DEPARTMENT OF ECOLOGY
State of Washington

Response to Comments

Draft Cleanup Action Plan, Legal Documents, and State Environmental Policy Act Documents for the Pasco Landfill

Facility Site ID: 575
Cleanup Site ID: 1910

Public comment period held:

September 3 – October 3, 2019

Summary of a public comment period and responses to comments

October 2019

Publication and Contact Information

This document is available on the Washington State Department of Ecology's website at https://fortress.wa.gov/ecy/gsp/CleanupSiteDocuments.aspx?csid=1910.

Contacts

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Washington State Department of Ecology - www.ecology.wa.gov

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4.	Southwest Regional Office, Lacey	360-407-6300
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Accommodation Requests

To request Americans with Disabilities Act accommodation, or printed materials in a format for the visually impaired, contact the Ecology ADA Coordinator at 360-407-6831 or ecyadacoordinator@ecy.wa.gov, or visit https://ecology.wa.gov/accessibility. People with impaired hearing may call Washington Relay Service at 711. People with speech disability may call TTY at 877-833-6341.

Toxics Cleanup in Washington State

Accidental spills of dangerous materials and past business practices have contaminated land and water throughout the state. The Washington State Department of Ecology (Ecology) Toxics Cleanup Program works to remedy these situations, which range from cleaning up contamination from leaking underground storage tanks, to large, complex projects requiring engineered solutions.

Contaminated sites in Washington State are cleaned up under the Model Toxics Control Act (MTCA, Chapter 173-340 Washington Administrative Code), a citizen-mandated law passed in 1989. This law sets standards to ensure toxics cleanup protects human health and the environment and includes opportunities for public input.

Public Comment Period Summary

Ecology held a comment period from September 3 through October 3, 2019, for a the following draft documents for the Pasco Landfill site:

- Cleanup Action Plan[1] — explains the cleanup methods we are proposing for this site.
- Legal agreements requiring the parties responsible for cleanup to enact the cleanup plan, which include a scope of work and schedule[2] for completing it. If any parties responsible for cleanup don't sign the Consent Decree[3], we will issue them the Enforcement Order[4].
- State Environmental Policy Act (SEPA) documents — we have reviewed the proposed cleanup actions using the SEPA checklist[5], and decided they won't adversely affect people or the environment (Determination of Non-significance[6])

More information is available in the public notice[7] that was mailed to the surrounding community (información en Español incluida), *Frequently Asked Questions: Pasco Landfill Cleanup*[8] (en Español[9]), and Ecology's 9/3 news release[10].

Ecology appreciates the comments we received from one person and two organizations, which we address in the Response to Comments section that begins on page 2. After

[1] https://fortress.wa.gov/ecy/gsp/DocViewer.ashx?did=85847
[2] https://apps.ecology.wa.gov/gsp/DocViewer.ashx?did=85849
[3] https://apps.ecology.wa.gov/gsp/DocViewer.ashx?did=85971
[4] https://apps.ecology.wa.gov/gsp/DocViewer.ashx?did=85972
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[8] https://apps.ecology.wa.gov/gsp/DocViewer.ashx?did=86270
[9] https://apps.ecology.wa.gov/gsp/DocViewer.ashx?did=86996
[10] https://ecology.wa.gov/About-us/Get-to-know-us/News/2019/Pasco-cleanup

considering the comments, we have finalized the draft documents without further changes.

Pasco Landfill Background

The Pasco Landfill is about 1.5 miles northeast of the City of Pasco, north of the intersection of Kahlotus Road and U.S. Highway 12. The landfill property covers nearly 200 acres and is surrounded by agriculture and commercial businesses. The Basin Disposal transfer station on Dietrich Road is at the southern end of the landfill. The landfill no longer accepts waste and is closed to the public. Gates, fencing, and signs restrict access to this active cleanup site.

The landfill opened in 1958. Waste was burned in trenches until 1971, when the site became a sanitary landfill. From 1972 to 1975, the landfill accepted municipal and industrial waste. Some industrial waste was delivered in 55-gallon drums and disposed in zones A and B. The rest was delivered as bulk liquids or semi-solid sludges that were placed into large evaporation lagoons in zones C/D and E.

The landfill closed in 2001. The City of Pasco passed an ordinance in 2001 that defined a groundwater protection area around part of East Pasco that is over a plume of groundwater contaminated by the landfill. A restrictive covenant is in place that prohibits activities and land uses at the landfill that could expose people to contamination.

Index of Comments Received

Everyone who submitted comments is listed below in alphabetical order by their last name, followed by the date we received their comments and the page on which their comments are printed as received.

Response to Comments

Comment letters are printed verbatim followed by Ecology's responses.

Sean Davis, Franklin County Emergency Management

PUBLIC COMMENT FORM

Please write your name and contact information (mailing address and/or email address) below.

We will respond to your comments after the public comment period closes. Our responses are published online, and we will also send them to you using the contact information you provide.

Name: Sean DAVIS
Mailing address: 1011 E. AINSWORTH ST., PASCO WA 99301
Email: sdavis@co.franklin.wa.us

COMMENTS:

There are 4 schools + many businesses + homes very close to the Landfill SITE. BDI waste management is less than a 100 yds from SITE A.

My Questions ARE:

1.) ARE THERE PLANNED NOTIFICATIONS THAT WILL BE MADE TO THE PUBLIC, BUSINESSES, Schools & RESPONDERS on days when major barrel removals will take place? High Risk days

2) ARE THERE PARAMETERS FOR A NO OPERATIONS to take EFFECT - WIND BLOWING DUE SOUTH TO BDI, BUSINESSES, Schools + Homes?

3) WHAT WILL THE PRIMARY TRANSPORTATION Route(S) be to the ULTIMATE DISPOSAL SITE?
END
395 Through PASCO/Kennewick OR EAST ON 12/182 ?
preferably EAST ON 12/182 much safer, less population + traffic.....

→ WHAT ARE THE ACTION Levels for Stop work for worker + public safety.

3A.) Most WRECKS in the area are on the Blue Bridge. The bridge is engineered from much earlier Standards it is very narrow. Additionally that route will take Shipments through the more Populated areas in the cities of Kennewick + PASCO.

4.) There are 4 schools w/in A mile of the Site, I would like to see PASCO School District involved in the process.

Ecology's response:

1. The drum removal will be executed with safety as the top priority. As the work plan documents are developed, we will work with local responders on notification protocols for various situations.
2. Yes, there will be parameters for stop-work situations. However, these situations will be triggered by action levels at specific monitoring locations. The intent is to have engineering controls in place so wind conditions will not result in a "stop-work" situation. The engineering controls include the continuous operation of the soil-vapor extraction (SVE) system, a temporary structure over the active work area, and air monitoring inside and outside the structure. For example, if vapor concentrations increase inside the structure, the first step will be to modify the ongoing work inside the structure to decrease vapor concentrations long before an impact is measured outside the structure.
    a. The action levels that would trigger a stop-work situation are currently under development. However, the levels will be very conservative and will be collaboratively developed with local responders and the Benton-Franklin Health District.
3. As the work plan documents are developed and the final disposal locations are selected, we will work with local agencies and emergency responders on determining the most appropriate transportation route(s).
    a. We understand that travelling through urban areas, including over the Blue Bridge, is undesirable. Given the site location, we believe routes through urban areas and using the Blue Bridge will be unnecessary.
4. We want the Pasco School District's (PSD) input on this cleanup project and agree it's necessary. We have and will continue to reach out to them for their input. In addition, we will invite PSD to any planning meetings that are held with local entities. We expect future meetings to discuss public safety, transportation routes, and emergency response.

Rick Dawson, Benton Franklin Health District

From: Rick Dawson <Rickd@bfhd.wa.gov>
Sent: Wednesday, October 2, 2019 7:31 AM
To: Gruenenfelder, Charles (ECY) <CHGR461@ECY.WA.GOV>
Cc: sstory@psd1.org; sdavis@co.franklin.wa.us
Subject: Pasco Landfill NPL Site

Mr. Gruenenfelder,

I have completed a thorough review of the documents addressing the cleanup of the Pasco Landfill site. Based on this review the Benton-Franklin Health District (BFHD)

agrees that aggressive action must be taken to prevent further contamination of ground water and get the site stabilized. That being said multiple issues must be addressed in significant detail prior to BFHD accepting this action. Please review and address these issues as the project moves forward:

1. The site safety plan must be completed in significant detail to insure the safety of workers, neighboring businesses, first responders, nearby residents and the presence of 4 schools within 1.5 miles of the site. This plan should address:
    - Weather and wind conditions that would make operations cease to protect both workers and the public
    - Plans to safely evacuate workers in the event of an issue within the containment area
    - Notification system for schools, EMS, and the public to take protective action in the event of an accident
    - A detailed air monitoring plan including an action plan to respond to any fugitive emissions from the site
    - This plan should be reviewed and accepted by Franklin County Emergency Management, the Benton-Franklin Health District and the Pasco School District [PSD]
2. A detailed waste disposal plan including transportation route must be developed and accepted by the affected entities including at a minimum Franklin County and the City of Pasco.

While this action is necessary to protect human health and the environment from the discharges currently happening at the site it must be noted that this action poses significant risk to workers and the community should it not be planned and executed properly. It is imperative that the public, the Pasco School District, Franklin County Emergency Management, Franklin County, the City of Pasco and the Benton-Franklin Health District remain actively engaged with the process not only in review but throughout the cleanup process.

Thank you for the opportunity to review and comment on this cleanup action.

James R. (Rick) Dawson
Sr. Manager – Surveillance & Investigation

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Ecology's response: We acknowledge BFHD interest in performing an aggressive cleanup action at the Pasco Landfill to stabilize the site and prevent further groundwater contamination. We understand the proposed cleanup work could potentially impact human health and the environment, and planning special precautions will be necessary to execute the work safely. Ecology has worked closely with the potentially liable persons (PLPs) to develop a detailed scope of work that emphasizes detailed planning and proper execution of the work that will be performed. Ecology recognizes the significance of this large-scale cleanup action, and the importance of involving and integrating the input and expertise of the local community. This includes the public, PSD, Franklin County Emergency Management, Franklin County, City of Pasco, and BFHD.

Ecology will work with the PLPs to ensure the planning documents thoroughly address a broad spectrum of health and safety considerations associated with the proposed cleanup work. This includes, but is not limited to, the excavation and off-site disposal of drums and associated waste debris from Zone A. BFHD, Franklin County Emergency Management, and PSD will be provided an opportunity to review and comment on these health and safety and contingency planning documents prior to their execution.

In response to your numbered comments:

1. A suite of planning documents will be prepared to address various aspects of the proposed cleanup work. The Health and Safety Plan (HASP) will include a job hazard analysis and job safety analysis covering all major work activities. Potential exposure to chemical and physical hazards will be thoroughly evaluated, and operating procedures will be developed. In addition to the HASP, the PLPs also will develop a Contingency Plan laying out methods, procedures, protocols, and chain-of-command to be followed in the event of an accident, incident, or emergency condition. The Contingency Plan will include provisions for notifying the local community if an accident or emergency condition occurs. The planning documents will describe stop-work decisions and authority (for example, actions to be taken in the event of an anomalous meteorological condition). The PLPs also will develop a detailed air monitoring plan addressing air quality conditions:
    - Within the active work zone(s)
    - Within on-site support areas or locations where hazardous substances may be temporarily stored or staged on-site
    - Around the site perimeter.

    The planning documents will be updated and modified, as appropriate, to address changed conditions, lessons learned, and input from the local community.

2. Safe transport of wastes is an essential element of the proposed cleanup work. Ecology understands the PLPs are working closely with potential waste disposal facility representatives to evaluate all aspects of waste characterization, handling, off-site transport, and final disposal. An evaluation of potential transportation routes from the landfill site to the selected disposal facility(ies) will be conducted and described in the Zone A Removal Action Engineering Design Report. Specifically, the PLPs will prepare a detailed Waste Handling, Characterization, and Disposal Plan to support the proposed off-site disposal of site wastes. Local government entities such as Franklin County and the City of Pasco will have the opportunity to provide input on proposed transportation routes.

Tiffany Hedgpeth, Sandvik Special Metals, LLC

ELG EDGCOMB LAW GROUP LLP
ENVIRONMENTAL LAW

October 3, 2019

Via Electronic Mail

Charles Gruenenfelder
Project Manager
Washington Department of Ecology
4601 North Monroe Street
Spokane, WA 99205-1265
Charles.Gruenenfelder@ecy.wa.gov

Re: Pasco Landfill NPL Site (Facility Site ID 575; Cleanup Site ID 1910) – Sandvik Special Metals, LLC's Comments to Draft Enforcement Order

Dear Mr. Gruenenfelder:

This firm represents Sandvik Special Metals, LLC ("SSM") with regard to the Pasco Landfill NPL Site ("Site"). The Washington Department of Ecology ("Ecology") recently issued for public comment a draft Consent Decree, a draft Enforcement Order, and a draft Cleanup Action Plan for the Site. Accompanying or included within each of the draft documents is a list of Potentially Liable Parties ("PLPs") for the Site. Ecology states the listed PLPs are being asked to sign the Consent Decree, which requires implementation of the Cleanup Action Plan. If a PLP does not sign the Consent Decree, Ecology asserts it will issue the Enforcement Order to the PLP, requiring the PLP to implement the work described in the Cleanup Action Plan. This letter sets forth SSM's comments to the draft Consent Decree, the draft Enforcement Order, and the draft Cleanup Action Plan.

For the reasons set forth below, SSM should not be listed as a PLP and should not be the recipient of an Enforcement Order. Given the nature of SSM's waste sent to the Site, where it was deposited at the Site, and the work to be performed at the Site as described in the Cleanup Action Plan, SSM has no, or at most *de minimis*, liability for the remediation of Site conditions proposed in the draft Cleanup Action Plan.

I. The Constituents in the Waste SSM Sent to the Site Are Not Causing the Need for the Proposed Cleanup Activities.

During the period in which waste was accepted at the Site, SSM operated (and continues to operate) a tubing manufacturing facility in Kennewick, WA.[1] The primary manufacturing operation used a process called pilgering, where tubes were reduced in diameter by passing them

[1] SSM would be happy to meet with Ecology to further discuss its operations and provide documents and transcripts from witness depositions that support the facts discussed herein.

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between rollers. The process also involved tool grinding and finishing operations. These operations required coolants. The coolant used in the pilgering process was comprised of a Baker Gubbins animal fat emulsion that was added to water along with an antifoaming agent and molybdenum disulfide. This mixture was sprayed on rollers and other parts for the tube reduction process. After use, the coolant was recycled back into the coolant tank and reused until the animal fat became rancid. A non-hazardous synthetic coolant was used in the tool grinding operations. Waste from tool grinding was combined with the rancid animal fat coolant, forming a mixture that was comprised primarily of the animal fat emulsion waste coolant along with very small amounts of metal shavings. Former SSM, Resource Recovery Corp., and Basin Disposal Inc. employees and documents identify that the only material sent to the Site was this waste coolant mixture.

When Ecology first identified SSM as a PLP with respect to the Site in May 1991, SSM objected to the characterization due to the nature of its waste sent to the Site. However, because of the presence of very small amounts of metals in the waste, Ecology continued to list SSM as a PLP, claiming that the issue of ultimate liability must wait until completion of the Remedial Investigation.

Now, 28 years later, the Site has been thoroughly investigated and it is clear that the metals in SSM's waste are not driving any of the proposed cleanup activities at the Site, which instead appear to be driven by the presence of volatile organic compounds, semi-volatile organic compounds, and polyaromatic hydrocarbons.

II. The Areas Where SSM's Waste Was Deposited at the Site Are Not Subject to Proposed Cleanup Activities.

SSM's waste arrived at the Site in tanks and was deposited in the Land Spreading and Sludge Management Areas. According to a former Resource Recovery Corp. employee, the material was spread onto the ground, allowed to dry, and was then picked up, along with dirt, by a scraper. It was then used as cover material at the municipal solid waste landfill. Significantly, SSM never sent drummed waste to the Site and its material was not deposited in Zone A, which is driving the majority of the work identified in the Cleanup Action Plan. After investigation of the Land Spreading and Sludge Management Areas (an investigation in which SSM participated), no chemicals of potential concern were identified for those areas. The Focused Feasibility Study concludes that no further action is recommended for the Land Spreading and Sludge Management Areas. The draft Cleanup Action Plan concurs with this conclusion: "The original Sludge Management and Landspread Areas are not considered ongoing areas of concern requiring additional cleanup actions, and therefore are not further addressed in this CAP." Draft Cleanup Action Plan, p. 14.

Although SSM's waste eventually was deposited into the MSW Landfill for use as cover, the remaining closure activities for the MSW Landfill are consistent with those typically required for a municipal landfill. Specifically, a gas control system is being operated to control vapor phase contaminants and the landfill cover maintained. No proposed cleanup activities are being driven by the very small quantities of metals that were in the SSM waste coolant sent to the Site.

Charles Gruenenfelder
October 2, 2019
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* * * * *

In light of the above facts, it is not appropriate for Ecology either to list SSM as a PLP for the Site or to issue the Enforcement Order to SSM. SSM's waste is divisible from the materials that are driving cleanup, both in terms of its chemical make-up and in terms of its disposal location. Moreover, none of the cleanup work that Ecology is requiring to be performed in the draft Cleanup Action Plan is due to the presence of SSM's material.

Despite SSM's non-liability for Site conditions requiring remediation, SSM currently is participating in settlement negotiations with the Industrial Waste Area Group, the current and former owners and operators of the Site, and other alleged waste generators to the Site, to develop a final resolution for Site liability. If successful, the negotiation will result in various parties (not including SSM) agreeing to sign the Consent Decree and perform the Cleanup Action Plan. Having a sufficient number of parties sign the Cleanup Action Plan, Ecology should not thereafter pursue non-signatory settlors by issuing an enforcement order against them.

In the event SSM is unable to reach a settlement agreement with the other named PLPs, SSM will seek to enter into a *de minimis* consent decree with Ecology.

SSM appreciates Ecology's attention to its comments and welcomes any questions regarding why SSM should not be listed as a PLP or be a recipient of the Enforcement Order.

Very truly yours,

Tiffany R. Hedgpeth

Ecology's response:

1. Ecology's May 30, 1991 "Notice of Potential Liability for the Release of Hazardous Substances Under the Model Toxics Control Act" letter identifies Sandvik Special Metals (SSM) as a major generator responsible for 47 percent of the 34,000 gallons per month of liquid waste disposed at the Pasco Sanitary Landfill. Disposal receipts and other documentation indicate that landspreading of SSM wastes occurred from late 1972 up through the early 1990s. The SSM wastes disposed at the Pasco Landfill contain generally low levels of hazardous substances that could pose a potential threat to human health and the environment. This includes, but is not limited to, various heavy metals (cadmium, copper, chromium, lead, nickel, zinc) and 2-butoxyethanol. The animal fat emulsion and soluble oil wastes were deposited within the Land Spreading and Sludge Management Area, allowed to drain and dry, and then scraped up along with soil material and placed into the Municipal Solid Waste (MSW) Landfill where it was used as a form of daily cover. Through this process, the majority of the SSM wastes ended up being

intermixed with other wastes disposed in the MSW Landfill. Ecology understands that the SSM wastes were not placed into the Zone A drum disposal area. The remedial investigation conducted during the 1990s did not show evidence of groundwater impacts directly traceable to the SSM wastes.

2. The 1970s decision to place the dried coolant/emulsion residue back into the MSW Landfill was based on the known composition of the SSM waste. This included the presence of residual low-level hazardous substances (including heavy metals) remaining in the dried residue. Placing the SSM waste residues into the MSW landfill provided for the long-term containment and management of these solid wastes that best aligned with local waste management goals and objectives at the time. In view of this historical context, the quantity and nature of the SSM wastes, and the conditions specified in 70.105D.040(4)(a) Revised Code of Washington (RCW), Ecology will not be entering into a de minimis consent decree agreement with SSM.

Keith Johnson, Franklin County

FRANKLIN COUNTY

BOARD OF COMMISSIONERS

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KEITH JOHNSON
COUNTY ADMINISTRATOR

October 4, 2019

Chuck Gruenenfelder, LG, LHG
Project Manager, Toxics Cleanup Program
Washington Department of Ecology
Eastern Regional Office
4601 North Monroe Street
Spokane, WA 99205-1295

Re: ***Pasco Landfill***

Dear Mr. Gruenenfelder:

This letter provides comments concerning the proposed Consent Decree for implementation of a remedy at the Pasco Sanitary Landfill. As you know, Franklin County was identified as a potentially liable party (PLP) in this matter and has previously responded to protect public health and safety by enactment of institutional controls at the Department's request in order to safeguard against threats from groundwater contamination and other potential pathways.

When Ecology initially proposed a removal option as part of the remedial action, we expressed concern about creating a new exposure pathway by transporting excavated wastes through the community. The FFS identified options that would have transported waste off-site at significantly higher costs than we believed were necessary and appropriate. The remedy proposed by the Consent Decree and Cleanup Action Plan incorporates on-site treatment with removal of drums. The proposal further requires that waste materials disposed of off-site must be characterized to meet requirements for waste packaging, transport, treatment, and/or disposal at an acceptable facility.

We encourage selection of routes that avoid population areas for those materials that are determined to require off-site disposal. We also support strong contingency planning that incorporates local governments into an emergency response protocol in the event of an accident involving hazardous substances, both on-site and during the transportation process.

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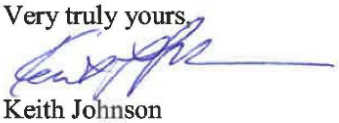
One of the principal goals of Franklin County has been to support cleanup actions that protect public health and the environment. We have been principally concerned about removal of threats and exposures via groundwater. The proposal continues groundwater remedies that incorporates source control by removing drums of hazardous materials and continuing soil vapor extraction of material that has leaked over the past.

We appreciate Ecology's hard work and efforts to craft a protective remedy at this site given the complex and challenging issues posed by a site closed several decades ago. We also appreciate Ecology's efforts to build a remedy that will be promptly implemented by a coalition of willing PLPs.

We continue to believe that Franklin County's share of responsibility is comparatively insignificant in terms of volume and toxicity of hazardous substances at the site. Despite its minimal role in contributing such substances, Franklin County shares the commitment to the protection the environment in developing remedial actions at the site. The County has supported interim actions including development of institutional controls to protect the public and environment.

We look forward to concluding this process so the remedy can be implemented in a manner that protects public health and the environment and which protects the public's interest in doing so without undue burden on County taxpayers. We believe such a resolution would be consistent with Ecology and the County's shared commitment to protecting the environment.

Very truly yours,



Keith Johnson
County Administrator

Ecology's response: We acknowledge Franklin County's PLP status for the landfill, and its active role in enacting institutional controls to safeguard against threats from groundwater contamination and other potential pathways.

Ecology acknowledges prior communications with Franklin County addressing concerns about transporting waste through the community and associated cost implications. The county's summary of the proposed Cleanup Action Plan for Zone A (drum removal followed by on-site in-situ thermal treatment) and the associated waste characterization requirements that will be imposed are accurate.

As noted in our response no. 3 to Sean Davis, Franklin County Emergency Management, Ecology will work with the PLPs, local agencies, and emergency responders to determine the most appropriate transportation route(s) for the waste materials that will require off-site disposal. As planning documents are prepared for the Zone A drum removal, we will seek local government input into emergency response protocols for on-site work and off-site waste transportation.

Ecology shares Franklin County's goal of conducting cleanup actions that protect public health and the environment. We also share your concern about threats and

impacts to groundwater caused by uncontrolled releases of contaminants from the landfill. We believe sustained SVE operations during Zone A drum removal, in-situ thermal treatment at Zone A, and installing a new Zone A cover system will provide effective source control to prevent future threats and impacts to local groundwater.

Ecology appreciates Franklin County's input related to the Cleanup Action Plan. We look forward to working closely with the county, local community, and the PLPs to successfully implement this final remedy.

Franklin County has played an important role in supporting the ongoing interim action cleanup activities at the site, and we appreciate your shared commitment to protect the public and the environment.

Ecology shares Franklin County's interest in positively advancing the cleanup process at this site in an efficient, cost-effective manner that provides long-term protection of human health and the environment.

T. Jeffrey Keane, Basin Disposal; Leslie Nellermoe, Pasco Sanitary Landfill

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October 3, 2019

Via Email and FedEx
Charles.gruenenfelder@ecy.wa.gov

Mr. Charles Gruenenfelder, L.G., L.Hg.
Toxics Cleanup Program
WA State Department of Ecology
4601 N. Monroe St.
Spokane, WA 99205-1265

Re: Basin Disposal, Inc. and Pasco Sanitary Landfill, Inc.'s Comments on Draft Consent Decree, Pasco Landfill NPL Site

Dear Mr. Gruenenfelder:

On behalf of Basin Disposal, Inc., ("Basin") and Pasco Sanitary Landfill Inc., ("PSLI") we provide what follows as Basin and PSLI's comments upon the draft Consent Decree and the accompanying dCAP (draft Cleanup Action Plan) and SOW (Scope of Work) with regard to the Pasco Sanitary Landfill ("PSL").

BACKGROUND FACTS

As you know Basin and PSLI were declared PLPs in 1992 and have, since that time, been actively engaged in the process of investigating and remediating the site. Our focus has been upon the Municipal Solid Waste (MSW) portion of the PSL site since neither Basin nor PSLI had any involvement with the industrial waste section of the site, now denominated Zone A, and PSLI's only involvement was as the property owner long after industrial waste disposal ceased.

You are aware that beginning in 2002 Basin, PSLI and other members of the "Landfill Group" became very active in implementing interim remedial actions at the MSW. These actions included installation of an extensive gas extraction well network, for capture and incineration of methane emissions from the waste mass as well as for monitoring purposes. At the same time a 40mil hard plastic cover was installed across the entire breadth of the former landfill, a nearly 40

acre expanse. *See Exhibit 1.* We believe you are aware that the cover, alone, costs millions to purchase and install. After installation the cover was overlaid with 18-24 inches of soil which then facilitated vegetative growth atop the overlay.

As you are also aware, the Solid Waste industry recognized early on that the performance of geomembranes in cover systems depended in large part on the quality of the geomembrane installed. As a result, the Geosynthetic Institute was created to establish consistent criteria for manufacturers of geomembranes so that manufacturers could supply reliable product for long-term engineering controls. Extensive service life data currently available to the industry and to Ecology establishes that the service life for commercially available geomembranes is measured in terms of at least several hundred years (Hsuan and Koerner, 1998; Hsuan and Koerner, 2002). The geomembrane cover of the MSW portion of the PSL site is no exception.

At the time the cover was installed, pursuant to industry standards, over 200 test sites were drilled in the cover and samples were examined in a laboratory to assure that the hard plastic had been manufactured properly in order for the geomembrane cover to achieve its more than 100 year useful life. The cover was found to be constructed and installed exactly as specified. *See Exhibit 2.* The referenced more than 100 year useful life of the cover, of course, is multiples of the time over which we expect it to take for the MSW to be sufficiently decomposed to achieve functional stability.

Year after year these interim remediation measures at the MSW have produced continuous improvement in the condition of the underlying groundwater. These measures have also assured that fugitive methane emissions have ceased. And these results have been obtained with minimal disruptions, and without complications, as verified by the quarterly and annual testing and reporting results provided to Ecology.

These interim actions—a sometimes proxy for vetting what may work as a final remedy—proved their worth. Consequently, Basin, PSLI and BNSF engaged Aspect Consulting to provide Ecology with a variety of remedial alternatives—including a continuation of the interim remedy apparatus and process, during the first of two Focused Feasibility Studies. One FFS was advanced in August, 2014, and another in August, 2017.

FINDINGS SUPPORTING FFS PROCESS: 2014 and 2017

Long discussion of the FFS process is not warranted since very little of note occurred during preparation of either the 2014 or the 2017, FFS. Basin and PSLI essentially recommended continuation of the interim remedies given their excellent performance. In doing so, Basin and PSLI value tested our recommended remedy by performing disproportionate cost analysis, affirming that not only was the ongoing remediation likely to be successful, but it could be accomplished at reasonable cost. Given the performance of the cover atop the MSW, its construction, testing results, and absence of any reason to expect it to fail during the likely remediation period (or, for that matter, for 50 years beyond that), Aspect/Basin/PSLI recommended a remedy which left the cover in place, and urged that the existing remediation apparatus continue in place as well.

When making these recommendations during the respective FFS processes, Basin and PSLI were armed with compelling laboratory and field data which fully supported the recommended alternative. So that any audience can judge for itself the efficacy of our measures, and the performance verified by testing, we discuss below some of the evidence supportive of the position taken here.

Total Historical Absence of Fugitive Methane Emissions/Exhibit 3

One principal purpose of installing a geomembrane cover over the MSW is to assure that the well suction/capture system is able to extract the methane which emits from the waste pile as it shrinks due to active microbial processes. Harm from methane is well understood, and any cover's performance can be judged, in part, by whether testing for fugitive methane emissions shows the presence of any such emission.

Exhibit 3 is a depiction of the track technicians walked with methane testing gear, every three months, throughout the past 17 years. As the table illustrates, at no time has fugitive methane emissions testing detected *any methane emissions* outside the cap. This demonstrates virtually perfect performance of the cap using that criterion of performance.

Dramatic Decrease in Methane Production/Exhibit 4

The scientific lore of landfills has long established that a waste pile generates methane during decomposition. Observing declining production of methane over time demonstrates the diminishing capacity of the waste pile to continue producing methane. Progress in this critical measurement helps demonstrate that the remediation measures in place at the MSW are effective.

That has been exactly the history of observation of methane production at the PSL since 2002. Exhibit 4 shows the decline of methane production over time from 66 cubic feet per minute in 2003 to 19 cubic feet per minute in 2018. The slope of the graph tracking methane shows methane production has consistently gone down and is now moving toward *de minimis* production levels.

At present the remaining methane produced by the waste pile will fuel the existing flare at the MSW but that will not remain the case much longer. By approximately 2022 our consultants have opined that too little methane will be produced to fuel the present flare any longer so, either a very small flare will replace the present flare, or levels will be low enough to allow exhaust to the atmosphere, or some form of bio-filter will be used to capture the remaining methane production.

These trends are, of course, more proof of the high utility of the interim remedies in place since 2002.

Chemicals of Concern (COC) Nearing and Meeting Cleanup Levels/Exhibits 5 and 6

The primary health hazard posed by the MSW stems from its production of methane, since the waste contains very little industrial or toxic waste. That said, two COCs were identified during testing of the MSW, which is quite unlike the situation at Zone A: PCE and TCE.

In the 17 years the interim remediation system has been operating, TCE levels have dropped below cleanup levels. This impressive result is borne out in the graphs shown in Exhibit 5, which track the downward trajectory of TCE over a long period, measured at five different wells. We are very pleased with these results which substantiate Basin and PSLI's long held view that the meager amounts of TCE present would be remediated during the interim remedy period.

Excellent progress has been made in remediating the small amounts of PCE present at the MSW as well, though PCE remains at slightly above cleanup levels in a single well, presently. If, as expected, PCE levels continue to drop consistent with their long-term declining trajectory, Basin and PSLI expect PCE levels to drop below cleanup thresholds in the next few years. These trends are depicted, across five different wells in the MSW, in Exhibit 6.

Pristine MSW Cover Condition: Absence of Indents or Depressions/Exhibits 7 and 8

In addition to the foregoing—all of which helps demonstrate the high performance of the MSW cap—it is evident the cover is in virtually the same condition it was in immediately following installation in 2002. Settlement has never been observed during any of the annual inspections of the MSW Landfill Cover carried out by our consultant. *See Exhibit 7.* This is in obvious contrast to the cover over Zone A, where deep indents (some as deep as 6-8 feet and holding water,) have raised concern that the Zone A cover cannot 'stretch' to respond when underground settlement causes the land beneath the cover to sink (the Zone A indents are probably, but not certainly, a response to the below ground drums collapsing over time, thereby occupying less space and allowing the land above to settle lower).

The topography of the land above the MSW remains virtually identical to its topography when the cover was installed. As the photos from 2010, and 2019 (attached in Exhibit 8) show, there are no areas of differential settlement in the MSW. Given that differential settlement can, when extreme, damage or compromise the cover, its absence supports the opposite inference: the cover is experiencing no strain since there is no observable differential settlement after 17 years of cap service.

According to our consultants, the odds of any differential settlement occurring in the future are lower than the odds of it appearing in the past because the mass of the waste pile shrinks over time. When, as here, the shrinking waste pile has never caused any differential settlement, it is highly unlikely that any significant differential settlement will occur between now and the time when the MSW achieves functional stability.

Solid Compounds Discussion/Exhibit 9

Groundwater conditions downgradient of the landfill have been within the natural variability of the aquifer. The maximum background concentrations for total dissolved solids (salts), total organic carbon (non-toxic decomposition byproducts), and ammonia reflect land use upgradient. If groundwater downgradient had higher concentrations than the maximum background concentrations, or increasing trends, it would indicate a potential source of leachate from the landfill. Thus, there have been no leachate impacts from the MSW landfill historically. The risk of leachate production in the future is lower than in the past due to aging waste and excellent cover system performance keeping water out of the waste, yet another consistent marker of the efficacy of the present cover. We expect no future leachate impacts from the MSW landfill.

These results are shown in the collection of figures at Exhibit 9.

No Landfill in Washington With Groundwater Issues Has Ever Replaced a Cover Post-Installation/ Exhibit 10

As discussed above, the 40mil hard plastic cover atop the MSW has proven to be an excellent and well-functioning component of the overall apparatus which is being used to remediate the MSW. Since good guidance, and EPA guidelines, recommend assessing cover performance by examining the very features discussed above, it is a safe conclusion that the present cover on the MSW is performing very well. It would be hard to imagine any way it could be performing better than it is.

Geomembrane landfill covers are extremely expensive (presently, they cost on the order of $250,000/acre—and this landfill cover extends over just less than 40 acres). They are manufactured to exacting standards. Some, including the one installed at the MSW have a useful life of more than 100 years, and its installation was meticulously performed to assure that that longevity standard can be met (Exhibit 2). From every available indicator, it appears that this landfill cover is already more than half way through the period it will require to achieve functional stability at the MSW (when leachate and gas production have stopped or slowed to the point that human health and the environment are protected). It is performing perfectly.

Similar covers are installed at multiple landfills in Washington State where groundwater issues have been encountered, and remediation efforts have required installation of geomembrane covers. Installation of those covers, and review of the operations at those landfills (as well as review of their going forward budgets for continuing remediation efforts) establish that *no similar landfill in the history of the State of Washington* has ever required replacement of the cover over the landfill. That is in part attributable to the high manufacturing standards met by the geomembrane cover manufacturers, and is also an artifact of the absence of high levels of heat, UV exposure, or exposure to high toxic chemical levels, in the ordinary municipal sanitary waste landfill, as is the case here.

Nothing in this experience, in the literature, or in the performance to date of the cover at the PSL suggests that the cover will *ever* require replacement during active remediation, or during monitoring of the landfill after active remediation operations cease in 10-15 years at the MSW.

Basin and PSLI's position is that no engineering or scientific source, anywhere, suggests that the PSL's 40mil hard plastic cover will ever require replacement. Indeed, the present cover has never required even simple repairs over the past 17 years (occasionally the overlying earth cover has needed additional soil or turf repair, but that is attributable to wind and weather events which have no effect on a geomembrane cover).

To assure ourselves that the history in Washington is as stated, Basin and PSLI have inventoried the landfills on Ecology's confirmed and suspected contaminated sites list where groundwater issues were present, including those at which Ecology, local health departments and federal agencies were directing the remedial actions and at which geomembrane caps were installed in response to groundwater contamination. From the resources available through Ecology and the local government agencies involved in clean up and monitoring of these landfills, we have determined that none of the geomembrane covers at these landfills have ever needed to be replaced and further, that there has never been a requirement for future replacement of covers at any of the landfills inventoried. Those landfills are described in Exhibit 10.

As the reader can see, not one landfill ever has required replacement of the cover.

Competent Cost Benefit Analysis Eliminates Consideration of an MSW Cap Replacement/ Exhibit 11

The historical record shows that Basin and PSLI have worked vigorously, throughout the 1990s, and to the current time, to advance and fund remediation at the MSW. We are as interested as any citizen, or any other PLP, in successfully remediating the MSW. Basin and PSLI have invested heavily in the success of that undertaking and have agreed to be bound by multiple interim remedy orders issued by Ecology during that process.

Now we find ourselves trapped between that history, and the desire to continue it, and the recent conduct of Ecology, which appears to require that Basin and PSLI cannot become a party to the Consent Decree now under consideration. Our reason is simple: after five years of process, only at the very end of the resolution process did Ecology require, or consider requiring, a replacement of the cap atop the MSW. This was for good reason, as the foregoing illustrates: nothing, anywhere, supports the notion that the cap will ever require replacement during the relatively short period it will continue to serve.

Yet the threat from Ecology that a cap replacement might be ordered in the future has foreclosed Basin and PSLI from agreeing to be bound by the present content of the Consent Decree. We continue to hope Ecology will modify its position relating to cap replacement at the MSW which would then allow Basin and PSLI to reconsider our present opposition to signing.

What brought the parties to this impasse is instructive. Long before discussions begin between PLPs and Ecology concerning a Consent Decree, PLPs will commonly engage expert consultants and will prepare a Focused Feasibility Study ("FFS") which is a technical document prepared after much engineering effort and study. When compiled, an FFS will include 'remediation alternatives,' which, in short, are descriptions of various plans by which the area in

issue (here, the MSW; other parties were required to prepare an FFS about Zone A) can be remediated.

Integral to the process of delineating and settling upon a final 'remediation alternative' is application of a mandate that the cleanup alternatives be subjected to rigorous 'cost benefit analysis.' The jargon used in the applicable mandate, WAC 173-340-360(3)(e)(i), requires that the parties and Ecology conduct a 'disproportionate cost analysis.' This analysis is required under Washington law and serves to make parties, and Ecology, analyze any potential remedial alternative to assure that it is cost effective.

This process, on occasion, requires additional study, research, and any likely alternative may be subject to challenge on the basis of prohibitive cost, or questionable efficacy, or any combination of the two. For example, were Ecology to raise a concern about the need for a future expense based upon a belief that a part of the proposed remedial apparatus might fail, or require replacement, the disproportionate cost analysis process would support study of the likelihood of failure, and if the likelihood is very low, would also include assessment of the cost of replacement. In this way, hopefully, resources are not devoted to expenditures which do not advance remedial objectives which are frankly wasteful of PLP funds.

One critical element in this process is that it requires advance notice of any concerns Ecology might have about efficacy or cost since, otherwise, decision-making could be based upon ill-considered or non-evidence-based deliberation. That is precisely why the FFS process occurs long before any work begins on a Consent Decree since the Consent Decree itself incorporates Ecology's partial or whole adoption of remedial alternatives outlined during the FFS process. Given that the FFS process for the PSL began in 2013, and that Ecology first outlined Consent Decree SOW and dCAP language in March/April 2019, a long deliberative process is possible *if* Ecology raises concerns in a manner timely enough to allow rigorous disproportionate cost analysis.

Ecology makes many efforts to interface with PLPs during this process. Work sessions, comments from Ecology, and additional long periods for comment are provided by Ecology which allow it to review and advise the parties regarding whether any issues of concern to Ecology are raised by the content of the FFS.

At the PSL, largely due to issues concerning Zone A and combustion there, and not regarding concerns about the MSW, two different FFS submittals were provided by the PLPs, one in August, 2014, and one in August, 2017. In the run up to the deadline for both submittals, many communications between Ecology and our consultants occurred to assure that the FFS process was as robust and productive as it could be.

Certainly during those processes, any concerns of any kind regarding the integrity and future service of the cover over the MSW would be raised by Ecology, had there been any such concerns. Given the performance of the cover during the long interim remedy period, and further given the showing that the MSW was evidencing strong results from Basin and PSLI's remediation efforts, it is unsurprising that never at any time during the FFS process, and during the post FFS submittal time period, was anything ever said by Ecology regarding concern that the cover might

lack 'integrity' or that in the future the cap might need 'replacement.' Neither of those concepts was ever even discussed during the FFS and post FFS periods.

Had any such concerns been raised during those processes, there remained adequate time to allow study or research into any concerns Ecology might raise about any issue, including future cap integrity. For example, if Ecology feared that a manufactured geomembrane cap with a more than 100 year useful life might, somehow, require replacement in the future, means existed to test the existing cap's strength and performance. But such testing requires time, laboratory analysis, and notice that such concerns even existed. Never, prior to March, 2019, did Ecology suggest at any time that it had concerns about the cover over the MSW.

An additional reason why such concerns need be raised prior to these activities culminating in creation of the work directives in the Consent Decree, is that otherwise there would be no means to conduct disproportionate cost analysis of anything Ecology might call out as a potential future burden on a PLP. For example, if the likelihood of any future failure of the MSW cover were 1:10,000,000, and replacing the cover would cost $10 million (the reader should bear in mind that the entire cost of the MSW remediation, going forward, will be less than $2.5 million from the present to the time the MSW achieves functional stability), a forceful case could be made that contemplating future cover replacement was simply not indicated.

Throughout this process at the PSL, Ecology was mute on the issue of ever requiring cover replacement. This is neither surprising nor unwarranted: as shown, no other landfill *has ever* replaced a cover in place and the expected lifetime of the cover at the PSL is multiple times the expected years of service the cover will function at the PSL.

Basin and PSLI have examined the history which brought us to the present and were witness to Ecology's very recent expression that the Consent Decree SOW/dCAP should include language suggesting the MSW cover may need future replacement. As the timeline in Exhibit 11 makes clear, this mandate appeared from nowhere, and was never raised at any time earlier when the suggestion now made could have been scientifically vetted, the cover could have been tested, and any claim that the cap might need replacement in the future could have been disposed of definitively.

By raising the issue at the very end of this six year process, Ecology deprived Basin, PSLI, and others, from showing with impactful disproportionate cost analysis that such a command is simply, and completely, unjustified.

Exhibit 11 calls out these events in a timeline which showcases the points Basin and PSLI make, above.

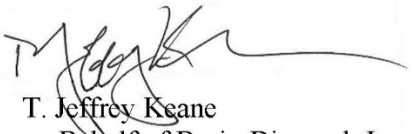
CONCLUSION

We trust anyone reading these comments has found them helpful, and informative. More importantly, we do hope Ecology will revisit the decision to include cover replacement/cover integrity testing language in the SOW/dCAP, will appreciate that no basis exists for the inclusion of same, and will remove such language.

Thank you for the opportunity to present these comments.

Very truly yours,

KEANE LAW OFFICES



T. Jeffrey Keane
on Behalf of Basin Disposal, Inc.

NOSSAMAN LLP

Leslie C. Nellermoe

Leslie C. Nellermoe
on Behalf of Pasco Sanitary Landfill, Inc.

enclosures

cc: Darrick Dietrich

EXHIBIT 1

Deployment of 40 mil textured LLDPE geomembrane north slope MSW area.

Deployment of 40 mil textured LLDPE geomembrane on west slope MSW area.

Field Lining Systems sewing geotextile.

Vegetative soil layer placement on north slope of MSW area.

EXHIBIT 2

PAGES FROM:

COMPLETION REPORT

PASCO LANDFILL INTERIM ACTION MSW LANDFILL & IWA ZONES A C/D and E

APPENDIX A

CONSTRUCTION QUALITY ASSURANCE REPORT

VOLUME I OF II

Prepared for:

Philip Services Corporation, Inc.
955 Powell Ave SW
Renton, Washington 98055

Prepared by:

GeoSyntec Consultants
11305 Rancho Bernardo Road, Suite 101
San Diego, California 92127

21 June 2002

7. CQA – GEOMEMBRANE

7.1 General

GeoSyntec monitored installation of the geomembrane components of the PAIA cover systems. Approximately 1,884,045 ft^2 of textured and approximately 177,422 ft^2 of smooth 40-mil LLDPE geomembrane, manufactured by Serrot International, Inc., were delivered to the site for use as the geomembrane component of the cover system in the MSW area. Approximately 181,240 ft^2 of textured and approximately 35,880 ft^2 of smooth 40-mil HDPE geomembrane, also manufactured by Serrot International, Inc., were delivered to the site for use as the geomembrane component of the cover systems in the IWAs. Smooth geomembrane was used as the base liner for the detention/evaporation basin component of the surface water control system. Table 3 summarizes the required testing frequencies, acceptance criteria, and results for the CQA monitoring activities.

Construction of the geomembrane components of the cover system began on 7 October 2001 and was substantially completed on 19 December 2001.

7.2 Manufacturer Documentation

The Contractor provided manufacturer quality control (MQC) documentation for the rolls of geomembrane. GeoSyntec reviewed the geomembrane MQC documentation and found it to be in compliance with the Project Documents as noted in Table 3. The documentation indicated that the geomembrane and resin properties met or exceeded the requirements specified in the Project Documents. As approved by the Design Engineer of Record, one (1) roll of textured HDPE geomembrane did not meet the asperity height requirements and, instead, was used on areas with slopes less than 10%.

7.3 CQA Monitoring and Testing

7.3.1 Geomembrane Conformance Testing

GeoSyntec personnel collected and shipped samples to the laboratory for conformance testing in order to determine the following properties of the geomembrane:

- Asperity height, as determined by test method GRI-GM12
- Density, as determined by test method ASTM D 1505;
- Carbon black content, as determined by test method ASTM D 4218;
- Carbon black dispersion, as determined by test method ASTM D 5596;
- Thickness, as determined by test method ASTM D 5994; and
- Tensile properties, as determined by test method ASTM D 638.

GeoSyntec personnel evaluated the following test results:

- 23 asperity height tests on textured geomembrane. This corresponds to a frequency of one test per 89,795 ft^2, which satisfies the required frequency of one test per 100,000 ft^2;

- 26 density tests. This corresponds to a frequency of one test per 87,638 ft^2, which satisfies the required frequency of one test per 100,000 ft^2;

- 26 carbon black content tests. This corresponds to a frequency of one test per 87,638 ft^2, which satisfies the required frequency of one test per 100,000 ft^2;

- 26 carbon black dispersion tests. This corresponds to a frequency of one test per 87,638 ft^2, which satisfies the required frequency of one test per 100,000 ft^2;

- 26 thickness tests. This corresponds to a frequency of one test per 87,638 ft^2, which satisfies the required frequency of one test per 100,000 ft^2; and

- 26 tensile properties tests. This corresponds to a frequency of one test per 87,638 ft^2, which satisfies the required frequency of one test per 100,000 ft^2.

GeoSyntec personnel reviewed the results of the density, carbon black content, carbon black dispersion, thickness, and tensile properties and verified that the geomembrane material test results satisfied the requirements of the Project Documents. Results of the tests are summarized on test logs presented in Appendix J.

7.3.2 Delivery and On-Site Storage

GeoSyntec observed the delivery, unloading, and storage of the geomembrane rolls. The geomembrane rolls were handled and stored in such a way as to reduce exposure to sources of damage. Upon receipt at the site, the roll number identifications were recorded and compared with the MQC documentation.

7.3.3 Subgrade Preparation

GeoSyntec monitored the GCL or geomembrane subgrade surface prior to geomembrane deployment. GeoSyntec CQA personnel observed that the GCL and subgrade surface met the Project Documents. Subgrade acceptance was indicated by IT.

7.3.4 Geomembrane Placement Methods

GeoSyntec visually observed the deployment of the panels of geomembrane. The Geosynthetic Installer transported the rolls using a spreader bar and front-end loader in a manner intended to reduce damage to the geomembrane. During and after deployment, geomembrane panels or rolls were visually observed for the following:

- Evidence of damage that may have occurred during shipping, storage, and/or handling; and

- Evidence of damage caused by the installation activities, (e.g., as a consequence of panel placement, seaming operations, or weather).

Damaged materials were either removed and discarded or repaired. GeoSyntec monitored repair locations and observed that the repair activities were performed properly. Whenever possible, the cause(s) of the damage was ascertained and addressed. The Geosynthetic Installer then acted to minimize the potential for further damage.

Panels were deployed by securing the roll to a spreader bar, manually placing the panel into position, and then securing the end of the geomembrane with sandbags. Approximately 93,170 ft^2 of textured 40-mil HDPE and approximately 9,070 ft^2 of smooth 40-mil HDPE geomembrane was deployed in IWA A; approximately 52,650 ft^2 of textured 40-mil HDPE geomembrane and approximately 12,712 ft^2 of smooth 40-mil HDPE geomembrane was deployed in IWA E; approximately 27,315 ft^2 of textured 40-mil HDPE geomembrane and approximately 8,100 ft^2 of smooth 40-mil HDPE geomembrane was deployed in IWA C\D; and approximately 1,734,201.5 ft^2 of textured 40-mil LLDPE geomembrane and 145,030 ft^2 of smooth 40-mil LLDPE geomembrane was deployed in the MSW area. Roll # 22281 of smooth LLDPE geomembrane was used in the construction of the storm water runoff flaps on the MSW. Rolls # 26462, # 26464, and # 26466 of textured LLDPE geomembrane were not used and subsequently removed from the site by the Geosynthetic Installer. GeoSyntec personnel recorded details of the panel placement on the geomembrane Panel Placement Logs, which are presented in Appendix K. The orientations of geomembrane panels placed during cover system construction are shown on the Construction Record Drawings presented in Figures 1 and 2.

9. SUMMARY AND CONCLUSIONS

Construction of the PAIA occurred during the period of 6 September 2001 to 23 December 2001. During this time, GeoSyntec provided qualified CQA personnel on-site to monitor and observe construction. As part of their CQA activities, GeoSyntec personnel monitored the construction and installation of the following features:

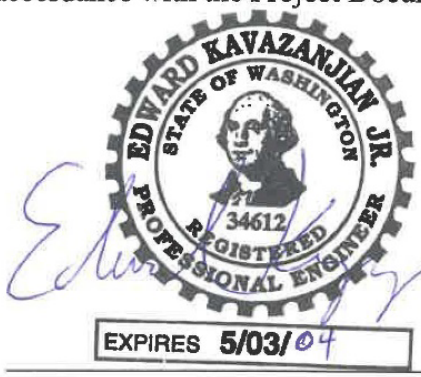
- Earthwork, including excavation, engineered fill, geomembrane subgrade preparation, drainage layer placement, and a majority of the vegetative layer placement;
- Landfill gas extraction wells and piping;
- Geotextile/Geogrid reinforcement;
- Geosynthetic clay liner (GCL);
- Geomembrane; and
- Geotextile.

During construction activities, GeoSyntec CQA personnel performed conformance testing and CQA testing on the construction materials identified in this report at the frequencies outlined in the Project Documents. GeoSyntec CQA personnel monitored that the materials tested during construction conformed to the requirements of the Project Documents. Tables 1 through 4 summarize the required testing frequencies, acceptance criteria, and test results. In the event of non-conforming work, the condition or material that was identified as non-conforming to the requirements of the Project Documents was corrected, repaired, and retested (as described in this report), or discarded and not used.

10. CERTIFICATION

CQA ENGINEER - OF - RECORD

Based on the observations made on site during construction by GeoSyntec personnel working under the direction and supervision of the CQA Engineer-of-Record as described in this Final CQA Report and based on the logs and test results presented in the appendices to this report, the construction of the engineered fill, geomembrane subgrade, drainage layer, the majority of the vegetative layer, landfill gas extraction wells and piping (not including the well head and flare equipment), geosynthetic reinforcement, GCL, geomembrane, and geotextile portions of the cover system at the Pasco Landfill were constructed in general accordance with the Project Documents.

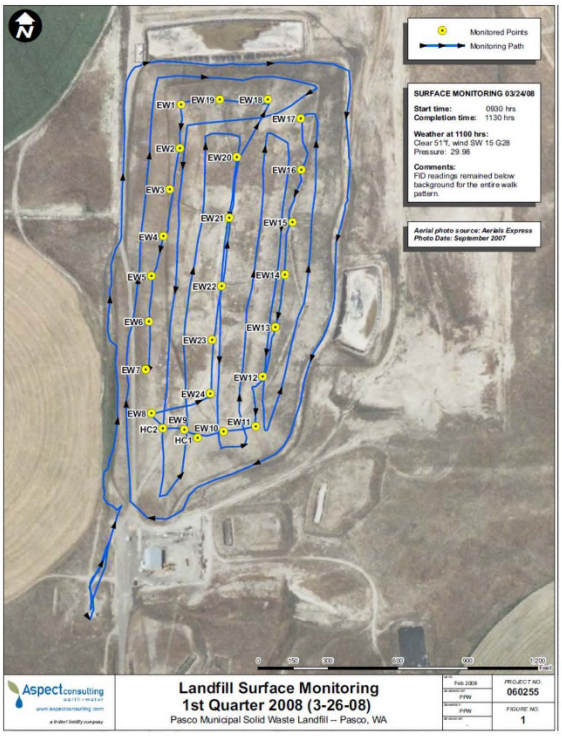


Edward Kavazanjian, Jr.
Registered Professional Engineer (Civil)
Certificate No. 34612

EXHIBIT 3

Landfill Surface Monitoring has been performed quarterly from 2007 through the present.
Fugitive methane has never been detected at any monitored points during this entire period.

Early Example of Landfill Surface Monitoring Map



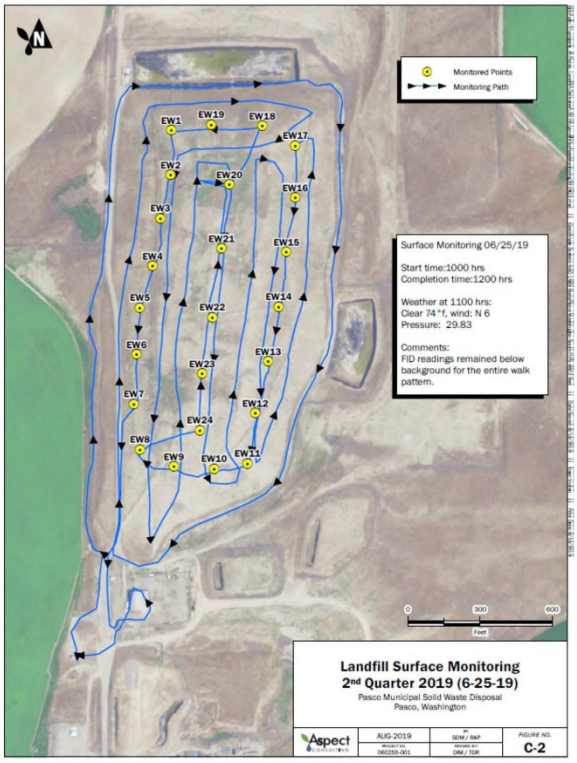
Dates of Quarterly Monitoring

Year	1st Q	2nd Q	3rd Q	4th Q
2007	03/11/07	06/12/07	09/21/07	12/21/07
2008	03/24/08	06/03/08	09/04/08	12/10/08
2009	03/09/09	06/02/09	09/17/09	12/02/09
2010	03/11/10	06/03/10	09/03/10	01/05/11
2011	03/17/11	06/23/11	09/15/11	12/09/11
2012	03/23/12	06/26/12	09/12/12	12/07/12
2013	03/08/13	06/14/13	09/26/13	12/17/13
2014	03/12/14	06/23/14	09/16/14	12/11/14
2015	03/12/15	06/03/15	09/17/15	12/01/15
2016	03/01/16	06/29/16	09/27/16	12/16/16
2017	03/30/17	06/01/17	09/08/17	12/05/17
2018	03/07/18	06/20/18	09/19/18	12/17/18
2019	03/26/19	06/25/19		

FID (Flame Ionization Detector) readings remained below background for the entire walk pattern for all of the above dates.

Landfill Surface Monitoring has been performed quarterly from 2007 through the present.
Fugitive methane has never been detected at any monitored points during this entire period.

Recent Example of Landfill Surface Monitoring Map

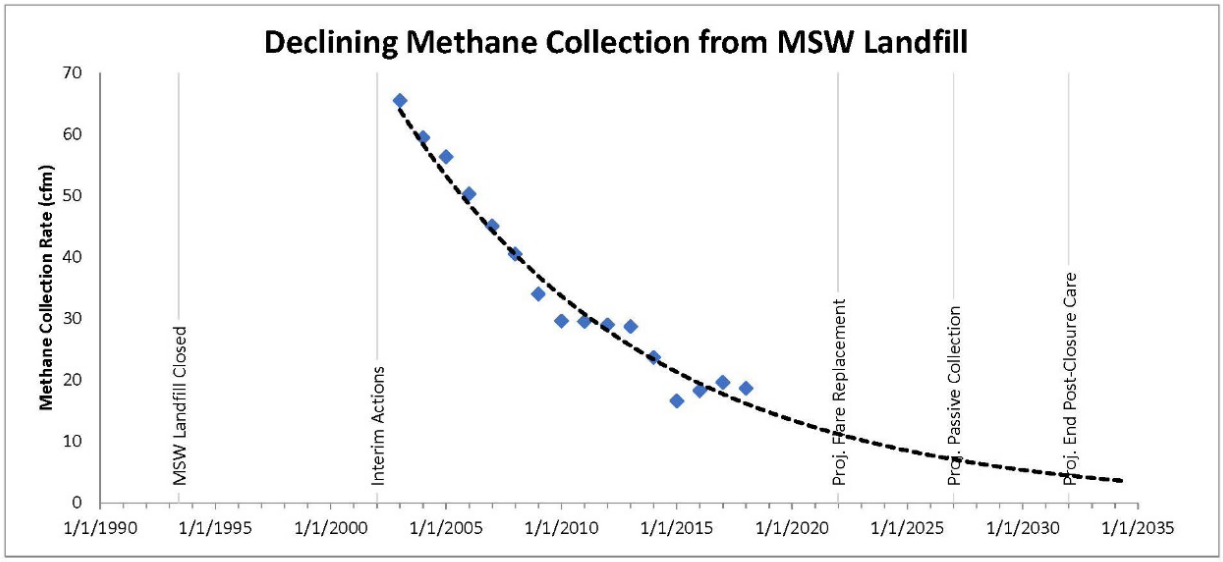


Dates of Quarterly Monitoring

Year	1st Q	2nd Q	3rd Q	4th Q
2007	03/11/07	06/12/07	09/21/07	12/21/07
2008	03/24/08	06/03/08	09/04/08	12/10/08
2009	03/09/09	06/02/09	09/17/09	12/02/09
2010	03/11/10	06/03/10	09/03/10	01/05/11
2011	03/17/11	06/23/11	09/15/11	12/09/11
2012	03/23/12	06/26/12	09/12/12	12/07/12
2013	03/08/13	06/14/13	09/26/13	12/17/13
2014	03/12/14	06/23/14	09/16/14	12/11/14
2015	03/12/15	06/03/15	09/17/15	12/01/15
2016	03/01/16	06/29/16	09/27/16	12/16/16
2017	03/30/17	06/01/17	09/08/17	12/05/17
2018	03/07/18	06/20/18	09/19/18	12/17/18
2019	03/26/19	06/25/19		

FID (Flame Ionization Detector) readings remained below background for the entire walk pattern for all of the above dates.

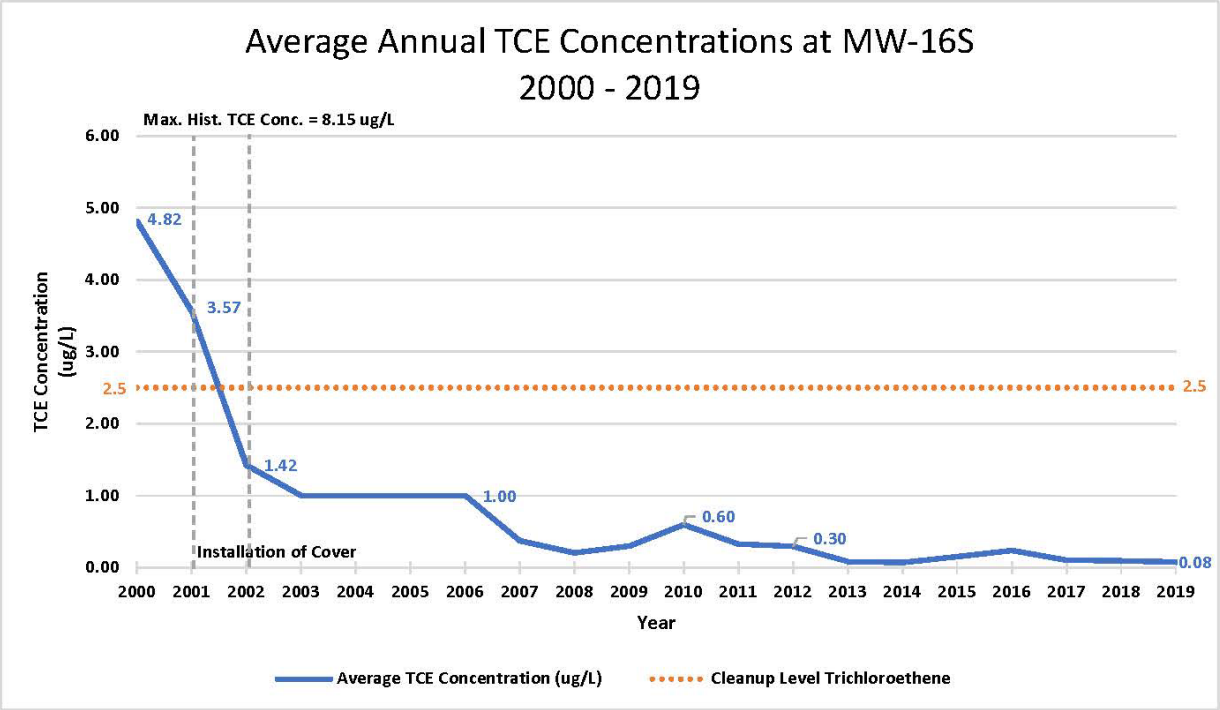
EXHIBIT 4

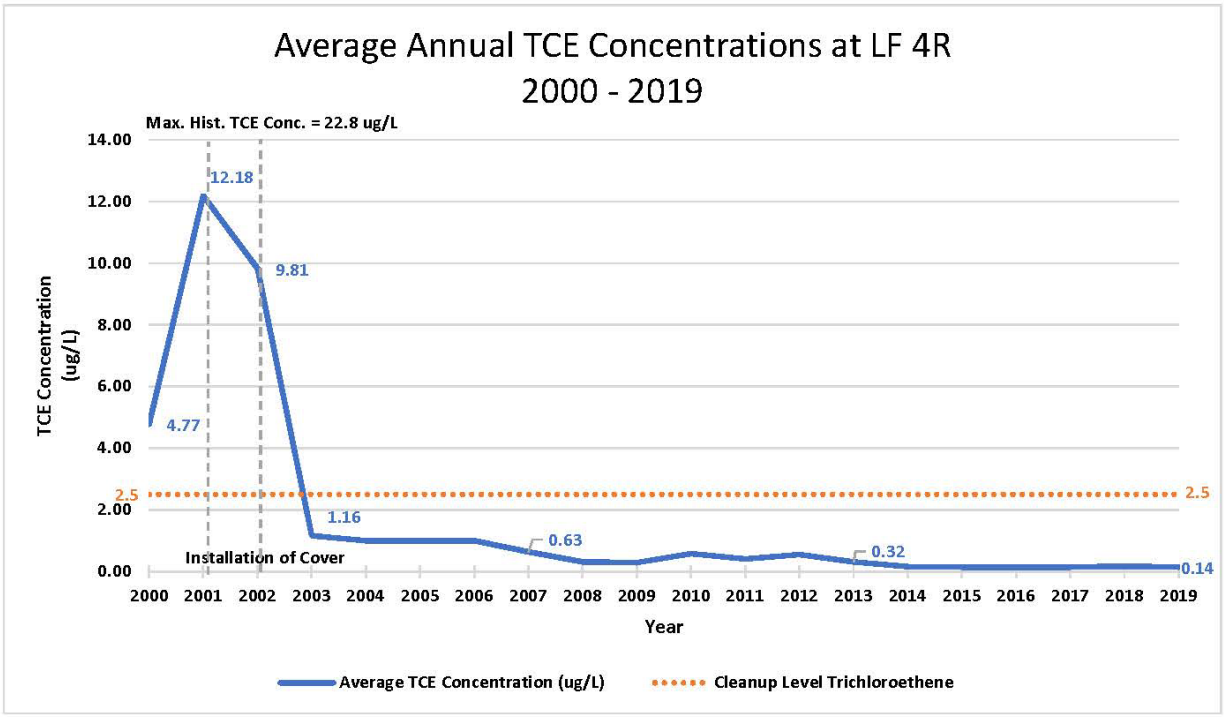


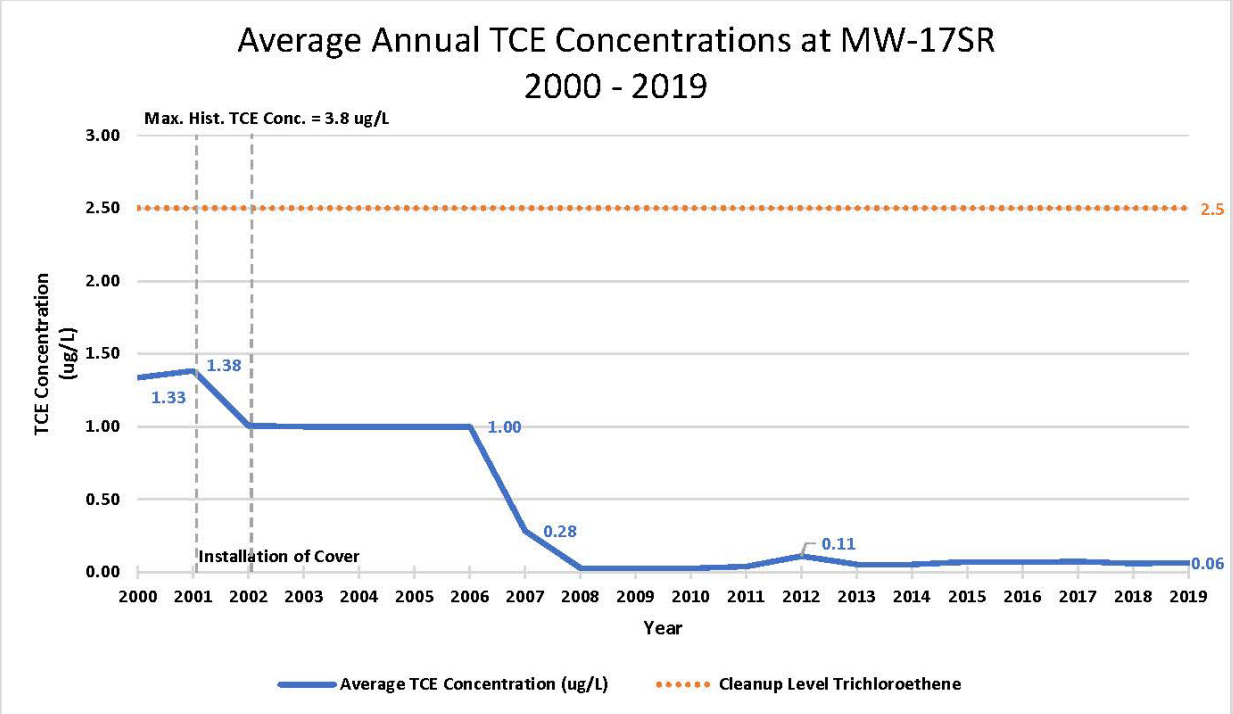
Aspect Consulting, LLC
09/20/19

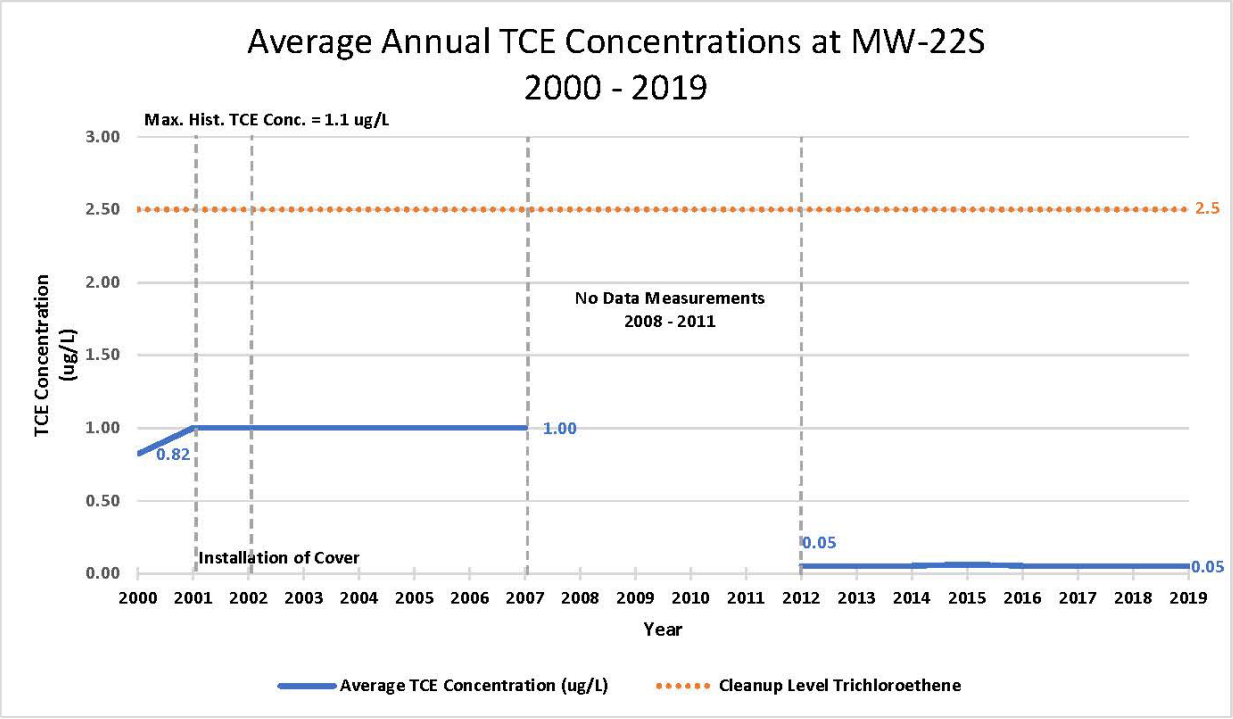
Methane Generation and Collection Rates
Pasco Municipal Solid Waste Landfill

EXHIBIT 5


Average Annual TCE Concentrations at MW-16S
2000 - 2019
Max. Hist. TCE Conc. = 8.15 ug/L
TCE Concentration (ug/L)
6.00
5.00
4.00
3.00
2.5
2.00
1.00
0.00
4.82
3.57
1.42
1.00
0.60
0.30
0.08
2.5
Installation of Cover
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Year
Average TCE Concentration (ug/L)
Cleanup Level Trichloroethene


Average Annual TCE Concentrations at LF 4R
2000 - 2019
Max. Hist. TCE Conc. = 22.8 ug/L
TCE Concentration (ug/L)
14.00
12.00
10.00
8.00
6.00
4.00
2.5
2.00
0.00
4.77
12.18
9.81
1.16
0.63
0.32
0.14
2.5
Installation of Cover
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Year
Average TCE Concentration (ug/L)
Cleanup Level Trichloroethene


Average Annual TCE Concentrations at MW-17SR
2000 - 2019
Max. Hist. TCE Conc. = 3.8 ug/L
TCE Concentration (ug/L)
3.00
2.50
2.00
1.50
1.00
0.50
0.00
2.5
1.33
1.38
1.00
0.28
0.11
0.06
Installation of Cover
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Year
Average TCE Concentration (ug/L)
Cleanup Level Trichloroethene


Average Annual TCE Concentrations at MW-22S
2000 - 2019
Max. Hist. TCE Conc. = 1.1 ug/L
TCE Concentration (ug/L)
3.00
2.50
2.00
1.50
1.00
0.50
0.00
2.5
No Data Measurements
2008 - 2011
0.82
1.00
0.05
0.05
Installation of Cover
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Year
Average TCE Concentration (ug/L)
Cleanup Level Trichloroethene

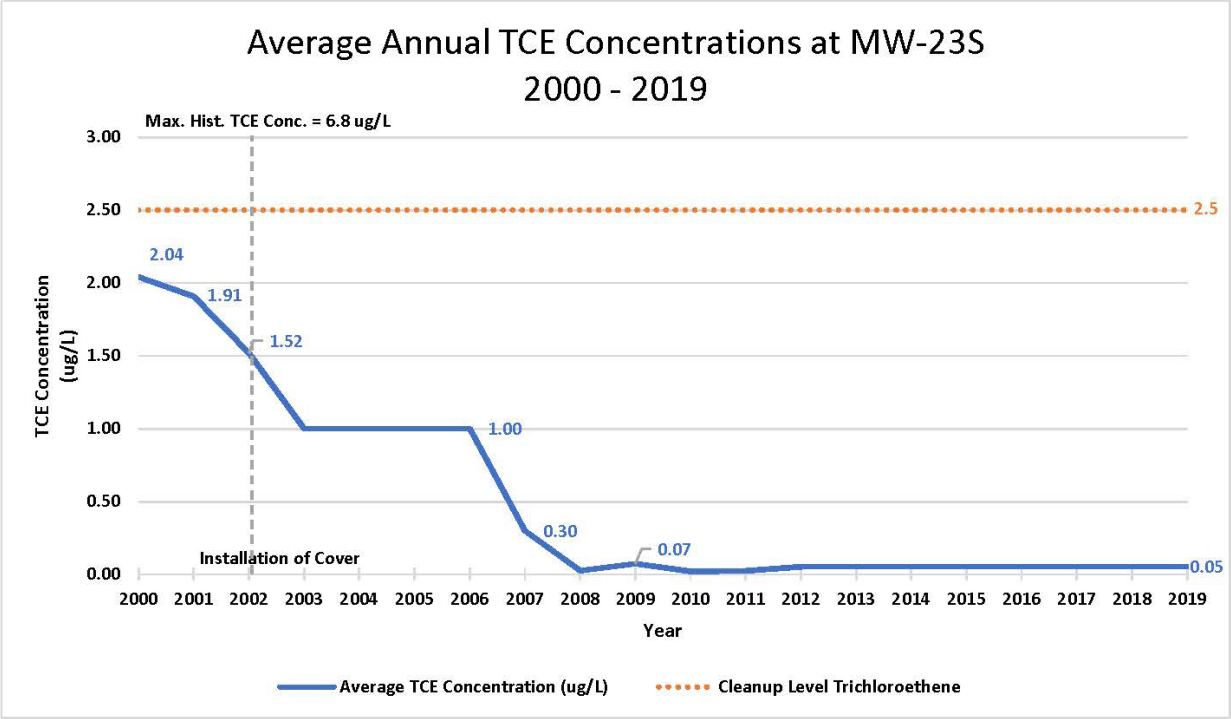
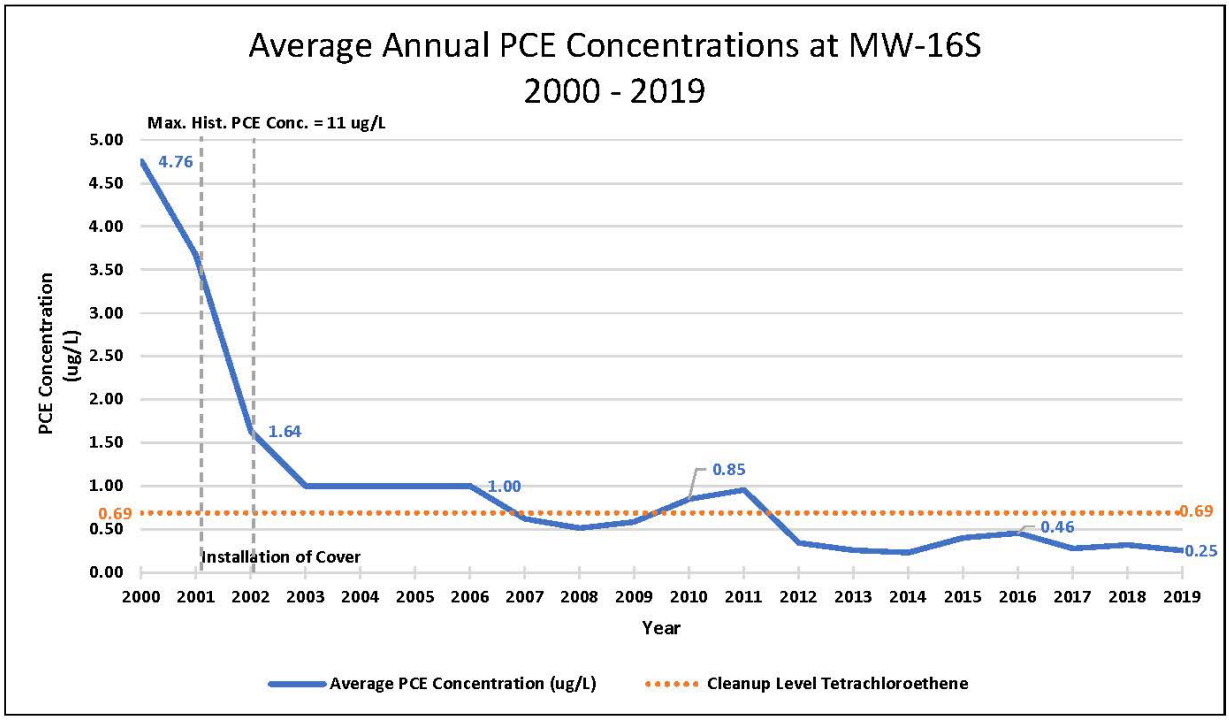
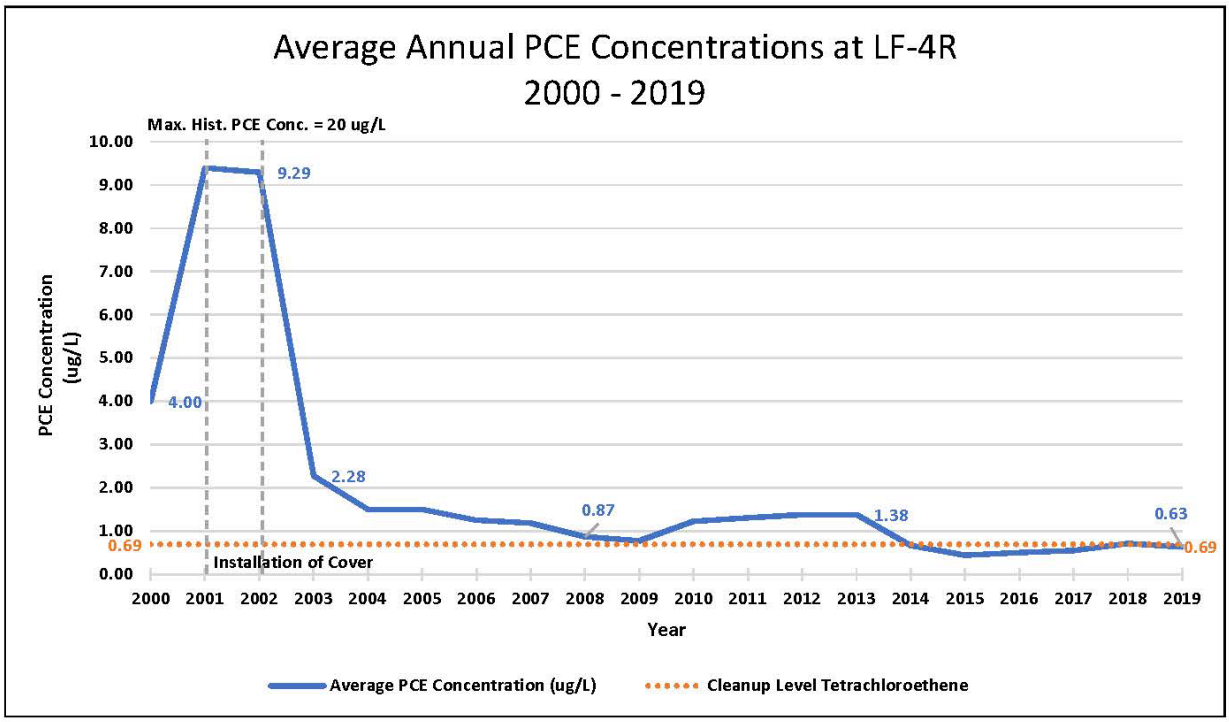
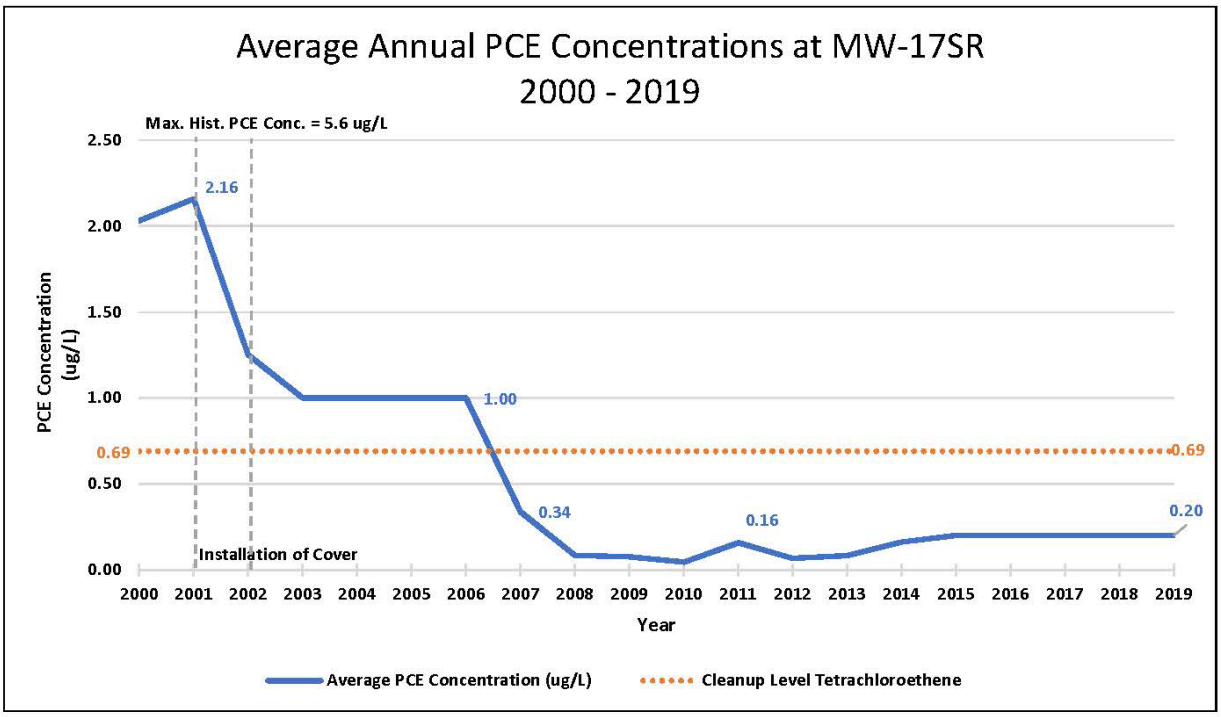
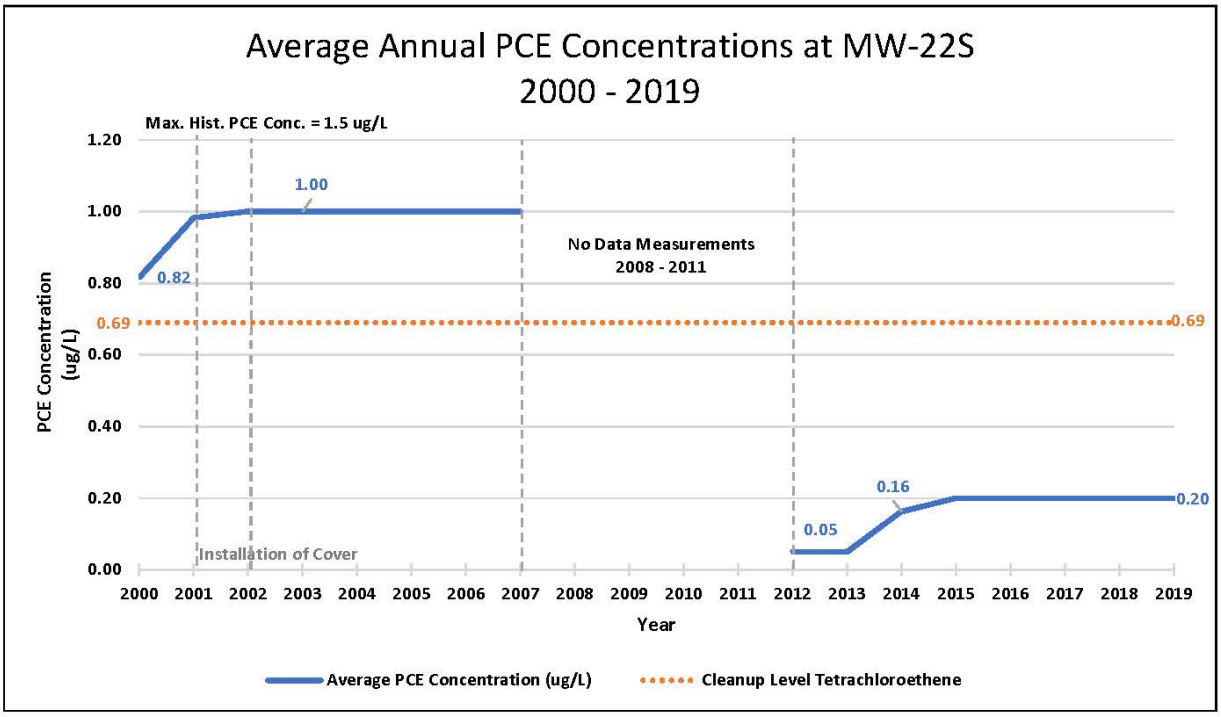

Average Annual TCE Concentrations at MW-23S
2000 - 2019
Max. Hist. TCE Conc. = 6.8 ug/L
3.00
2.50
2.00
1.50
1.00
0.50
0.00
TCE Concentration (ug/L)
2.5
2.04
1.91
1.52
1.00
0.30
0.07
0.05
Installation of Cover
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Year
Average TCE Concentration (ug/L)
Cleanup Level Trichloroethene

EXHIBIT 6


Average Annual PCE Concentrations at MW-16S
2000 - 2019
Max. Hist. PCE Conc. = 11 ug/L
PCE Concentration (ug/L)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.69
0.50
0.00
4.76
1.64
1.00
0.85
0.69
0.46
0.25
Installation of Cover
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Year
Average PCE Concentration (ug/L)
Cleanup Level Tetrachloroethene


Average Annual PCE Concentrations at LF-4R
2000 - 2019
Max. Hist. PCE Conc. = 20 ug/L
PCE Concentration (ug/L)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.69
0.00
4.00
9.29
2.28
0.87
1.38
0.63
0.69
Installation of Cover
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Year
Average PCE Concentration (ug/L)
Cleanup Level Tetrachloroethene


Average Annual PCE Concentrations at MW-17SR
2000 - 2019
Max. Hist. PCE Conc. = 5.6 ug/L
2.16
1.00
0.34
0.16
0.20
0.69
Installation of Cover
PCE Concentration (ug/L)
Year
Average PCE Concentration (ug/L)
Cleanup Level Tetrachloroethene


Average Annual PCE Concentrations at MW-22S
2000 - 2019
Max. Hist. PCE Conc. = 1.5 ug/L
1.00
0.82
No Data Measurements
2008 - 2011
0.16
0.05
0.20
0.69
Installation of Cover
PCE Concentration (ug/L)
Year
Average PCE Concentration (ug/L)
Cleanup Level Tetrachloroethene

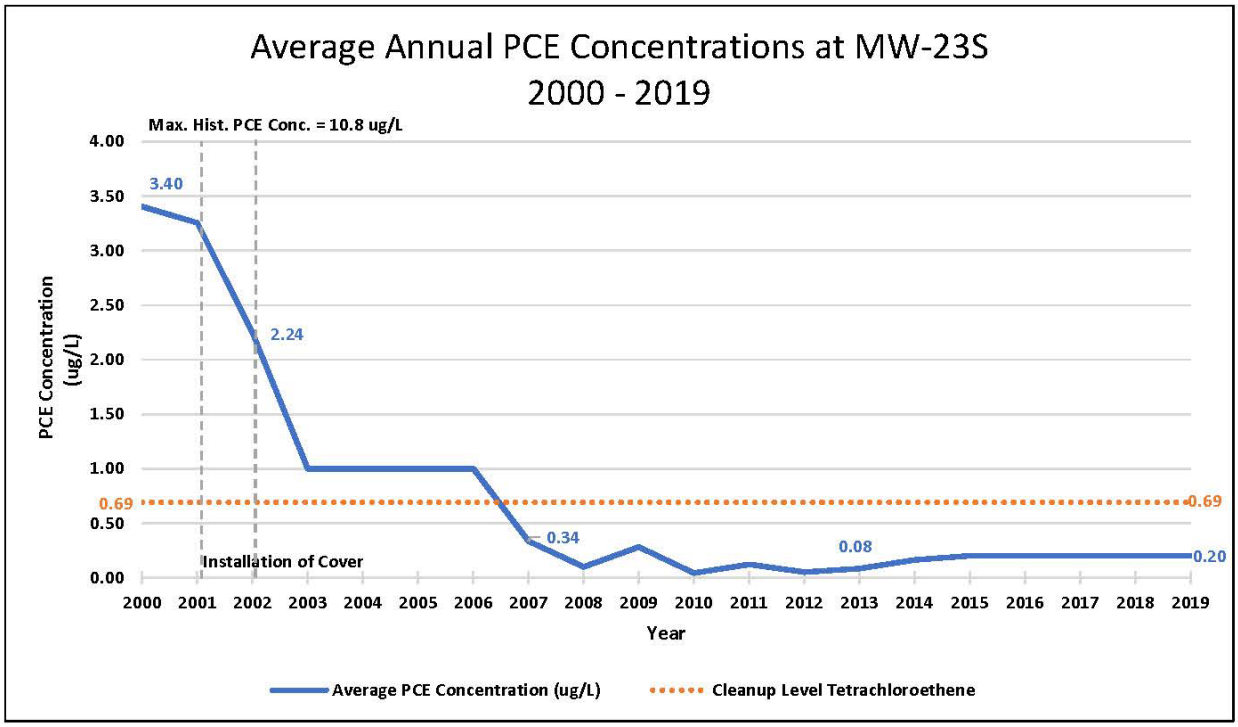

Average Annual PCE Concentrations at MW-23S
2000 - 2019
Max. Hist. PCE Conc. = 10.8 ug/L
PCE Concentration (ug/L)
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.69
0.50
0.00
3.40
2.24
0.34
0.08
0.20
0.69
Installation of Cover
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Year
Average PCE Concentration (ug/L)
Cleanup Level Tetrachloroethene

EXHIBIT 7

Annual MSW Landfill Cover Inspections
Natural Disturbances

No stormwater erosion or settlement has ever been observed during any MSW Landfill Cover Inspection. Regular wind erosion has required minor repairs to the soil and vegetative cover on three occasions (following inspections in 2006, 2012 and 2017). No other repairs have been required during the period for which Annual MSW Cover Inspection data was available (2005 - 2018).

Year	Date	Wind Erosion	Stormwater Erosion	Settlement	Sparse Vegetation	Distressed Vegetation	Repairs Required?	Comments on Required Repairs
2005	04/14/05	Yes	No	No	Yes	No	No	N/A
2006	05/02/06	Yes	No	No	Yes	No	Yes	Repairs for wind erosion: wind erosion down to the geotextile in 3 places: on the south side between EW-11 and EW-20, between HC-1 and EW-9, and uphill of EW-13
2007	04/12/07	Yes	No	No	Yes	No	No	N/A
2008	04/30/08	Yes	No	No	Yes	No	No	N/A
2009	05/01/09	Yes	No	No	Yes	No	No	N/A
2010	05/28/10	Yes	No	No	Yes	No	No	N/A
2011	05/20/11	Yes	No	No	Yes	No	No	N/A
2012	05/24/12	Yes	No	No	Yes	No	Yes	Repairs for wind erosion: three foot diameter area eroded down to the geotextile, 50 feet SW of EW-11
2013	12/11/13	Yes	No	No	Yes	No	No	N/A
2014	12/11/14	Yes	No	No	Yes	No	No	N/A
2015	12/10/15	Yes	No	No	Yes	No	No	N/A
2016	12/15/16	Yes	No	No	Yes	No	No	N/A
2017	12/05/17	Yes	No	No	Yes	No	Yes	Repairs for wind erosion: soil cover eroded to the fabric in a small area above the drainage layer on the ridge at the SE corner of the Landfill.
2018	12/04/18	Yes	No	No	Yes	No	No	N/A

Source: Annual Reports, Pasco Municipal Solid Waste Disposal Areas, 2005 - 2018

EXHIBIT 8

No differential settlement has occurred at the MSW Landfill since the cover was installed in 2002. The topography at the MSW landfill has remained the same, and no indentations or collapses in the landfill cover have ever been observed.

Photo of portion of MSW Landfill cover in 2010

Photo of same portion of MSW Landfill cover in 2019

EXHIBIT 9

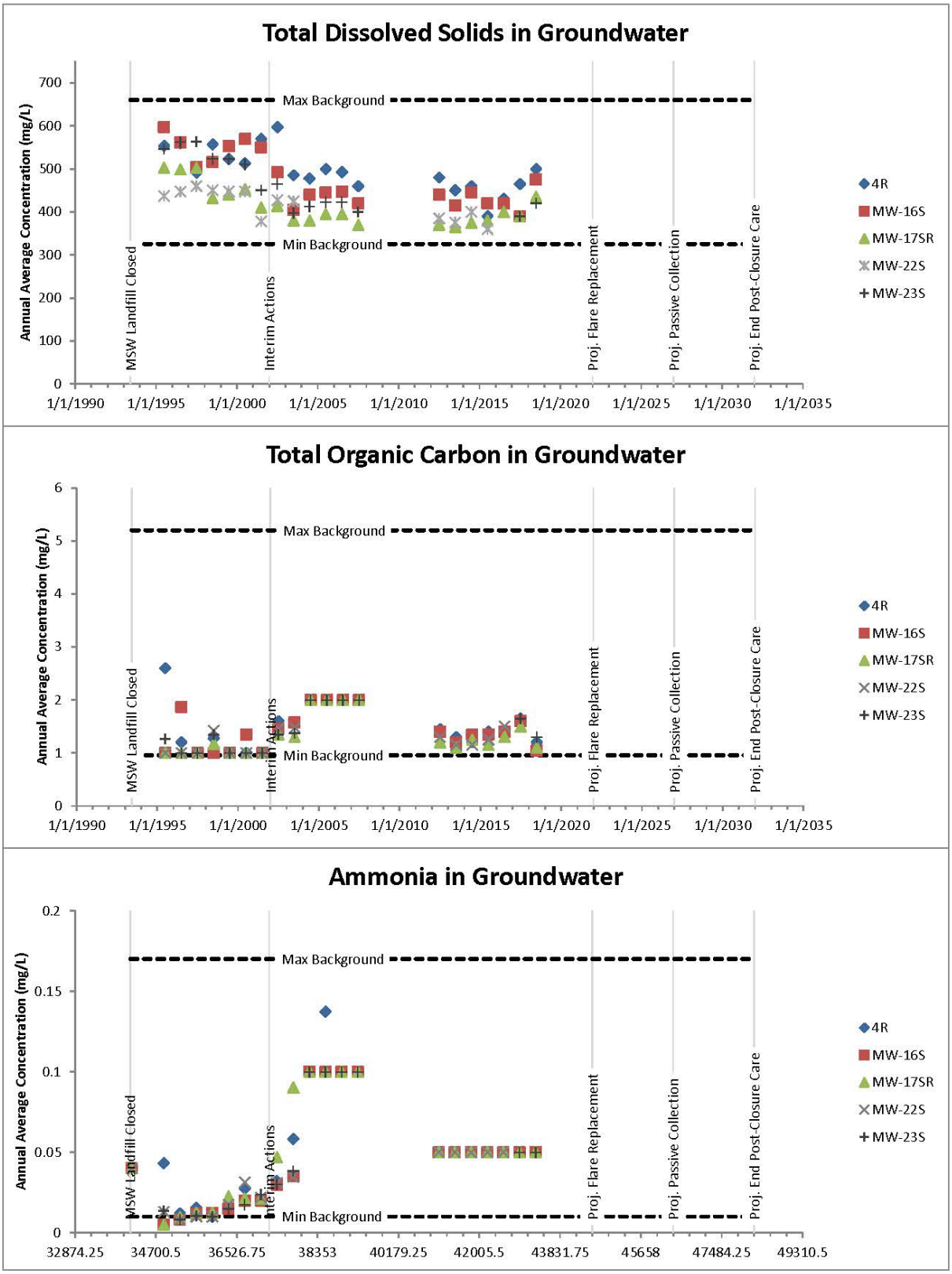

Total Dissolved Solids in Groundwater
Annual Average Concentration (mg/L)
Max Background
Min Background
MSW Landfill Closed
Interim Actions
Proj. Flare Replacement
Proj. Passive Collection
Proj. End Post-Closure Care
4R
MW-16S
MW-17SR
MW-22S
MW-23S
Total Organic Carbon in Groundwater
Annual Average Concentration (mg/L)
Max Background
Min Background
MSW Landfill Closed
Interim Actions
Proj. Flare Replacement
Proj. Passive Collection
Proj. End Post-Closure Care
4R
MW-16S
MW-17SR
MW-22S
MW-23S
Ammonia in Groundwater
Annual Average Concentration (mg/L)
Max Background
Min Background
MSW Landfill Closed
Interim Actions
Proj. Flare Replacement
Proj. Passive Collection
Proj. End Post-Closure Care
4R
MW-16S
MW-17SR
MW-22S
MW-23S

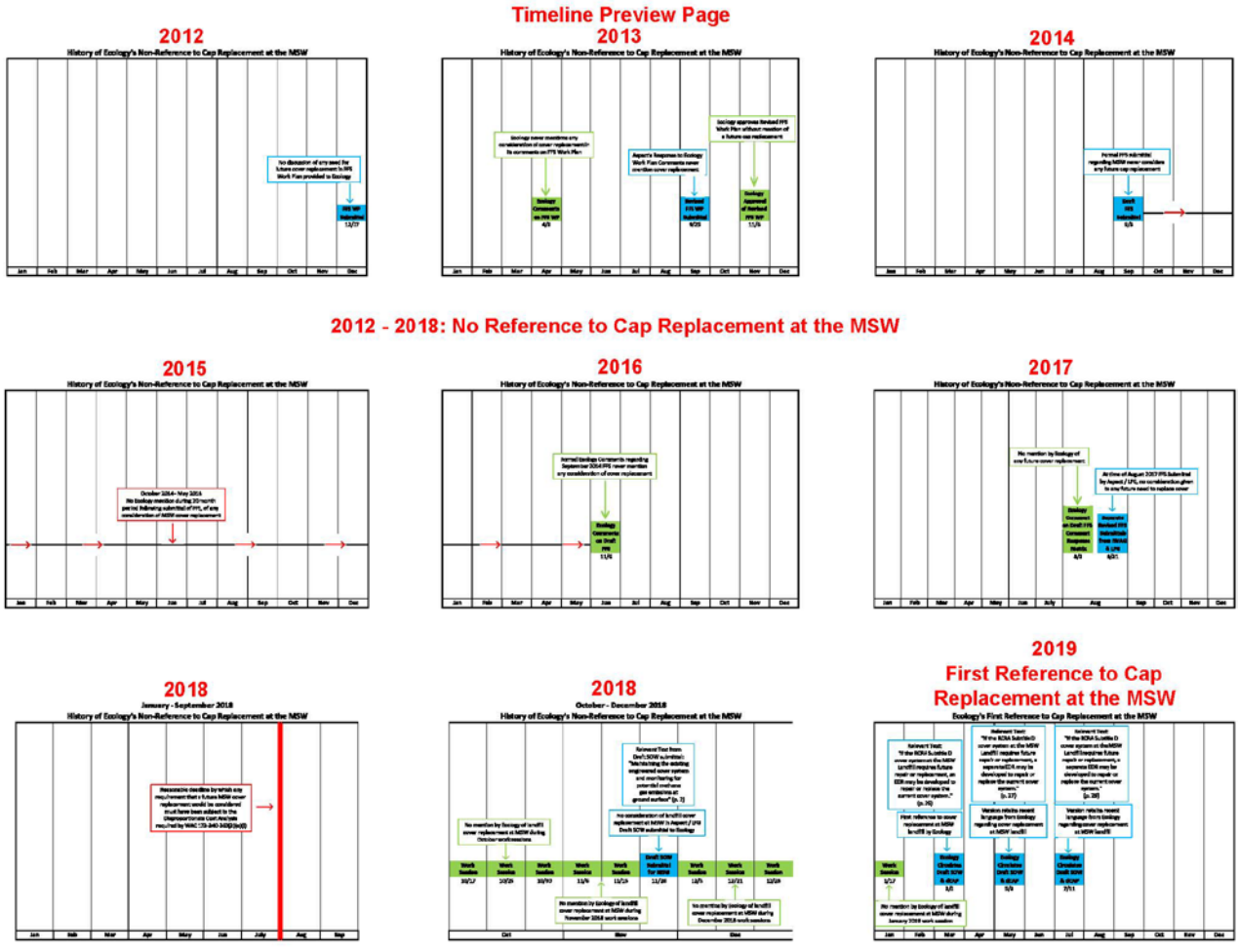
EXHIBIT 10

Inventory of Landfills from Ecology's Confirmed and Suspected Contaminated Sites List at which Geomembrane Caps were Installed in Response to Groundwater Contamination

NO LANDFILL COVER HAS EVER BEEN REPLACED, NOR HAS THERE EVER BEEN A REQUIREMENT FOR FUTURE REPLACEMENT, AT THESE WASHINGTON STATE LANDFILLS

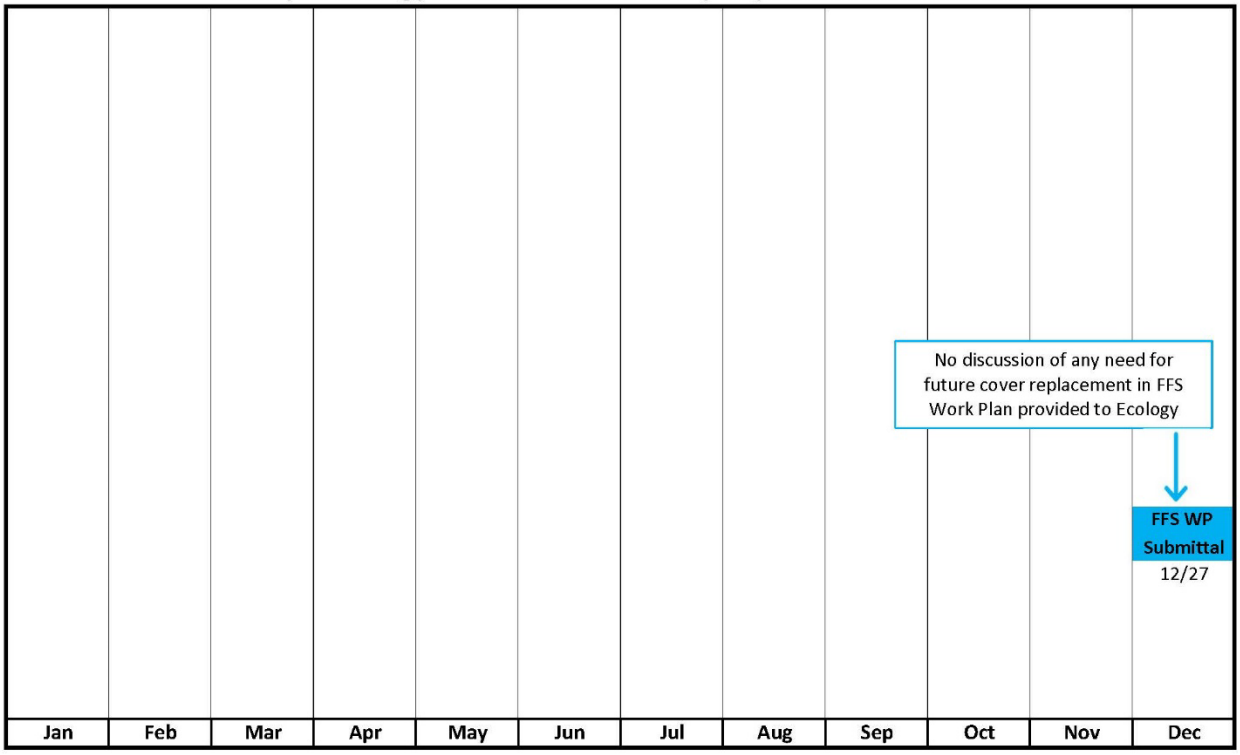
Cleanup Site ID	Site Name	County	Site Discovery OR Investigation / NPL Designation
7027	Cedar Hills	King	1992
2657	Centralia Landfill	Lewis	1990 / 1991
3035	Colbert Landfill	Spokane	1984
220	Cornwall Avenue Landfill	Whatcom	1992 / 1992
1308	Enumclaw Landfill	King	1988
1692	Grant County Ephrata Landfill	Grant	1984 / 1990
1019	Greenacres Landfill	Spokane	1987 / 1990
695	Hansville Landfill	Kitsap	1987 / 1991
3649	Hidden Valley Landfill	Pierce	1985 / 1990
3153	Inman Landfill	Skagit	1990
4428	Kent Highlands Landfill	King	1987 1990 / 1990
3019	Leichner Brothers Landfill	Clark	1987 1990 / 1990
1020	Mica Landfill	Spokane	1984 / 1990
2500	Northside Landfill	Spokane	1988 / 1990
4217	Olympic View Sanitary Landfill	Kitsap	1993 / 1993
4061	Ryegrass Landfill	Kittitas	1998 / 1998
4729	Seattle Public Utilities Midway Landfill	King	1990 / 1990
1183	Southside Landfill	Spokane	1984 / 1985
654	Tacoma Landfill	Pierce	1986 / 1995
1146	Vashon Island Landfill	King	1988
585	WA ECY Manchester Lab	Kitsap	1994 1995 / 1995
4087	Waste Management Greater Wenatchee Landfill	Douglas	1988
947	Wilder Landfill	Whatcom	1990 / 1990

EXHIBIT 11


Timeline Preview Page
2012
History of Ecology's Non-Reference to Cap Replacement at the MSW
2013
History of Ecology's Non-Reference to Cap Replacement at the MSW
2014
History of Ecology's Non-Reference to Cap Replacement at the MSW
2012 - 2018: No Reference to Cap Replacement at the MSW
2015
History of Ecology's Non-Reference to Cap Replacement at the MSW
2016
History of Ecology's Non-Reference to Cap Replacement at the MSW
2017
History of Ecology's Non-Reference to Cap Replacement at the MSW
2018
January - September 2018
History of Ecology's Non-Reference to Cap Replacement at the MSW
2018
October - December 2018
History of Ecology's Non-Reference to Cap Replacement at the MSW
2019
First Reference to Cap Replacement at the MSW
Ecology's First Reference to Cap Replacement at the MSW

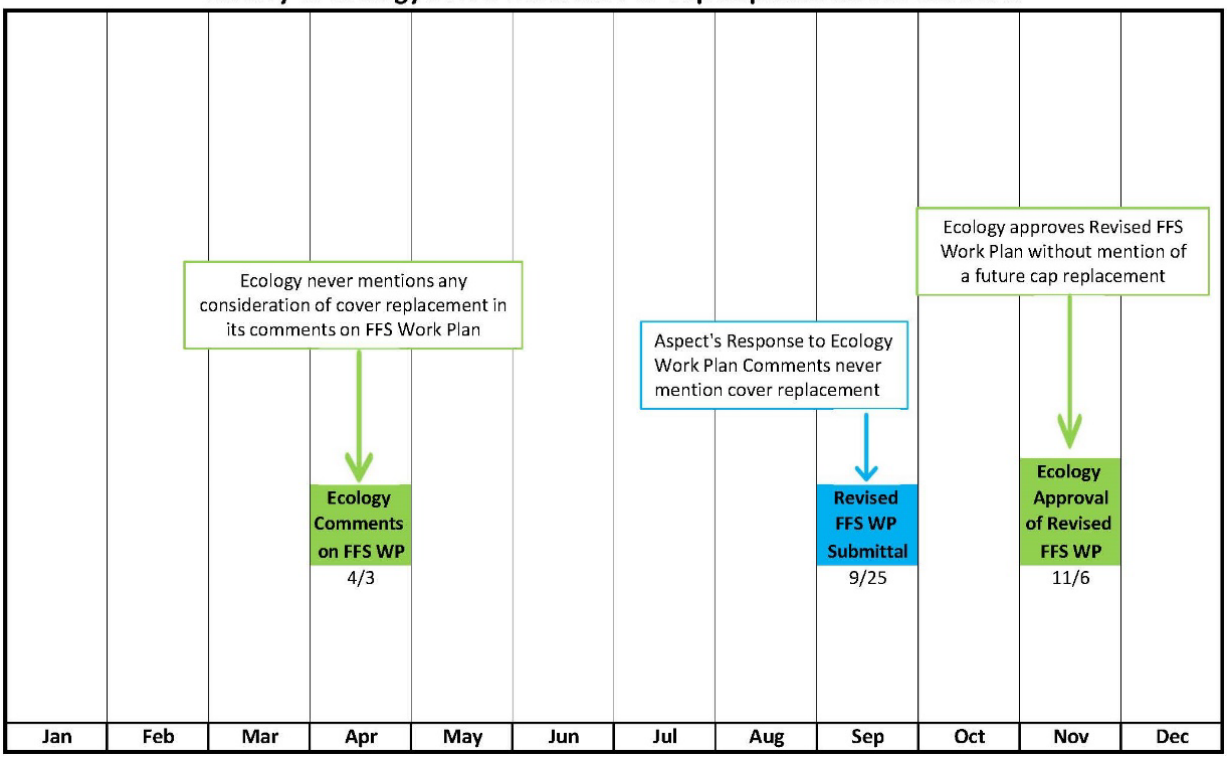
2012

History of Ecology's Non-Reference to Cap Replacement at the MSW



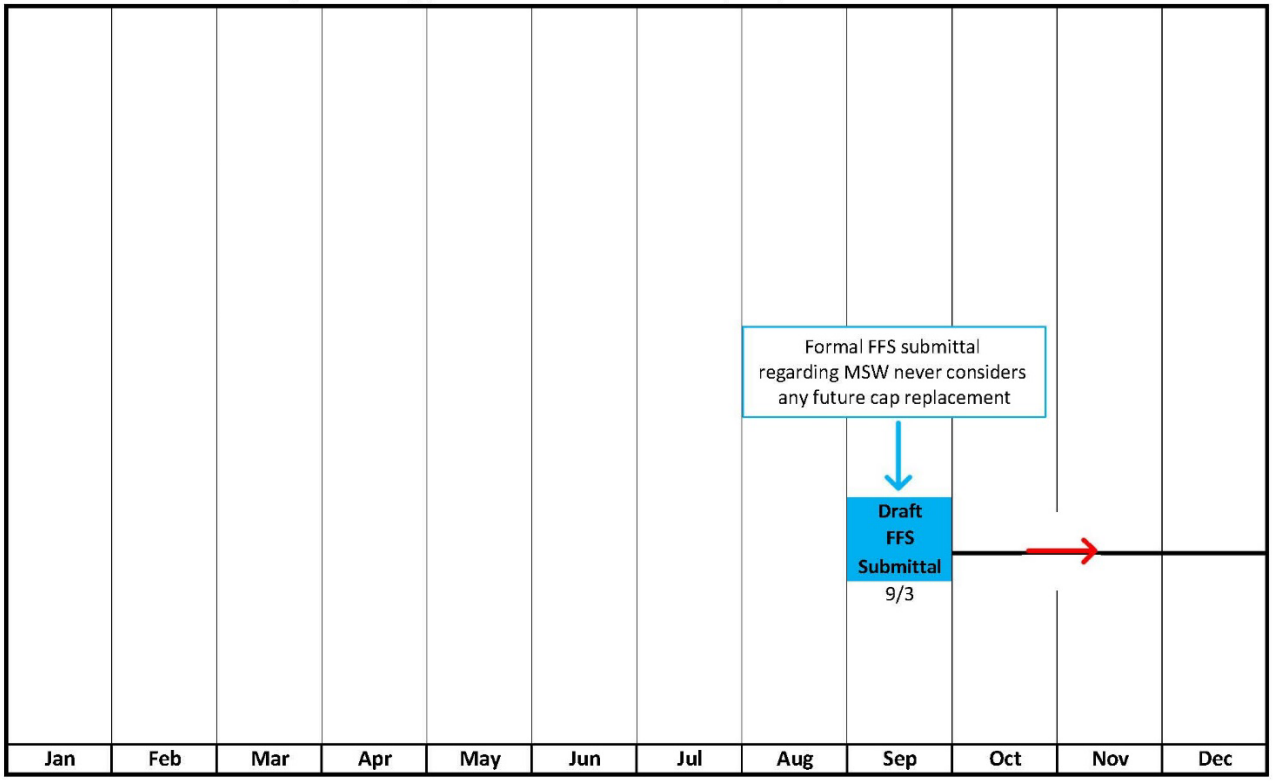
2013

History of Ecology's Non-Reference to Cap Replacement at the MSW



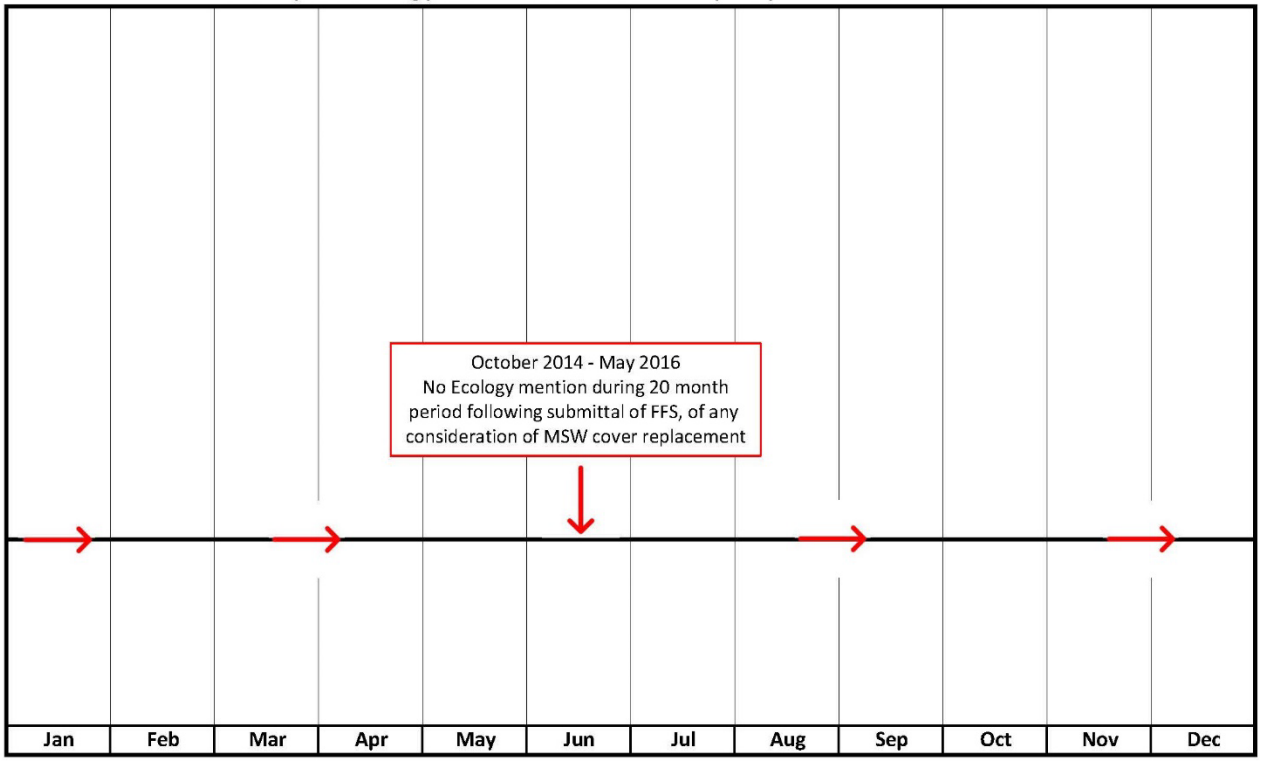
2014

History of Ecology's Non-Reference to Cap Replacement at the MSW



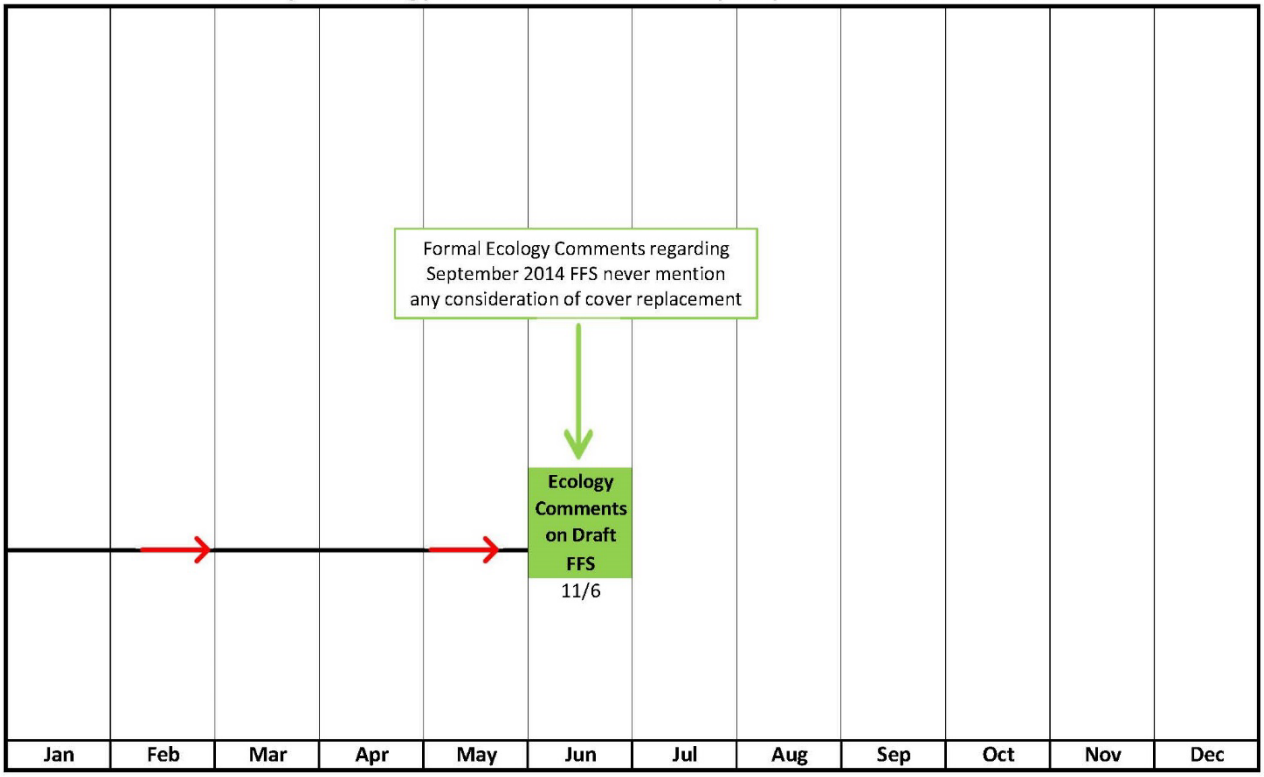
2015

History of Ecology's Non-Reference to Cap Replacement at the MSW



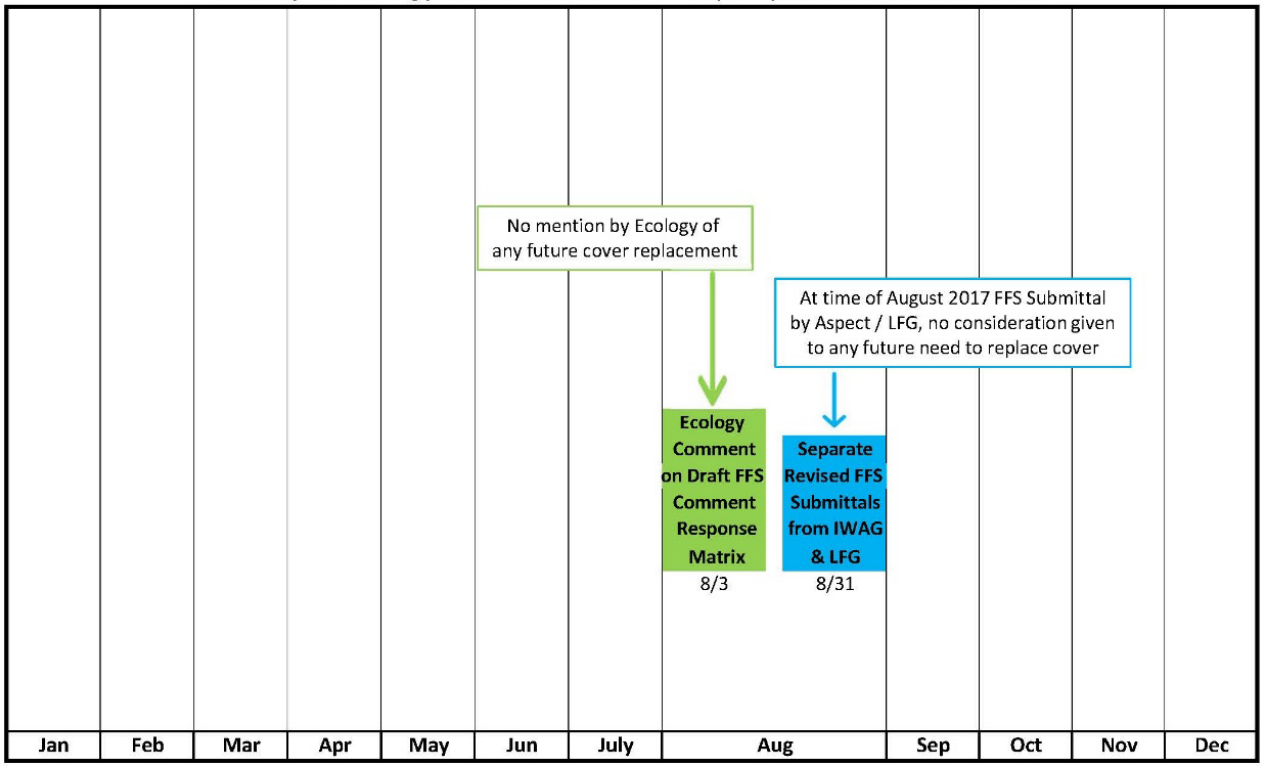
2016

History of Ecology's Non-Reference to Cap Replacement at the MSW



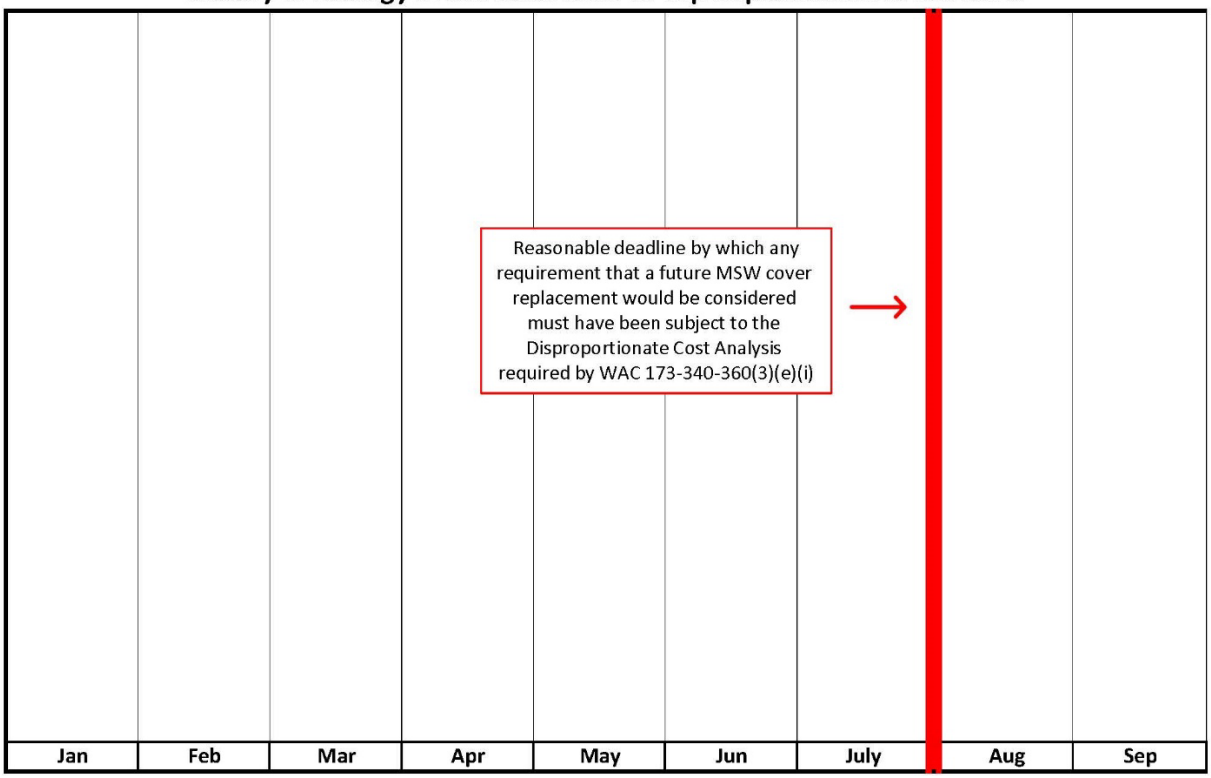
2017

History of Ecology's Non-Reference to Cap Replacement at the MSW



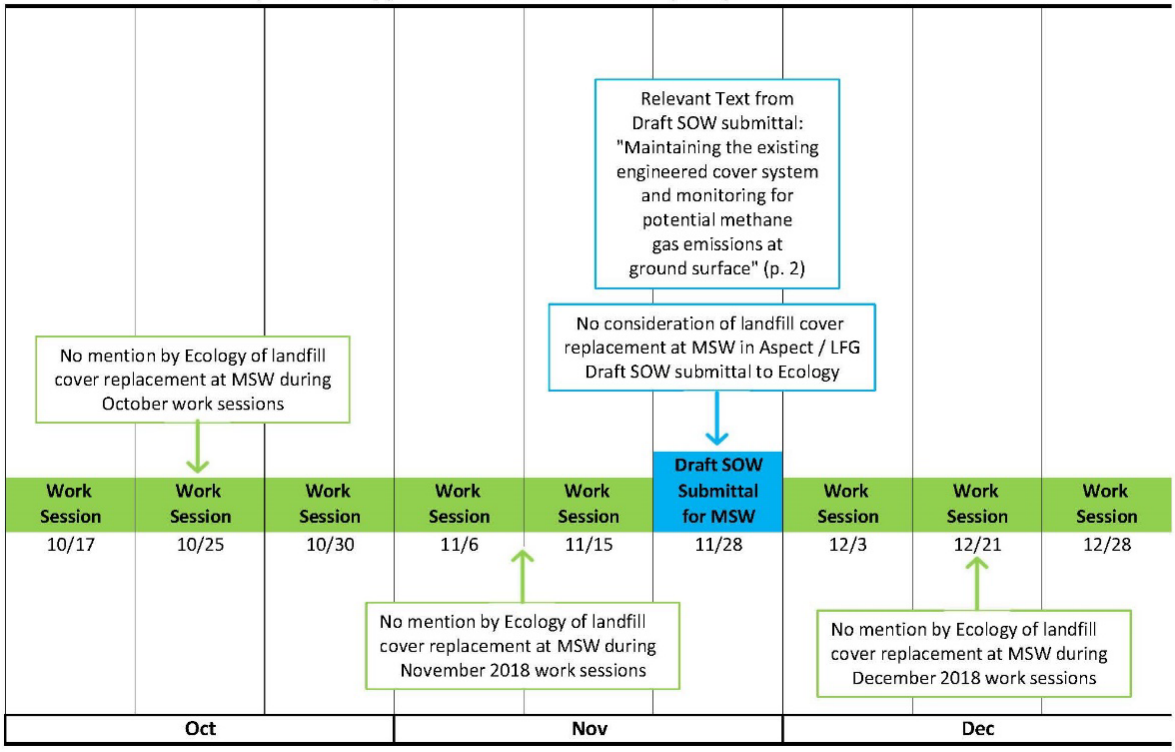
January - September 2018

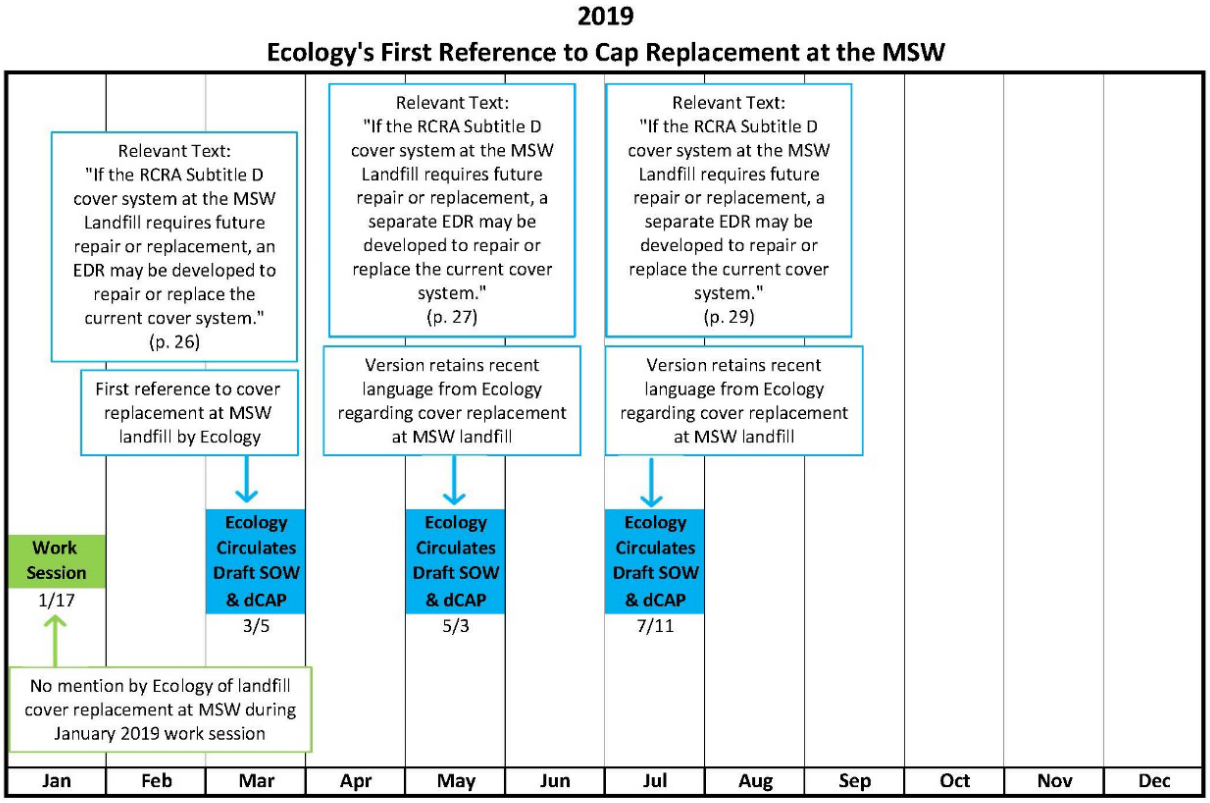
History of Ecology's Non-Reference to Cap Replacement at the MSW



October - December 2018

History of Ecology's Non-Reference to Cap Replacement at the MSW





Ecology's response:

General statement regarding Basin Disposal, Inc. and Pasco Sanitary Landfill Inc. comments

The commenters' use of hyperbole and speculation diminishes the true, known condition of the MSW Landfill cover, its expected long-term performance, and associated environmental conditions that exist now, and may exist in the future. Ecology's Cleanup Action Plan requires destructive testing of small samples of the MSW Landfill geomembrane every 10 years. These sampling and testing requirements have been added to provide direct, empirical information about the cover system's ongoing geotechnical integrity, and chemical resistance to progressive chemical, physical, and biological degradation.

The final cleanup remedy for the unlined MSW Landfill involves long-term containment of wastes. The wastes are expected to remain in their current contained configuration "in perpetuity," or until future land use decisions favor an alternative use or management strategy for this landfill area. Ecology cannot project or hypothesize the containment timeframe for the MSW Landfill wastes. Similarly, we cannot assume the future performance and integrity of the existing cover system without defensible, substantive, empirical evidence.

The cleanup remedy for the MSW Landfill involves the long-term containment of waste materials deposited over 30+ years of active landfilling. The remedial action objectives and long-term performance requirements of the selected remedy rely on the understanding that the integrity and functionality of the cover system will be maintained in perpetuity. Various wastes within the landfill interior could become subject to leaching and pose a potential threat to groundwater if cover system performance diminishes over time. Ecology's requirement to periodically examine, through selective testing, the physical and chemical characteristics of the cover system geomembrane, provides (in addition to other monitoring information) another line of direct, empirical evidence to confirm cover system performance.

MTCA, RCW 70.105D.101(2) states, "many of our municipal landfills are current or potential hazardous waste sites and present serious threats to human health and the environment." Conditions at the Pasco Landfill site have posed, and continue to pose, adverse threats to human health and the environment. The final cleanup remedy for the site, and for the MSW Landfill in particular, seeks to minimize potential threats to human health and the environment permanently.

MTCA further recognizes the importance of all land in Washington state, and the desire to minimize releases of hazardous substances to air, land, and water that can adversely affect the health and welfare of the public, the environment, and property values. RCW 70.105D.101(4) specifically notes:

> "It is in the public's interest to efficiently use our finite land base, to integrate our land use planning policies with our clean-up policies, and to clean up and reuse contaminated industrial properties in order to minimize industrial development pressures on undeveloped land and to make clean land available for future social use."

Ecology's requirement to periodically sample and test the MSW Landfill cover system is a reasonable verification process for a cleanup remedy involving long-term isolation of waste containing a variety of residual hazardous substances. Similar geomembrane sampling and testing requirements will apply to the interim cover systems installed at zones B, C/D, and E. The commenters mistakenly imply the whole cover system would be replaced in response to the required geomembrane testing. Complete cover system replacement would only be required if the associated testing and related cover system evaluation were to demonstrate a catastrophic failure of the entire cover system. Ecology does not think it's likely this will occur at the MSW Landfill or other interim action cover systems.

Ecology strongly disagrees with the commenters' inferences that we modified our expectations associated with long-term management obligations of each PLP, including those entities responsible for the MSW Landfill, after the FFS process was completed. Ecology has consistently presented its views about the need to ensure the

long-term performance and integrity of any containment-based remedial alternatives. Any suggestions to the contrary are inaccurate and misrepresent MTCA cleanup goals and expectations. Ecology does not plan to modify the current sampling and testing requirements for the MSW Landfill in response to the comments received.

Responses to specific Basin Disposal, Inc. And Pasco Sanitary Landfill, Inc. comments

The MSW Landfill geomembrane condition at the time of installation represents an important baseline for gauging the anticipated long-term performance of a cover system. This singular metric, however, is insufficient to demonstrate the long-term performance of the cover system following exposure to physical, chemical, and biological factors inherent to the landfill environment.

Simply relying on manufacturer's warranty and literature evaluations is insufficient to verify the long-term cover system performance, including the life expectancy of the geomembrane.

Ecology believes the MSW Landfill cover system and associated engineering controls have been operating according to overall performance expectations and requirements of the existing Agreed Order. That said, past performance of the interim action cover system cannot be used as a singular indicator of the cover system's expected future performance. All engineered systems have a finite service life. With or without the required sampling and testing of the cover system geomembrane, the PLPs responsible for the MSW Landfill will need to manage this containment remedy in perpetuity. This will include routine monitoring of groundwater, routine monitoring of landfill gas generation rates over time, ground settlement, and the potential for fugitive gas emissions to the atmosphere. Demonstrating "functional stability" will provide the basis to reassess long-term monitoring requirements, but does not eliminate the PLPs long-term management obligations for the MSW Landfill, including (but not limited to) confirming cover system integrity and functionality.

Volatile organic compounds (VOCs) are still present in the landfill wastes as evidenced by their continued migration to groundwater. Existing VOC concentrations have declined to levels at or near the established groundwater cleanup levels. This is a favorable demonstration of the effectiveness of the interim action remedy. Uncertainty exists, however, about the quantity of VOCs and other residual hazardous substances that are still in the MSW. Routine testing of the cover system geomembrane will help gauge its long-term performance. A fully functioning cover system will help ensure that only minimal quantities of residual organic and inorganic contaminants leach and migrate to groundwater over the years ahead.

Ecology agrees that the MSW Landfill does not appear to have experienced a significant degree of differential settlement based on existing visual observations of

cover system topography. The amount of distributed areal settlement since the cover system was installed in 2001 has not been documented by the PLPs. Surface-based visual observations alone are insufficient to assess potential impacts to the cover system over its' 18+ years of service. All cover systems experience some degree of strain from the construction and post-installation settlement processes. The required geomembrane testing would provide empirical evidence to confirm the integrity and performance of the MSW Landfill cover system more directly.

Statements about groundwater quality conditions immediately downgradient of the landfill margins and suggesting that past or current groundwater quality conditions are solely attributable to upgradient land use are inaccurate and inconsistent with existing data. Demonstrable changes in groundwater quality have been, and continue to be, evident in areas downgradient from the landfill (including both organic and inorganic constituents). Some finite quantity of landfill leachate has, and is, influencing groundwater quality in the immediate vicinity of the landfill. Questions remain about whether some wastes near the north end of the landfill are in direct contact with groundwater. These conditions would become even more pronounced if cover system integrity were adversely affected and greater quantities of infiltrating precipitation moved into, and interacted with, the landfill wastes.

Robert Lowry, BNSF Railway

From: Robert B. Lowry <RLowry@kelrun.com>
Sent: Thursday, October 3, 2019 5:00 PM
To: Gruenenfelder, Charles (ECY) <CHGR461@ECY.WA.GOV>
Subject: BNSF Public Comment - Pasco Landfill NPL Site, Facility Site ID 575, Cleanup Site ID 1910

Dear Mr. Gruenenfelder:

This email provides additional comment on behalf of BNSF Railway Company (BNSF) on Ecology's draft Consent Decree, draft Enforcement Order, draft Cleanup Action Plan (dCAP), and draft Scope of Work (SOW) concerning the Pasco Landfill NPL Site, Ecology Facility Site ID 575 and Cleanup Site ID 1910 (Draft Documents). BNSF has received a copy of an October 3, 2019 letter submitted to you today by Basin Disposal, Inc. (Basin) and Pasco Sanitary Landfill, Inc. (PSLI) providing their comments on the Draft Documents (Basin/PSLI Letter). Without commenting for present purposes on the Basin/PSLI Letter's first paragraph in the "BACKGROUND FACTS section," BNSF Railway Company concurs with the other points made in that letter and also urges Ecology to revisit and remove wording in the Draft Documents concerning MSW cover replacement and laboratory testing of the MSW disposal areas cover system geomembrane.

We add that the August 31, 2017 *Revised Draft Focused Feasibility Study Report Pasco Sanitary Landfill National Priorities List Site – MSW Disposal Areas* (MSW FFS) stated that the anticipated life of the Municipal Solid Waste (MSW) areas cover system is greater than 100 years, citing Koerner et. al., 2011, and that the cover system does not need to be replaced. (MSW Final FFS at 37). Ecology did not ask for any revisions to the MSW FFS. In September 2018 Ecology posted the MSW FFS for public comment together with an Ecology Fact Sheet which summarized the remedial actions Ecology proposed for the MSW disposal areas (the Fact Sheet also separately summarized the industrial waste areas). The summarized MSW remedial actions proposed by Ecology were the preferred cleanup actions described in the MSW FFS. Ecology received no public comments concerning the MSW disposal areas at that time and issued no response after the comment period that addressed the MSW disposal areas (Ecology issued a response to public comments that were limited to the separate industrial waste area Zone A which was the subject of a different FFS submitted by other PLPs).

As detailed in the Basin/PSLI Letter and its Exhibit 11, it was not until March 2019 that Ecology first included any wording regarding cover replacement at the MSW areas. Ecology made no mention of any MSW geomembrance laboratory testing until the June PLP technical meeting and a revised draft SOW which Ecology circulated after that meeting. As far as BNSF knows, there have been no MSW disposal areas changes in conditions which have caused Ecology to add either potential cover replacement or geomembrance testing to the Draft Documents, and at no time has Ecology performed or requested input on a cost analysis, disproportionate or otherwise, regarding either MSW cover replacement or MSW geomembrane testing.

It is for these reasons, which could be developed in greater detail, that BNSF continues to urge Ecology to revisit and remove wording in the Draft Documents concerning MSW cover replacement and laboratory testing of the MSW disposal areas cover system geomembrane.

Thank you for Ecology's consideration and the opportunity to comment.

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Ecology's response: Section 6.1 of the Cleanup Action Plan describes the selected cleanup action for the MSW Landfill. The second-to-last paragraph states the following:

> "To confirm the long-term integrity and functionality of the cover system, routine inspection and geotechnical/material testing analysis will be required. Any destructive testing of the cover system geomembrane would occur with subsequent periodic reviews."

Ecology is requiring routine operations and monitoring of the existing MSW Landfill cover system. This includes periodic sampling and testing of the geomembrane to confirm its long-term performance and integrity over time. The selected containment remedy for the MSW Landfill assumes full functionality of the cover system in perpetuity. Assuming the periodic geotechnical/material testing (and other routine cover system evaluation metrics) confirm the operational integrity and functionality of the cover system, no further actions would be required. If localized areas of cover system damage or degradation were identified, Ecology would work with the PLPs to develop an appropriate and cost-effective repair strategy. Please also see our response to Katherine Page (page 68).

Tiger Moon

1. Remedial action in place is to cover the area with impermeable barrier. The barrier will stop VOCs from escaping to air. Accumulation of VOCs in soil could trigger explosion in the future under favorable climate condition. How is this potential explosion hazard addressed?
2. Adjacent farm uses irrigation of crop land. Was any of this irrigation investigated if it uses ground water?

Ecology's response:

1. At the present and continuing during drum and waste removal, the SVE system is collecting VOCs from soil, and they are treated on-site at a regenerative thermal oxidation unit. After the drums and associated waste are removed, the remaining contaminated soil will be thermally treated. The soil will be heated to volatilize the residual VOCs, which will be captured by newly installed vapor extraction wells and treated on-site. When thermal treatment is complete, the SVE system may be restarted to remove remaining VOCs, if necessary. These engineering controls should address any potential explosion hazard from VOCs in soil.
2. Yes, some nearby farms use groundwater for irrigation. The areal extent of the groundwater contamination associated with the site is well defined, and no farms are irrigating with groundwater that exceeds site-specific groundwater cleanup levels. In addition, the groundwater cleanup levels are currently being met in all off-property wells.

Katherine Page, Industrial Waste Area Group III (IWAG)

INDUSTRIAL WASTE AREA GROUP III ("IWAG")
FOR THE PASCO SANITARY LANDFILL NPL SITE

COMPRISED OF: 3M Company; Blount, Inc.; The Boeing Company; Crown Beverage Packaging, LLC; Daimler Trucks North America LLC; Georgia-Pacific LLC; Goodrich Corporation; Intalco Aluminum Corporation; PACCAR Inc.; PCC Structurals, Inc.; Pharmacia LLC; PPG Architectural Coatings Canada, Inc.; Simpson Timber Company; Union Oil Company of California; and Weyerhaeuser NR Company

BY IWAG STEERING COMMITTEE CO-CHAIRS:

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September 26, 2019

VIA EMAIL (PDF)

Mr. Chuck Gruenenfelder, LG, LHG
Project Manager, Toxics Cleanup Program
Washington Department of Ecology
Eastern Regional Office
4601 North Monroe Street
Spokane, WA 99205-1295

Re: **Pasco Sanitary Landfill NPL Site**
IWAG Comments on August 2019 Cleanup Action Plan

Dear Mr. Gruenenfelder:

This letter provides the Industrial Waste Area Generator Group III ("IWAG") response to the Washington Department of Ecology ("Ecology") invitation for public comment on the documents prepared for the Pasco Sanitary Landfill NPL Site (the "Site"), which describe the final remedial actions for the Site. The documents consist of the August 2019 Cleanup Action Plan, legal documents (Consent Decree and/or Enforcement Order), the accompanying Exhibit C: Pasco Sanitary Landfill NPL Site Scope of Work and Schedule, and other relevant information. On behalf of the IWAG, we provide the following comment pertaining to the Scope of Work.

{JZS2014299.DOCX;2/01342.000001/ }

September 26, 2019

I. **IWAG Comment regarding laboratory testing of the, to be installed, Zone A geomembrane and the existing Zones C/D and E geomembranes.**

Task A.8., Submitting a Zone A O&M Plan, item G, and Task B.1., Submitting a Zones C/D and E O&M Plan, item g, include the following requirement:

Performing laboratory testing of the cover system geomembrane at least once every 10 years to confirm long-term performance and compliance with design requirements. Specific testing methods will align with the 2015 Geosynthetic Institute White Paper #32, and/or other state-of-practice testing requirements recognized by EPA or other state agencies for evaluating the long-term integrity and functionality of cover system geomembranes.

This task requires laboratory testing of the cover system geomembranes for the Industrial Waste Areas (IWAs) at least once every 10 years to confirm long-term performance and compliance with design requirements. In support of this requirement, Ecology cites Geosynthetic Institute White Paper #32. The White Paper describes the rationale of selecting the relevant test methods and the background for establishing specified values for an HDPE liner. The performance testing cited is typically applied during cover system installation as part of construction quality control and assurance. The IWAG acknowledges it is standard practice to conduct the performance testing noted in the Geosynthetic Institute White Paper #32 (and associated GRI-GM13 Standard) with Oxidation Induction Time (ASTM D3895 and ASTM D5885) and UV Resistance (GM11 and ASTM D5885) during cover installation. The testing above is commonly used as part of the cover system installation Quality Control and Quality Assurance process, and involves sampling every 100,000 square feet of placed liner or one sample per each resin batch.

Ecology's Scope of Work requires a non-standard application of this testing to be performed post-construction to assess on-going performance of the geomembrane. Such an application is beyond the scope of the White Paper. By its clear terms, the purpose of the White Paper is to describe specifications for geomembrane manufacturing quality control. Ecology assumes without any evidence that a set of test methods that is appropriate for a newly manufactured geomembrane is also appropriate for a decades-old liner.[1]

We are not aware of other sites where this post-construction testing was required. Laboratory testing has the potential to negatively impact geomembrane condition and performance. It requires the destructive cutting and collection of samples, resulting in additional welds and seams, which create additional points of vulnerability in the geomembrane.

[1] Regarding long term durability, the authors of the White Paper observe, "The vast majority of geomembranes, however, are covered and backfilled. Twenty year warrantles do not even begin to challenge the potential lifetime for HDPE geomembrane durability. Depletion of antioxidants alone should reach 200 years depending on site temperature, and this is only the first stage in the aging process, e.g., see Hsuan and Koerner, 1998." White Paper #32 at page 26.

In order to meet Ecology's intent while diminishing the risk of cutting into the geomembrane, IWAG recommends required laboratory testing only when monitoring results indicate a potential integrity or functionality issue, such as differential settlement over an area in excess of the liner elongation percentage at yield, rather than destructive testing without any field indicators of performance concerns.

Thank you for consideration of this comment.

Jennifer L. Sanscrainte
Counsel for Daimler Trucks North America LLC

Katie Page
Counsel for The Boeing Company

JLS:

cc: All-IWAG Members

Ecology's response: While we are requiring physical testing of geomembranes to confirm cover integrity every 10 years *after* the cover system design life of 30 years is exceeded, it is important to note this requirement was not based on the Geosynthetic lnstitute White Paper #32 (White Paper). Rather, the White Paper offers examples of physical testing procedures that could be used to verify geomembrane integrity. The physical tests required are appropriate to determine the cover's current and potential long-term performance. Ecology's requirement to complete geomembrane physical testing to confirm cover integrity every 10 years *after* the cover system design life is exceeded is based on the following rationale:

- The U.S. Environmental Protection Agency's (EPA) declaration that, at Resource Conservation and Recovery Act (RCRA) C disposal facilities, "A viable cover is the most important mechanism in preventing leachate generation and, ultimately, releases of contaminants. Cracks, burrows from animals, and other problems are likely to occur after termination of post-closure care. If testing and inspection end, problems can go undetected and releases could occur. Thus, it is vital to evaluate the performance of the cover system during the post-closure care period." "Memorandum: Guidelines for Evaluating the Post-Closure Care Period for Hazardous Waste Disposal Facilities under Subtitle C of RCRA[11]," EPA, December 15, 2016

[11] https://www.epa.gov/sites/production/files/2017-01/documents/pcc_guidance_508_withdateandletterhead.pdf

- Given the predominant VOC nature of contaminants contained in the industrial waste areas (IWAs), long-term degradation of the high-density polyethylene (HDPE) liners may not be recognized by obvious surface indicators.
- Given the information contained in the site record, Ecology assumes the waste and associated contaminated soil contained within the IWA repositories will be present for hundreds or even thousands of years. The cover system over each IWA is integral in protecting human health and the environment. The HDPE liners are the most important part of these cover systems, and their long-term integrity must be verified to demonstrate the selected remedy continues to be protective.
- Ecology recognizes that the required testing necessitates cutting and collecting samples from the intact HDPE liner. However, sample collection can be completed in the low-risk areas of the cover, and repairs will be performed and thoroughly tested for integrity as was completed during cover installation.