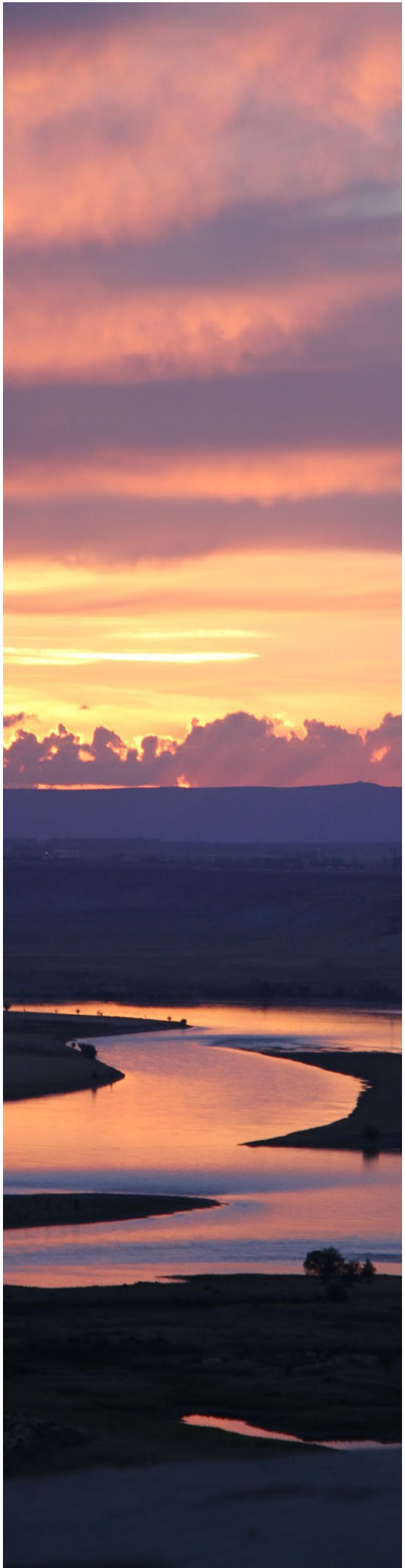

DEPARTMENT OF ECOLOGY
State of Washington

Response to Comments

Notice of Construction DE16NWP-003, Revision 1– Effluent Management Facility

June 18 – July 20, 2018

Summary of a public comment period and responses to comments

December 2019

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Response to Comments

Notice of Construction
DE16NWP-003, Revision 1

Effluent Management Facility

June 18 – July 20, 2018

Nuclear Waste Program
Washington State Department of Ecology
Richland, Washington

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Introduction

The Ecology's Nuclear Waste Program regulates air pollution sources at the Hanford Site. In particular, Ecology is the permitting authority for new or modified sources requiring new source review under WAC 173-400-110 on the Hanford Site.

When a new order or modification to an existing order is proposed, we may hold a public comment period to allow the public to review the change and provide formal feedback. (See WAC 173-400-171 for Public Notice and Opportunity for Public Comment requirements for approval of a notice of construction application.)

The Response to Comments is the last step before issuing the final order, and its purpose is to:

- Specify which provisions, if any, of a permit will become effective upon issuance of the final order, providing reasons for those changes.
- Describe and document public involvement actions.
- List and respond to all significant comments received during the public comment period and any related public hearings.

This Response to Comments is prepared for:

Comment period:	Effluent Management Facility June 18 through July 20, 2018
Order:	Non-Radioactive Air Emissions Notice of Construction Approval Order Conditions and Restrictions DE16NWP-003, Revision 1
Permittee(s):	United States Department of Energy
Issuance date:	December 20, 2019
Effective date:	December 20, 2019

To see more information related to the Hanford Site and nuclear waste in Washington, please visit our website: https://www.ecology.wa.gov/Hanford.

Reasons for issuing the order

The United States Department of Energy (USDOE) proposed to modify their existing facility (Hanford) located in Richland, Washington.

At Hanford, USDOE is engaged in a cleanup effort to address the waste resulting from decades of plutonium production. Much of the waste to be cleaned up is stored in underground tanks near the center of Hanford, several miles from any residence or agricultural land.

The waste in Hanford's tanks will be treated at the Waste Treatment Plant (WTP). USDOE submitted an application to modify the current approval order for the Effluent Management

Facility, DE16NWP-003, in support of the direct feed of low-activity waste configuration at the WTP. The proposed modification consists of an alternative condition for demonstrating dimethyl mercury emissions sampling compliance. The proposal is to perform monthly dimethyl mercury grab sampling instead of elemental mercury continuous emissions monitoring. The proposed approach does not result in an emissions increase and does not impact ambient air quality standards.

This Approval Order will approve the project proposed by the Permittee and describe conditions and restrictions they must meet.

Public involvement actions

Ecology encouraged public comment on the Notice of Construction DE16NWP-003, Revision 1 Effluent Management Facility during a 30-day public comment period held June 18 through July 20, 2018.

The following actions were taken to notify the public:

- Emailed a notice announcing the start of the comment period to the Hanford-Info email list, which has 1310 recipients.
- Placed a legal classified advertisement in the *Tri-City Herald* on June 17, 2018.
- Posted the comment period as an event on the Washington Department of Ecology – Hanford Facebook page

The following public notices for this comment period are in Appendix A of this document:

- Notice sent to the Hanford-Info email list
- Classified advertisement in the *Tri-City Herald*
- Event posted on the Washington Department of Ecology – Hanford Facebook page

List of Commenters

The table below lists the names of organizations or individuals who submitted a comment on the Notice of Construction DE16NWP-003, Revision 1. The comments and responses are in Attachment 1.

Commenter	Organization
Teresa M. Holt	Citizen
Mike Conlan	Citizen
Bill Green	Citizen
U.S. Department of Energy	Agency
Confederated Tribes of the Umatilla Indian Reservation	Tribe

Attachment 1: Comments and responses

Description of comments:

Ecology accepted comments from June 18 through July 20, 2018. This section provides a summary of comments we received during the public comment period and our responses, in accordance with WAC 173-400-171(7)(c). Comments are grouped by individual and each comment is addressed separately.

I-1: TERESA M. HOLT

Comment I-1-1

It is preferable that the current elemental mercury continuous emissions monitoring be continued. The current method allows more consistent and thorough monitoring that is less prone to breakdown, omission or manipulation.
Thank you.

Response to I-1-1

Dimethyl mercury is the specific toxic air pollutant (TAP) exceeding acceptable source impact levels (ASIL) and evaluated under a Second Tier Review in accordance with Washington Administrative Code (WAC) 173-460-090. The approval order requires a method to monitor emissions of dimethyl mercury to ensure it remains within the permitted limit.

Mercury continuous emissions monitoring cannot distinguish between different forms of mercury. The measurements taken from this monitoring system provides total mercury emission values. In the original permit all of the monitoring system's measurements were considered dimethyl mercury to demonstrate compliance with the permit. However, the EMF also emits elemental mercury. Due to the system evaluating total mercury emissions, this could lead to measurements above the dimethyl mercury permitted emission rate, even if the actual emissions of dimethyl mercury are less than the permitted emission rate. Without the ability to distinguish between different mercury compounds, the continuous emissions monitor does not provide a representative sample to determine compliance with the permit.

It is more accurate to measure dimethyl mercury emissions to determine compliance with the permit than to assume total mercury is equivalent to dimethyl mercury emissions. Currently, dimethyl mercury does not have a real-time monitoring device. Dimethyl mercury samples can be collected using a grab sample that is analyzed at a laboratory. These samples provide a more direct comparison of dimethyl mercury emissions to determine compliance.

Additionally, the EMF developed estimated emissions using conservative assumptions and upper limits for the feed characteristics to the facility. Waste coming into the facility must comply with specified waste acceptance criteria. The permit requires a baseline sampling to occur within 90 days after commencement of operations which will verify the assumptions used in developing the emissions estimate. Based on the conservative assumptions used in the emissions estimate and the facility's requirement to ensure the incoming waste feed meets the criteria used in determining the emissions estimate, monthly sampling is adequate to determine compliance.

No change to the approval order is required.

I-2: MIKE CONLAN

Comment I-2-1

Remove all nuclear waste

Response to I-2-1

Thank you for your comment.

The Approval Order DE16NWP-003, Revision 1 covers active emissions to the atmosphere from the EMF. It is not a permitting mechanism in and of itself to clean-up the Hanford Site by removal of all nuclear waste. Other Programs on the Hanford Site (e.g. the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)) are used to clean-up the Hanford Site.

No changes to the approval order are required.

Comment I-2-2

Do not allow anymore nuclear waste into the facility

Response to I-2-2

Thank you for your comment.

Approval Order DE16NWP-003, Revision 1, has no authority over the allowance of radioactive waste on the Hanford site. It covers toxic emissions from the EMF.

No changes to the approval order are required.

Comment I-2-3

Replace all the single storage tanks

Response to I-2-3

Approval Order DE16NWP-003, Revision 1, covers active emissions to the atmosphere from the EMF. It is not a permitting mechanism in and of itself to require replacement of all of the single shell storage tanks.

No changes to the approval order are required.

Comment I-2-4

Stop all the nuclear leakage entering the Columbia River

Response to I-2-4

Thank you for your comment.

Approval Order DE16NWP-003, Revision 1, covers toxic air emissions from the EMF. Groundwater contamination is covered under other programs (e.g. the CERCLA).

No changes to the approval order are required.

I-3: BILL GREEN

Comment I-3-1

Approval conditions 1.1.2 and 1.2.1: Before Ecology incorporates conditions from the subject Order into Hanford's air operating permit (AOP) Ecology must either re-write the conditions to eliminate reference to documents not included in the Order, or include the referenced material. For example, condition 1.1.2 reads:

"All TAPs, as submitted in the Permittee's original NOC Application as Table 1 and subsequent follow-on informational email, shall be below their respective ASIL or approved through a Second Tier review."

When this condition is incorporated into Hanford's AOP, "Table 1 and subsequent follow-on informational email" must also be included in the condition to be consistent with the congressionally-specified purpose of an operating permit. ["The air permit program will ensure that all of a source's obligations with respect to each of the air pollutants it is required to control will be contained in one permit document. . . . This system will enable the State, EPA, and the public to better determine the requirements to which the source is subject, and whether the source is meeting those requirements." S. Rep. No. 101-228, at 3730 (12-20-89), as reprinted in 1990 U.S.C.C.A.N. 3385.]

Response to I-3-1

Thank you for your comment.

Incorporation into the Hanford Site Air Operating Permit (AOP), Number 00-05-006 is out of scope of this public comment period. WAC 173-401-600(1), WAC 173-401-605(1), and 40 CFR 70.6(a)(1) each require that the operating permit shall contain terms and conditions that assure compliance with all applicable requirements. Ecology will evaluate how to incorporate conditions from this approval order during the next AOP modification or renewal.

Ecology revised Condition 1.1.2 to read "All TAPs, as listed in Table 1 of this Approval Order, shall be below their respective ASIL or approved through a Second Tier review." A new Table 1 now identifies the TAPs associated with this Approval Order.

Comment I-3-2

Approval condition 1.1, "Emissions": The initial version of this Order required continuous monitoring for only elemental mercury, while this version (Revision 1) requires monthly "grab sampling" for only dimethyl mercury. The change in analyte and frequency is based, not on operational data, but on projected performance and assumed feed characteristics. While some compounds of mercury are more highly neurotoxic and more environmentally persistent than others, all compounds of mercury are regulated as hazardous air pollutants (HAPs) under section 112 of the federal clean air act (CAA). Until actual operational data confirms the assumptions this Order considers as fact, Ecology should take a conservative approach by requiring continuous monitoring for mercury and all compounds of mercury. Monitoring should be relaxed only after analyses of samples taken under start-up and steady-state operations confirm what compounds of mercury are actually present.

Response to I-3-2

Thank you for your response.

Dimethyl mercury is the specific TAP exceeding ASILs and evaluated under a Second Tier Review in accordance with WAC 173-460-090. The approval order requires a method to monitor emissions of dimethyl mercury to ensure it remains within the permitted limit.

Elemental mercury was also identified as a TAP emitted from this facility. The estimated unabated mercury emissions from the facility are less than de minimis values. Emissions less than de minimis values listed in WAC 17-460-150 do not require application of Best Available Control Technology for toxics (tBACT) or new source review. Other National Emissions Standards of Hazardous Air Pollutants (NESHAPs) or Maximally Achievable Control Technology (MACT) standards do not apply.

Mercury continuous emissions monitoring cannot distinguish between different forms of mercury. The measurements taken from this monitoring system provide total mercury emission values. The original permit required the permittee to assume the monitoring system's measurements were entirely dimethyl mercury to demonstrate compliance with the permit. The EMF also emits elemental mercury and the system evaluates total mercury emissions. This could lead to measurements above the dimethyl mercury permitted emission rate, even if the actual emissions of dimethyl mercury are less than the permitted emission rate. Without the ability to distinguish between different mercury compounds, the continuous emissions monitor does not provide a representative sample to determine compliance with the permit.

It is more accurate to measure dimethyl mercury emissions to determine compliance with the permit than to assume total mercury is equivalent to dimethyl mercury emissions. Currently, dimethyl mercury does not have a real-time monitoring device. Dimethyl mercury samples collected using a grab sample can be analyzed at a laboratory. These samples provide a more direct comparison of dimethyl mercury emissions to determine compliance.

Additionally, the EMF developed estimated emissions using conservative assumptions and upper limits for the feed characteristics to the facility. Waste coming into the facility must comply with specified waste acceptance criteria. The permit requires baseline sampling within 90 days after commencement of operations to verify the assumptions used in developing the emissions estimate. If the baseline sampling indicates the assumptions underlying the emission estimate submitted in the application were inaccurate, the permittee would need to reevaluate their emissions estimate and submit a modification application as applicable.

Based on the conservative assumptions used in the emissions estimate and the facility's requirement to ensure the incoming waste feed meets the criteria used in determining the emissions estimate, monthly sampling of dimethyl mercury is adequate to determine compliance.

No change to the permit is required.

Comment I-3-3

Approval condition 1.1, "Emissions": The EMF is truly unique in both scope and mission. There are no analogous facilities in industry or in government. This unique facility is proposed to begin operations before any bench-scale or pilot-scale testing has occurred. One primary concern should be the need for exacting characterization of the feed. Without knowing actual constituents

in the feed, it is not possible to determine monitoring capable of identifying regulated pollutants in the actual emissions. Because this Order is based on suppositions rather than on actual operating data, because the EMF is a one-of-a-kind facility, and because the feed material heavily determines the constituents in the actual emissions, Ecology should take a conservative approach to protecting public health and the environment by requiring adequate characterization of the feed material before relaxing any monitoring scheme. Once operations at the EMF reach a steady state, the requirement to characterize the feed stream should be reduced to only that needed for verification. Ecology has the authority under both state and federal statute to regulate the potential-to-emit for all HAPs, TAPs, and all other regulated air pollutants. The specific contents of the feed material represent a potential-to-emit. Ecology should focus on conservatively establishing adequate monitoring, sufficient to demonstrate continuous compliance with any appropriate emission limit. At present, Ecology has no actual (fact-based) information to use as a basis for doing so. A conservative approach toward protection public health and the environment is certainly appropriate. The permittee definitely could have provided verifiable data by following industry-standard practice of conducting bench-scale and pilot-scale testing before rolling-out a unique processing facility. Ecology, the public, and the environment should not fall victim to a short cut.

Response to I-3-3

Thank you for your comment.

This waste feed stream has been evaluated as part of the Waste Treatment and Immobilization Plant. The EMF developed estimated emissions using conservative assumptions and upper limits for the waste feed characteristics to the facility. Waste coming into the facility must comply with specified waste acceptance criteria which served as the basis for the emissions estimate. Condition 4.6 states, "any activity undertaken by the permittee or others, in a manner that is inconsistent with the original Notice of Construction (NOC) application and this determination, shall be subject to Ecology enforcement under applicable regulations." If the waste feed is outside of the bounding waste acceptance criteria, the Permittee is operating outside of their permit and is subject to enforcement. The data presented to support the emissions estimate for this permit was adequate to determine permit emission limits based on the design of the facility at the time of permitting.

Additionally, dimethyl mercury is the specific TAP which exceeding ASIL and evaluated under a Second Tier Review in accordance with WAC 173-460-090. The approval order requires a method to monitor emissions of dimethyl mercury to ensure it remains within the permitted limit. The original approval order identified a total mercury emission limit with compliance demonstrated by a continuous mercury monitor where the measurements were considered to be dimethyl mercury.

The EMF also emits elemental mercury. Because the EMF also emits elemental mercury and the system evaluates total mercury emissions, this could lead to measurements above the dimethyl mercury permitted emission rate, even if the actual emissions of dimethyl mercury are less than the permitted emission rate. Without the ability to distinguish between different mercury compounds, the continuous emissions monitor does not provide a representative sample to determine compliance with the permit.

It is more accurate to measure dimethyl mercury emissions to determine compliance with the permit than to assume total mercury is equivalent to dimethyl mercury emissions. Currently,

dimethyl mercury does not have a real-time monitoring device. Dimethyl mercury samples can be collected using a grab sample that is analyzed at a laboratory. These samples provide a more direct comparison of dimethyl mercury emissions to determine compliance.

Based on the conservative assumptions used in the emissions estimate and the facility's requirement to ensure the incoming waste feed meets the criteria used in determining the emissions estimate, monthly sampling of dimethyl mercury is adequate to determine compliance. Baseline sampling will verify these assumptions. While this is a change in the frequency of monitoring from continuous to monthly, it is a more direct measure of compliance.

No change to the permit is required.

Comment I-3-4

Approval condition 1.1.1, "Visible emissions . . . shall not exceed five (5) percent opacity.": Visible emissions are to be determined using EPA Method 9 (see condition 1.3.1.1). According to the Visible Emissions Field Manual EPA Methods 9 and 22, EPA 340/l -92-004 December 1993, p.6, a 5% opacity requirement for a black plume is at the method detection limit (MDL) for Method 9. If the plume is white, the 5% opacity requirement is below the MDL. Either require that all visible emissions be black, or use an appropriate EPA-approved method or methods, or instrumental monitoring, capable of determining continuous compliance with the 5% opacity requirement regardless of the color of the plume.

Response to I-3-4

Thank you for your comment.

The referenced condition for discharge point 1.4.80 requires conformance with EPA Reference Method 9 of 40 CFR 60, Appendix A. The method requires a qualified observer to determine the opacity of emissions. To receive certification as a qualified observer, a candidate must demonstrate the ability to assign opacity readings in 5 percent increments to black and white plumes. It is not necessary to require a specific plume color in the permit because the observer must be certified to perform the method correctly for both black and white plumes.

Additionally, Method 9 requires opacity observations shall be recorded to the nearest 5% interval with 5% being the approximate minimum detection threshold for white or black smoke. If any visible emissions are observed, a certified observer would be able to determine if the visible emissions are within the compliance limit, independent of the plume color.

Furthermore, proper operation of the abatement control technology selected as tBACT for the control of particulates and aerosols controls particulate emissions to less than visible levels. Maintenance of the abatement control technology is designed to preserve the particulate control effectiveness. Condition 1.2.1 of Approval Order DE16NWP-003, Revision 1, requires the ventilation systems shall be operated in compliance with tBACT controls.

Based on these requirements, Ecology does not believe that continuous instrumental monitoring is necessary to determine compliance for visible emissions.

No change to the approval order is required.

Comment I-3-5

Approval condition 1.3.1.1: This condition requires, in part, that for visible emissions "not solely attributable to water condensation, compliance with Approval Condition 1.1.1 shall be met by performing an opacity determination utilizing. . .Method 9". However, Method 9 cannot distinguish between emissions composed solely of water condensation and those emissions that are NOT solely attributable to water condensation. Supply an appropriate method or methods along with an appropriate monitoring frequency needed to verify continuous compliance with the 5% visible emission requirement. The chosen method or methods must also be capable of, and approved for, detecting and discounting "emissions solely attributable to water condensation".

Response to I-3-5

Thank you for your comment.

The referenced condition requires conformance with EPA Reference Method 9 of 40 CFR 60, Appendix A. The method requires a qualified observer to determine the opacity of emissions. To receive certification as a qualified observer, a candidate must follow the method's procedures to demonstrate the ability to assign opacity readings in 5 percent increments to black and white plumes. The procedure states "opacity observations shall be made at the point of greatest opacity in that portion of the plume where condensed water vapor is not present" and identifies steps for attached and detached steam plumes (e.g., condensed water vapor). It is not necessary to require a different EPA-approved method because the observer must perform the method correctly, which includes procedures for plumes containing steam.

No change to the approval order is required.

Comment I-3-6

Approval condition 1.3.1.1: Lines 18 & 19 of this condition vacates the requirement to conduct opacity monitoring in the event of a nuclear explosion or other such catastrophic event. Thus, Ecology has included a condition in this Order that contemplates the possibility of a nuclear criticality or other catastrophic event occurring at the EMF. Conditioning this Order to protect only the visible emission observer from a nuclear explosion or other catastrophic event and the aftermath from such occurrences, overlooks Ecology's statutory responsibility to also protect human health and the environment. This responsibility obligates Ecology use its authority to require the EMF to continuously evaluate its feed and processes, ceasing operations if there is a remote possibility of a nuclear explosion or other catastrophic event. Ecology has all necessary authority to regulate potential emissions of all HAPs under both the CAA and Washington Clean Air Act (RCW 70.94), and the mandate to do so. Plus, a nuclear explosion or other catastrophic event will produce massive amounts air pollutants, pollutants that include HAPs, TAPs, and other regulated air contaminants present anywhere within the EMF and, possibly within near-by facilities. Eliminating the possibility of a nuclear explosion or other catastrophic event will allow Ecology to delete the clause "providing that such determination shall not place the visible emission observer in hazard greater than that identified for the general worker". This Order should be conditioned to show the same level of concern for the public and the environment as it does for the visible emission observer.

Response to I-3-6

Thank you for your comment.

The referenced text does not vacate the requirement to conduct opacity monitoring in the event of a nuclear explosion or other such catastrophic event. The language is to ensure that the observer does not subject themselves to an increased risk or hazard, understanding that any visible emissions seen from the discharge point may indicate failure of the radioactive air emissions abatement control technology.

The permittee, U.S. Department of Energy (USDOE), is still required to determine the opacity using 40 CFR 60, Appendix A, Method 9, though the observer must find a safe location to complete their observations following the method's procedures. 40 CFR 60 Appendix A, Method 9, procedures requires the observer to stand at a distance sufficient to provide a clear view of the emissions with the sun oriented in the 140-degree sector to their back and, as much as possible, make their observations from a position such that their line of vision is approximately perpendicular to the plume direction. Additionally, observers can also be certified using devices, such as glasses, sunglasses, or binoculars. Following the method and utilizing certification using devices, a certified observer will be able to find a location without increased hazards and determine the opacity of a plume from the discharge point, meeting the requirements of the condition. Therefore, this compliance demonstration does not overlook the protection of public health and welfare.

No change to the approval order is required.

Comment I-3-7

Approval condition 1.3.2: Specify "the mass release rate of these TAPs in pounds and their respective release rate averaging times". When this condition is incorporated into Hanford's AOP, "the mass release rate of these TAPs in pounds and their respective release rate averaging times" must also be included to be consistent with the congressionally-specified purpose of an operating permit. ["The air permit program will ensure that all of a source's obligations with respect to each of the air pollutants it is required to control will be contained in one permit document." S. Rep. No. 101-228, at 3730 (12-20-89), as reprinted in 1990 U.S.C.C.A.N. 3385.]

Response to I-3-7

Thank you for your comment.

Incorporation into the Hanford Site AOP, Number 00-05-006 is out of scope of this public comment period. WAC 173-401-600(1), WAC 173-401-605(1), and 40 CFR 70.6(a)(1) each require that the operating permit shall contain terms and conditions that assure compliance with all applicable requirements. Ecology will evaluate how to incorporate conditions from this approval order during the next AOP modification or renewal.

Approval Condition 1.3.2 is for determining compliance with the emission limit in Approval Condition 1.1.2, which states "All TAPs (toxic air pollutants), as submitted in the Permittee's original NOC (Notice of Construction) Application as Table 1 and subsequent follow-on informational email, shall be below their respective ASIL or approved through a Second Tier Review." Compliance is demonstrated by sampling for TAPs and determining the mass release rate, specifically in pounds and their respective release rate averaging times in WAC 173-460-

150. This is specifying to calculate the data from the sampling results from concentrations to mass release rates.

No change to the approval order is required.

Comment I-3-8

Approval condition 2.3, "Recordkeeping", lines 14 through 16: As written, these lines require laboratory analysis result summaries for "dimethyl mercury or other TAPs". (Emphasis is mine.) The approval condition should require recordkeeping of laboratory analysis result summaries for all TAPs, including dimethyl mercury and not just for either "dimethyl mercury or [for] other TAPs".

Response to I-3-8

Thank you for your comment.

Approval Condition 2.3 requires records of laboratory analysis result summaries taken in accordance with approval conditions. Sampling requirements for the approval order consist of annual sampling of a minimum of three analytes with the highest potential ambient concentration relative to their ASILs in addition to dimethyl mercury. Furthermore, dimethyl mercury sampling is required monthly.

To clarify the intent, Approval Condition 2.3 will be revised to state "Laboratory analysis result summaries taken in accordance with this Approval Order of any samples undertaken after the effective date of this ORDER." The phrasing of the text is inclusive of any sample taken, whether the sample results include mercury or other TAPs.

Comment I-3-9

Approval condition 2.4, "Reporting", lines 20, 21, & 22: These lines require, in part, "[i]dentification of any TAP not previously identified within the original NOC Application . . . ". However, there is no requirement to sample for TAPs not previously identified. Require sampling needed to identify "any TAP not previously identified within the original NOC Application".

Response to I-3-9

Thank you for your comment.

Additional monitoring or laboratory analyses are not necessary to identify any TAP not previously identified. The required laboratory analysis result summaries would provide tentatively identified compounds for the permittee, USDOE, to identify any not previously identified TAPs. Additionally, other samples taken from the waste feed stream can be used to determine if there have been compounds not previously identified and the permittee, USDOE, must evaluate the compounds for compliance with all state and federal regulations.

No change to the approval order is required.

Comment I-3-10

Approval condition 3.0, "Emission sampling", gap-fill monitoring requirement under 40 C.F.R. 70 and WAC 173-401: When conditions from this Order are incorporated into Hanford's operating permit, Ecology must ensure that all monitoring be "sufficient to yield reliable data from the relevant time period that are representative of the source's compliance with the permit"

[40 C.F.R. 70.6 (a)(3)(i)(B); see also WAC 173-401- 615 (1)(b)] For example, approval condition 1.1.1 requires that visible emissions not exceed 5% opacity. However, there is no specified frequency for the conduct of monitoring, nor is there even a requirement to actually monitor for visible emissions. While approval condition 1.3.1.1 specifies what method to use for monitoring of visible emissions and certain parameters that are to be considered should monitoring occur, there is no actual requirement regarding when monitoring is to take place and how often monitoring must take place. Under 40 C.F.R. 70.6 (a)(3)(i)(B), monitoring requirements "sufficient to yield reliable data from the relevant time period that are representative of the source's compliance with the permit" will need to be in place when this condition is incorporated into Hanford's AOP. If the EMF doesn't operates under steady-state conditions, then compliance with the 5% opacity requirement can only be met with continuous monitoring. Should the EMF be required to operate under steady-state conditions, then compliance with the 5% opacity requirement can be met with something less than continuous monitoring.

Response to I-3-10

Thank you for your comment.

Incorporation into the Hanford Site AOP, Number 00-05-006 is out of scope of this public comment period.

Approval Order DE16NWP-003, Revision 1 is being permitted pursuant to General Regulations for Air Pollution Sources, Chapter 173-400 WAC, and Controls for new Sources of Toxic Air Pollutants, Chapter 173-460 WAC, and not Operating Permit Regulation, Chapter 173-401 WAC. Ecology has reviewed the conditions in Approval Order DE16NWP-003, Revision 1, and have determined that the approval order includes monitoring, recordkeeping, and reporting requirements sufficient to ensure that the permittee, USDOE, complies with all established conditions in the approval order. Even though WAC 173-401 is not directly applicable to this permit, Ecology has determined the information supplied by the Permittee, USDOE, is sufficient for future incorporation into the AOP.

Compliance with Approval Condition 1.1.1 for visible emissions is demonstrated by the Tier 3 Visible Emissions Survey Requirements of the AOP. This requirement calls for maintenance of abatement control technology as required in Attachment 2 of the AOP for the unit (e.g., the radioactive air emission license issued for the Hanford Site by the Washington Department of Health). The EMF radioactive emission license requires abatement control technology using High Efficiency Particulate Air (HEPA) filters, which control particulate emissions to less than visible levels. HEPA filters are also permitted in Approval Order DE16NWP-003, Revision 1, as the selected tBACT for the control of particulates and aerosols. If this abatement control technology is maintained in a manner consistent with the applicable radioactive emission license, the significant monitoring requirements on HEPA filters in the radioactive emission license is sufficient to yield reliable data to determine compliance. If there ever was to be an incident wherein the abatement control technology failed and visible emissions are observed, a Method 9 certified observer would need to determine the opacity of the plume, as required in Approval Condition 1.3.1.1.

Furthermore, Approval Condition 4.8 requires a notice to Ecology at least 60 days prior to any modifications to the ventilation system operation and maintenance procedures described in the NOC applications. This allow for a determination that such a change would require a new or

amended Approval Order. This makes the current maintenance schedule required by the AOP a state-enforceable requirement for DE16NWP-003 Revision 1, unless Ecology were to determine that a modified operation and maintenance schedule would still provide sufficient monitoring for state tBACT requirements.

This concept does not require the facility to operate under steady state conditions to ensure compliance with the visible emissions opacity limit. Properly maintained HEPA filters will control visible emissions to less than to less than visible levels during both steady state and non-steady state conditions, therefore, ensuring compliance with the condition is met.

No change to the approval order is required.

Comment I-3-11

Approval conditions 3.1 "Baseline Assessment" and 3.1.1 "Dimethyl Mercury Assessment", and inadequacy of initial monitoring: Both conditions 3.1 and 3.1.1 contemplate establishment of an emissions baseline as a single time-limited event. A baseline established from a one-time or time-limited sampling event has validity only if the affected process operates in steady state; consistent feed, constant feed rate, constant processing rate, constant operating temperatures, etc. Ecology needs to require the EMF operate at steady state, or that baselines be re-established at the beginning of every campaign. The EMF is a one-of-a-kind facility that will emit pollutants that include toxic air pollutants, hazardous air pollutants, and extremely hazardous air pollutants, and a facility that Ecology contemplates could experience catastrophic failure. Thus, Ecology must take a conservative approach with regard to verifying the presumed emission constituents, the presumed composition of the feed, the presumed efficiencies of the process, the presumed operating temperatures, the presumed emission rate, and the presumed emissions. The initial suite of required monitoring must be conservative and comprehensive, focusing on verifying the permittee's assumptions. Ecology should factcheck assumptions used in preparing this Order. The initial suite of monitoring should be relaxed, if warranted, based on actual operating information. (Trust, but verify.) After all, EMF is a truly unique facility that is scheduled to spring into operation absent the benefit of knowledge gleaned from any bench-scale testing or testing in a pilot plant. Furthermore, there very likely could be disastrous consequences should the permittee's assumptions prove to be inaccurate.

Response to I-3-11

Thank you for your comment.

The EMF developed estimated emissions using conservative assumptions and upper limits for the feed characteristics to the facility. Waste coming into the facility must comply with specified waste acceptance criteria. The permit requires baseline sampling of dimethyl mercury within 90 days after commencement of operations to verify the assumptions used in developing the emissions estimate. TAPs are assessed annually and dimethyl mercury sampling is required monthly. If the sampling results indicate the assumptions underlying the emission estimate submitted in the application were inaccurate, the permittee would need to reevaluate their emissions estimate and submit a modification application as applicable.

No change to the permit is required.

Comment I-3-12

Approval condition 3.3, "Dimethyl Mercury Emission Assessment": a) Lines 17 & 18, and the enumerated items following, require monthly sampling to determine compliance with an emission limit in lbs/24-hours. Monthly sampling to satisfy a 24-hour requirement works only if the system operates at steady state, yet the Order does not require steady-state operation. Either require steady-state operation of the EMF or require sampling for dimethyl mercury sufficient to confirm continuous compliance with the stated emission limit in units of lbs/24-hours. b) Lines 32 through 34 require that "[d]imethyl mercury sample results will be compared to the limit in condition 1.1.3". The clause "compared to the limit" appears to overlook the definition of a limit. An emission "limit" that does not have to be complied with is not a "limit", but rather a suggestion. Emphatically state that no condition in this Order allows the permittee to exceed any emission limit.

Response to I-3-12

Thank you for your comment.

a) Monthly sampling to determine compliance with an emission limit as a mass per averaging period release rate does not require steady state operation of the EMF to ensure continuous compliance with the emission limit. Additionally, continuous compliance with the emission limit does not require continuous monitoring, as implied by the comment.

The EMF emissions are calculated and modeled from the inputs to the EMF from other facilities that are part of the overall Waste Treatment and Immobilization Plant. The application provides bounding requirements for inputs into the EMF. The inputs are part of the permit conditions in Section 4.0 (e.g., the Permittee's, USDOE's, application). If changes to the inputs exceed values presented in the application, the conditions of the permit are not being met and the EMF will need to cease operations until conditions are being met again or obtain a permit modification. The assumptions used in emission calculations presented in the application must be verified before operations commence.

Monthly sampling is then used [to] determine compliance by verifying that the emission limits have not been exceeded and that actual emissions are consistent with the assumptions provided in the application calculations. Monthly sampling is required to be collected during facility operations that are expected to produce the most dimethyl mercury emissions, providing a conservative approach in collecting a representative sample of facility emissions for the sampling period. By bounding the input requirements and verifying actual emissions do not exceed the emission limit, steady state operation is not necessary to ensure continuous compliance with the emission limit.

As the basis of the permitted emission limit is bound by the EMF inputs and verified through monthly sampling to ensure compliance with the emission limit, no change to the approval order is required due to part (a).

b) The referenced text on page 7, lines 32 through 34 of Section 3.3 describes a required record used to determine compliance with the approval order. This record requirement does not imply that the Permittee is allowed to exceed the emission limit in Approval Condition 1.1.3, but rather specifies the information in the record needed to ensure compliance with the emission limit.

The Permittee, USDOE, must make a record every month comparing the monthly dimethyl mercury sample results to the emission limit in Approval Condition 1.1.3. Each record must

include the comparison results for the entire year in order to ensure emissions limits have not been exceeded for more than two months in a 12-month rolling period.

As the referenced text does not allow the Permittee to exceed any emission limit, no change to the approval order is required due to part (b).

A-1: U.S. DEPARTMENT OF ENERGY

Comment A-1-1

3.3, 6th paragraph, 2nd sentence

If the measured dimethyl mercury values exceed the limit in two calendar monthly samples in a 12- month rolling period, the facility will need to cease waste processing operation in a safe and controlled manner. The facility can continue to run to [support non waste operations (e.g. simulant runs to maintain the rest of the Waste Treatment Plant in an operational manner)] maintain the melter in a safe and operable condition.

If this event occurs, the melters will be placed into "idle" mode but cannot be shut down once started. Depending on the length of the idle mode, the chemistry of the glass formers in the melt pool will shift due to ongoing volatilization. The conductivity, viscosity, and melting point must be maintained within acceptable parameters or the melter may malfunction or fail. To prevent malfunction, glass formers may need to be added to the melter to maintain chemistry within acceptable parameters.

Response to A-1-1

Thank you for your comment.

Ecology is aware the melters cannot be shut down once started. The identified text was included to address this operational constraint while eliminating the potential for additional dimethyl mercury emissions until the exceedances are assessed and resolved. Ecology understands that glass formers may need to be added to the melters to maintain chemistry within acceptable parameters and intended to allow this circumstance in the identified text.

Specific permit language is necessary to preclude the permittee from adding waste streams to the melters that may contain or create dimethyl mercury, which are eventually transferred as a liquid effluent to the facility, until corrective actions are in place. The proposed language provided in your comment does not specifically preclude waste which is known to contain, may potentially contain, or may create dimethyl mercury being added to the melters at the Low Activity Waste facility.

To clarify the intended operational circumstance, the identified text will be changed to state, "The facility can continue to run to maintain the Low Activity Waste Facility melters in a safe and operable condition, provided feed to the melters after the point in which the second exceedance is identified does not contain, potentially contain, or create dimethyl mercury."

Comment A-1-2

3.3, 6th paragraph, 4th sentence

The EMF can restart waste operations once an assessment of the cause behind the exceedances occurred and corrective actions to take preventing future exceedances is submitted and approved by Ecology. If Ecology approval is not provided within 30 days of receipt of the assessment, waste operations can proceed. If the actions required result in a permit modification, the Permittee will need to follow the standard NOC process as an additional action.

To minimize delay of Tank Waste treatment, recommend adding the clarifying sentence with the understanding that the permittee and Ecology will have already held formal discussions of the cause of exceedances and corrective actions planned to prevent reoccurrence.

Response to A-1-2

Thank you for your comment.

The EMF is a complex system. Many factors underlie permitted emission rates and the cause of an exceedance may be complicated. Adequate review of any submitted documents would be necessary to ensure public health and welfare and coordinate a path forward with the permittee, USDOE, for returning to compliance. Without currently knowing all of the possibilities that could cause emission exceedances, review of an assessment and proposed corrective actions could take more than 30 days. Initiating waste operations without sufficient review may result in further non-compliance issues or endanger public health and welfare.

Additionally, there is no regulatory requirement for Ecology to review and approve an assessment and proposed corrective actions within 30 days of receipt. Ecology understands this process could delay Tank Waste treatment and would prioritize our review of any submitted documentation, as necessary at that time, to minimize the delay.

As the request is not based on regulation, no change to the approval order is required.

T-1: CTUIR

Comment T-1-1

There are several references to figures and equations. These can be found in Reference 1.

Page 6 of 10, Section 3.1.1, text stating: "...including the use of sorbent tubes or approved instruments provided such devices are spanned to collect representative samples of the stack dimethyl mercury...."

Comment: It is the assumption of this reviewer that the proposed change to mercury monitoring is the result of Ecology's response to Comment 1 in Ecology Publication 17-05-001. Ecology acknowledging that:
1) The Permittee used conservative assumptions in analyzing DMM emissions.
2) The EMF DMM emissions in the Permittee's application (24590-WTP-RPT-ENV- 15-001, Rev 0) were below levels evaluated in the Second Tier Review.
3) DMM monitoring is required because emissions of DMM in the application (i.e. 5.29E-07 g/s

from the EMF) resulted in exceedance of the ASIL value (See Table A- 1 in 24590-WTP-RPT-ENV-15-001, Rev 0).
4) Because the Second Tier Review relied on the assumption that total mercury was equivalent to DMM, it was reasonable to require total mercury monitoring as a surrogate for DMM monitoring.
5) Ecology acknowledged that another monitoring approach would be considered if the Permittee had a better surrogate for DMM than total mercury.

Given Item 5 (above), the Permittee is now proposing to use monthly grab samples to directly measure DMM rather than measure a surrogate. This reviewer has three concerns with underlying assumptions used to estimate DMM emissions in the original permit application (24590-WTP-RPT-ENV-15-007, Rev0) and subsequently this proposed change.

Concern 1: The kinetic model used to estimate DMM formation in 24590-WTP-RPT-ENV-15-007, Rev 0 may not be appropriate for the application. If this is the case, then the estimated amount of DMM produced in the EMF in the original application is not accurate. This assertion is based on the observation that Section 9.1 of 24590-WTP-RPT-ENV-15-007, Rev 0 states that, "As previously described, the EMF emissions are based on 24590-BOF-M4C-DEP-00001,...". Section 5.3.1.3.3.4 of 24590-BOF-M4C-DEP-00001provides the following equation for net DMM formation in caustic salt solutions with organics: (see Reference 1)

The equation for the first order rate constant (k) was taken from Reference 9.24 of 24590-BOFM4C- DEP-00001 (CNN 160522 – SRNL letter "Input for Dimethylmercury Formation and Partitioning).

A review of the original reference reveals that the authors of this equation specifically state that it should be only be applied qualitatively. Specifically, it is stated on Page 2 of 11 of the original document, "Due to the limited range of initial conditions (mercury concentration, organic concentration, and variety of organics), the summary memoranda deemed that the kinetics formed from the formation tests should only be relied upon in qualitative assessments.".

Furthermore, the document on Page 3 of 11 states that, "Note that the first order dependence of the formation rate on soluble mercury content was only assumed and alternative valid assumptions could have been made....For those reasons, it is impossible to determine from existing data the reaction order of dimethylmercury formation....".

Hence, the authors of the equations used in 24590-BOF-M4C-DEP-00001 to estimate DMM concentrations in the EMF (and subsequently emission rates) specifically warn that:
1) the assumption that the reaction is first-order in soluble mercury concentration is not validated; and
2) the equation for the rate constant should not be applied for quantitative analysis.

Unfortunately, the Permittee appears to have ignored both these warnings. For this reason, the computed results are suspect.

Concern 2: Even if the kinetic model could be applied in a quantitative manner, the calculation

approach reported in 24590-BOF-M4C-DEP-00001 does not represent a worst case analysis of DMM emissions; a claim that is made in several places in the document. For example, Section 6.1.20 states, "Therefore, the amount of Hg captured in the SBS condensate and transferred to the DEP system in stream RLD21 is not modeled in this emissions estimate...". A review of Appendix M of 24590-WTP-RPT-PET-10-22, Rev 0 shows that 28.6% of the mass of mercury entering the LAW meters exits in RLD21. Hence, RLD21 is a significant source of mercury.

Also, Section 6.1.33 states that "Mercury has the potential to accumulate in the recycle stream from the DEP system back to LAW during DFLAW operations since mercury is not vitrified (DF of 1 in the LAW melter per Ref. 9.14, Table 14), is captured in the SBS (Assumption 6.1.32), and the non-volatile mercury species are concentrated in the DEP evaporator. However, a detailed analysis of the accumulation of mercury in the DEP system is outside the scope of this emissions estimate." The section goes on to imply that neglecting recycle is acceptable because the total mass mercury is still represented, but the distribution within the various EMF tanks is different. While the total mass of mercury may be still represented (an assumption this reviewer has not verified), the formation of DMM will not be the same since the rate of formation is assumed to be a function of the concentration of soluble mercury in each tank and tank temperature, hold time, and processing time. These parameters vary from tank to tank (see the assumptions in Sections 6.1.22 through 6.1.30 of 24590-BOF-M4C-DEP-00001).

Concern 3: The DMM emission rate in 24590-BOF-M4C-DEP-00001 does not consider the range of temperatures and tank hold-times that can occur during EMF operations. Sections 6.1.22 through 6.1.28 indicate that the estimated DMM formation rate were based on single values of temperature and tank residence time. However, it is the opinion of this reviewer that these values will likely vary during plant operations and that this variation should have been considered in the DMM formation estimates. For example, Attachment 1 of CNN 160522 (SRNL letter "Input for Dimethylmercury Formation and Partitioning) proves a range of operating temperatures for WTP vessels [Footnote 1]. The variation from minimum to maximum operating temperature ranges from approximately 10 ?F to 135 ?F, depending on the vessel. It is recognized that the vessels in the EMF will likely not experience temperature fluctuations at the upper end of the quoted range. However, variations should have been estimated and accounted for in the DMM formation estimate. Alternatively a maximum temperature for each vessel should have been used.

Similarly, the DMM formation estimates in 24590-BOF-M4C-DEP-00001 assumed the reaction time was equal to the hold times in each vessel under normal continuous operations. This reaction time [Footnote 2] was calculated as: (See Reference 2).

However, process upsets or temporary shutdowns are likely during LAW operations and this will result in longer hold times and subsequently higher DMM formation rates.

The impacts of temperature and reaction time on DMM emissions from the EMF are illustrated in the following figure: (See Reference 3).

Values in this figure were created by this reviewer using the calculation approach outlined in 24590-BOF-M4C-DEP-00001. The parameter (M/M-base) represents the estimated DMM emission rate from the EMF for each condition divided by the emission rate calculated using the

values for temperature and RT in the report. Delta-T represents the assumed temperature increase (□F) from the values reported in Sections 6.1.22 through 6.1.27 of 24590-BOF-M4CDEP-00001. Note that some input parameters for these calculations were not readily evident in 24590-BOF-M4C-DEP-00001 and this reviewer was not able to exactly match the Permittees base emissions rate of 5.29E-07 g/s. Rather the base rate calculated was 1.5E-07 g/s.

Finally, the mercury feed rate to the LAW system will also have an impact on DMM emission rates from the EMF. The following graph represents the predicted DMM emissions using the mercury feed rate reported in Appendix M of 25490-WPT-RPT-PET-10-022 (2.79E-03 kg/hr feed to LAW melter, process stream LFP04a) and the highest estimated mercury feed rate reported in the recent Environmental Performance Demonstration Test (EPDT) for the LAW system (1.93E-01 kg/hr, feed to LAW melter, process stream LFP04a). Values were computed using the same approach outlined in 24590-BOF-M4C-DEP-00001. In this figure, the blue line represents results using the feed rate from 25490-WPT-RPT-PET-10-022 and the orange line represents the results using the EPDT feed rate. Note that the y-axis is a logarithmic scale. (See Reference 4).

This reviewer was not able to obtain a copy of 24590-WTP-RPT-ENV-16-001, Rev. 0 (Feed Vector Development in Support of WTP Environmental Risk Assessment Activities) before the end of the comment period to verify how the mercury feed rate used in 24590-BOF-M4C-DEP-00001 compares to those used to generate above estimate. Hence, Ecology is requested to verify that the feed rate estimate used in 24590-BOF-M4C-DEP-00001 is at the upper end of expected feed rates.

Requested action: Please consider the above concerns and assess whether the Permittee has properly estimated the DMM formation rates in the EMF and other WTP facilities in preparing the original application (24590-WTP-RPT-ENV-15-007, Rev 0) and the Second Tier Review. If these estimates are not an accurate reflection of the amount of DMM formed, then determine if a new health impact assessment for DMM is needed.

Footnote 1: This analysis was done before the EMF was part of the WTP design and so includes the Pretreatment System and not the EMF.
Footnote 2: Note that the residence time (RT) was used as the reaction time.

Response to T-1-1

Thank you for your comment.

Regarding concern 1, there is agreement across between 24590-BOF-M4C-DEP-00001 and SRNL-CST-2007-00076, Rev. 0 (CCN 160522) regarding the first order rate constants for dimethyl mercury (DMM) formation, Equation 63 in 24590-BOF-M4C-DEP-00001 yields the kinetic constants used in the SRNL letter. Additionally, the 24590-BOF-M4C-DEP-00001 calculation used conservative temperatures which in the Arrhenius equation drives the rate constant. There is also agreement across 24590-WTP-ENV-16-003 (Second Tier Review), 24590-BOF-M4C-DEP-00001, and 24590-WTP-RPT-ENV-15-007 regarding the emission rates of DMM. The bounding assumptions in the kinetic model appears to be appropriate for the application.

Regarding concern 2, the 24590-BOF-M4C-DEP-00001 calculation utilized the maximum allowable mercury feed rate (contract maximum). The feed vector conservatively partitions the mercury to the supernate stream as a liquid constituent instead of to the solid mercury oxide sludge stream. Although sludge is not processed through EMF, the calculation conservatively assumes the combined amount of mercury from the supernate and sludge are processed resulting in conservative emissions.

Regarding concern 3, The emissions rates in 24590-BOF-M4C-DEP-00001 are calculated for a single nominal temperature, unlike the rates calculated for Pretreatment Facility in the Savannah River evaluation, which results in higher DMM generation rates. The high operating temperature was assumed because the vessels are located in a portion of EMF that is not climate controlled. For example, if the evaporator concentrate temperature is reduced from 116 to 90 degrees F, DMM emission rates would have been reduced by approximately 60%. In addition, as the residence time in the vessel increases in equation 64 in 24590-BOF-M4C-DEP-00001, the annual vessel throughput decreases – resulting in no change to emission rate.

In addition to the explanations above, the permit requires baseline and monthly sampling for DMM. The proposed monitoring approach will verify the assumptions used in determining the emission estimate, providing reasonable assurance of compliance with the permitted emission limits. If the sampling indicates the assumptions underlying the emission estimate submitted in the application were inaccurate, the permittee would need to reevaluate their emissions estimate and submit a modification application as applicable.

No change to the permit is required.

Comment T-1-2

Page 6 of 10, Section 3.1.1, text stating: "Dimethyl mercury sampling and analysis will be in accordance with the United States Environmental Protection Agency (EPA) procedures or Ecology approved alternative procedure including the use of sorbent tube or approved instrument provided such devices are spanned to collect representative samples of the stack dimethyl mercury concentration. Contemporaneous stack flow rate and temperature will be applied with the stack gas concentration to report dimethyl mercury in terms of pounds per 24-hour period."

Comment: It is not clear what is meant by the phrase "are spanned to collect representative samples". Does the author mean that the samples span the appropriate operating period for the month so that they represent an average (or worst case?) for the month?

Requested action: Please clarify what is meant by the indicated phrase. Also "tube" and "instrument" in the paragraph should be plural and "pressure" should be added to the phrase "....stack flowrate and temperature..." since pressure is also part of converting volumetric flow rate to mass flowrate for gas. This comment also applies to the first paragraph of Section 3.3

Response to T-1-2

Thank you for your comment.

The indicated phrase is meant to direct the permittee to ensure the sampling procedure and associated equipment can collect a representative sample. The required sampling and analysis plan would describe what is considered a representative sample for the process. Ecology

maintains authority to inspect the sampling and analysis plans to ensure we agree that samples taken in accordance with the approval conditions are representative.

The identified sentences in Section 3.1.1 and Section 3.3 will be revised to state, "Dimethyl mercury sampling and analysis will be in accordance with the EPA procedures or Ecology approved alternative procedure including the use of sorbent tubes or approved instruments provided such devices collect representative sample of the stack dimethyl mercury concentration. Contemporaneous stack flow rate, temperature, and pressure will be applied with the stack gas concentration to report dimethyl mercury in terms of pounds per 24-hour period."

Comment T-1-3

Page 7 of 10, Section 3.3, Line 9, text stating: "Permittee will develop and implement a monthly specific SAP...."

Comment: The phrase "monthly specific SAP" is awkward. The phrasing "Permittee will develop a SAP for monthly measurement of dimethyl mercury concentration in the EMF exhaust stack" is a suggested alternative. Also, the detection limit of the new method should be low enough to ensure that emissions at the level specified in Permit Condition 1.1.3 are detected. Please add a sentence to indicate that the Permittee will demonstrate in the SAP or accompanying Quality Assurance Plan that the analytical methods will have a detection limit that meets the minimum requirement set by Condition 1.1.3.

Requested action: Please consider changing the text as indicated.

Response to T-1-3

Thank you for your comment.

Ecology revised section 3.3, Line 9, to state "The permittee will develop and implement a SAP that shall address monthly sampling of dimethyl mercury emissions." Section 3.3 of the Approval Order requires submittal of the Sampling and Analysis Plan (SAP) and approval by Ecology before sampling occurs. Ecology will evaluate the detection limit for dimethyl mercury proposed in the SAP as part of the approval process. The approval order does not need to specify the detection limit.

Comment T-1-4

Page 7 of 10, Section 3.3, Lines 17 through 27: General comment.

Comment: It is important that Items 1-4 be worded to avoid ambiguity. Please consider the following:
1) The sample will be collected while actively processing secondary liquid waste streams generated from the low-activity waste melter offgas control system during low activity waste processing.
2) If the EMF is not processing the waste stream defined in Item 1 within the calendar month, then the sample will be collected while actively processing other liquid waste streams in the EMF.
3) If the EMF will not process any liquid waste streams within the calendar month, then the sample will be collected while the EMF is operating [Footnote 3].
4) If the EMF is will not operate within the calendar month, then the sample will be collected

when operations restart. If it has been more than one calendar month since the last sample was collected then the Permittee will collect a sample to represent the skipped month as soon as the EMF evaporator has restarted and is at steady-state. The Permittee will then plan for the next month's sample considering the priority ranking detailed in this section.

Requested action: Please consider the indicated language.

Footnote 3: What is meant by "EMF operating" if the system is not processing liquid waste? Does this mean processing a non-waste stream in the evaporator while collecting a sample? This phrase should be clarified to indicate exactly what is expected.

Response to T-1-4

Thank you for your comment.

Page 7, Lines 17-27 have been revised to the following:
1. The sample will be collected while actively processing secondary liquid waste streams generated during low-activity waste melter offgas control system operation from the Low-Activity Waste Facility.

2. If the EMF is not processing the waste streams defined in Item 1 within the calendar month, then the sample will be collected while actively processing other liquid waste streams in the EMF.

3. If the EMF will not process any liquid waste streams within the calendar month, then the sample will be collected while the EMF is operating.

4. If the EMF does not operate within the calendar month, sample collection will not be required. Upon restarting operations, sample collection will resume and be taken in accordance with the precedential ranking detailed in Items 1-3 for the calendar month in which operations restart.

Comment T-1-5

Page 7 of 11, Section 3.3, Line 30-31, text stating: "The notification must include an explanation and justification for why the sample was not collected at the highest ranked operational status which occurred during the calendar month."

Comment: This sentence highlights a major flaw in this approach to monitoring DMM. This flaw is that it will be difficult to predict during a month when a sample will be representative, or worst case. First, operating plans can change. Second, there are many process variables that will impact DMM formation (such as organic type and concentration, mercury concentration, amount of recycle, vessel temperature, hold times, mercury feed levels, the pH of upstream process units, and the like), and, it will be impossible to predict when the appropriate combination of these parameters has occurred to provide average (or worst case) DMM formation.

Requested action: Please consider validity of the proposed monitoring approach and permit requirements and the potential impacts on human health of not being able to collect representative monthly samples.

Response to T-1-5

Thank you for your comment.

The proposed monitoring approach provides reasonable assurance of compliance by requiring sampling to be performed during operations where dimethyl mercury emissions are expected. The calculations used to determine the dimethyl mercury emission rates used conservative assumptions bounding the potential inputs and parameters to estimate the emission rate. Baseline sampling of dimethyl mercury is also required. The baseline and the monthly sampling both provide methods to verify the assumptions made in the emissions estimate.

Additionally, the estimated impact of dimethyl mercury emissions from the EMF is about 0.0001% of the total impact evaluated for the Health Impact Assessment. Ecology has determined the emissions from operations defined in the Health Impact Assessment, which include the operations in this permit, will have no significant impact on air quality.

Considering the low emission rate of dimethyl mercury, the approved impact evaluation, and the conservative assumptions used in the emission calculations, monthly sampling during operations that would expect to produce dimethyl mercury emissions is adequate to demonstrate compliance with the emission limit.

No change to the permit is necessary.

Comment T-1-6

Page 27 of 11 Section 3.3, Lines 41-43 text stating: "The EMF can restart waste operations once an assessment of the cause behind the exceedances occurred and corrective actions to take preventing future exceedances is submitted and approved by Ecology.

Comment: The indicated sentence is contains a typo. Please correct the sentence to read "The EMF can restart waste operations once an assessment of the cause of the exceedances had been completed and corrective action(s) to prevent future exceedances have been identified and approved by Ecology".

Requested action: Please consider the indicated language change.

Response to T-1-6

Thank you for your comment.

Page 7, lines 41-43 have been revised to state "The EMF can restart waste operations once an assessment of the cause of the exceedances has been completed and corrective action(s) to prevent future exceedances have been submitted and approved by Ecology."

Comment T-1-7

Page 9 of 10, Line 19: General comment

Comment: A line break is needed between Lines 19 and 20.

Requested action: Please correct the text as appropriate.

Response to T-1-7

Thank you for your comment.

A line break will be added between lines 19 and 20 of page 9.

T-2: CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION,

Comment T-2-1

The complete comment with corresponding tables and figures is Reference 2.

I requested and received the air modeling files used by the Permittee in preparing document 24590-WTP-RPT-ENV-15-007 (Nonradioactive Air Emissions Notice of Construction Permit Application for the WTP Effluent Management Facility) during my review of the recent change request for the Effluent Management Facility (EMF) air Permit DE16NWP-003. These files are contained in Document 24590-RMCD-04990. Subsequent review of the AERMOD input files has led me to the conclusion that there may be a significant error in the Permitee's analysis. This error is reflected in the maximum vapor concentrations reported by the Permittee on Page 21 of 24590-WTP-RPT-ENV-15-007. Although the comment period is closed for the EMF change request, I thought it would be prudent to notify Ecology of this potential issue.

Response to T-2-1

Thank you for your comment.

The permittee reviewed modeling files and provided a comparison of the modeling results with the WDROTATE command set at 180 and 0 degrees. The results from the WDROTATE command set at zero resulted in higher dispersion factors and higher ambient air impacts for the emitted constituents. After applying the new dispersion factors to the abated emissions from the applications, dimethyl mercury was the only TAP with an ambient air impact above the ASIL. The emissions of dimethyl mercury were found to be within acceptable limits and approved through a second tier review in accordance with WAC 173-460-090.

To clarify the permitted TAPs, Table 1 was added to the approval order listing the pollutants, estimated emission rates, and their ambient source impact. Approval Condition 1.1.2 will be changed to state, "All TAPs, as listed in Table 1 of this Approval Order, shall be below their respective ASIL or approved through a Second Tier review."

Appendix A: Copies of all public notices

Public notices for this comment period:

- Notice sent to the Hanford-Info email list
- Classified advertisement in the *Tri-City Herald*
- Event posted on Washington Department of Ecology – Hanford's Facebook page

From: McFadden, Daina (ECY)
To: HANFORD-INFO@LISTSERV.ECOLOGY.WA.GOV
Subject: Upcoming Comment Period for DE16NWP-003, Revision 1
Date: Thursday, May 17, 2018 10:54:43 AM

30-Day Advance Notice for the DE16NWP-003, Revision 1

The Washington State Department of Ecology is providing notification of a 30-day public comment period starting mid to late June 2018. This comment period will address proposed modifications to the Non-Radioactive Air Emissions Notice of Construction Approval Order DE16NWP-003 for the Effluent Management Facility (EMF) at the Waste Treatment and Immobilization Plant. The Permittee is United States Department of Energy, Office of River Protection. The EMF is located on the Hanford Site in southeastern Washington.

What Changes are Being Proposed?

The Permittee proposed an alternative condition for demonstrating dimethyl mercury emissions sampling compliance. The proposal is to perform monthly dimethyl mercury grab sampling instead of elemental mercury continuous emissions monitoring. The proposed approach does not result in an emissions increase and does not impact ambient air quality standards.

Public Hearing

A public hearing is not scheduled, but if there is enough interest, we will consider holding one. To request a hearing or for more information, contact:

Daina McFadden
Hanford@ecy.wa.gov
509-372-7950

Ecology logo

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From: McFadden, Daina (ECY)
To: HANFORD-INFO@LISTSERV.ECOLOGY.WA.GOV
Subject: Public Comment Period starts today
Date: Monday, June 18, 2018 9:38:43 AM

Notice of Construction Approval Order DE16NWP-003, Revision 1

Public Comment Period Notification

The Washington State Department of Ecology is providing notification of a 30-day public comment period starting **June 18 through July 20, 2018**. This comment period is regarding a proposed a change to the Non-Radioactive Air Emissions Notice of Construction Approval Order DE16NWP-003 for the Effluent Management Facility (EMF). The EMF is located on the Hanford Site in southeastern Washington.

What Changes are Being Proposed?

The Permittee proposed an alternative condition for demonstrating dimethyl mercury emissions sampling compliance. The proposal is to perform monthly dimethyl mercury grab sampling instead of elemental mercury continuous emissions monitoring. The proposed approach does not result in an emissions increase and does not impact ambient air quality standards.

The permittee is U.S. Department of Energy, Office of River Protection.

How to Comment

Ecology invites you to review and comment on this Notice of Construction. Copies of the Notice of Construction are available at the Administrative Record, Ecology's Nuclear Waste Program office, or online at https://ecology.wa.gov/Waste-Toxics/Nuclear-waste/Public-comment-periods.

Nuclear Waste Program, Resource Center
3100 Port of Benton Blvd. Richland, WA 99354
509-372-7950

U.S. Department of Energy, Administrative Record
2440 Stevens Drive, Room 1101 Richland, WA 99354
509-376-2530

Please submit comments by **July 20, 2018.**

Electronic submission (preferred):
http://wt.ecology.commentinput.com/?id=bMZRY

Mail or hand-deliver to:
Daina McFadden
3100 Port of Benton Blvd
Richland WA 99354

Fax 509-372-7971

Public Hearing

A public hearing is not scheduled, but if there is enough interest, we will consider holding one. To request a hearing or for more information, contact:

Daina McFadden
Hanford@ecy.wa.gov
509-372-7950

For more information, contact:
Lilyann Murphy
Hanford@ecy.wa.gov
509-372-7950
To request materials in a format for the visually impaired, visit https://ecology.wa.gov/accessibility, call Ecology at 509-372-7950, Relay Service 711, or TTY 877-833-6341.

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The City of Kennewick is requesting bids for the construction of a new 2,616 square foot one-story golf clubhouse in Kennewick, Washington at 2701 Columbia Park Trail, Kennewick, WA. The building will utilize conventional construction. The Engineers estimate is between $725,000 and $800,000. A pre-bid meeting will not be held.

Sealed Bids must be received by the City at the Dan Frost Municipal Building, 1010 E. Chemical Drive, Kennewick, WA 99336 no later than 2:00 p.m., Pacific Time, on Tuesday, July 10th, 2018. Bids will then be publicly opened and read aloud. Bids received after the date and hour stated above will not be accepted or considered.

The bid documents for this project will be made available through a third party online web portal, Public Purchase. If you are not already registered with Public Purchase please follow the instructions posted on the City's website at: www.go2kennewick.com/BidOpportunities to complete the two step registration process.

John Noble, Purchasing Manager, City of Kennewick
#3714256 06/17 & 06/24/2018

CITY OF WEST RICHLAND
BOMBING RANGE ROAD PHASE 8
FEDERAL AID NO.
STPUL-3509(006)
BENTON COUNTY, WASHINGTON
INVITATION TO BID

The City Of West Richland will receive sealed bids for the BOMBING RANGE ROAD PHASE 8 at the Municipal Services Facility, 3100 Belmont Blvd, Suite 102, West Richland, Washington, 99353 until Tuesday, July 10, 2018 at 11:00 a.m.

The project provides for the improvement of Dallas Road, Bombing Range Road and Kennedy Road by widening the roadway, grinding and overlying pavement, installing curb, gutter and sidewalk, pavement markings, water pipe and other related work in accordance with the technical specifications, drawings and contract documents.

All bid proposals shall be accompanied by a bid proposal deposit in cash, certified check, cashier's check, or surety bond in an amount equal to five percent (5%) of the amount of such bid proposal. Should the successful Bidder fail to enter into such contract and furnish satisfactory performance bond or quality assurance submittals within the time stated in the contract documents, the bid proposal deposit shall be forfeited to the City of West Richland. Each Bidder shall warrant that he has not entered into collusion with another bidder or any other person, and does not discriminate in any manner against any person based solely on race, color, sex or creed.

Only properly executed proposals submitted on the forms furnished by the City of West Richland will be accepted. The City of West Richland reserves the right to reject any or all bids, to waive any informality, to accept any bid deemed to be responsive in the best interest of the City of West Richland, and reserves the right to re-advertise for new proposals.

Upon request each firm, company, and/or corporation shall receive a CD containing a PDF of all contract documents, specifications and plans by contacting the Public Works Department of the City of West Richland by either phone, (509)967-5434, email: ilka@westrichland.org or by mail, 3100 Belmont Blvd., Suite 102, West Richland, Washington.

This project includes Federal Funds and is subject to the wage provisions of the Washington State Public Works Laws, Federal Davis-Bacon, and related acts.

The City of West Richland is an Equal Opportunity Employer, Minority and Women-Owned businesses are encouraged to bid.

The City of West Richland in accordance with Title VI of the Civil Rights Act of 1964 and 78 Stat. 252, 42 USC

Legals & Public Notices

2000d–42 and Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-Assisted Programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises as defined at 49 CFR Part 26 will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

Roscoe C. Slade III,
Public Works Director
#3711931 06/17, 06/24, & 07/01/2018

Please be advised the Educational Service District has completed the budget of the Operating fund for Fiscal Year 2018-2019 and placed the same on file in the administration office and that a copy thereof will be furnished to any person who might call upon the district for it and that the ESD Board will meet for the purpose of fixing and adopting the budget on June 28, 2018 at 4:00 pm at the Educational Service District 123, Cascade Room 1, 3924 W. Court St, Pasco, Washington. Any person may appear there at and be heard for or against any part of such budget.
3701701 06/10 & 06/17/2018

Please be advised the Educational Service District has completed a budget extension of the Operating fund for Fiscal Year 2017-2018 and placed the same on file in the administration office and that a copy thereof will be furnished to any person who might call upon the district for it and that the ESD Board will meet for the purpose of fixing and adopting the budget extension on June 28, 2018 at 4:00 pm at the Educational Service District 123, Cascade Room , 3924 W. Court St, Pasco, Washington. Any person may appear there at and be heard for or against any part of such budget extension.
#3701733 06/10 & 06/17/2018

Sylkie S. Reynoso is looking for Jorge father of Sylem J. Nieblas to present in court 06/18/2018 at 9:30am. For name change of child.
#3683574 05/27, 06/03, 06/10, & 06/17/2018

Notice of Construction Approval Order DE16NWP-003, Revision 1

The Washington State Department of Ecology (Ecology) is proposing a change to the Non-Radioactive Air Emissions Notice of Construction Approval Order DE16NWP-003 for the Effluent Management Facility (EMF). The EMF is located on the Hanford Site in southeastern Washington.

The Permittee proposed an alternative condition for demonstrating dimethyl mercury emissions sampling compliance. The proposal is to perform monthly dimethyl mercury grab sampling instead of elemental mercury continuous emissions monitoring. The proposed approach does not result in an emissions increase and does not impact ambient air quality standards.

The permittee is U.S. Department of Energy, Office of River Protection.

Ecology invites you to review and comment on this Notice of Construction. The comment period is **June 18, 2018, through July 20, 2018.**

To submit comments electronically (preferred) via: http://wt.ecology.commentinput.com/?id=bMZRY

Send by U.S. Mail, or hand-deliver to:
Daina McFadden, 3100 Port of Benton Blvd., Richland WA 99354

We will consider and respond to all comments received during the public comment period. We will make our final permitting decision after the close of the comment period. A Response to Comments document will be published with the issuance of the final permit.

A public hearing is not scheduled, but if there is enough interest we will consider holding one. To request a hearing, or for more information, contact:
Daina McFadden, 509-372-7950, Hanford@ecy.wa.gov

Copies of the Notice of construction are available at the Administrative Record, Ecology's Nuclear Waste Program office, or online at https://ecology.wa.gov/Waste-Toxics/Nuclear-waste/Public-comment-periods.

Ecology Nuclear Waste Program Resource Center
3100 Port of Benton Blvd. Richland, WA 99354
509-372-7950

U.S. Department of Energy Administrative Record
2440 Stevens Drive, Room 1101 Richland, WA
99354
509-376-2530

To request materials in a format for the visually impaired, visit https://ecology.wa.gov/accessibility, call Ecology at 509-372-7950, Relay Service 711, or TTY 877-833-6341.
#3706345 06/17/2018

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that a Public Hearing will be held before the Board of Benton County Commissioners on June 26th, 2018 at 9:00 a.m., Local Time, to consider CRID No. 25, 1469 PR NW, which proposed project consists of constructing a road to County standards, lying over and across the following described property:

Section 27, Township 9 North, Range 24 East. W.M.; lying westerly of N. Gap Rd. and easterly of Missimer Rd.

All persons desiring to be heard regarding the improvements and formation of the county road improvement district are notified to appear and state their views at that hearing. Testimony for or against the proposed CRID No. 25 will be taken at the hearing, to be held in the Commissioners Meeting Room, Benton County Courthouse, 620 Market Street, Prosser, or also viewed via web cam at the Benton County Justice Center, Commissioners Meeting Room, 7122 W. Okanogan Place, Bldg. A, Kennewick, WA 99336.

DATED this 6th day of June 2018.
#3707129 06/10 & 06/17/2018

Pasco School District – Elementary School #16
INVITATION TO BID
PASCO SCHOOL DISTRICT No. 1
1215 W. Lewis Street
Pasco, WA 99301
DESIGN WEST ARCHITECTS
830 N. Columbia Center Blvd., Suite E
Kennewick, WA 99336

You are invited to bid on a General Contract for construction in the City of Pasco for the Construction of the New Elementary School #16.

A new 2 story building consisting of approximately 74,000 square feet, including Site Work, Structures, Finishes, Fire Protection, Mechanical, and Electrical work.

Preliminary Estimate:
Base Bid: $19,000,000

Proposals will be accepted by the District until 2:00pm, prevailing time, on Tuesday, July 17, 2018 at the Pasco School District Booth Building at 1215 W. Lewis Street, Pasco, WA. Bid proposals will be opened publicly and read aloud at 2:00pm. Interested parties are invited to attend.

A Pre-Bid Conference, mandatory for all General Contractor prospective bidders, will be held Tuesday June 26, 2018 at 2:00pm at the project site, 3901 Road 84, Pasco, WA.

Plans and Specifications are available, beginning Monday, June 18, 2018, through the Architect. Printed paper sets are available at $100 per set (limit 2 sets to General Contractors and 1 set for subcontractors). The cost is refundable provided the documents are returned in good condition within 10 days after bid opening.

Additional sets may be purchased at cost, non-refundable. E-mailed PDF drawings and specifications are available at no cost (highly encouraged). Contact Caroline Kunkel, Office Manager with Design West Architects by e-mail at ckunkel@designwestwa.com to request documents.

Bid security amounting to five percent (5%) of the total Base Bid and Bid Alternates must accompany each Bidder's proposal in accordance with Instructions to Bidders.

Bid documents will be available for examination during the bidding period at the following locations:
Abadan Regional Plan Center
–Spokane, WA

Washington Department of Ecology - Hanford

Published by Joanna Ecology Morse [?]
Like This Page · 1 min ·

Share your input! From now until July 20, you can comment on proposed changes to the Non-Radioactive Air Emissions Notice of Construction for the Effluent Management Facility (EMF) on the #Hanford site.

Find out more and submit your comments: https://ecology.wa.gov/Waste-Toxics/Nuclear-waste/Public-comment-periods

Tag Photo | Add Location | Edit

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Like | Comment | Share

Write a comment...

References

Reference 1

CTUIR DNR-EESP COMMENTS TO:

Non-Radioactive Air Emissions
Notice of Construction Approval Order
Conditions and Restrictions
DE16NWP-003, Revision 1

July 2018

Prepared By:
Rodney S. Skeen, Ph.D., P.E.
Energy and Environmental Sciences Program
Phone: (541) 429-7420
Email: rodskeen@ctuir.org

Non-Radioactive Air Emissions Notice of Construction Approval Order Conditions and Restrictions (DE16NWP-003, Revision 1)

Page 6 of 10, Section 3.1.1, text stating: "*…including the use of sorbent tubes or approved instruments provided such devices are spanned to collect representative samples of the stack dimethyl mercury….*"

Comment: It is the assumption of this reviewer that the proposed change to mercury monitoring is the result of Ecology's response to Comment 1 in Ecology Publication 17-05-001. Ecology acknowledging that:

1. The Permittee used conservative assumptions in analyzing DMM emissions.
2. The EMF DMM emissions in the Permittee's application (24590-WTP-RPT-ENV-15-001, Rev 0) were below levels evaluated in the Second Tier Review.
3. DMM monitoring is required because emissions of DMM in the application (i.e. 5.29E-07 g/s from the EMF) resulted in exceedance of the ASIL value (See Table A-1 in 24590-WTP-RPT-ENV-15-001, Rev 0).
4. Because the Second Tier Review relied on the assumption that total mercury was equivalent to DMM, it was reasonable to require total mercury monitoring as a surrogate for DMM monitoring.
5. Ecology acknowledged that another monitoring approach would be considered if the Permittee had a better surrogate for DMM than total mercury.

Given Item 5 (above), the Permittee is now proposing to use monthly grab samples to directly measure DMM rather than measure a surrogate. This reviewer has three concerns with underlying assumptions used to estimate DMM emissions in the original permit application (24590-WTP-RPT-ENV-15-007, Rev0) and subsequently this proposed change.

Concern 1: The kinetic model used to estimate DMM formation in 24590-WTP-RPT-ENV-15-007, Rev 0 may not be appropriate for the application. If this is the case, then the estimated amount of DMM produced in the EMF in the original application is not accurate. This assertion is based on the observation that Section 9.1 of 24590-WTP-RPT-ENV-15-007, Rev 0 states that, "*As previously described, the EMF emissions are based on 24590-BOF-M4C-DEP-00001,…".* Section 5.3.1.3.3.4 of 24590-BOF-M4C-DEP-00001provides the following equation for net DMM formation in caustic salt solutions with organics:

$$c_{DMHg,j} = k_j * c_{Hg,j} * RT_j * \frac{3600\ sec}{hr}$$

Where:

$c_{DMHg,j}$	=	Concentration of dimethyl mercury in vessel j, in g/L
k_j	=	Rate constant for vessel j, in s^{-1} (Equation 63)
$c_{Hg,j}$	=	Concentration of Hg in vessel j, in g/L (Section 5.3.1.3.3.1)
RT_j	=	Vessel j residence time, in hr (Section 5.3.1.3.3.3)

And:

$$k_j = e^{-(\frac{5886.9}{T_j}+2.7037)}$$

Where:

k_j = Rate constant for vessel j, in s^{-1}

T_j = Vessel j Nominal Temperature, in K

The equation for the first order rate constant (k) was taken from Reference 9.24 of 24590-BOF-M4C-DEP-00001 (CNN 160522 – SRNL letter "Input for Dimethylmercury Formation and Partitioning).

A review of the original reference reveals that the authors of this equation specifically state that it should be only be applied qualitatively. Specifically, it is stated on Page 2 of 11 of the original document, "*Due to the limited range of initial conditions (mercury concentration, organic concentration, and variety of organics), the summary memoranda deemed that the kinetics formed from the formation tests should only be relied upon in qualitative assessments."*.

Furthermore, the document on Page 3 of 11 states that, "*Note that the first order dependence of the formation rate on soluble mercury content was only assumed and alternative valid assumptions could have been made….For those reasons, it is impossible to determine from existing data the reaction order of dimethylmercury formation…."*.

Hence, the authors of the equations used in 24590-BOF-M4C-DEP-00001 to estimate DMM concentrations in the EMF (and subsequently emission rates) specifically warn that:

1. the assumption that the reaction is first-order in soluble mercury concentration is not validated; and
2. the equation for the rate constant should not be applied for quantitative analysis.

Unfortunately, the Permittee appears to have ignored both these warnings. For this reason, the computed results are suspect.

Concern 2: Even if the kinetic model could be applied in a quantitative manner, the calculation approach reported in 24590-BOF-M4C-DEP-00001 does not represent a worst case analysis of DMM emissions; a claim that is made in several places in the document. For example, Section 6.1.20 states, "*Therefore, the amount of Hg captured in the SBS condensate and transferred to the DEP system in stream RLD21 is not modeled in this emissions estimate*…". A review of Appendix M of 24590-WTP-RPT-PET-10-22, Rev 0 shows that 28.6% of the mass of mercury entering the LAW meters exits in RLD21. Hence, RLD21 is a significant source of mercury.

Also, Section 6.1.33 states that "*Mercury has the potential to accumulate in the recycle stream from the DEP system back to LAW during DFLAW operations since mercury is not vitrified (DF of 1 in the LAW melter per Ref. 9.14, Table 14), is captured in the SBS (Assumption 6.1.32), and the non-volatile mercury species are concentrated in the DEP evaporator. However, a detailed analysis of the accumulation of mercury in the DEP system is outside the scope of this emissions estimate*." The section goes on to imply that neglecting recycle is acceptable because the total mass mercury is still represented, but the distribution within the various EMF tanks is different.

While the total mass of mercury may be still represented (an assumption this reviewer has not verified), the formation of DMM will not be the same since the rate of formation is assumed to be a function of the concentration of soluble mercury in each tank and tank temperature, hold time, and processing time. These parameters vary from tank to tank (see the assumptions in Sections 6.1.22 through 6.1.30 of 24590-BOF-M4C-DEP-00001).

Concern 3: The DMM emission rate in 24590-BOF-M4C-DEP-00001 does not consider the range of temperatures and tank hold-times that can occur during EMF operations. Sections 6.1.22 through 6.1.28 indicate that the estimated DMM formation rate were based on single values of temperature and tank residence time. However, it is the opinion of this reviewer that these values will likely vary during plant operations and that this variation should have been considered in the DMM formation estimates. For example, Attachment 1 of CNN 160522 (SRNL letter "Input for Dimethylmercury Formation and Partitioning) proves a range of operating temperatures for WTP vessels[1]. The variation from minimum to maximum operating temperature ranges from approximately 10 °F to 135 °F, depending on the vessel. It is recognized that the vessels in the EMF will likely not experience temperature fluctuations at the upper end of the quoted range. However, variations should have been estimated and accounted for in the DMM formation estimate. Alternatively a maximum temperature for each vessel should have been used.

Similarly, the DMM formation estimates in 24590-BOF-M4C-DEP-00001 assumed the reaction time was equal to the hold times in each vessel under normal continuous operations. This reaction time[2] was calculated as:

$$RT_j = CT_j * N_j$$

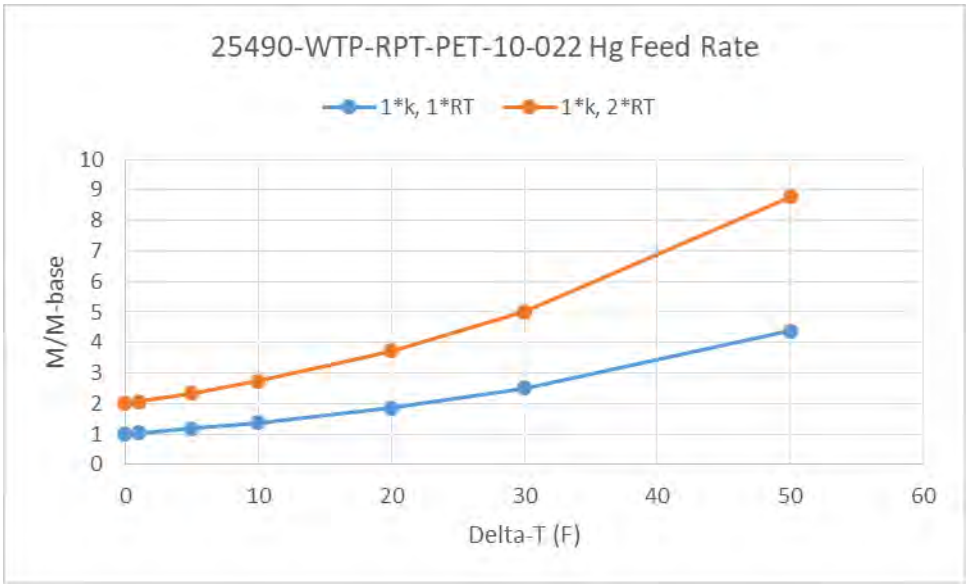
Where:

RT_j	=	Residence time for vessel j, in hr
CT_j	=	Vessel j batch cycle time, in hr (Assumption 6.1.28)
N_j	=	Quantity of vessel j (e.g. $N_{DEP-VSL-4} = 2$)

However, process upsets or temporary shutdowns are likely during LAW operations and this will result in longer hold times and subsequently higher DMM formation rates.

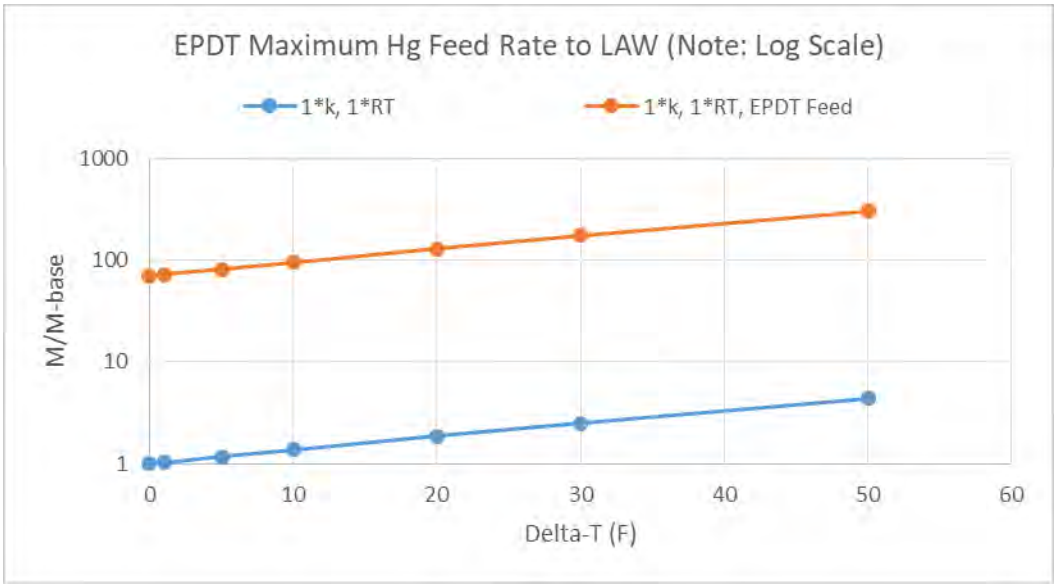
The impacts of temperature and reaction time on DMM emissions from the EMF are illustrated in the following figure:

[1] This analysis was done before the EMF was part of the WTP design and so includes the Pretreatment System and not the EMF.
[2] Note that the residence time (RT) was used as the reaction time.



Values in this figure were created by this reviewer using the calculation approach outlined in 24590-BOF-M4C-DEP-00001. The parameter (M/M-base) represents the estimated DMM emission rate from the EMF for each condition divided by the emission rate calculated using the values for temperature and RT in the report. Delta-T represents the assumed temperature increase (°F) from the values reported in Sections 6.1.22 through 6.1.27 of 24590-BOF-M4C-DEP-00001. Note that some input parameters for these calculations were not readily evident in 24590-BOF-M4C-DEP-00001 and this reviewer was not able to exactly match the Permittees base emissions rate of 5.29E-07 g/s. Rather the base rate calculated was 1.5E-07 g/s.

Finally, the mercury feed rate to the LAW system will also have an impact on DMM emission rates from the EMF. The following graph represents the predicted DMM emissions using the mercury feed rate reported in Appendix M of 25490-WPT-RPT-PET-10-022 (2.79E-03 kg/hr feed to LAW melter, process stream LFP04a) and the highest estimated mercury feed rate reported in the recent Environmental Performance Demonstration Test (EPDT) for the LAW system (1.93E-01 kg/hr, feed to LAW melter, process stream LFP04a). Values were computed using the same approach outlined in 24590-BOF-M4C-DEP-00001. In this figure, the blue line represents results using the feed rate from 25490-WPT-RPT-PET-10-022 and the orange line represents the results using the EPDT feed rate. Note that the y-axis is a logarithmic scale.



This reviewer was not able to obtain a copy of 24590-WTP-RPT-ENV-16-001, Rev. 0 (Feed Vector Development in Support of WTP Environmental Risk Assessment Activities) before the end of the comment period to verify how the mercury feed rate used in 24590-BOF-M4C-DEP-00001 compares to those used to generate above estimate. Hence, Ecology is requested to verify that the feed rate estimate used in 24590-BOF-M4C-DEP-00001 is at the upper end of expected feed rates.

Requested action: Please consider the above concerns and assess whether the Permittee has properly estimated the DMM formation rates in the EMF and other WTP facilities in preparing the original application (24590-WTP-RPT-ENV-15-007, Rev 0) and the Second Tier Review. If these estimates are not an accurate reflection of the amount of DMM formed, then determine if a new health impact assessment for DMM is needed.

Page 6 of 10, Section 3.1.1, text stating: "*Dimethyl mercury sampling and analysis will be in accordance with the United States Environmental Protection Agency (EPA) procedures or Ecology approved alternative procedure including the use of sorbent tube or approved instrument provided such devices are spanned to collect representative samples of the stack dimethyl mercury concentration. Contemporaneous stack flow rate and temperature will be applied with the stack gas concentration to report dimethyl mercury in terms of pounds per 24-hour period.*"

Comment: It is not clear what is meant by the phrase "*are spanned to collect representative samples*". Does the author mean that the samples span the appropriate operating period for the month so that they represent an average (or worst case?) for the month?

Requested action: Please clarify what is meant by the indicated phrase. Also "*tube*" and "*instrument*" in the paragraph should be plural and "*pressure*" should be added to the phrase

"….*stack flowrate and temperature*…" since pressure is also part of converting volumetric flow rate to mass flowrate for gas. This comment also applies to the first paragraph of Section 3.3

Page 7 of 10, Section 3.3, Line 9, text stating: "*Permittee will develop and implement a monthly specific SAP….*"

Comment: The phrase "*monthly specific SAP*" is awkward. The phrasing "*Permittee will develop a SAP for monthly measurement of dimethyl mercury concentration in the EMF exhaust stack*" is a suggested alternative. Also, the detection limit of the new method should be low enough to ensure that emissions at the level specified in Permit Condition 1.1.3 are detected. Please add a sentence to indicate that the Permittee will demonstrate in the SAP or accompanying Quality Assurance Plan that the analytical methods will have a detection limit that meets the minimum requirement set by Condition 1.1.3.

Requested action: Please consider changing the text as indicated.

Page 7 of 10, Section 3.3, Lines 17 through 27: General comment.

Comment: It is important that Items 1-4 be worded to avoid ambiguity. Please consider the following:

1. The sample will be collected while actively processing secondary liquid waste streams generated from the low-activity waste melter offgas control system during low activity waste processing.
2. If the EMF is not processing the waste stream defined in Item 1 within the calendar month, then the sample will be collected while actively processing other liquid waste streams in the EMF.
3. If the EMF will not process any liquid waste streams within the calendar month, then the sample will be collected while the *EMF is operating*[3].
4. If the EMF is will not operate within the calendar month, then the sample will be collected when operations restart. If it has been more than one calendar month since the last sample was collected then the Permittee will collect a sample to represent the skipped month as soon as the EMF evaporator has restarted and is at steady-state. The Permittee will then plan for the next month's sample considering the priority ranking detailed in this section.

Requested action: Please consider the indicated language.

[3] What is meant by "*EMF operating*" if the system is not processing liquid waste? Does this mean processing a non-waste stream in the evaporator while collecting a sample? This phrase should be clarified to indicate exactly what is expected.

Page 7 of 11, Section 3.3, Line 30-31, text stating: "*The notification must include an explanation and justification for why the sample was not collected at the highest ranked operational status which occurred during the calendar month."*

Comment: This sentence highlights a major flaw in this approach to monitoring DMM. This flaw is that it will be difficult to predict during a month when a sample will be representative, or worst case. First, operating plans can change. Second, there are many process variables that will impact DMM formation (such as organic type and concentration, mercury concentration, amount of recycle, vessel temperature, hold times, mercury feed levels, the pH of upstream process units, and the like), and, it will be impossible to predict when the appropriate combination of these parameters has occurred to provide average (or worst case) DMM formation.

Requested action: Please consider validity of the proposed monitoring approach and permit requirements and the potential impacts on human health of not being able to collect representative monthly samples.

Page 27 of 11 Section 3.3, Lines 41-43 text stating: "*The EMF can restart waste operations once an assessment of the cause behind the exceedances occurred and corrective actions to take preventing future exceedances is submitted and approved by Ecology.*

Comment: The indicated sentence is contains a typo. Please correct the sentence to read "*The EMF can restart waste operations once an assessment of the cause of the exceedances had been completed and corrective action(s) to prevent future exceedances have been identified and approved by Ecology".*

Requested action: Please consider the indicated language change.

Page 9 of 10, Line 19: General comment

Comment: A line break is needed between Lines 19 and 20.

Requested action: Please correct the text as appropriate.

Reference 2

From:	Murphy, Lilyann (ECY)
To:	McFadden, Daina (ECY)
Subject:	FW: Potential Issues with Air Model used in 24590-WTP-RPT-ENV-15-007
Date:	Thursday, November 29, 2018 11:44:22 AM
Attachments:	image005.png image006.png

Daina,

We are changing items in the approval order due to this comment that was received out of the public comment period. Would you please add this comment to the EMF NOC (DE16NWP-003 Rev 1) eComments page?

Thank you!

Lily

From: McFadden, Daina (ECY)
Sent: Tuesday, July 24, 2018 12:20 PM
To: Murphy, Lilyann (ECY) <liba461@ECY.WA.GOV>
Subject: FW: Potential Issues with Air Model used in 24590-WTP-RPT-ENV-15-007

☺

~ Daina

From: Rod Skeen [mailto:RodSkeen@ctuir.org]
Sent: Tuesday, July 24, 2018 11:46 AM
To: Hanford (ECY) ; McFadden, Daina (ECY)
Cc: Matthew Johnson
Subject: Potential Issues with Air Model used in 24590-WTP-RPT-ENV-15-007

Good Morning,

I requested and received the air modeling files used by the Permittee in preparing document 24590-WTP-RPT-ENV-15-007 (Nonradioactive Air Emissions Notice of Construction Permit Application for the WTP Effluent Management Facility) during my review of the recent change request for the Effluent Management Facility (EMF) air Permit DE16NWP-003. These files are contained in Document 24590-RMCD-04990. Subsequent review of the AERMOD input files has led me to the conclusion that there may be a significant error in the Permitee's analysis. This error is reflected in the maximum vapor concentrations reported by the Permittee on Page 21 of 24590-WTP-RPT-ENV-15-007. Although the comment period is closed for the EMF change request, I thought it would be prudent to notify Ecology of this potential issue.

As you are aware, the wind at Hanford generally blows from the NW to the SE and so that a vapor plume released from the EMF should also flow in a SE direction. This is not the case for the model files provided to me in 24590-RMCD-04990. The following figure provides a Windrose Plot (data represented as "blowing from") for the 2004 surface meteorological data along with the corresponding predicted annual air concentration for a 1 g/s vapor release from the EMF. Both the meteorological data and AERMOD model inputs used to generate this figure were taken directly from 24590-RMCD-04990.

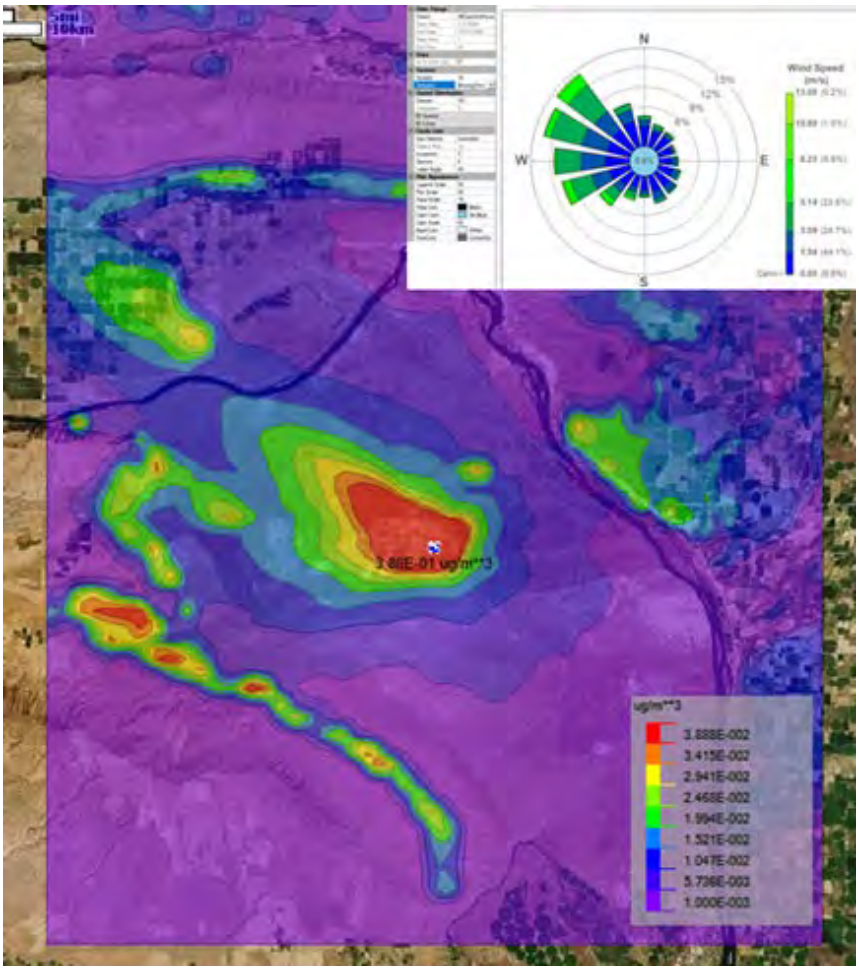


Figure 1: 2004 Meteorological data Windrose (direction represented as "blowing from") and corresponding annual air concentration for a 1 g/s vapor release from the EMF. Data and model were taken directly from 24590-RMCD-04990.

Obviously, the vapor plume in Figure 1 appears to be moving in the opposite direction as the wind. A subsequent review of the AERMOD input files contained in 24590-RMCD-04990 revealed that each contained the command "ME WDROTATE 180" which shifts the wind direction by 180 degrees.

Removal of the "ME WDROTATE 180" command results a vapor plume moving with the wind (Figure 2).

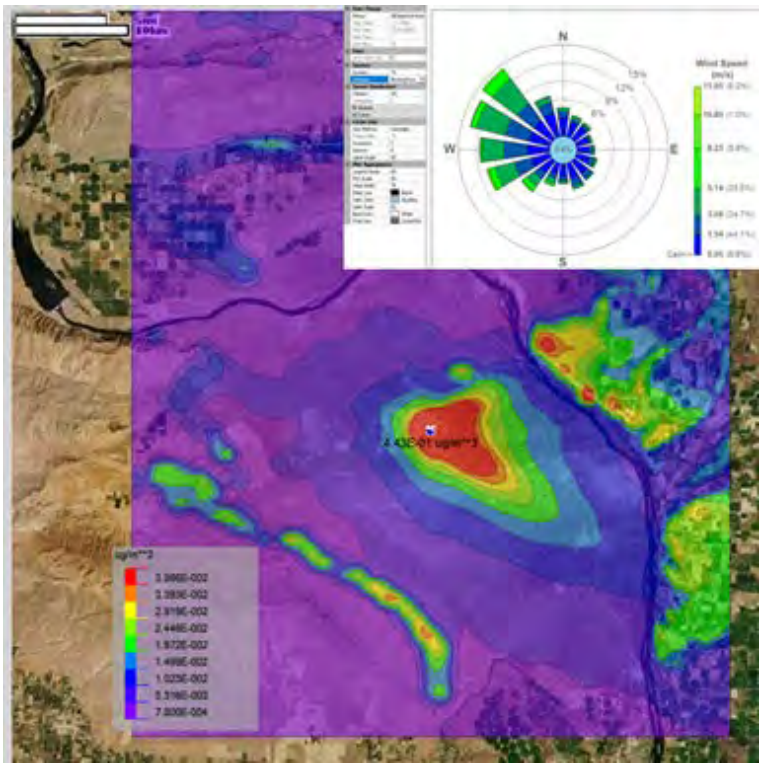


Figure 2: 2004 Meteorological data Windrose (direction represented as "blowing from") and corresponding annual air concentration for a 1 g/s vapor release from the EMF. Data and model were taken directly from 24590-RMCD-04990 with the exception that the line "ME WDROTATE 180" was removed from the AERMOD input file.

The impacts of shifting the wind direction on the maximum vapor concentration is provided in the Table 1. The first three rows in Table 1 correspond to the 1-hr, 24-hr, and annual values reported on Page 21 of 24590-WTP-EMV-15-007, Rev 0. These values were also reproduced in this analysis using the AERMOD and 2004 meteorological files from 24590-RMCD-04996. The next three rows represent the 1-hr, 24-hr, and annual maximum values generated by removing the 180 degree shift of the wind direction and applying Permittee's method of taking each from calendar year 2004. The final three rows show the maximums for each parameter using the corrected wind data and evaluating all five years of meteorological data. The last column in the table presents the difference between a new maximum value and that reported by the permittee. Altering the wind direction results in higher concentrations for all parameters under all conditions presented in the Table. The increase in maximum values ranges from 46% to 80%.

Table 1: Maximum Vapor Concentration Results

Condition	Averaging Time	Concentration (µg-s/g-m^3)	Easting (UTM)	Northing (UTM)	Percent Difference (%)
24590-RMDC-04990, 2004 only considered	1 hr	8.78767	325000	5168897	NA
24590-RMDC-04990, 2004 only considered	24 hr	0.82655	325000	5172897	NA
24590-RMDC-04990, 2004 only considered	Annual	0.02725	323500	5160897	NA
24590-RMDC-04990, Wind Corrected, 2004 only considered	1 hr	12.82774	323958	5160500	46.0%
24590-RMDC-04990, Wind Corrected, 2004 only considered	24 hr	1.29417	321944	5160811	56.6%
24590-RMDC-04990, Wind Corrected, 2004 only considered	Annual	0.04552	321944	5160811	67.0%
24590-RMDC-04990, Wind Corrected, all years considered	1 hr	12.82774	323958	5160500	46.0%
24590-RMDC-04990, Wind Corrected, all	24 hr	1.364457	323958	5160500	65.1%

years considered					
24590-RMDC-04990, Wind Corrected, all years considered	Annual	0.04911	321944	5160811	80.2%

Thank you for your time and I hope this information is both accurate and useful in your continued review of the pending change to EMF air permit. Please feel free to contact me if you have any questions concerning this matter, or would like the modeling files used to generate these results.

Sincerely,

Rod Skeen

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