.
- Cleaning compactor wheels of wire and other debris.
- Other services listed in the operator's handbook for that piece of equipment.

Additionally, inspections and maintenance are performed on each piece of equipment based upon the number of hours of use.

An inspection of the fire extinguisher on each piece of equipment will be performed as part of the daily check. The extinguisher will be checked for:

- Charge
- Current tag
- Safety pin
- Mounting
- Any visual damage

In addition to Daily inspections, all equipment will follow the manufacturers' recommendation for maintenance and frequency. All Emergency Equipment laid out in the Emergency/Contingency Plan (**Appendix C**) will be inspected as stated in the Plan. All manufacturers' recommendations for emergency equipment will be adhered to.

Regular inspections and abiding by the manufacturers recommendations will increase the efficiency and lifespan of equipment, as well as, decrease the probability of issues occurring while in use. If inspections and maintenance plans are not followed or conducted, equipment is likely to breakdown or cease functioning, causing delays to working operations or in serious cases potential injury to personnel. In the case of a working failure or injury to persons follow the instructions laid out in the Emergency/Contingency Plan.

7.1.15 Incoming Waste Loads

Self-inspections for incoming wastes will be conducted per the facility's Unauthorized Waste Exclusion and Contingency Plan (Section 2.3), which has been prepared and shall be implemented in accordance with 9VAC20-81-100.E and 9VAC20-81-485.A.4 of the VSWMR.

8.0 CONTROL AND MONITORING OF LIQUIDS AND GAS

8.1 LEACHATE DISPOSAL

8.1.1 Operations

A leachate collection system is located above the primary liner at the base of the Landfill. The collection system is designed to function automatically under normal operating conditions.

Leachate is collected from the piping network and drainage blanket, and gravity flows from the landfill to the wet well where it is discharged via a force main into an existing sanitary sewer line for treatment at the Bristol publicly owned treatment works (POTW). Leachate discharge volume is measured by a flowmeter or timed and recorded on a strip chart recorder.

In accordance with an agreement with the Facility's wastewater treatment provider, a minimum 500,000-gallon leachate storage tank is anticipated to become available for backup storage, if necessary, during significant storm events in the near future. The leachate storage tank will be equipped with fill level float meter and automatic overfill protection. If the leachate inflow rate is greater than the outflow and the tank reaches capacity, the overflow system will temporarily allow leachate to drain directly into the sanitary sewer. Leachate may also be hauled by tanker truck during system shutdowns.

Secondary containment is provided for all tanks or permanent pressure conduits. All pumps have automatic controls to switch on and off at high/low liquid levels.

8.1.2 Leachate System Maintenance

The leachate collection piping is surge-cleaned annually during the operating life of the Landfill and bi-annually during PCC. The surging procedure consists of flushing the piping with the introduction of water at the upstream cleanout location, thus cleaning the pipe through a water surge action.

Leachate pumps arc maintained as directed by the manufacturer. Standby pumps are available on an emergency basis in case a replacement is necessary. Standby emergency equipment is listed in Appendix C. Liquid level sensors, cables, and alarms are tested monthly, or more frequently, if operating experience shows this is required. The automatic dial-up system is tested on a routine basis.

8.1.3 Leachate Monitoring

The leachate volume in the Landfill is measured daily by a flowmeter owned by the Facility's wastewater treatment provide. The Facility is taking measures to procure additional flowmeters multiple sub-streams of the site's liquids generation. Leachate quality is measured by sampling the leachate on at least a biannual basis. Leachate samples are submitted to a laboratory qualified by the Groundwater Sampling and Analysis Plan. Samples are analyzed for the constituents listed in Addendum II to the Industrial Wastewater Discharge Permit (**Appendix E**). Results of leachate analysis are kept on record in the Landfill office and included as part of the Annual Groundwater Monitoring Report.

8.2 LANDFILL GAS MONITORING PLAN

The Landfill is undergoing additional design measures to control migration of methane landfill gas from the Landfill into the surrounding rock or the atmosphere. An active LFGCCS with connections to the leachate collection system operates to increase extraction, collection, and destruction of LFG from the Landfill.

LFG is monitored for the following purposes:

1. To monitor the changing LFG quality inside the Landfill;
2. To plan appropriate LFG venting, flaring, or recovery activities;
3. To adjust valves and blowers, as necessary, to maintain adequate gas removal capacity through the Landfill;
4. To monitor the presence of LFG and ambient air outside the Landfill and to control LFG migration on-site;
5. To monitor and maintain compliance with the Clean Air Act (CAA) and VSWMR; and,
6. To extract excess heat from the waste mass.

Layers of gas collection infrastructure are installed at various locations and depths within the Landfill. Vertical subsurface gas wells as well as horizontal collection layers provide an integrated means of active LFG collection and control.

LFG quality monitoring is conducted on leachate collection, horizontal gas collection features, and the vertical well components. Portable methane monitoring equipment is used to analyze the samples directly at the collection structures. All systems are monitored at least monthly for barometric pressure, methane, carbon dioxide, and oxygen. These measurements are compared to the ambient conditions at the time of measurement, including weather conditions. Active vacuum pressures are adjusted when odor problems are noticed or when dangerous concentrations of any of the above gases are measured.

8.3 GROUNDWATER MONITORING PLAN

The Groundwater Monitoring Plan developed for this site discusses the groundwater monitoring system, sampling and analysis plan, as well as the groundwater monitoring well abandonment procedures. Refer to the Landfill Gas and Groundwater Sampling and Analysis Manual.

8.4 QUARRY CELL SURFACE STORMWATER MANAGEMENT

The surface of the Quarry Landfill is anticipated to be contoured and shaped through the addition of soil and a geomembrane on top of the waste so as to facilitate the controlled conveyance of stormwater across it. Clean water from precipitation events will be directed via engineered slopes and channels across the cell to a Stormwater containment basin for pumping out of the Landfill in the future. Maintenance of existing slopes and ditches involves inspecting and repairing areas where water has been directed and will be subject to erosion. Repair may consist of refilling washouts lining with stone or riprap, or cutting new ditches when the old ones are full of sediment. Adequate soil cover must be maintained to reduce infiltration.

8.5 DRAINAGE AND EROSION CONTROL

The sediment control system maintenance can be performed in conjunction with that of the stormwater control system. Visual monitoring on a weekly basis is performed, as well as observations during periods of heavy precipitation. Visual monitoring will focus on the final cover surface, looking for signs of distressed vegetative cover, loss of topsoil, soil erosion, or storm water flow to other than designated systems. Repairs of defects found during monitoring will be accomplished expeditiously. Repairs to the clay cover will include placement of additional materials in accordance with the design requirements without creating a seepage path at the repair limit.

The vegetative cover will be maintained in a stable, healthy growing condition. This may require irrigation during periods of drought. If the vegetation dies, the root system may not hold the topsoil layer in place and erosion could occur. Dead or dying vegetation shall be reestablished promptly.

The level of deposited sediment in the sediment ponds is monitored on an annual basis. The sediment capacity level is clearly marked in a manner that is easily monitored.

9.0 RECORDKEEPING

The Landfill should maintain records of all activities. Records will be kept at the facility's office, and a backup copy of the most important records should be kept in an electronic format or in an additional City office. At a minimum, the following records should be maintained:

- Incoming Waste to include tonnages, charges, haulers, dates and type of waste.
- Fill Area records of the phase, lift, and area of lift being filled on any day. If necessary, the location of an area filled on a particular day can be approximated.
- Equipment Use includes records of machine hours, maintenance, fuel and fluid use, and operations costs.
- Personnel Records should include names, addresses, social security numbers, attendance records, phone numbers, job classifications, performance reviews, medical history and training history.
- Environmental Monitoring schedule, procedures and results of testing. This includes the gas monitoring records and groundwater monitoring records previously discussed.
- A copy of the Landfill permit.
- Records of special wastes accepted at the Landfill.
- Waste inspection and acceptance records.
- Official Inspection Reports.
- Records of leachate flow and quality. Records of leachate pumped from the equalization basin and the records of the volume of leachate used for dust control.
- VDEQ Solid Waste Management Regulations.
- Virginia Erosion and Sediment Control Handbook (VESCH).
- A log including a daily narrative account of the activities at the Landfill. Information on weather, rainfall, unusual events, verbal directives given and received, counseling of personnel and miscellaneous comments should be recorded daily.
- A copy of the pertinent sections of the City Code and subsequent Ordinances concerning Landfill operation, tipping fees, litter control and related subjects.
- Training program lessons, schedules and attendance should be kept to document operator skill improvement efforts.

10.0 CLOSURE AND POST-CLOSURE CARE

Reference is made to the "Closure Plan." In general, the final use of the Facility including SWP #498, SWP #588, and the three PBR facilities will be to maintain it as an open space. The Facility will incorporate stormwater drainage systems and sedimentation and erosion control systems, both of which will preclude or significantly diminish problems associated with erosion during the closure and post-closure periods as well as during the operation of the site. The last amendment to the closure and PCC plan as necessitated by regulations must be submitted no later than 180 days prior to the final use of the site, or its anticipated closing date. This will allow for sufficient time to prepare a Closure Plan which at that time will be in accordance with future regulations.

Appendix A

Vehicle Inspection Form

City of Bristol ISWMF Incoming Vehicle Inspection Form

CAUSE: Random Suspicious (circle one)

DATE: _____ START TIME: _____ A.M./P.M. STOP TIME: _____ A.M./P .M.

NAME OF HAULER: _____

ADDRESS: _____

PHONE: _____

VEHICLE DRIVER'S NAME: _____

TRUCK #: _____ BOX#:_____ LICENSE PLATE #: _____

ORIGIN OF WASTE: _____

TYPE OF WASTE: (Circle as Necessary)

HOUSEHOLD WASTE	0-20%	21-40%	41-60%	61-80%	81-100%
COMMERCIAL W ASTE	0-20%	21-40%	41-60%	61-80%	81-100%
CONSTRUCTIO'N/DEMOLITION	0-20%	21-40%	41-60%	61-80%	81-100%
INDUSTRIAL WASTE	0-20%	21-40%	41-60%	61-80%	81-100%
INSTITUTIONAL WASTE	0-20%	21-40%	41-60%	61-80%	81-100%

LIQUIDS	YES	NO
INFECTIOUS	YES	NO
HAZARDOUS WASTE	YES	NO
PCB WASTE	YES	NO
ACM	YES	NO

Use this box for any Inapprpropriate Waste Discovered

INAPPROPRIATE/BANNED MATERIALS (DESCRIBE COMPLETELY):

HW / RMW CONTINGENCY PLAN UTILIZED: YES NO

If NO, explain: _____

DATE & TIME DEQ NOTIFIED: _____

I certify that the above vehicle was screened and that all information is correct.

SIGNATURE OF INSPECTOR: _____ _

REVIEWED BY: _____ DATE: _____ _

Appendix B

Industrial Wastewater Discharge Permit

BVU AUTHORITY

INDUSTRIAL WASTEWATER DISCHARGE PERMIT

PERMIT NUMBER: 013G
ISSUE NUMBER: 2022

In accordance with all terms and conditions of the BVU Authority Sewer Use Rules and Regulations, and also with any applicable provisions of federal or state law or regulation;

Permission is Hereby Granted to:	**City of Bristol Virginia**
Categorical Determination:	**Significant User, 40 CFR 445, Subpart B**
Classified by SIC Number(s):	**5058**
New or Existing source:	**Existing**

For the contribution of: **Leachate from Sanitary Landfill and Quarry Balefill Facility**

Into the BVU Wastewater Treatment System at: **2655 Valley Dr**
Bristol, Virginia

This permit is granted subject to the General and Special Conditions, discharge limitations, monitoring schedule and compliance schedule attached (as applicable), and in accordance with the application and/or Industrial Waste Questionnaire filed on **July 30, 2020** for the office of the BVU Authority President (President) and in conformity with plans, specifications and other data submitted to the President or his/her designated official in support of the above application/questionnaire, all of which are filed with and considered as part of this permit, together with the following named conditions and requirements.

Effective this **1st** day of **May, 2022**
To expire this **31st** day of **July, 2022**

Granted by:

Philip H. King
Water Resources & GIS Director
Engineering

Accepted by:

Title: _____

GENERAL CONDITIONS

A. **Compliance With Sewer Use Rules**

Permittee shall comply with all provisions of the BVU Authority Sewer Use Rules and Regulations (BVU Rules) as amended and all other pertinent ordinances or regulations that may be adopted in the future. Compliance with this permit does not relieve the permittee of his obligation to comply with any or all applicable pretreatment regulations, standards or requirements under local, State, and Federal laws including any regulations, standards, requirements or laws that may become effective during the term of this permit.

Noncompliance with any term or condition of this permit shall constitute a violation of the Sewer Use Rules and Regulations of the BVU Authority.

Section 6.1. General discharge prohibitions.

No user shall contribute or cause to be contributed, directly or indirectly, any pollutant or wastewater which will interfere with the operation and performance of the POTW. These general prohibitions apply to all such users of a POTW whether or not the user is subject to national categorical pretreatment standards or any other national, state, or local pretreatment standards or requirements. A user may not contribute the following substances to any POTW:

a) Any liquids, solids, or gases which by reason of their nature or quantity may be sufficient, either alone or by interaction with other substances, to cause fire or explosion to be injurious in any other way to the POTW or to the operation of the POTW. No two successive readings on an explosion hazard meter, at the point of discharge into the system (or at any point in the system) shall be more than five percent, nor shall any single reading be over ten percent of the lower explosive limit (LEL) of the meter. Prohibited materials include, but are not limited to, gasoline, kerosene, naphtha, benzene, toluene, xylene, ethers, alcohols, ketones, aldehydes, peroxides, chlorates, perchlorates, bromate, carbides, hydrides, and sulfides and other substances which the BVU Authority, the City, the State, or EPA has notified the user is a fire hazard or a hazard to the system.

b) Solid or viscous substances of a kind or in a quantity of which may cause obstruction to the flow in a sewer or other interference with the operation of the wastewater treatment facilities such as, but not limited to: solid organic material, milk or milk products, grease, garbage with particles greater than one-half inch in any dimension, paunch manure, bones, hair, hides, or fleshings, entrails, whole blood, feathers, ashes, cinders, sand, spent lime, stone or marble dust, metal, glass, straw, shavings, grass, clippings, rags, spent grains, spent hops, waste paper, wood, plastic, gas, tar, asphalt residues,

residues from refining, or processing of fuel or lubricating oil, mud, or glass grinding or polishing wastes.

c) Any wastewater having a pH less than 5.0 or wastewater having any other corrosive property capable of causing damage or hazard to structures, equipment, and/or personnel of the POTW.

d) Any wastewater containing any toxic pollutants, chemical elements, or compounds in sufficient quantity, either singly or by interaction with other pollutants, to injure or interfere with any wastewater treatment process, constitute a hazard to humans or animals, create a toxic effect in the receiving waters of the POTW, or to exceed the limitation set forth in a categorical pretreatment standard. A toxic pollutant shall include but not be limited to any pollutant identified pursuant to section 307(a) of the Act.

e) Any noxious or malodorous liquids, gases, or solids which either singly or by interaction with other wastes are sufficient to create a public nuisance or hazard to life or are sufficient to prevent entry into the sewers for maintenance and repair.

f) Any substance which may cause the POTW's effluent or any other product of the POTW such as residues, sludges, or scums, to be unsuitable for reclamation and reuse or to interfere with the reclamation process. In no case shall a substance discharged to the POTW cause the POTW to be in noncompliance with sludge use or disposal criteria, guidelines or regulations developed under section 405 of the Act; any criteria, guidelines, or regulations affecting sludge use or disposal developed pursuant to the Solid Waste Disposal Act, the Clean Air Act, the Toxic Substances Control Act, or state criteria applicable to the sludge management method being used.

g) Any substance which will cause the POTW to violate its NPDES permit or the receiving water quality standards.

h) Any wastewater causing discoloration of the wastewater treatment plant effluent to the extent that the receiving stream water quality requirements would be violated, such as, but not limited to, dye wastes and vegetable tanning solutions.

i) Any wastewater having a temperature which will inhibit biological activity in the POTW treatment plant resulting in interference or damage to the collection system, but in no case wastewater with a temperature at the point of introduction into the POTW which exceeds 60 degrees Celsius (140 degrees Fahrenheit).

j) Any pollutants, including oxygen demanding pollutants (BOD, etc.) released at a flow rate and/or pollutant concentration which will cause interference to the POTW.

k) Any waters or wastes causing an unusual volume of flow or concentration of waste constituting sludge.

l) Any wastewater containing any radioactive wastes or isotopes of which half-life or concentration as may exceed limits established by the President in compliance with applicable state and federal regulations.

m) Any wastewater that has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment stand or requirement [in accordance with 40 CFR Part 403.8(f)(6)].

n) Any trucked or hauled pollutants, except at discharged points designated by the POTWs in accordance with Sections 4.1 through 4.4.

o) Any stormwater, surface water, groundwater, roof runoff, subsurface drainage, uncontaminated cooling water, or unpolluted industrial process waters to any sanitary sewer. Stormwater and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as storm sewers, or to a natural outlet approved by the President and the state. Industrial cooling water or unpolluted process waters may be discharged on approval of the President and the state, to a storm sewer or natural outlet.

p) It shall be unlawful to discharge into the BVU sewer system water other than from a metered water supply without written permission from BVU.

A user, except a small industrial user where explicitly noted and whose permit is issued subject to Section 6.6, may not contribute the following substances to the POTW:

a) Any wastewater having a pH higher than 10.0, or greater as permitted for small industrial users, or wastewater having any other corrosive property capable of causing damage or hazard to structures, equipment, and/or personnel of the POTW.

b) Any waters or wastes containing animal based fats, wax, grease, or oil, whether emulsified or not, in excess of a daily average of 375 mg/l, or greater as permitted for small industrial users, or containing substances which may solidify or become viscous at temperatures between 32 and 140 degrees Fahrenheit (zero and 60 degrees Celsius).

c) Any wastewaters containing mineral based oils in excess of 100 mg/l, or greater as permitted for small industrial users.

d) Any wastewaters containing biochemical oxygen demand concentration in excess of 2,800 mg/l, or greater as permitted for small industrial users, in a 24-hour composite sample.

e) Any wastewaters containing total suspended solids concentration in excess of 2,800 mg/l, or greater as permitted for small industrial users, in a 24-hour composite sample.

Sec.6.2. Restrictions on Wastewater Strength

No person or User shall discharge wastewater that exceeds the following set of standards (Table A – User Discharge Restrictions) unless an exception is permitted as provided in these Rules. These User Discharge Restrictions are established at concentrations which allow a User variations in his wastewater strength throughout a day so long as the average daily limits and maximum daily limits of the User's Permit are not exceeded. A grab sample taken at any instant shall not contain any contaminant in excess of the respective Instantaneous Maximum Concentrations found in Table A. In addition to these Instantaneous Maximum Concentrations, a User in his Permit may be assigned average daily limits and/or maximum daily limits based on a methodology used by BVU to allocate waste loads to Users and to protect the POTW. In such case, the User shall not discharge wastewater that exceeds any of the limits of his/her Permit or of these Rules. Dilution of any wastewater discharge for the purpose of satisfying these requirements shall be considered in violation of this Ordinance.

Table A
User Discharge Restrictions

Pollutant	Instantaneous Maximum Concentration* (mg/L)
Arsenic	0.50
Cadmium	0.29
Chromium (total)	16.8
Copper	9.4
Cyanide	2.61
Lead	3.0
Mercury	0.008
Molybdenum	0.86
Nickel	3.44
Phenols (total) by 4AAP Method	7.50
Phthalates (total)	5.60
Selenium	1.15
Silver	0.45
Zinc	11.4
Ethylbenzene	1.59
Toluene	1.35
1,2 trans Dichloroethylene	0.27
Naphthalene	0.27

*Based upon a single grab sample at any time.

B. **Maintenance of Records**

The Permittee shall maintain records of all information resulting from any monitoring activities required by this section. Such records shall include for all samples:

1. The date, exact place, method, and time of sampling and the names of the persons taking the samples;

2. The dates analyses were performed;

3. The names of the persons who performed the analyses; and the name and location of the laboratory;

4. The analytical techniques/methods used; and

5. The results of such analyses.

The Permittee shall be required to retain for a minimum of three (3) years records of monitoring activities and results (whether or not such monitoring activities are required by this section) and shall make such records available for inspection and copying by the President or his/her designated official, by the Commonwealth, and by the Environmental Protection Agency. This period of retention shall be extended during the course of any unresolved litigation regarding the Industrial User or when requested by the President or his/her designated official, the Approval Authorities, or the Environmental Protection Agency.

C. **Notification of Accidental Discharge**

Any person causing or suffering from any accidental discharge, slugs, bypasses, upsets, etc. shall immediately notify the Industrial Monitoring Program Manager (IMP Manager), the President's designated official by telephone (423-989-5570) to enable countermeasures to be taken to minimize damage to the Publicly Owned Treatment Works (POTW), the health and welfare of the public, and the environment.

This notification shall be followed, within five (5) days of the date of occurrence, by a detailed written statement describing the cause of the accidental discharge and the measures being taken to prevent future occurrence.

D. **Notification of Discharge Changes**

The Permittee shall promptly notify the President or his/her designated official, (Industrial Monitoring Program Manager, 423-989-5570) in advance, of any substantial change in the volume or character of pollutants in their wastewater discharge. Also, the Permittee shall notify the President or his/her designated official, in writing, at least thirty (30) days prior to the introduction of any new wastewater constituents.

E. **Modification of Permit**

The terms and conditions of this permit may be subject to modification by the President during the term of the permit as limitations or requirements are modified or other just cause exists.

F. **Revocation of Permit**

This permit is subject to be suspended or revoked in whole or in part during its term for cause in accordance with the BVU Rules.

G. **Transfer of Permit**

This permit shall not be reassigned or transferred or sold to a different premise, or a new or changed operation without the approval of the President and provision of a copy of the existing permit to the new owner or operator.

H. **Charges and Fees**

The Permittee may be assessed charges and fees as established by the BVU to cover the costs of wastewater service. These may include: fees for application for discharge; tapping fees; sewer use charges; surcharge fees; permit fees; fees for industrial discharge monitoring; and other fees as the BVU may deem necessary to carry out the requirements of the BVU Rules.

I. **Penalties**

The Permittee, if found to have violated an Order of the President or to have willfully or negligently failed to comply with any provision of this Permit or of the BVU Rules, shall be subject to enforcement in a accordance with BVU's Enforcement Response Plan. Permittee may be subject to a civil penalty of not less than One Hundred Dollars ($100.00) nor more than Ten Thousand Dollars ($10,000.00) for each offense. Each day on which a violation shall occur or continue shall be deemed a separate and distinct offense. Criminal charges may also apply.

J. **Enforcement Inspections**

The Permittee shall allow representatives of the President to inspect the permitted facilities for compliance with the conditions of this permit on a regular semiannual basis and more frequently if required due to non-compliance.

K. **Reporting Requirements**

All samples collected and analyzed in accordance to this permit and 40 CFR 136, including all monitoring results, shall be included in the Monthly Monitoring Report, as well as production and flow data**. Monthly monitoring reports shall be submitted to the Industrial Monitoring Program Manager at:**

Industrial Monitoring Program Manager
578 Beaver Creek Road
Bluff City, Tennessee 37618-1220

Monitoring reports must be signed in ink and dated by a responsible corporate officer and must contain the following Certification Statement:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

L. **Definitions**

Monthly Average is defined as the summation of all the measured samples divided by the number of measured samples during the calendar month when the measurements were made.

Maximum Daily is defined as the concentration in units of mass per volume (e.g. milligrams per liter) or mass (e.g. pounds per day) of the discharge during any calendar day. When a flow proportional composite or time composite sampling device is used, the maximum daily concentration is the concentration of that 24 hour composite. When other sampling means are used (e.g. grab samples), the maximum daily concentration is the arithmetic mean of the concentrations of equal volume samples collected during any calendar day or sampling period.

Maximum Instantaneous is defined as a limitation on the concentration, in milligrams per liter (with the exception of pH which is measured in Standard Units), of any pollutant contained in the wastewater discharge determined from a grab sample taken from the discharge at any point in time.

Calendar Day is defined as the 24 hour period from midnight to midnight or any other 24 hour period that reasonably approximates the midnight to midnight time period.

SPECIAL CONDITIONS

The following conditions and referenced addenda form a part of this permit:

1. **Description of Wastewater**

   300,000 gallons per day or 6,000,000 gallons per month of leachate from sanitary and balefill facility. Maximum flow rate shall not exceed 600 gallons per minute.

2. **Effluent Discharge Limitations**

   a. The General Discharge Prohibitions and the Restrictions on Wastewater Strength found in Sections 6.1. and 6.2., respectively, of the BVU Rules are applicable to this permit.

   b. In addition, specific discharge limitations may be applicable to this permit. If applicable, see Addendum I.

3. **Discharge Monitoring and Reporting Schedule**

   Discharge monitoring and reporting by the Permittee may be required. If required, see Addendum II.

4. **Compliance Schedule**

   The Permittee may be required to meet a compliance schedule. If required, see Addendum III.

PERMIT SPECIFIC DISCHARGE LIMITATIONS

ADDENDUM I

Parameter	Average Daily Limit	Maximum Daily Limit	Maximum Instantaneous Limit	Limit* Type	Monitoring** Requirements
Arsenic	0.08 ppd	….	0.50 mg/l	LOC	E
Cadmium	0.04 ppd	….	0.13 mg/l	LOC	E
Chromium	0.09 ppd	….	….	LOC	E
Copper	….	….	….	….	SV
Cyanide	0.04 ppd	….	….	LOC	E
Lead	0.188 ppd	….	….	LOC	E
Mercury	0.0005 ppd	….	0.0030 mg/l	LOC	E
Nickel	….	….	….	….	SV
Selenium	0.04 ppd	….	1.00 mg/l	LOC	E
Silver	0.025 ppd	….	….	LOC	E
Total Phenols	0.6255 ppd	….	….	LOC	E
Zinc	….	….	….	….	SV
Chloroform	….	….	0.42 mg/l	LOC	E
1,4 Dichloro-benzene	….	….	3.54 mg/l	LOC	E
Heptachlor	….	….	0.003 mg/l	LOC	E
Hexachloro-1-3 Butadiene	….	….	0.0002 mg/l	LOC	E

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* Limit Type: LOC = Local; Cat = National Categorical Pretreatment Limitation; Spec = Special (see footnote)

** Monitoring Requirements: E = Enforcement; SV = Surveillance; SC = Surcharge; ppd = pounds per day

Permittee shall notify the IMP Manager within 24 hours of becoming aware of a violation and repeat the sampling and analysis of the violated parameter and submit the results within 30 days.

PERMIT SPECIFIC DISCHARGE LIMITATIONS

ADDENDUM I

Parameter	Average Daily Limit	Maximum Daily Limit	Maximum Instantaneous Limit	Limit* Type	Monitoring** Requirements
pH	….	….	No Lower Than 5.0	LOC	E
pH	….	….	No Higher Than 10.0	LOC	E
Benzene	….	….	0.07 mg/l	LOC	E
Carbon Tetrachloride	….	….	0.013 mg/l	LOC	E
1,2 Dichloroethane	….	….	0.5 mg/l	LOC	E
1,1 Dichloroethane	….	….	4.58 mg/l	LOC	E
Methyl Ethyl Ketone	….	….	200 mg/l	LOC	E
Trichloro-ethylene	….	….	0.71 mg/l	LOC	E
Barium	….	….	1.00 mg/l	LOC	E
Chlordane	….	….	0.03 mg/l	LOC	E
Endrin	….	….	0.02 mg/l	LOC	E
Methylene Chloride	….	….	2.07 mg/l	LOC	E
Lindane	….	….	0.4 mg/l	LOC	E
Methoxychlor	….	….	10.0 mg/l	LOC	E
Toxaphene	….	….	0.5 mg/l	LOC	E
2,4-D	….	….	10.0 mg/l	LOC	E

* Limit Type: LOC = Local; Cat = National Categorical Pretreatment Limitation; Spec = Special (see footnote)

** Monitoring Requirements: E = Enforcement; SV = Surveillance; SC = Surcharge; ppd = pounds per day

Permittee shall notify the IMP Manager within 24 hours of becoming aware of a violation and repeat the sampling and analysis of the violated parameter and submit the results within 30 days.

PERMIT SPECIFIC DISCHARGE LIMITATIONS

ADDENDUM I

Parameter	Average Daily Limit	Maximum Daily Limit	Maximum Instantaneous Limit	Limit* Type	Monitoring** Requirements
Ethylbenzene	0.30 ppd	….	….	LOC	E
Xylene	….	….	….	….	SV
Acetone	….	….	….	….	SV
Dichlorodi-fluoromethane	….	….	0.04 mg/l	LOC	E
Cis 1, 2-Dichloroethene	….	….	….	….	SV
1, 1, 1, Tri-chloroethane	….	….	1.55 mg/l	LOC	E
Methyl Isobutyl Ketone	….	….	….	….	SV
Chloromethane	….	….	0.007 mg/l	LOC	E
Chloroethane	….	….	0.42 mg/l	LOC	E
Silvex	….	….	1.0 mg/l	LOC	E
Chlorobenzene	….	….	2.35 mg/l	LOC	E
Tetrachloro-ethylene	….	….	0.53 mg/l	LOC	E
Toluene	….	….	1.35 mg/l	LOC	E
Vinyl Chloride	….	….	0.015 mg/l	LOC	E

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* Limit Type: LOC = Local; Cat = National Categorical Pretreatment Limitation; Spec = Special (see footnote)

** Monitoring Requirements: E = Enforcement; SV = Surveillance; SC = Surcharge; ppd = pounds per day.

Permittee shall notify the IMP Manager within 24 hours of becoming aware of a violation and repeat the sampling and analysis of the violated parameter and submit the results within 30 days.

MONITORING SCHEDULE

ADDENDUM II

Parameter	Type of Sample	Self Monitoring Frequency	BVU Monitoring Frequency
pH	Grab	Monthly	Semiannual
Total Phenols	Grab	Monthly	Semiannual
Cyanide	Grab	Monthly	Semiannual
Cadmium	Grab	Monthly	Semiannual
Total Chromium	Grab	Monthly	Semiannual
Lead	Grab	Monthly	Semiannual
Silver	Grab	Monthly	Semiannual
Barium	Grab	Monthly	Semiannual
Mercury	Grab	Monthly	Semiannual
Arsenic	Grab	Monthly	Semiannual
Selenium	Grab	Monthly	Semiannual
Copper	Grab	Monthly	Semiannual
Nickel	Grab	Monthly	Semiannual
Zinc	Grab	Monthly	Semiannual
Chloroform	Grab	Monthly	Semiannual
1,4-Dichlorobenzene	Grab	Monthly	Semiannual
1,2-Dichloroethane	Grab	Monthly	Semiannual
1,1-Dichloroethane	Grab	Monthly	Semiannual
Methyl Ethyl Ketone	Grab	Monthly	Semiannual
Tetrachloroethylene	Grab	Monthly	Semiannual

MONITORING SCHEDULE

ADDENDUM II

Parameter	Type of Sample	Self Monitoring Frequency	BVU Monitoring Frequency
Chlorobenzene	Grab	Monthly	Bi-weekly
Vinyl Chloride	Grab	Monthly	Semiannual
Ethylbenzene	Grab	Monthly	Bi-weekly
Xylene	Grab	Monthly	Semiannual
Acetone	Grab	Monthly	Semiannual
Benzene	Grab	Monthly	Bi-weekly
Carbon Tetrachloride	Grab	Monthly	Semiannual
Dichlorodifluoro-methane	Grab	Monthly	Semiannual
Methylene Chloride	Grab	Monthly	Semiannual
Hexachloro-1-3-Butadiene	Grab	Monthly	Semiannual
Cis 1,2-Dichloroethene	Grab	Monthly	Semiannual
1,1,1-Trichloroethane	Grab	Monthly	Semiannual
Toluene	Grab	Monthly	Bi-weekly
Methyl Isobutyl Ketone	Grab	Monthly	Semiannual
Chloromethane	Grab	Monthly	Semiannual
Chloroethane	Grab	Monthly	Semiannual
Trichloroethylene	Grab	Monthly	Semiannual
* Herbicides	Grab	Monthly	Annual
* Pesticides	Grab	Monthly	Annual
Flow	….	Monthly	Daily

* Chlordane, Endrine, Heptachlor, Heptechlor Exoxide, Lindane, Methoxychlor, Toxaphene, 2-4-D and Silvex

Samples are to be collected from the following location:

1. **Samples are to be collected from the access manhole above the junction of the two monitoring well discharge outlets.**

***** 24-hour composite samples must be obtained through flow-proportional composite sampling techniques. Where flow-proportional composite sampling is not feasible, time-proportional composite sampling or grab sampling may be performed only if authorized by the President (or his/her designated official). Where time-proportional composite sampling or grab sampling is authorized the samples must be representative of the Discharge.

** Daily flows are to be recorded by a continuous (defined as uninterrupted or unbroken) effluent flow metering device. This metering device will receive certification of calibration at frequencies required by the meter specifications or as otherwise warranted. This calibration record will be maintained by the industry. Individual daily, monthly average and monthly high flow readings in gallons for each calendar month shall be submitted at the self monitoring frequency stated in the above Table Addendum II.

Monthly self-monitoring reports including all monitoring results shall be submitted to the BVU Authority by the 15th day of the following month. Semiannual summary reports of self-monitoring and compliance (see 40 CFR, 403.12) shall be submitted by February 1st for the period ending the previous December 31st and by August 1st for the period ending the previous June 30th. Failure to comply with these reporting requirements may be considered a violation of this permit.

COMPLIANCE SCHEDULE

ADDENDUM III

⇒ **When required, Permittee shall install flow measuring and sampling devices to the specifications provided by BVU and shall install them to allow sole access to be released to BVU for security purposes during BVU enforcement monitoring periods.**

Note: If required, subsequent pages of this compliance schedule shall be indexed and numbered consecutively following this page of the permit.

Appendix C

Emergency/Contingency Plan

EMERGENCY CONTINGENCY PLAN
BRISTOL QUARRY LANDFILL
BRISTOL, VIRGINIA

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this Emergency Contingency Plan ("Plan") is to minimize the hazards to human health and the environment from fires, explosions, or any unplanned releases of wastes or waste constituents. The Plan shall be carried out immediately whenever there is an explosion, fire, or release of wastes or their constituents, which could threaten human health or the environment. It is vitally important that the facility personnel comply with this Plan and its procedures in response to any emergency situation.

1.2 AMENDING THE CONTINGENCY PLAN

The Plan must be reviewed annually and otherwise revised when necessary for the reasons noted below:

- Applicable regulations are revised;
- The facility permit is amended;
- The Plan fails in the event of an emergency;
- Change in the facility design, construction, operation, maintenance, or other circumstances that materially increase the potential for fire, explosion and release of hazardous waste, or change the response deemed necessary in the event of an emergency;
- The list of emergency, safety, technical or security coordinators is changed;
- The list of emergency equipment is changed; and/ or
- Any changes in pertinent telephone numbers occur.

1.3 DISTRIBUTION OF THE CONTINGENCY PLAN

A copy of the Plan will be maintained in the offices of the Emergency Response Coordinator, his/her alternates, members of the Bristol Emergency Response Team, and the general office file to be maintained at the Department of Public Works Landfill Office.

2.0 EMERGENCY RESPONSE PROCEDURES

2.1 IMPLEMENTATION

The Plan must be implemented whenever there is an imminent or actual emergency situation such as a fire, explosion, spillage or discharge of a waste material which could be deemed a threat to personnel inside and outside the facility or to the environment.

2.2 EMERGENCY RESPONSE COORDINATOR

The Emergency Response Coordinator is the person responsible for coordinating all emergency response procedures as outlined in this Plan. He or she must be either on the facility premises at all times or on call, i.e., be available to respond to an emergency within a short period of time.

The Emergency Response Coordinator shall be thoroughly familiar with all aspects of the Plan, all operations and activities at the facility, the characteristics and location of waste handled, the location of all records within the facility, and the facility layout. In addition, the Emergency Response Coordinator has the authority to commit all resources that are necessary to carry out and implement the Plan.

	Name	Address	Office Phone	Mobile Phone
Coordinator	Jake Chandler	2515 Valley Drive Bristol, VA 24201	276-645-7360	276-642-2316
Alternate	Mike Martin	2515 Valley Drive Bristol, VA 24201	276-645-7380	

2.3 CHAIN OF COMMAND

The chain of command for responsibility and supervision of the Plan is as follows:

- Individual Employees: All emergency incidents shall be reported immediately to the employee's Foreman or Area Supervisor,
- Foreman/Area Supervisor: If the incident cannot be immediately and completely contained, it shall be reported immediately to the Emergency Response Coordinator. If immediate medical help is required, the Foreman or Area Supervisor shall initiate the call to The Virginia State Police Med Flight II - Emergency Response, Their telephone number is provided in Table 1.
- Emergency Response Coordinator: Upon notification to the Emergency Response Coordinator, the Emergency Response Coordinator shall report the incident to the Emergency Response Team, management, and the appropriate government agencies.

Table 1. Response Agencies

Bristol Police Department/Hazmat (emergency) (non-emergency)	911 276-645-7400
Bristol Fire Department (emergency) (non-emergency)	911 276-645-7306
EPA Hotline (8:30 a.m. - 7:30 p.m.)	1-800-535-0202
National Response Center	1-800-424-8802
Department of Environmental Quality Southwest Regional Office	540-676-4800
Department of Natural Resources, Secretary	804-786-0044
Chemical Transportation Emergency Center (CHEMTREC)	1-800-262-8200
Poison Control Center	1-800-222-1222
Bristol Regional Medical Center (main no.)	423-844-1121
Virginia State Police Med Flight II Emergency Response	1-800-433-1028
Hazardous Materials Officer, Region Four Virginia Department of Emergency Management (VDEM)	276-708-6017

2.4 GENERAL EMERGENCY PROCEDURES

In response to an emergency, the Emergency Response Coordinator must immediately:

1. Assess the emergency situation, activate facility communication systems and notify all facility personnel to take immediate action,
2. Notify the appropriate emergency response agencies if their help is needed,
3. Identify the character, exact source, and extent of any release of hazardous materials resulting from a spill, discharge, fire or an explosion,
4. Assess the possible hazards to human health and the surrounding environment caused by the emergency resulting from a spill, discharge, fire or an explosion,
5. Notify the appropriate local authorities, if it is determined that the incident could threaten or has threatened human health or the environment beyond the facility boundaries; and provide the exact location if evacuation is advised. Furthermore, notify the National Response Center immediately at (800) 424-8802 and other appropriate Response Agencies (Table 1) and report the following information:

a) Name and telephone number of the person reporting the incident,

b) Name and location of the facility,

c) Date, time and exact location of the incident,

d) A brief description of the incident, nature of materials involved, extent of any injuries, and possible hazards to human health and the surrounding environment within and beyond the facility boundaries,

e) Estimated quantity of materials spilled or released.

Take all necessary steps to ensure that the fire, explosion, or release does not spread to other wastes or petroleum products at the facility or outlying areas. This may include the orderly shutdown of all operations, if necessary, and the following steps:

1. Order the removal of any storage of materials which have not been affected by the incident, but may still have the potential to be affected by the incident, if not removed.
2. Order, the check of valves, pipes, and other equipment which could leak, or have pressure build up that may cause a reoccurrence, should operations be discontinued during the incident,
3. Ensure that the affected area of the facility will be cordoned off and shall remain so until it is determined that the cleanup is complete and the area safe.
4. Verbally relay an "all clear" message to employees to enable the resumption of activities in all affected areas of the facility.
5. Supervise the cleanup activities, ensuring that all hazardous wastes, petroleum products and/ or contaminated materials are collected, stored and disposed of properly. Wastes that are incompatible with the released material should be stored away from the area affected by the release. Equipment in affected areas shall be cleaned before operations are resumed in that area.
6. Order that disposable equipment used for the emergency response be treated as a hazardous waste and be disposed of accordingly, and oversee the cleanup of non-disposable equipment based on acceptable procedures and retested to assure safe operation before being placed back into the proper location.
7. Notify the appropriate Federal, State and local authorities with a written report within 15 days of the incident. The written report shall include the following:
    a) Name, address and telephone number of the facility.
    b) Date, time and type of incident (explosion, fire, release, etc.).
    c) Name and quantity of materials involved.
    d) The extent of injuries or damage, if any.
    e) An assessment of actual or potential hazards to human health or the environment.
    f) Estimated quantity and disposition of recovered material resulting from the incident. Hazardous Waste Material Manifest forms that indicate the final disposal of hazardous waste material will be attached to the written report.

2.5 RESPONSIBILITIES OF THE EMERGENCY RESPONSE TEAM

In the event of an emergency involving fire, explosion, spill or release of hazardous wastes or materials, the Emergency Response Team will respond as directed by the Emergency Response Coordinator, and shall respond to the emergency quickly and efficiently. The members of the Emergency Response Team are: (1) Emergency Response Coordinator and alternates, (2) Media Contact, (3) Maintenance, and (4) Emergency Responders.

Each member of the Emergency Response Team shall be thoroughly familiar with all aspects of the Plan, all activities and operations at the facility, the characteristics and location of all wastes handled at the facility, and the layout. The Emergency Response Coordinator shall have the responsibility for coordinating all emergency response measures, including directing the Emergency Response Team to respond to all emergencies. In addition, the Emergency Response Coordinator shall have the authority to commit all resources that are necessary to fulfill the Plan, and to respond to any emergency situation.

The duties of the Response Team members are as follows:

- Emergency Response Coordinator and Alternates - In-charge of overall emergency response management and coordination.
- Maintenance - Responsible for securing utility systems, and providing for protection equipment.
- Emergency Responders - Responsible for being the first to react by trying to stop or contain the release from beyond the work area, if this can be done so safely. They shall be responsible for responding to a small fire in its incipient stage at the facility.
- Media Contact - Act as the central clearinghouse for information and be directly responsible for responding to inquiries from the press and the general public.

With respect to explosion-generated fires, the Emergency Response Team shall follow the procedures set forth in this section regarding the activation of firefighting equipment and systems.

2.6 EMERGENCY RESPONSE PROCEDURES IN CASE OF SPILLAGE OR DISCHARGE OF HAZARDOUS WASTES PETROLEUM PRODUCTS OR OTHER HAZARDOUS MATERIALS

If a spill or release of wastes, petroleum products or materials occurs, all personnel in the affected area shall be evacuated. The Emergency Response Team shall be notified.

The Emergency Response Team shall respond to the emergency by acquiring the absorbent bags and containment equipment from the Fire Department. Maintenance personnel can also acquire absorbent material from the storage room in the baling facility. The Emergency Response Coordinator shall ensure that all members of the Emergency Response Team are properly equipped. If a situation arises when respiratory protection is needed, the Emergency Response Team will cease work.

The Emergency Response Coordinator shall identify the materials involved, and immediately assess the hazards of coming into contact with or handling the materials. Action shall be taken immediately to ensure that the materials do not come into contact with incompatible or reactive materials.

The Emergency Response Coordinator shall inform members of the Emergency Response Team of the nature of materials involved, and the hazards associated with handling the materials, including ensuring that proper protective equipment is being utilized.

Action shall be taken immediately to contain the materials involved, and to prevent further spread of the material, if this can be done so safely. The material shall be collected to ensure that the materials do not migrate to subsurface areas. The materials should be drummed, sealed, and affixed with proper labels and markings. If containment and collection cannot be performed safely with the available protective equipment, the Emergency Response Coordinator shall first contact the Haz Mat Response Team-Virginia, for assistance in handling the spill or discharge. The Emergency Response Coordinator will give the facility's address and telephone number, the identity of the spilled material and a brief description of the spill (i.e., quantity, location, and hazards associated with the material). Under no circumstance will facility personnel be permitted to handle materials in an unsafe manner without the proper training and equipment.

The Emergency Response Coordinator shall contact a properly licensed and permitted waste hauler and make arrangements to have the materials analyzed and removed off-site for proper disposal.

2.7 EMERGENCY PROCEDURES FOR EMISSIONS OF HAZARDOUS GASES

If an emergency event occurs which results in a release of a hazardous gas, all personnel in the affected area shall be evacuated immediately to areas upwind of any possible releases. The Emergency Response Coordinator shall activate the Voice Broadcast System or other equivalent mass communication method to alert site personnel of the affected area.

The Emergency Response Coordinator shall make an evaluation regarding whether the hazard posed by the emission of hazardous materials requires a facility-wide or an area-wide evacuation. This may involve contacting appropriate local government response units in Table 1. If the Emergency Response Coordinator decides that an area-wide evacuation may be necessary, then the City Fire Department (see Table 1) shall be contacted immediately, who will help decide whether or not a HazMat team is necessary. Appropriate agencies and authorities shall be informed of the nature of the hazardous materials involved, and be provided with both an estimate of the amount emitted and all actions taken to respond and localize the emissions.

3.0 EMERGENCY EQUIPMENT

3.1 FIRE RESPONSE

Access roads, i.e. fire lanes shall be designed to allow access of firefighting equipment to all areas. Extinguishers will be on all vehicles and shall be marked on facility drawings.

- Access to all available firefighting equipment shall be maintained at all times.
- All firefighting equipment shall be conspicuously located.

- All firefighting equipment shall be periodically inspected and maintained in operating condition. Defective equipment shall be immediately replaced.
- A trained and equipped firefighting organization shall be provided to assure adequate protection to life. A list of the available firefighting equipment is given in Section 6. L6 of the Operations Manual.

3.2 PERSONAL PROTECTION EQUIPMENT

The following is a list of the personal protective equipment, which shall be available to the Emergency Response Team in the case of an emergency by the HazMat Response Team:

- Chemically-resistant safety glasses and goggles meeting the requirements specified in American National Standard Institute, 287.1-1968;
- Chemically-resistant rubber, knee-length boots;
- Chemically-resistant gloves; and
- Protective outer clothing (flame retardant).

3.3 SAFETY AND DECONTAMINATION STATIONS

Safety /Decontamination Stations consisting of a shower station and an eyewash station shall be available by the HazMat Response Team.

3.4 SPILL CONTROL EQUIPMENT

Spill Control Equipment shall be available and maintained in a state of readiness for instant use. The City of Bristol maintains a mobile Haz/Mat response unit with spill control capability at the Fire Department in downtown Bristol.

3.5 EMERGENCY MEDICAL SUPPLIES

Emergency medical equipment and First-Aid trained staff and supplies shall be provided. In locations where oxygen deficiency or gaseous conditions are possible, air shall be monitored and controls established to assure acceptable atmospheric conditions. When flammable gases are present, adequate ventilation shall be provided or sources of ignition shall be eliminated. Emergency rescue equipment shall be readily available where adverse atmospheric conditions may exist or develop.

3.6 COMMUNICATION

As described in the Operations Manual, landfill personnel will be equipped with two-way radios or cellular phones to allow emergency communication.

3.7 STANDBY EQUIPMENT FOR LIQUID AND GAS MANAGEMENT SYSTEMS

In preparation for an emergency, where liquids management systems fail, the following backup equipment will be readily and easily accessible and installed quickly:

- Power Supply (3 phase, 460 volt, 300 amps for (2) 800 gpm pumps);

- 800 gpm liquids pump (FlowWay Type lIJKH or equivalent);
- 200 gpm liquids pump (FlowWay Type lOXKL or equivalent);
- 18 gpm liquids pump such as [EPG TSP3-4 Sump Drainer] or equivalent;
- 1.5 gpm bladder pump such as [Geotech #0510, pneumatic] or equivalent;
- 1500 CFM blower (Lamson No. 515 or equivalent).

4.0 EVACUATION PLAN

4.1 EVACUATION OF FACILITY PERSONNEL

Every employee shall be made aware of the evacuation plan and shall be instructed in evacuation procedures. Designated evacuation areas shall be displayed at strategic locations throughout the facility.

Once evacuation has taken place, supervisors will take a headcount of persons at the congregating areas and report this information to the Emergency Response Coordinator or his/her designee. The Emergency Response Coordinator shall determine if all individuals have been accounted for and will report to the appropriate authorities.

The following procedure shall be adhered to for any emergency evacuation:

- Know the safe area to which you are to report to for a headcount in an emergency situation.
- After exiting the work area, proceed at once to the assigned safe area for headcount.

5.0 PERSONNEL TRAINING PROGRAM

5.1 IMPLEMENTATION OF TRAINING PROGRAM

Each employee shall be provided with safety information and given training per the Hazard Communication Standard 29CFR1926.59(h)(2)(i)-(iii),(i)(2). Periodic training shall be provided to reinforce safety procedures to see that procedures are understood and are being complied with. Regularly scheduled safety meetings shall also include inspection of all safety equipment.

5.1.1 Hazardous Materials Training Program

An additional formalized training program shall be provided for employees directly responsible for responding to emergencies. First responders at the operational level shall receive at least eight (8) hours of training. The training shall be sufficient to demonstrate competency in the following areas:

- An understanding of what hazardous substances are, and the risks associated with them in an incident.
- An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
- An ability to recognize the presence of hazardous substances in an emergency.
- An ability to identify the hazardous substances, if possible.

- An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control including shut down of operations in the event of fire, explosion, discharge or release of hazardous materials.
- An ability to realize the need for additional resources, and to make appropriate notifications to the communication center.
- An understanding of basic hazard and risk assessment techniques.
- A knowledge of selection and use of proper personal protective equipment.
- An understanding of basic hazardous materials terms.
- A knowledge of basic control, containment and/ or confinement operations within the capabilities of the resources and personal protective equipment available.
- An ability to implement basic decontamination procedures.
- An understanding of the relevant standard operating procedures and termination procedures.

The specific training requirements set forth above are to be repeated annually and certain items reiterated periodically to maintain continual awareness, familiarity and understanding.

5.2 DOCUMENTATION/RECORDKEEPING

5.2.1 Documentation - Hazardous Materials Training

Through safety meetings and on-the-job training all personnel shall meet the emergency training requirements. Documentation of all hazardous materials-related training shall be maintained on site. These records shall be kept for at least three years as required, and shall be maintained at least three years after the employee's termination of employment.

The record will be in a format containing the following information:

Name

Title

Qualifications

Duties

Training

6.0 COORDINATION AGREEMENT

6.1 ARRANGEMENTS WITH LOCAL AUTHORITIES

Arrangements have been made with the following local emergency response agencies to provide services in the event of an incident:

RESPONSE AGENCIES	TELEPHONE NUMBERS
Police Department - General traffic control and vehicle or helicopter escort to medical facilities Bristol Police	911 or 276-645-7400
Fire Department - Fire services Bristol Fire Department	911 or 276-645-7306
Rescue/Ambulance - Assist in coordinating emergency response actions Virginia State Police Med Flight II	1-800-433-1028
Hospital - Medical services Bristol Regional Medical Center Number 1 Medical Park Drive Bristol, TN 37620	423-844-1121

The City of Bristol Police Department and Fire Departments are activated by calling 9-1-1. The Police Department has the names and phone numbers of Department of Public Works' employees to be contacted, in order of priority, in the event of different categories of emergencies. Response time to the location of the proposed landfill should be less than 5 minutes, based on previous responses to the area.

Appendix D

ISWMF Inspection Checklist

WEEKLY INSPECTION CHECKLIST

Bristol Integrated Solid Waste Management Facility

Date of Inspection_____ Weather_____

Inspector's Name_____

Category	No.	Inspection to be Conducted		
Security	1	Is entrance gate and lock functioning properly	Yes	No
Control	2	Is fencing maintained	Yes	No
Devices	3	Is access controlled by wooded areas where no fence exists	Yes	No
Cover	22	Adequate equipment on site to cover wastes daily	Yes	No
Material	23	Daily cover applied	Yes	No
	24	Compacted daily soil cover thickness at least 6 inches	Yes	No
	25	Intermediate soil cover applied where necessary	Yes	No
	26	Compacted intermediate soil cover thickness at least 6 inches	Yes	No
	27	Final cover applied to closed areas	Yes	No
	28	Is vegetative cover established on closed areas	Yes	No
Aesthetics	35	Litter controlled (portable fences, etc., entire working face to have continuous fence)	Yes	No
	36	Litter removed from fences weekly	Yes	No
	37	Public Use Area cleaned of litter and debris	Yes	No
	38	Access roads cleaned of litter and debris	Yes	No
Leachate	57	Leachate Manholes checked	Yes	No
Erosion	42	Is there sign of erosion damage on the landfill cap (rills, cracks)	Yes	No
Damage	45	Are the spillways cleaned, functional, and undamaged	Yes	No
	46	Surface water control features functional (is run on collected and run-off diverted from site)	Yes	No
	47	Is ponding on water on top of waste	Yes	No
	48	Is there contact between wastes and water	Yes	No

Note: Erosion damage and Cover Materials to be inspected after every major storm event in addition to monthly inspections

Comments: (Include item number from checklist where applicable)

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MONTHLY INSPECTION CHECKLIST

Bristol Integrated Solid Waste Management Facility

Date of Inspection_____ Weather_____

Inspector's Name_____

Category	No.	Inspection to be Conducted		
Site Accessibility	4	Site accessible to vehicles by all-weather roads leading from public system	Yes	No
	5	Scale attendant at landfill entrance	Yes	No
	6	Is traffic pattern safe for landfill users	Yes	No
Records	72	Are records maintained of incoming waste volumes/tonnages	Yes	No
	72	Records of inspections backed up electronically	Yes	No
	75	Are records maintained of waste inspections	Yes	No
	73	Records of rejected loads and actions taken	Yes	No
Leachate	57	Leachate pumps functioning		
	59	Forcemain pipes intact	Yes	No
	60	Is the leachate holding facility near capacity	Yes	No
	61	Is there evidence of leachate discharge at the holding facility	Yes	No
	62	Liquid level sensors, cables, alarms checked	Yes	No
	63	Monthly LFG monitoring completed	Yes	No

Comments: (Include item number from checklist where applicable)

QUARTERLY INSPECTION CHECKLIST

Bristol Integrated Solid Waste Management Facility

Date of Inspection_____ Weather_____

Inspector's Name_____

Category	No.	Inspection to be Conducted		
Cover Material	29	Is vegetative cover established on exterior landfill slopes	Yes	No
	30	Do areas required seeding on the site	Yes	No
	31	Is there sign of settlement on the landfill	Yes	No
	32	Is there evidence of slope failures on the landfill cap	Yes	No
	33	Does the vegetation require mowing	Yes	No
	34	Does the vegetation appear healthy	Yes	No
Scales	88	Scale calibrated	Yes	No

Comments: (Include item number from checklist where applicable)

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ANNUAL INSPECTION CHECKLIST

Bristol Integrated Solid Waste Management Facility

Date of Inspection_____ Weather_____

Inspector's Name_____

Category	No.	Inspection to be Conducted		
Erosion and Sedimentation Controls	43	Are ditches and channels collecting silt	Yes	No
	44	Are the sedimentation basins at capacity	Yes	No
	45	Leachate piping surge cleaned	Yes	No
Benchmarks	85	Have the benchmarks been damaged or struck	Yes	No
	86	Is there sign of settlement around the benchmarks	Yes	No
	87	Are the benchmarks readily accessible	Yes	No
Cover Material *not in growing season	29	Is vegetative cover established on exterior landfill slopes	Yes	No
	30	Do areas required seeding on the site	Yes	No

Comments: (Include item number from checklist where applicable)

Monitoring, Maintenance and Repair Plan

Bristol Integrated Solid Waste Management Facility

Solid Waste Permit #588

2655 Valley Drive
Bristol, VA 24201

02218208.05 | December 30, 2022

SCS ENGINEERS

15521 Midlothian Turnpike, Suite 305
Midlothian, VA 23113
804-378-7440

Signature/Certification Sheet

We certify that we have prepared this Plan, that it has been prepared in accordance with industry standards and practices, and that the information contained herein is truthful and accurate to the best of our knowledge.

Name: Paul Mandeville, P.E., Senior Vice President/Project Director

Signature: _____

Date: December 30, 2022

Name: Charles Warren, PE, Project Manager

Signature: _____

Date: December 30, 2022

Virginia Professional Engineer's Certification:

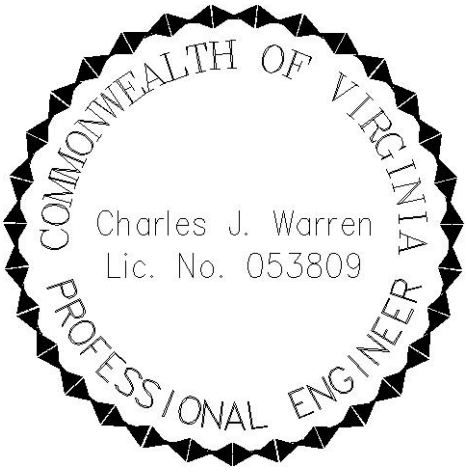

Table of Contents

Section Page

Figures

Appendices

1.0 INTRODUCTION

This Monitoring, Maintenance, and Repair Plan documents procedures to implement a long-term plan for monitoring, maintaining, and repair/upgrade for the landfill cover, leachate and gas collection system, sidewall odor mitigation system, and the stormwater management controls for the City of Bristol Integrated Solid Waste Management Facility Solid Waste Permit #588 Landfill. This plan was prepared in response to the Expert Panel Report (Virginia Tech, 2022) prepared by the Expert Panel convened by the Virginia Department of Environmental Quality (VDEQ). This document is intended to be a "living" document to be revised as construction is completed and new information becomes available.

Site Background

The City of Bristol Integrated Solid Waste Management Facility, which includes Solid Waste Permit Landfills #221, 498, and 588, is owned and operated by the City of Bristol. Solid Waste Permit #588 was issued by VDEQ on February 13, 1996.

The Permit #588 Landfill, which is constructed within a former limestone quarry, was permitted by the VDEQ in accordance with the Virginia Solid Waste Management Regulations. The Permit #588 landfill began accepting waste in March 1998 and has a total permitted volume of 7,800,000 cubic yards. The bottom liner for the Permit #588 Landfill consists of the following components, from top to bottom:

- An 18 inch thick leachate collection stone with a hydraulic conductivity of 1 x 10^{-2} cm/sec
- A primary composite liner consisting of a 60 mil thick high density polyethylene geomembrane underlain with a 3 foot thick recompacted clay liner with a hydraulic conductivity of 1 x 10^{-7} cm/sec
- A witness zone consisting of a 12 inch thick layer of sand with a hydraulic conductivity of 1 x 10^{-3} cm/sec
- A secondary liner consisting of a 2 foot thick recompacted clay liner with a hydraulic conductivity of 1 x 10^{-7} cm/sec underlain with a geotextile filter fabric
- A 12 inch thick crushed stone gradient control layer

Because the base of the quarry is below static groundwater levels, the gradient control layer controls the water level to a maximum elevation of 1,557 feet above mean sea level. The gradient control water discharges to the Bristol Virginia Utilities (BVU) Authority Sewer.

The quarry walls are lined with a 60-mil thick high-density polyethylene geomembrane with an interior geocomposite drainage net keyed into the leachate collection stone and a 16-ounce per square yard geotextile between the geomembrane and the quarry walls for protection.

The quarry landfill is about 5.6 acres at the base and approximately 27 acres at the rim; however, the Permit 588 Landfill is only about half full and well below the rim. The current depth of waste ranges between 250 feet and 275 feet. Leachate emanating from the leachate collection system drains to a sump where it is pumped to a 500,000-gallon on-site leachate storage tank.

The Permit 588 landfill has an active landfill gas collection, and a leachate extraction system as described in Sections 4 and 3 respectively.

Physical Setting

The City of Bristol Integrated Solid Waste Management Facility is located on Valley Road in the southeastern section of the City of Bristol. The location of the Facility is illustrated on a portion of the Bristol, Virginia, United States Geologic Society 7.5-minute topographic quadrangle map presented as **Figure 1**. The land surrounding the Facility is primarily wooded and residential. Residents in the area are served by public water supply.

The Facility encompasses approximately 138 acres. The limits of waste occupied by the Permit #588 Landfill encompasses approximately 20 acres. The base of the limestone quarry covers approximately 5.6 acres. The Permit #588 Landfill is bordered to the east by the Permit #498 Landfill and to the north by intermittent streams that drain into Sinking Creek.

Based on a review of the Bristol, Virginia USGS 7.5-minute topographic quadrangle map, several unnamed tributaries of Sinking Creek are intermittent streams located east of the adjacent Permit No. 498 landfill. Sinking Creek is the nearest permanent water body and is located east/southeast of the adjacent Permit No. 498 facility.

2.0 LANDFILL COVER SYSTEMS

The Virginia Solid Waste Management Regulations 9 VAC20-81-140(B)(1) requires a minimum of six inches of compacted soil cover over exposed waste, plus an intermediate cover of at least six inches of additional compacted soil whenever an additional lift of waste will not be placed within 30 days. The Permit 588 landfill will be covered with a temporary cover over the compacted soil covers consisting of the following from top to bottom:

- Geotextile wind screen (Wind Defender or approved equal) layer
- EVOH geomembrane overlying the daily and intermediate soil cover

The daily and intermediate soil cover has been placed and the required minimum 12 inches has been confirmed from test pits. The design of the interim EVOH cover system is underway.

The Solid Waste Permit #588 Landfill includes a final cover consisting of the following, from top to bottom:

- 6” vegetative support soil cover
- 18” protective soil cover
- Geocomposite drainage net (GDN) with 5 x 10^{-3} m^2/sec transmissivity
- 40 mil textured LLDPE geomembrane
- Geosynthetic clay layer (GCL)
- 12” of daily plus intermediate soil cover

Cross sections of the interim and final covers are provided in **Figure 2.**

Cover System Monitoring

The Virginia Solid Waste Management Regulations require that the integrity and effectiveness of landfill cover systems be maintained. The regulations specifically require repairs to cover systems to correct the effects of settlement, subsidence, and erosion. Furthermore, the regulations require that run-on and run-off from cover systems must not erode or otherwise damage cover systems. To

monitor the integrity of the Permit 588 landfill cover, the cover will be inspected as outlined in Table 1, which presents a summary of items to be inspected and the recommended frequency.

Table 1. Inspection Schedule

Inspection Category	Specific Items to Check	Types of Problems to Observe	Inspection Frequency
Interim EVOH Cover System	Integrity of wind screen	Worn or damaged wind screen	Quarterly
	Integrity of EVOH geomembrane	Geomembrane tears, punctures, seam separation; settlement	Quarterly
	Integrity of boot penetrations	Boot tears, separation, punctures	Quarterly
Final Cover System	Vegetation	Bare or dead areas and trees	Quarterly
	Integrity	Erosion, burrows, settlement	Quarterly
Stormwater	Stormwater pipes and channels	Erosion/scour, ponding, flow obstructions	Quarterly
	Sediment basins	Sediment level, flow obstructions	Quarterly
General site	NA	Litter, illegal dumping, tree growth on cap	Quarterly

The inspection personnel will walk the extent of the cover system, stormwater management features, and general site during the inspection process. At a minimum, the inspection personnel will follow a path sufficient to provide clear visual observation of the entire cover system and the stormwater management features too.

For the interim EVOH cover system, inspections will primarily include verifying the integrity of the wind screen so that damaged wind screen can be repaired or replaced. The wind screen will obstruct direct visual observation of the underlying EVOH geomembrane. Any apparent damage to the wind screen will also be inspected for possible damage to the underlying EVOH geomembrane.

A field inspection form is provided in Appendix A. Photographs will be taken during inspections to document the condition of the cover system and ancillary features, to document items in need of maintenance, repair, or upgrade, and for recordkeeping purposes.

Responsibility

The City intends to complete these inspections using City staff. The Environmental and Safety Compliance Officer or an Environmental Technician will perform these inspections. Inspection forms will be scanned and stored on the landfill computer server in a folder designated for storing environmental records. These inspections will begin once the interim EVOH cover has been installed.

Surface Emissions Monitoring

The facility will continue to perform surface emissions monitoring in accordance with the site-specific GCCS Design Plan, the facility's Title V Permit, the requirements of 40 CFR 63.1960(c) and (d), 40 CFR 60.36f(c) and (d), and 40 CFR 60, Appendix A, Method 21.

Sampling will be conducted with a Thermo Scientific TVA-2020 Flame Ionization Detector (FID) or equivalent instrument at 30-meter intervals throughout the entire waste footprint and where visual observations indicate the potential for elevated concentrations of LFG, such as distressed vegetation and surface cover cracks. In addition, in accordance with 40 CFR 63.1958(d)(ii)(2) and 40 CFR 60.34f(d), monitoring will be conducted at all surface cover penetrations within the waste footprint.

The results of the monitoring will be reviewed to identify pathways for methane emissions that may not be observed during visual inspections. Locations on both the serpentine route and at surface cover penetrations that have methane emissions (which indicate damage to the cover system) will be targeted for repair.

Responsibility

The City's designated Engineering Consultant will perform surface emissions monitoring and review monitoring results to identify locations at which repairs are needed. Monitoring will be scheduled in accordance with applicable regulatory requirements.

Cover System Maintenance, Repairs and Upgrades

Items in need of maintenance, repair, or upgrade will be addressed as described below.

Erosion Damaged Areas

Eroded areas of the final cover system will be backfilled, seeded and mulched or protected with erosion control matting to deter new erosion. Suitable backfill material, seed, and mulch or erosion control matting will be kept on site for repairs to damaged areas.

Correction of Settled or Subsided Areas

Settlement or subsidence of the final cover system will be corrected by backfilling and grading to promote positive surface drainage. Regraded areas will be seeded and mulched as described above for eroded areas.

For the interim EVOH cover system, areas with major settlement or subsidence causing low, non-draining areas will be corrected by first removing the wind screen within the settled area. The existing EVOH geomembrane will be cut out within the extent of the settled area, using appropriate methods to create a clean edge suitable for welding to the replacement EVOH geomembrane patch. The settled area will be backfilled to the original grade or slope using soil and compaction procedures specified in the original EVOH cover system specifications. If continued differential settlement is anticipated in the problem area, backfill soil may be mounded relative to its surroundings to maintain long-term positive drainage.

The replacement EVOH geomembrane patch will be fitted to the repair area and extrusion welded to the existing EVOH geomembrane and covered with replacement wind screen. All regrading and repair procedures will comply with the original EVOH cover system installation specifications.

Interim EVOH Cover System Repairs

A surplus of wind screen and EVOH geomembrane shall be kept on site so that damage to the EVOH cover system can quickly be repaired. Damaged wind screen will be removed and replaced, and if the underlying EVOH geomembrane is damaged too, it will be repaired with new a new extrusion

welded EVOH geomembrane patch. Damaged boot penetrations will be repaired as soon as practicable.

Qualified personnel will complete all repairs to the EVOH geomembrane in accordance with the EVOH geomembrane specification. This includes conducting trial weld testing as specified.

A field report will be prepared documenting the repair work in accordance with the EVOH geomembrane specification.

Run-on and Run-off Control Structures

Eroded channels and pipe entrance/exits will be returned to design conditions as soon as possible by adding soil fill material to the original grades or slopes to promote positive drainage as designed. Erosion issues will be investigated and the underlying causes evaluated and corrected to reduce future erosion problems.

Responsibility

The City's designated Operation and Maintenance contractor will be responsible for landfill cap maintenance, repairs and upgrades. For larger repairs, the City may elect to utilize a public bid to identify a contractor to do the work.

3.0 LEACHATE COLLECTION SYSTEMS

The Permit #588 landfill currently consists of 17 pneumatic leachate extraction pumps, the associated force main and air lines, and an air compressor that routes extracted leachate to an on-site sanitary sewer. Monitoring and maintenance of these pneumatic pumps and the associated leachate extraction system is essential to continuous removal of leachate. In addition to the leachate extraction system, the Permit #588 Landfill was designed and constructed with a bottom leachate collection system that drains to a leachate sump. The Permit 588 Leachate Management Plan addresses the leachate collection system and sump so it is not included in this Plan.

Leachate Collection System Monitoring

The City's GCCS Operations, Maintenance & Monitoring (OM&M) contract operator is required to perform LFG monitoring at all vertical extraction components at the landfill on a monthly basis. On a monthly basis (or more frequent), the stroke counter, which documents the amount of times the pump has stroked, will be recorded. The existing pumps currently discharge approximately 0.3 gallons per stroke. Calculations will be done monthly to estimate the amount of liquid removed at each well. If the well is moving less than 10 gallons per day, additional investigations at that pump will be performed as described in the next Section.

In addition to pump stroke counters, force main pressures will be recorded at select locations to verify there is no vapor lock, or other issues with the force main, which would prevent successful leachate extraction.

Responsibility

The City's designated Engineering Consultant will perform monitoring of leachate collection systems including stroke counters on behalf of the GCCS OM&M operator as outlined in this plan. Monitoring will begin prior to March 31, 2022.

Leachate Collection System Maintenance, Repairs and Upgrades

A variety of factors may contribute to low leachate extraction flow rates at each well. The GCCS operator will perform preliminary field investigations once a pump is identified to be stroking fewer than 10 gallons per day. Potential causes are listed below:

- no liquid in well
- no air supplied to the pump
- high force main pressures
- pump is fouled
- mechanical issue with pump

If the issue is likely related to a mechanical issue with the pump or fouling of the pump, the pump will be pulled for cleaning and repair. Due to the nature of the conditions of the pump operation, maintenance and repair of leachate extraction pumps is likely to be a frequent occurrence.

Repairs and maintenance to other components of the leachate extraction system will be made as necessary. This includes the air release valves, the air, and force main lines, and the pumps at the main collection tank on site.

Responsibility

The City's designated OM&M contractor will be responsible for leachate collection system maintenance, repairs and upgrades. For larger repairs and pump replacement, the City may elect to utilize a public bid to identify a contractor to do the work.

4.0 LANDFILL GAS SYSTEMS

The Bristol Integrated Solid Waste Management Facility is subject to Virginia Rule 4-43.1, which references the EG Subpart Cf, and the revised NESHAP Rule under Subpart AAAA both of which require the Facility to maintain and operate a Landfill Gas Collection and Control System (GCCS). The GCCS for the Permit 588 landfill is integrated with the GCCS at the adjacent Permit 221 and 498 landfills.

The landfill gas collection and control system (GCCS) at the ISWMF was been installed in phases by several contractors beginning in July 2000. The blower/flare station was installed in conjunction with the Landfill No. 221 initial LFG wellfield and collection system installation in July 2000. The gas moving equipment consists of one 50-hp Parnel 65A blower capable of delivering approximately 1200 scfm at 60 inches-water column vacuum, as rated by the manufacturer. The flare is a 25-foot tall, 8-inch diameter Parnel Biogas, Inc. open (utility-type) flare with a smaller diameter (4-inch) stack and tip (manufactured by Parnel Biogas, Inc.) to allow combustion of lower LFG flows. The flare is equipped with a thermocouple. The piping and valves at the blower/flare station enable LFG to be directed to an electric power generating facility owned and operated by Ingenco.

The Permit 588 LFG collection system currently consists of the components presented below in **Table 2.**

Table 2. Current Permit 588 LFG Collection System Components

Type of Component	Total No.	No(s).
Vertical Extraction Wells	38	EW-29-42, EW-46-68
Horizontal Collectors	2	HC-1-2
Leachate Cleanouts	19	South End LC-1-9 North End NC-1-10

Five new dual phase extraction wells are scheduled for design and construction no later than June 2023, and additional wells near the landfill sidewalls are to be designed and installed by March 2023.

Landfill Gas Systems Monitoring

In accordance with 40 CFR 63.1960 and 40 CFR 60.36f, the LFG collection and control system must operate such that pressure measured at individual wellheads is negative, and such that each interior wellhead temperature is less than 62.8°C (145°F), unless higher operating values (HOV) have been approved. Monitoring is recorded at the LFG extraction components on a monthly basis.

When neutral or positive pressure or temperatures greater than 145°F are recorded, the landfill initiates corrective actions within 5 days.

Beyond regulatory compliance, additional data analysis and review will be conducted on a monthly basis. Wellhead monitoring data at each individual well will be compared to a set of standard operating procedure (SOP) values to identify if additional action is required at each well. If an SOP Action Limit is exceeded, the well will be flagged for further review. Table 3 below provides several wellhead gas parameters, the standard operating procedure (SOP) action limit, regulatory requirement, and typical field actions that may be appropriate if the wellhead is outside of the typical operating range.

Table 3. Wellfield Monitoring Action Levels

Parameter	Standard Operating Procedure (SOP) Action Limit	Regulatory Requirement?	Potential Actions
Static Pressure (in-wc)	0	Yes	increase vacuum at well, investigate lateral piping at well, investigate system vacuum issues
Temperature (°F)	145	Yes	remove liquids, remove gas characterized as elevated temperature, balance well to verify no over pull at these wells
Oxygen (% by Volume)	5 %	No	reduce vacuum, remove liquids, inspect well casing

Methane (% by Volume)	56	No	increase vacuum, remove liquids
System Pressure (in-wc)	-10	No	investigate lateral and header piping. investigate piping network for low points, potential blockages
Flow (scfm)	5	No	remove liquids, inspect well casing, Increase vacuum

Landfill Gas Collection System Maintenance, Repairs and Upgrades

As outlined above, the City's GCCS OM&M operator will take a LFG measurement at each LFG component on a monthly basis. While performing this activity, the operator will perform an inspection for the following:

- verify that all hoses are properly connected
- look for audible or visual evidence of a leak
- inspect for damage to the wellhead or well casing
- verify that the well is straight and not leaning
- during the exposed EVOH geomembrane cover period, check the status of boot penetrations

If the operator notices a need for routine repairs to the well casing or wellhead, repairs will be made in an appropriate timeframe.

In addition to inspections of the well riser and well head, the GCCS operator will perform inspections on other components of the LFG system on a monthly basis. If data analysis identifies locations of low system pressure, the operator will investigate the system and look for potential causes such as blocked sumps, low points, pinched or damaged header lines, etc. If high oxygen is observed at individual wells, the operator will decrease vacuum and look for potential sources of oxygen intrusion into the well. This could potentially be caused by elevated liquid levels so maintenance of leachate extraction pumps may be required.

Wellfield sounding will be completed prior to GCCS expansions and modifications to identify wells that have been silted in and/or pinched and may not be performing as designed. If Surface Emission Monitoring (SEM) results indicate certain locations on the landfill have clustered and/or repeat elevated methane concentrations, it may indicate that that portion of the landfill needs additional gas collection components. If system vacuum is low in some portions of the landfill, following routine field maintenance, it may indicate that the gas header pipe to these select wellheads needs to be resized or upgraded. These inspections and monitoring activities will be evaluated during GCCS expansions and modifications.

Responsibility

The City's designated OM&M contractor will be responsible, for landfill gas collection system monitoring, maintenance, repairs and upgrades by March 31, 2023. For larger repairs and upgrades, the City may elect to utilize a public bid to identify a contractor to do the work.

5.0 SIDEWALL ODOR MITIGATION SYSTEM

The Facility is currently installing a pilot sidewall odor mitigation system, which collects LFG along the perimeter sidewall of the quarry landfill. The system was designed in response to observed sidewall gas emissions dating back to 2018. The sidewall odor mitigation system design includes two parallel buried horizontal collectors that circle the quarry perimeter, immediately adjacent to the sidewall. One collector is located on either side of the sidewall liner system. The collectors will connect to stub-up laterals equipped with wellheads at regular intervals for gas collection.

Sidewall Odor Mitigation System Monitoring

Once the sidewall odor mitigation system becomes functional, SCS plans to incorporate the wellheads into the landfill gas systems monitoring. The procedures described in Section 4 will be applied to the wellheads along the sidewall odor mitigation system horizontal collectors. The GCCS operator will inspect the items listed in Section 4 and check for any apparent visual signs of ongoing sidewall gas leakage.

The sidewall odor mitigation system will occur in two parts: a small pilot system followed by the remainder of the system. Landfill gas systems monitoring will begin for the pilot system once it becomes operational.

Sidewall Odor System Maintenance, Repairs and Upgrades

Basic visual inspection by the GCCS OM&M operator will be the starting point for routine repair work of the wellheads and above grade pipes. During the exposed EVOH geomembrane cover period, the geomembrane boot penetrations will also be examined during the monthly wellhead readings. Monitoring data from the sidewall odor system wellheads will guide vacuum adjustment and maintenance decisions.

Responsibility

The City's designated OM&M contractor will be responsible for sidewall odor mitigation system monitoring, maintenance, repairs and upgrades. For larger repairs and upgrades, the City may elect to utilize a public bid to identify a contractor to do the work.

6.0 STORMWATER MANAGEMENT SYSTEMS

The quarry landfill currently has no on-site stormwater management features. The design of a new stormwater management system is underway, and the existing landfill surface will be graded to direct runoff towards a proposed stormwater management pond in the southeast corner. Once the temporary EVOH geomembrane cover is installed, the pond will collect clean stormwater on top of the liner. A pumping system will be designed and installed to lift the stormwater out of the quarry and discharge it as uncontaminated stormwater to nearby drainage features.

Stormwater Management Systems Monitoring

Monitoring for the proposed stormwater management system will include assessing the physical condition of the stormwater conveyance features and sampling the stormwater for analysis. Per VDEQ's request, a separate SWM plan will address the stormwater discharged offsite, including monitoring protocols, monitoring parameters, discharge limits, and sampling frequencies.

Once installed, the physical condition of the stormwater conveyance features will be periodically inspected by field personnel. The inspection procedures and frequencies outlined in Section 2 for the cover system are also applicable to the stormwater management system monitoring. Visual inspection of the exposed geomembrane cover is planned so that damaged geomembrane can be repaired. Inspections will also monitor for potential settlement that may create low areas with undesired ponding. Field personnel conducting the inspections will photograph and take notes of any observed problem areas requiring repair. The Appendix A Inspection Form includes provisions for inspecting future cover system stormwater channels, culverts, and basins.

Responsibility

The City intends to complete stormwater management monitoring using City staff. The Environmental and Safety Compliance Officer or an Environmental Technician will perform these inspections. Inspection forms will be scanned and stored on the landfill computer server in a folder designated for storing environmental records. These inspections will begin once the interim EVOH cover has been installed.

Stormwater Management Systems Maintenance, Repairs and Upgrades

Repairs to the stormwater management systems will be completed as soon as practicable but issues that pose a risk of worsening with time will be completed immediately. The goal of any maintenance, repairs or upgrades will be to return the systems to their original constructed condition.

Responsibility

The City's designated OM&M contractor will be responsible for stormwater management systems maintenance, repairs and upgrades once the stormwater management system is installed. For larger repairs and upgrades, the City may elect to utilize a public bid to identify a contractor to do the work.

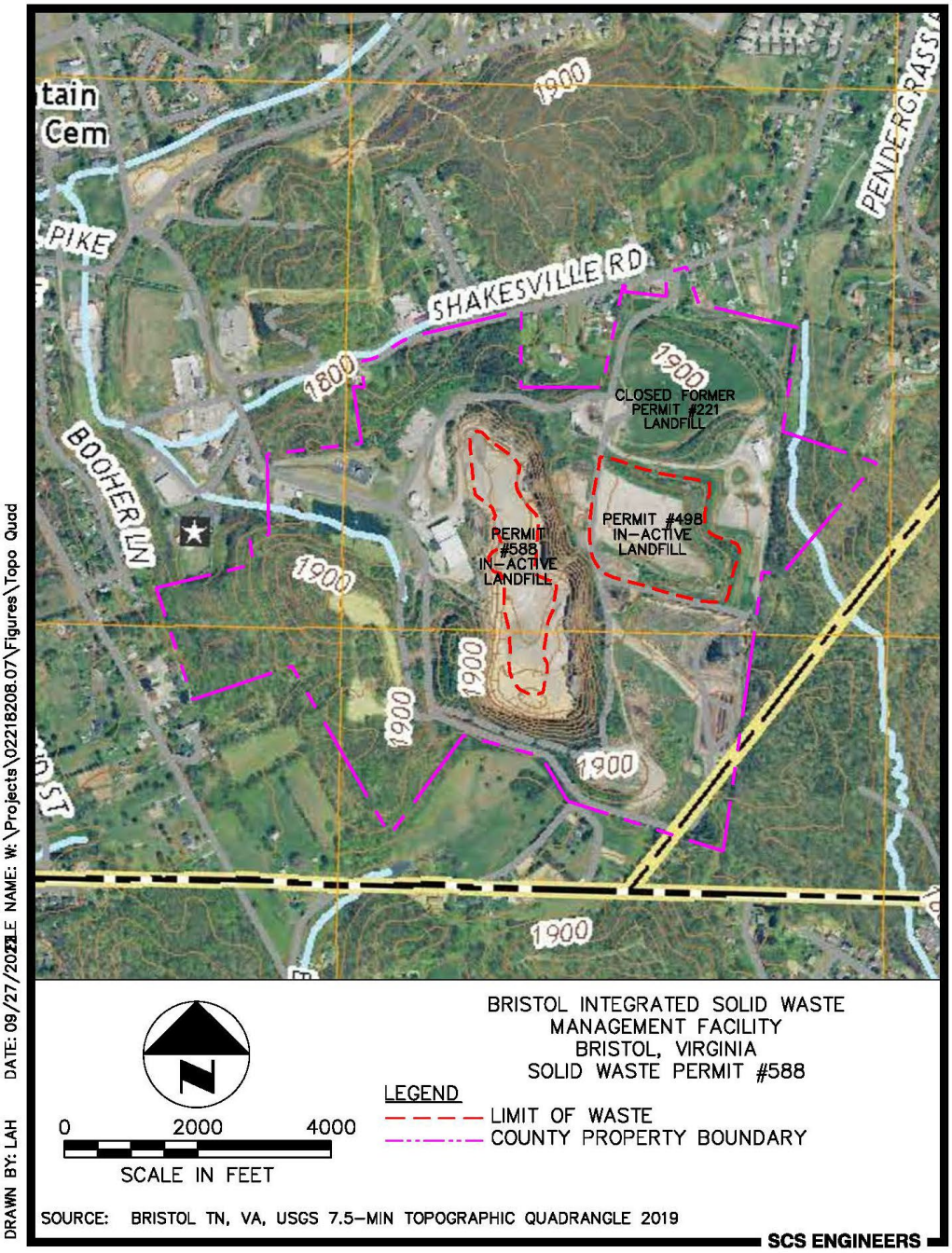

FIGURE 1 - TOPOGRAPHIC QUADRANGLE MAP

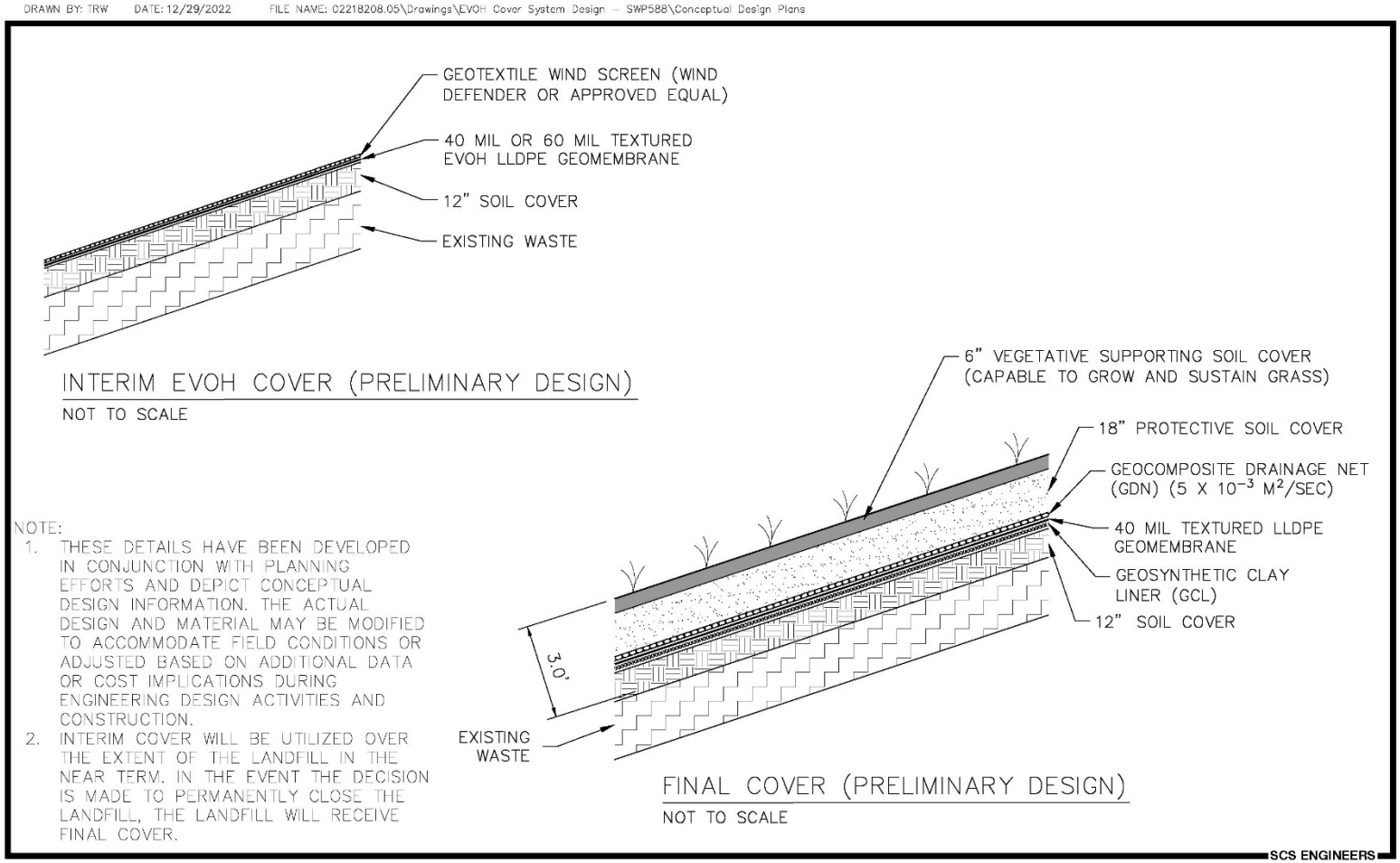

FIGURE 2 - INTERIM & FINAL COVER — PRELIMINARY DETAILS

Appendix A

Inspection Report

INSPECTION REPORT

Name of Inspector: _____ Date: _____

Weather: _____

INSPECTION ITEM	CRITERIA	SATISFACTORY/ UNSATISFACTORY	COMMENTS
Vegetation	Adequate to control soil loss, no or negligible bare areas		
Mowing	Height of grass does not impede inspection		
Woody Vegetation	No trees or shrubs on capped areas		
Final Cap Material	No or minimal erosion rills. Subsurface drainage material/geomembrane protected		
Temporary Geomembrane Cover (if applicable)	No apparent tears, rips, holes, or other damage;		
Boot penetrations	Verify in good shape		
Slope Stability	No slope failures		
Settlement	Positive drainage maintained on landfill		
Stormwater Channels	Adequate to carry flows and surface stable		
Culverts	Properly functioning		
Sediment Basins	Riser and embankment in working order, sediment level below clean-out level		

INSPECTION ITEM	CRITERIA	SATISFACTORY/ UNSATISFACTORY	COMMENTS
Dikes and Downchutes	No ponding, pipes unclogged, no erosion around dikes		
Leachate Seeps	No seeps on landfill or near toe of landfill		
Vectors	No burrowing animals or other animals detrimental to landfill cap observed		

Corrective Measures Required:

Additional Comments: