MONTANA HAZARDOUS WASTE PERMIT

Permit Number MTHWP-17-01

Issued To:

Exxon Mobil Corporation

~~**ExxonMobil Refining & Supply Company**~~

Billings Refinery

Billings, Montana

EPA ID Number MTD010380574

Previously Issued As:

MTHWP-99-02

Issued: June 28, 1999

Formatte

MTHWP-88-01
Issued: October 19, 1988

DEQ
Montana Department
of Environmental Quality

MONTANA HAZARDOUS WASTE PERMIT

Permit No. MTHWP-17-01

Permittee: ExxonMobil Refining & Supply Company
ExxonMobil Billings Refinery
EPA ID Number MTD010380574

Pursuant to the Montana Hazardous Waste Act (MHWA) and regulations promulgated thereunder by the Montana Department of Environmental Quality (hereafter referred to as DEQ), a Permit is hereby issued to ExxonMobil Refining & Supply Company, (hereafter called Permittee) for operation of a waste staging area, land treatment unit and associated vehicle decontamination pad; post-closure care of two land treatment units; and continued implementation of facility-wide corrective action at the ExxonMobil Billings Refinery. The ExxonMobil Billings Refinery is located northeast of Billings, Montana, in Section 24 and 25, Township 1 North, Range 26 East, Yellowstone County, Montana (latitude 45° 48' 58" and longitude 108° 26' 02").

This Permit consists of the conditions contained herein (including those in any attachments and appendices), and the applicable requirements in Title 17, Chapter 53, Administrative Rules of Montana as specified in the Permit. The Permittee must comply with all terms and conditions of the Permit.

DEQ presumes the Permit application and amendments (hereafter referred to as the Application), is accurate. Where portions of the Application are incorporated herein, they are deemed to be part of this Permit.

The Permittee must inform DEQ of any changes in on-site operations or Application information that would affect the Permittee's ability to comply with the Permit conditions or applicable regulations. Any inaccuracies or misrepresentations found in the Application may be grounds for termination, modification, or revocation and reissuance of this Permit.

This Permit is effective as of March 9, 2017, and shall remain in effect through March 9, 2027, unless revoked and reissued, or terminated.

Signature: Tom Livers Date: 3/8/17

Tom Livers, Director
Montana Department of Environmental Quality

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I.A. Citation Convention

For ease of reading and referencing, where the federal rule under the Code of Federal Regulations (CFR) is incorporated by reference into the Administrative Rules of Montana (ARM), only the federal citation is used. Attachment I.1 includes a cross-reference table showing the CFR citations and corresponding ARM citations.

I.B. Permittee

This Permit is issued to Exxon Mobil Corporation (ExxonMobil) by the Montana Department of Environmental Quality (DEQ) for management of the regulated hazardous waste management units listed in Condition I.C.2. and implementation of facility-wide corrective action requirements.

I.C. Facility Description

I.C.1. *Refinery*

The ExxonMobil Billings Refinery is a petroleum refinery located in Billings, Yellowstone County, Montana, in an area known as Lockwood (Attachment I.2). The legal description of the refinery is S24, T01 N, R26 E, 2065, Parcel 001, TR 1 COS 2065 IN SEC 24/25-1N-26E 282.660 AC (2001).

I.C.2. *Permitted Units Descriptions*

Permitted Units at the ExxonMobil Billings Refinery include a South Land Treatment Unit (SLTU), New East Land Treatment Unit (NELTU), Old East Land Treatment Unit (OELTU), and Waste Staging Area (WSA).

I.C.2.a. <u>South Land Treatment Unit (SLTU):</u>

Located in Section 25, Township 1 North, Range 26 East, Yellowstone County. The SLTU also contains a Vehicle Decontamination Facility (VDF). A map showing the location of the SLTU and VDF is provided in Attachment I.3. The SLTU has been in operation since 1980. A No Migration Variance was granted by EPA on July 27, 1993, allowing ExxonMobil to place Slop Oil Emulsion Solids and API Separator Sludges (EPA Hazardous Waste Numbers K049 and K051 respectively), generated at the ExxonMobil Billings Refinery. The No Migration Variance is terminated as of the date of the Permit Reissuance.

I.C.2.b. <u>New East Land Treatment Unit (NELTU):</u>

Located in the SW ¼ of Section 19, Township 1 North, Range 27 East, encompassing approximately 19.3 acres as shown in Attachment I.4. Waste application ceased on June 22, 1989. DEQ accepted closure certification on September 14, 2011, and, therefore, the NELTU is currently in post-closure.

I.C.2.c. Old East Land Treatment Unit (OELTU):

Located in the East ½, Southeast ¼ of Section 19, Township 1 North, Range 27 East, encompassing 5.6 acres as shown in Attachment I.4. Waste application ceased on June 22, 1989. DEQ accepted closure certification on September 14, 2011, and, therefore, the OELTU is currently in post-closure.

I.C.2.d. Waste Staging Area (WSA):

Located in Section 24, Township 1 North, Range 26 East, Yellowstone County, Montana. A map showing the location of the WSA is provided in Attachment I.5. The WSA allows containerized hazardous waste to be stored for greater than 90 days.

I.C.3. *Closed Unit No Longer Permitted:*

I.C.3.a. Lead Weathering Tank:

Located in the Southeast ¼, Northeast ¼, Section 25, Township 1 North, Range 26 East, Yellowstone County, Montana. The lead weathering tank was closed March 30, 2000 and was removed from service. The closure letter for the lead weathering tank is provided in Attachment I.6. Therefore, requirements in this Permit are not applicable to the lead weathering tank.

I.D. **Applicability**

The conditions of this Module apply to the Permitted Units described in Condition I.C.2., and all solid waste management units (SWMUs) and areas of concern (AOCs) defined in Condition VII.A.3.

I.E. **Definitions**

The terms used in this Permit have the same meaning as those in the Resource Conservation Recovery Act (RCRA), Montana Hazardous Waste Act (MHWA), ARM Title 17, Chapter 53, 40 CFR 124, 260, 261, 264, 268, 270, and 279, and the Federal Register dated July 27, 1990, unless this Permit specifically provides otherwise. Where terms are not defined in the rules and regulations, this Permit, or EPA guidance or publications, the terms shall have the meaning of a standard dictionary reference or the generally accepted scientific or industrial meaning of the term. The following terms are specifically defined in this Permit.

I.E.1. Area of Concern (AOC) means any area at a facility having a probable release of a hazardous waste or hazardous constituent which may or may not be from a solid waste management unit and is determined by DEQ to pose a current or potential threat to human health or the environment. AOCs include areas that have been contaminated by routine and systematic releases of hazardous waste or hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities. AOCs must be considered equivalent to SWMUs for the purposes of investigation and corrective action.

I.E.2. Corrective Measures means all corrective actions necessary to protect human health and the environment from all releases of hazardous waste or hazardous constituents from any Permitted Unit, SWMU, and/or AOC at the facility regardless of the time of placement of the waste in the unit, as required under this Permit and 40 CFR 264.101. Corrective measures may address releases to air, soils, subsurface gases, surface water, or groundwater.

I.E.3. DEQ means the Montana DEQ of Environmental Quality

I.E.4. Director means the Director of the Montana DEQ of Environmental Quality.

I.E.5. Exxon Mobil Corporation Part B Application means the information submitted by Exxon Mobil Corporation in the RCRA Part B Permit Application submitted September 30, 1983, the Part B Permit Renewal Application submitted August 3, 1998, ~~and~~ the Part B Permit Renewal Application received by DEQ on November 24, 2008, and the Part B Permit Modification Application received by DEQ on January 19, 2021.

I.E.6. Facility means contiguous land, structures, other appurtenances, and improvements on the land under the control of the owner or operator seeking a permit under the MHWA and ARM Title 17, chapter 53.

I.E.7. Hazardous Constituent means any constituent identified in Appendix VIII of 40 CFR Part 261 or Appendix IX of 40 CFR Part 264.

I.E.8. Hazardous Waste means a hazardous waste as defined in 40 CFR 261.3. [40 CFR 270.2]

I.E.9. Hazardous Waste Management Facility means all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units. [40 CFR 270.2]

I.E.10. Hazardous Waste Management Unit means a contiguous area of land on or in which hazardous waste is placed or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area. Examples include a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system, and a container storage area. A container alone does not constitute a unit; the unit includes containers and the land or pad upon which they are placed.

I.E.11. Land Disposal means placement in or on the land, except in a corrective action management unit or staging pile, and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, underground mine or cave, or placement in a concrete vault, or bunker intended for disposal purposes. [40 CFR 268.2]

I.E.12. Permit Reissuance means the reissuance of ExxonMobil's Montana Hazardous Waste Permit pursuant to the Part B Permit Renewal Application initially filed by the Permittee on November 24, 2008.

I.E.13. Permittee means Exxon Mobil Corporation (ExxonMobil).

I.E.14. Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof. [40 CFR 270.2]

I.E.15. Regional Administrator means the Regional 8 Administrator of the Environmental Protection Agency or his/her designee. [40 CFR 260.10 and 40 CFR 270.2]

I.E.16. Release means any spill, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of any hazardous waste or hazardous constituents into the environment.

I.E.17. Remediation Waste means all solid and hazardous wastes, and all media (including ground water, surface water, soils, and sediments) and debris that are managed for implementing clean-up. [40 CFR 260.10]

I.E.18. Solid Waste Management Unit (SWMU) means any discernible unit at which solid waste has been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. SWMUs include MHWA-regulated hazardous waste management units. Such units include any area at a facility at which solid waste has been routinely and systematically released.

I.E.19. Unit includes, but is not limited to, any landfill, surface impoundment, waste pile, land treatment unit, incinerator, injection well, contaminated groundwater collection/storage tank, drum, or other storage device, spray device, splash pad, drip pad, skimmer tank, oil water separator, container storage area, septic tank, drain field, lateral underdrain, sump, emulsion aerator device, wastewater treatment unit, elementary neutralization unit, transfer station soil ventilation device, recycling unit, underground lateral drain, French drain, waste transfer routes, pipes, sewers, and/or other interim measure or corrective action structure.

I.F. Effect of Permit

I.F.1. *General*

I.F.1.a. In accordance with 40 CFR 270.4(a)(1), compliance with this Permit during its term constitutes compliance, for purposes of enforcement, with the MHWA except for those requirements not included in the Permit which:

I.F.1.a.i. Become effective by statute [40 CFR 270.4(a)(1)(i)];

I.F.1.a.ii. Are later promulgated; or are promulgated under 40 CFR 268 restricting the placement of hazardous wastes in or on the land [40 CFR 270.4(a)(1)(ii)]; or

I.F.1.a.iii. Are promulgated under 40 CFR 265, subpart AA, BB, or CC limiting air emissions. [40 CFR 270.4(a)(1)(iv)]

I.F.1.b. The issuance of this Permit does not convey any property rights of any sort, or any exclusive privilege. [40 CFR 270.4(b)]

I.F.1.c. The issuance of this Permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations. [40 CFR 270.4(c)]

I.F.2. *Hazardous Waste Storage, Treatment, and Disposal*

The Permittee is allowed to store, treat, or dispose of hazardous waste in accordance with the Conditions of this Permit. Any storage of hazardous waste not authorized by this Permit is prohibited.

I.F.3. *Facility-Wide Corrective Action*

I.F.3.a. The Permittee is required, under the Conditions of this Permit and 40 CFR 264.101, to institute facility-wide corrective action as necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any SWMU or AOC at the facility, regardless of the time at which waste was placed in such units.

I.F.3.b. The Permittee must implement corrective actions beyond the facility property boundary, where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of the Director that, despite the Permittee's best efforts, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis.

I.F.3.c. AOCs shall receive the same level of investigation and remediation as that required by rules, regulations and statutes for SWMUs. [40 CFR 270.32(b)(2)]

I.G. Financial Assurance

ExxonMobil must provide financial assurance for the Permitted Units described in Condition I.C.2. and for facility-wide corrective action required in Module VII (Facility-Wide Corrective Action) at the ExxonMobil Billings Refinery.

I.G.1. *General Financial Assurance Requirements*

I.G.1.a. The Permittee shall comply with the requirements of 40 CFR 264.148 with regard to the incapacity of the Permittee, its guarantors, or financial institutions to provide financial assurance.

I.G.1.b. In the event that DEQ incorporates changes to 40 CFR 264 Subpart H after the effective date of this Permit, DEQ may consider a revision of the financial requirements of this Permit in accordance with the new subpart H requirements and modify the Permit accordingly.

I.G.2. *Cost Estimates for Closure and Post-Closure Care*

I.G.2.a. Cost estimates must include all necessary long term costs for closure and post-closure care for each Permitted Unit described in Condition I.C.2.

I.G.2.b. All cost estimates must be in current dollars and must not incorporate any salvage value that may be realized from the sale of wastes, facility structures or equipment, land, or other assets associated with the facility.

I.G.2.c. The Permittee must adjust the cost estimate(s) for inflation each year.

I.G.2.d. The Permittee must adjust the cost estimate(s) if DEQ determines that additional work is required, or if any other conditions increase the cost of the work to be performed under this Permit.

I.G.2.e. The Permittee must submit each written cost estimate to DEQ for its review and approval.

I.G.2.f. The Permittee must keep the latest closure and post-closure care cost estimate at the offices of the ExxonMobil Billings Refinery.

I.G.3. *Financial Assurance Demonstration*

I.G.3.a. The Permittee shall demonstrate continuous compliance with 40 CFR 264.146 by providing documentation of financial assurance, as required by 40 CFR 264.151 in at least the amount of the cost estimates required by Condition I.G.2. and I.G.6.

I.G.3.b. The Permittee's inability to secure financial assurance for the completion of work to be performed in accordance with this Permit shall in no way excuse performance of any other requirements of this Permit.

I.G.4. *Liability Requirements for the Permitted Units*

I.G.4.a. The Permittee shall demonstrate continuous compliance with the requirements in 40 CFR 264.147 including the requirements to have and maintain liability coverage for sudden and non-sudden accidental occurrences in the amount of at least $4 million per occurrence with an annual aggregate of at least $8 million, exclusive of legal defense costs. Changed in the liability coverage mechanism must be approved by DEQ.

I.G.5. *Financial Assurance for Facility-Wide Corrective Action*

I.G.5.a. Within forty-five (45) calendar days after receipt of written DEQ approval of the work plan for the current phase of activity required under Module VII (Facility-Wide Corrective Action), the Permittee shall provide financial assurance for that phase of activity in accordance with 40 CFR 264.144 through .148.

I.G.5.b. If the Permittee is using a financial test or guarantee, all facilities in the United States and its territories that are also being covered by the financial test or guarantee of the Permittee must be listed and the amounts covered must be included in Alternative I or Alternative II, whichever is appropriate.

I.G.5.c. The Permittee may meet the financial assurance requirements for facility-wide corrective action with any combination of instruments being used for closure and post-closure as required by 40 CFR Part 264 provided the Permittee assures that the cost estimates for compliance with HSWA corrective action are separate from operation, maintenance, closure, and post-closure care cost estimates for the Permitted Units.

I.G.5.d. Documentation of financial assurance for RCRA Facility Investigation (RFI), Interim Measures (IM), Corrective Measures Study (CMS), and Corrective Measures Implementation (CMI) may be combined with financial assurance documentation for the Permitted Units listed in Condition I.C.2.

I.G.5.e. In sections of the financial assurance documentation referring to facility-wide corrective action, the appropriate term(s) "RFI", "IM", "CMS", and/or "CMI" shall be substituted for the word "closure and/or post-closure" when referring to 40 CFR Part 264 Subpart H. Also, the word "Permittee" shall be substituted for the words "owner or operator" when referring to 40 CFR 264 Subpart H.

I.G.6. *Cost Estimates for Facility-Wide Corrective Action*

I.G.6.a. The Permittee shall comply with the financial assurance requirements of 40 CFR 264.144 regarding the cost estimates for all corrective action measures required by this Permit, including studies, reports, and plan submissions.

I.G.6.b. The financial assurance requirements of 40 CFR 264.144 shall continue throughout the term of the Permit and shall include 40 CFR 264.144(a)(1), third party costs; 40 CFR 264.144(b), annual inflation adjustments; and 40 CFR 264.144(c), revision of the cost estimate when there has been a change in the RFI, IM, CMS, and CMI activities and work plans which results in an increase in the cost of such activities, even though the facility may have had closure certification accepted by DEQ.

I.G.7. *Liability Coverage for Facility-Wide Corrective Action*

I.G.7.a. The Permittee must provide liability coverage for third party injury and property damage claims resulting from sudden and non-sudden accidental occurrences arising from any activity performed in accordance with the corrective action provisions of this Permit. The Permittee shall provide liability coverage as follows:

I.G.7.b. Within forty-five (45) days after receipt of written DEQ approval of the workplan for the current phase of activity, the Permittee shall provide liability coverage using one or a combination of mechanisms allowed under 40 CFR 264.147(f) through (j).

I.G.7.c. The liability coverage for sudden and non-sudden occurrences arising solely from RFI, IM, CMS, and/or CMI activities shall consist of $4 million per occurrence with $8 million annual aggregate exclusive of legal defense costs and shall be in addition to liability insurance required under any other section of the hazardous waste regulations.

I.G.7.d. If DEQ determines that the levels of liability insurance required by Condition I.G.7.c. are not consistent with the degree and duration of risk associated with the RFI/CMS/CMI and/or IM activities at the facility, DEQ may adjust the level of liability insurance as may be necessary to protect human health and the environment. This adjusted level will be based on DEQ's assessment of the degree and duration of risk associated with RFI, CMS, CMI, and IM activities to determine whether cause exists for such adjustments of level or type of coverage.

I.G.8. *DEQ Draw on Financial Instrument*

I.G.8.a. If DEQ determines that the Permittee has failed to perform the activities in accordance with any of the terms or Conditions of this Permit, DEQ will provide written notification to the Permittee of its intent to utilize the Permittee's financial responsibility instruments for the purpose of undertaking or supplementing such performance. Notification of intent to draw on the Permittee's financial instrument will specify in detail DEQ's reasons for taking such action. DEQ may draw on any financial instrument used by the Permittee to comply with the requirements of Condition I.G.

I.H. General Permit Application Requirements

I.H.1. *Permit Application*

I.H.1.a. Any person who is required to have a permit (including new applicants and permittees with expiring permits) shall complete, sign and submit an application to the Director as described in 40 CFR 270.10 and 40 CFR 270.70 through 270.73. [40 CFR 270.10(a)(3)]

I.H.2. *Reapplications*

I.H.2.a. The Permittee shall submit a new application at least 180 days before the expiration date of the effective permit, unless permission for a later date has been granted by the Director, or

I.H.2.b. If the Permittee intends to be covered by a standardized permit, the Permitee may submit a Notice of Intent as described in 40 CFR 270.51(e)(1) at least 180 days before the expiration of the effective permit unless the Director allows a later date. The Director may not allow the Permittee to submit applications or Notices of Intent later than the expiration date of the existing permit, except as allowed by 40 CFR 270(e)(2). [40 CFR 270.10(h)]

I.H.3. *Fees*

I.H.3.a. DEQ will assess an applicant of a hazardous waste permit a filing and review fee as specified in ARM 17.53.112.

I.I. **Signatories to Permit Applications and Reports**

I.I.1. All permit applications shall be signed as specified in 40 CFR 270.11(a).

I.I.2. All reports required by permits and other information requested by DEQ shall be signed by a person described in 40 CFR 270.11(a) or by a duly authorized representative of that person. [40 CFR 270.11(b)]

I.I.3. A person is a duly authorized representative only if:

I.I.3.a. The authorization is made in writing by a person described in 40 CFR 270.11(a);

I.I.3.b. The authorization specifies either an individual or a position having responsibility for overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, environmental section chief, remedial project manager, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

I.I.3.c. The written authorization is submitted to DEQ. [40 CFR 270.11(b)]

I.I.4. If an authorization under Condition I.I.2. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Condition I.I.2. must be submitted to DEQ prior to or together with any reports, information, or applications to be signed by an authorization representative. [40 CFR 270.11(c)]

I.I.5. As stated in 40 CFR 270.11(d), any person signing a document under Condition I.I.1. and I.I.2. must make the following certification:

I certify under penalty of law that this document and all attachments are prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

I.J. **Conditions Applicable to All Permits**

The conditions of 40 CFR 270.30 apply to all MHWA permits and are hereby incorporated into this Permit. [40 CFR 270.30]

I.J.1. *Duty to Comply*

The Permittee must comply with all Conditions of this Permit, except that the Permittee need not comply with the Conditions of this Permit to the extent and for the duration such noncompliance is authorized in an emergency permit (40 CFR 270.61). Any Permit noncompliance, except under the terms of an emergency permit, constitutes a violation of the appropriate Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. [40 CFR 270.30(a)]

I.J.2. *Duty to Reapply*

If the Permittee wishes to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittee must apply for and obtain a new permit. [40 CFR 270.30(b)]

I.J.3. *Need to Halt or Reduce Activity Not a Defense*

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the Conditions of this Permit. [40 CFR 270.30(c)]

I.J.4. *Duty to Mitigate*

In the event of noncompliance with the Permit, the Permittee shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment. [40 CFR 270.30(d)]

I.J.5. *Proper Operation and Maintenance*

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the Conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facility or similar systems only when necessary to achieve compliance with the Conditions of this Permit. [40 CFR 270.30(e)]

I.J.6. *Permit Actions*

This Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation, and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition. [40 CFR 270.30(f)]

I.J.7. *Property Rights*

The Permit does not convey any property rights of any sort, or any exclusive privilege. [40 CFR 270.30(g)]

I.J.8. *Duty to Provide Information*

The Permittee shall furnish to DEQ within a reasonable time, any relevant information which DEQ may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to DEQ, upon request, copies of records required to be kept by this Permit. [40 CFR 270.30(h)]

I.J.9. *Inspection and Entry*

I.J.9.a. The Permittee shall allow DEQ, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

I.J.9.a.i. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the Conditions of this Permit;

I.J.9.a.ii. Have access to and copy, at reasonable times, any records that must be kept under the Conditions of this Permit;

I.J.9.a.iii. Inspect at reasonable times any faculties, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and

I.J.9.a.iv. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by MWHA, any substances or parameters at any locations. [40 CFR 270.30(i)]

I.J.10. *Monitoring, Sampling, and Analytical Requirements*

Samples and measurements taken for the purposes of monitoring must be representative of the monitoring activity. The method used to obtain a representative sample of wastes to be analyzed must be the appropriate method from Appendix I of 40 CFR Part 261 or an equivalent method approved by DEQ. Laboratory methods for wastes or other media must be those specified in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846), (third edition, 1986 and most recent updates); *Standard Methods for the Examination of Water and Wastewater*, (twenty-first edition, 2005); or an equivalent method approved by DEQ. [40 CFR 270.30(j)(1)]

I.J.11. *Signatory Requirements*

All applications, reports, or information submitted to DEQ shall be signed and certified as specified in Condition I.I. [40 CFR 270.30(l)]

I.J.12. *Reporting Requirements*

I.J.12.a. Planned changes: The Permittee shall give notice to DEQ as soon as possible of any planned physical alterations or additions to the permitted facility which will affect the regulated unit or any SWMUs and/or AOCs included in the facility-wide corrective action process. [40 CFR 270.30(l)(1)]

I.J.12.b. Anticipated noncompliance: The Permittee shall give 30-days advance written notice to DEQ of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 270.30(l)(2)]

I.J.12.c. Transfers: This Permit is not transferable to any person except after notice to DEQ. DEQ may require modification or revocation and reissuance of the Permit to change the name of the Permittee and incorporate such other requirements as may be necessary under MHWA. [40 CFR 270.30(l)(3)]

I.J.12.d. Monitoring reports: Monitoring results shall be reported at the intervals specified elsewhere in this Permit. [40 CFR 270.30(l)(4)]

I.J.12.e. Compliance schedules: Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Permit shall be submitted no later than 14 days following each schedule date unless this Permit specifies a different date or the Permittee has made prior written arrangement with DEQ. [40 CFR 270.30(l)(5)]

I.J.12.e.i. DEQ may modify this Permit when it determines good cause exists for modification of a compliance schedule, such as an act of God, strike, flood, or materials shortage or other events over which the Permittee has little or no control and for which there is not reasonably available remedy in accordance with Condition I.U. [40 CFR 270.41(a)(4)]

I.J.12.f. Twenty-four hour reporting: Pursuant to 40 CFR 270.30(1)(6), the Permittee shall report any noncompliance which may endanger health or the environment. The Permittee shall report any situation that poses or presents an imminent, potential, or existing hazard to public health or the environment from any release of hazardous waste or hazardous constituent. Any such information must be reported to DEQ verbally within twenty-four (24) hours from the time the Permittee becomes aware of the circumstances.

I.J.12.f.i. The oral report must include the following:

- Information concerning release of any hazardous waste or hazardous constituents that may cause an endangerment to public drinking water supplies.
- Any information of a release or discharge of hazardous waste and/or hazardous constituents, or of a fire or explosion from the HWM facility, which could threaten the environment or human health outside the facility.
- The description of the occurrence and its cause must include:
- Name, address, and telephone number of the owner or operator;
- Name, address, and telephone number of the facility;
- Date, time, and type of incident;
- Name and quantity of material(s) involved;
- The extent of injuries, if any;
- An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and
- Estimated quantity and disposition of recovered material that resulted from the incident.

I.J.12.f.ii. A written submission shall also be provided within five (5) calendar days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the non-compliance and its cause; the period of noncompliance including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. DEQ may waive the five-day written notice requirement in favor of a written report within fifteen (15) calendar days. [40 CFR 270.30(l)(6)]

I.J.12.g. <u>Other noncompliance</u>: The Permittee shall report all instances of noncompliance not reported under Conditions I.J.12.d., I.J.12.e., and I.J.12.f. at the time monitoring reports are submitted. The reports shall contain the information listed in Condition I.J.12.f. [40 CFR 270.30(l)(10)]

I.J.12.h. <u>Other information</u>: Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to DEQ, it shall promptly submit such facts or information. [40 CFR 270.30(l)(11)]

I.J.12.i. Information repository: The Permittee must maintain an information repository that is held at the local public library, based on the factors set forth in 40 CFR 124.33(b). The information repository is governed by the provisions in 40 CFR 124.33(c) through (f). [40 CFR 270.30(l)(m)]

I.K. **Operation of Facility**

I.K.1. *Food Chain Crops*

No crops or commercial forage may be grown on land that has been used for the treatment of hazardous wastes at this facility. [40 CFR 264.267]

I.K.2. *Off-Site Wastes*

The Permittee shall receive no off-site hazardous wastes at the facility.

I.K.3. *Security*

The Permittee shall comply with the following security provisions for each Permitted Unit specified in Condition I.C.2.:

I.K.3.a. A perimeter fence with locked access gates surrounding the active portion of the Permitted Unit must control entry to the active portion of the Permitted Unit at all times.

I.K.3.b. For the WSA and SLTU, signs with the legend, "Danger – Unauthorized Personnel Keep Out", must be posted at each entrance and a minimum of one sign per 200 feet of straight fence to ensure a sign will be seen from any approach. The legend must be written in English and must be legible from a distance of at least 25 feet. [40 CFR 264.14(c)]

I.K.3.c. Groundwater monitoring wells must be protected with steel risers or well vaults and locking caps.

I.K.3.d. Any hazardous waste management unit or portion of a unit located in a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood. [40 CFR 264.18(b)]

I.L. **Institutional Controls**

The following institutional controls must be maintained with the appropriate State and local authorities for all Solid Waste Management Units and Areas of Concern listed in Attachment VII.1, and all active Permitted Units included in Condition I.C.2., for as long as environmental and human health risk is associated with the property:

I.L.1. *Deed Notices and Deed Restrictions*

The following Deed Notices and Deed Restrictions must be maintained with the appropriate State and local authorities. Any changes to the filed deed notices and deed restrictions must be approved by DEQ prior to filing the changes with the appropriate authorities. DEQ must be notified and given copies of the Deed Notices and Deed Restriction documentation within thirty (30) days after any modifications or changes.

I.L.1.a. Deed Notices

The Permittee shall maintain the notice on all instruments of conveyance such as deeds or contracts for deeds. The notice must include the following:

- Notice provisions to subsequent purchasers and lessees that the property has been used to manage and dispose of hazardous waste, and, as applicable, use of the land is restricted;
- Notice provision that any State-required institutional or land use control or conditions on the land must be maintained;
- As applicable, notice provisions that any State-required engineering controls must be maintained for the duration of the required remediation;
- Notice of any restrictions placed on the Facility pursuant to Condition I.L.1.b. below. Such notice must include a precise statement of the Parties' intentions with regard to the scope and duration of the restrictions. Where applicable, such notice must also include a statement that particular restrictions placed on the Facility "run with the land"; and
- Notice, in precise and easily understandable language which designates the specific activities and uses that will be allowed and the specific activities and uses that will be prohibited.

I.L.1.b. Deed Restriction

Where applicable, the Permittee shall maintain restriction on the deed notice required in Condition I.L.1.a. that includes the following:

- A requirement for notification to be sent by the owner of the property to purchasers, lessees, and tenants disclosing the existence of residual chemicals of concern;
- A requirement that the owner and successors and assigns give notice in all deeds, mortgages, leases, subleases, and rental agreements that, as applicable, there are residual chemicals of concern on the property;

- A requirement for advance notice to DEQ of any sale, lease, or other conveyance of the property;

- A requirement for notice in the deed notifying prospective purchasers that the property has been used to manage and dispose of hazardous waste, and that, as applicable, its use is restricted (notice must specify the restricted use); and

- Restriction of the property to land uses selected as part of corrective measure(s). Should the property be used for purposes other than the land uses selected as part of the corrective measures specified in Module VII, the owner must ensure the property is reevaluated to determine whether additional remediation is needed to provide an adequate level of protection to human health and the environment and ensure that any necessary remediation takes place.

I.L.2. *Notice to Government Authority*

The Permittee shall provide notice to DEQ within ten (10) days prior to completion of any land transaction.

I.L.3. *Permit Continuation*

I.L.3.a. Activity and land use limitations are considered to be part of the remedial action for the property and, therefore, land use controls must continue through the duration of this Permit, and subsequent permits or other enforcement mechanisms as allowed in 40 CFR 270.1(c)(7).

I.L.3.b. Sale of the property to a third party must follow requirements for transfer of the Permit in accordance with 40 CFR 270.30(l)(3) and 40 CFR 270.40(b).

I.L.4. *Survey Plat*

No later than sixty (60) days after DEQ approval of completion of corrective measures as set forth in Condition VII.M., the Permittee must submit to the local zoning authority or the authority with jurisdiction over local land use, to DEQ, and to the county planner or equivalent, a survey plat indicating the location and dimension of the Permitted units with respect to permanently surveyed benchmarks.

I.L.4.a. The plat must be prepared and certified by a professional land surveyor.

I.L.4.b. The plat must be filed with the local zoning authority or the authority with jurisdiction over local land use and must contain a note prominently displayed which states the owner's or operator's obligation, in accordance with Conditions I.L.1., to restrict any future land use and continue any required remediation and/or post-completion care as applicable.

I.L.4.c. The plat and restriction notice must be attached to all instruments of conveyance such as deeds or contracts for deeds.

I.M. **Changes to the Permit**

I.M.1. *Transfer*

I.M.1.a. A permit may be transferred by the Permittee to a new owner or operator only if the permit has been modified or revoked and reissued under 40 CFR 270.40(b) or 40 CFR 270.41(b)(2) to identify the new Permittee and incorporate such other requirements as may be necessary under MHWA. [40 CFR 270.40]

I.M.1.b. Changes in the ownership or operational control of the facility may be made as a Class 1 modification with prior written approval of the Director in accordance with 40 CFR 270.42. [40 CFR 270.40(b)]

I.M.1.c. The new owner or operator must submit a revised permit application no later than ninety (90) calendar days prior to the scheduled change. A written agreement containing a specific date for transfer of permit responsibility between the current and new permittees must also be submitted to DEQ. [40 CFR 270.40(b)]

I.M.1.d. Before transferring ownership of the facility, the Permittee shall notify the new owner or operator in writing of the requirements of this Permit, and 40 CFR Parts 264 and 270. The Permittee shall demonstrate to DEQ that the new owner or operator has been notified of these requirements by sending a copy of the written notification to DEQ within 30 days of new owner or operator notification.

I.M.2. *Modification or Revocation and Reissuance*

I.M.2.a. This Permit may be modified, revoked and reissued, or terminated by DEQ for cause as specified in 40 CFR 270.4, 270.30, 270.41 through 270.43.

I.M.2.b. When a permit is modified, only the conditions subject to the modification are reopened. [40 CFR 270.41]

I.M.2.c. If a permit modification is requested by the Permittee, DEQ shall approve or deny the request according to the procedures of 40 CFR 270.42. Otherwise, a draft permit must be prepared and other procedures in 40 CFR Part 124 followed. [40 CFR 270.41]

I.M.3. *Permit Modification at the Request of the Permittee*

I.M.3.a. <u>Class 1 modification</u>: Class 1 modifications are listed in Appendix I of 40 CFR 270.42. For Class 1 modifications, the Permittee shall follow the procedures specified in 40 CFR 270.42(a).

I.M.3.a.i. Class 1 permit modifications identified in Appendix I by an asterisk may be made only with the prior written approval of DEQ.

I.M.3.b. Class 2 modifications: Class 2 modifications are listed in Appendix I of 40 CFR 270.42. For Class 2 modifications, the Permittee shall follow the procedures specified in 40 CFR 270.42(b).

I.M.3.c. Class 3 modifications: Class 3 modifications are listed in Appendix I of 40 CFR 270.42. For Class 3 modifications, the Permittee shall follow the procedures in 40 CFR 270.42(c).

I.M.3.d. Other modifications: In the case of modifications not explicitly listed in Appendix I of 40 CFR 270.42, the Permittee shall follow the procedures in 40 CFR 270.42(d).

I.M.3.e. Temporary authorizations: Upon request of the Permittee, DEQ may, without prior public notice and comment, grant the Permittee a temporary authorization in accordance with 40 CFR 270.42(e). The temporary authorization must have a term of not more than 180 days.

I.M.4. *Termination of Permits*

DEQ may terminate a permit during its term, or deny a permit renewal application for the causes listed in 40 CFR 270.43.

I.N. Expiration and Continuation of Permits

I.N.1. *Duration of Permits*

I.N.1.a. This Permit shall be effective for a fixed term not to exceed 10 years. [40 CFR 270.50(a)]

I.N.1.b. Except as provided in 40 CFR 270.51, the term of this Permit shall not be extended by modification beyond 10 years. [40 CFR 270.50(b)]

I.N.2. *Continuation of Expiring Permits*

I.N.2.a. Pursuant to 40 CFR 270.51, the conditions of an expired permit continue in force until the effective date of a new permit if:

I.N.2.b. The Permittee has submitted a timely application under 40 CFR 270.14 and the applicable sections in 40 CFR 270.15 through 40 CFR 270.29 which is a completed (under 40 CFR 270.10(c)) application for a new permit; and

I.N.2.c. DEQ through no fault of the Permittee does not issue a new permit with an effective date under 40 CFR 124.15 on or before the expiration date of the previous permit.

I.N.2.d. Permits continued under 40 CFR 270.51 remain fully effective and enforceable. [40 CFR 270.51(b)]

I.N.2.e. When the Permittee is not in compliance with the conditions of the expiring or expired permit, DEQ may choose to do any or all of the options specified in 40 CFR 270.51(c).

I.N.2.f. Pursuant to 40 CFR 270.51(d), if a Permittee has submitted a timely and complete application, the terms and conditions of an EPA-issued RCRA permit continue in force beyond the expiration date of the permit, but only until the effective date of DEQ's issuance or denial of a Montana RCRA permit.

I.O. **Personnel Training**

I.O.1. The Permittee shall conduct personnel training as required by 40 CFR 264.16. The Permittee shall maintain training records and documents as required by 40 CFR 264.16(d) and (e).

I.P. **Preparedness and Prevention**

I.P.1. At a minimum, the Permittee shall maintain equipment, communications and alarm systems as set forth in the *ExxonMobil Billings Refinery Facility Response Plan*. [40 CFR 264.32 and 264.33]

I.P.2. The Permittee shall maintain preparedness and prevention arrangements with state and local authorities as set forth in the *ExxonMobil Billings Refinery Facility Response Plan*. If state or local officials refuse to enter into these arrangements, the Permittee shall document this refusal in the operating record. [40 CFR 264.37]

I.Q. **Contingency Plan and Emergency Procedures**

I.Q.1. The Permittee shall immediately carry out the provisions of the *ExxonMobil Billings Refinery Facility Response Plan* whenever there is a fire, explosion, or release of hazardous waste or hazardous constituents which threaten human health or the environment. [40 CFR 264.51]

I.Q.2. The Contingency Plan as it pertains to the Permitted Units included in Condition I.C.2. is provided in Attachment I.7. Incident commander contact information provided in Attachment I.7 must be updated annually and included in the annual report. Updates to incident commander contact information will not require a Permit modification.

I.R. **Recordkeeping and Reporting**

I.R.1. *Operating Record*

Pursuant to 40 CFR 264.73, the Permittee must keep a written operating record at the offices of ExxonMobil. At a minimum, the following information must be recorded and maintained in the operating record for the time specified below:

I.R.1.a. <u>Records Retained Until Facility Closure</u>

I.R.1.a.i. Records and results of waste analysis and waste determinations performed as specified in 40 CFR 264.73(b)(3).

I.R.1.a.ii. Records of the following activities for SLTU operations:

I.R.1.a.ii.1. Waste Application

- Types of wastes applied;
- Waste volumes;
- Application dates;
- Areas to which wastes were applied;
- Waste sampling and analytical records; and
- Evaluations/calculations or waste application rates and loading.

I.R.1.a.ii.2. Operations

- Tillage dates and areas tilled;
- Nutrient and pH control application dates;
- Any activities taken to control wind dispersal or ponding on the SLTU;
- Records of all routine inspections;
- Information regarding decontamination-derived wastes; and
- Monitoring records, including sampling logs and/or notes, analytical results, evaluations, and required reports for wastes, ZOI and TZ/BTZ soils, soil pore liquid, and groundwater samples.

I.R.1.a.iii. Monitoring, testing, analytical, and QA/QC data for all monitoring conducted at the site, including corrective action documentation where required by 40 CFR 264, Subpart F – Releases from Solid Waste Management Units and 40 CFR Subpart CC – Air Emission Standards for Tanks, Surface Impoundments, and Containers.

I.R.1.a.iv. All closure cost estimates required under 40 CFR 264.142 and post-closure cost estimates required under 40 CFR 264.144.

I.R.1.a.v. Certification of closure documentation as required by 40 CFR 264.115 upon completion of final closure of each Permitted Unit.

I.R.1.b. <u>Records Retained for Three Years</u>

I.R.1.b.i. Summary reports and details of all incidents that require implementing the contingency plan as specified in 40 CFR 264.51(b).

I.R.1.b.ii. Records and results of inspections as required by 40 CFR 264.15(d).

I.R.1.b.iii. A certification by the Permittee no less often than annually, that the Permittee has a program in place to reduce the volume and toxicity of hazardous waste that he generates to the degree determined by the Permittee to be economically practical; and the proposed method of treatment, storage or disposal is that practicable method currently available to the Permittee which minimizes the present and future threat to human health and the environment. [40 CFR 264.73(b)(9)]

I.R.1.b.iv. All notices, certifications, waste analysis date, and other documentation produced pursuant to 40 CFR 268.7 for at least three years from the date that the waste that is the subject of such documentation was last sent to on-site or off-site treatment, storage, or disposal. [40 CFR 268.7(a)(8)]

I.R.2. *Other Records*

The Permittee must maintain the following documents and any and all amendments, revisions, and/or modifications to these documents at the offices of ExxonMobil:

I.R.2.a. A current copy of this Permit;

I.R.2.b. The Part B application for this Permit;

I.R.2.c. Personnel training documents and records as required by 40 CFR 264.16(d) and (e);

I.R.2.c.i. Training records on current personnel must be kept until closure of the facility; training records on former employees must be kept for at least three years from the date the employee last worked at the facility. [40 CFR 264.16(e)]

I.R.2.d. All progress reports, work plans and reports required in Module VII (Facility-Wide Corrective Action);

I.R.2.e. All reports required in Modules II through VI; and

I.R.2.f. All other documentation as required by this Permit.

I.R.3. *Availability, Retention, and Disposition of Records*

I.R.3.a. All records, including plans, required under 40 CFR 264 must be furnished upon request, and made available at all reasonable times for inspection by DEQ or any representative of DEQ. [40 CFR 264.74(a)]

I.R.3.b. The retention period for all records required by this Permit is extended automatically during the course of any unresolved enforcement action regarding the facility or as requested by DEQ. [40 CFR 264.74(b)]

I.R.4. *Reporting*

I.R.4.a. Annual Report from Facilities

Pursuant to ARM 17.53.803, the Permittee must submit an annual report to DEQ, on forms obtained from DEQ.

I.R.4.b. Generator Reporting and Annual Fee Requirements

The Permittee shall comply with the hazardous waste generator registration and reporting requirements of ARM 17.53.111, 113, 603, and 604.

I.R.4.c. Facility-Wide Corrective Action Reporting

All reports and work plans required in Module VII (Facility-Wide Corrective Action) must be submitted within the timeframes specified within that module, unless the Permittee obtains prior approval from DEQ.

I.R.4.d. Groundwater Monitoring Reporting

Analytical results of sampling events must be reported to DEQ within thirty (30) days after the date the Permittee receives the final analytical results. Requirements for groundwater reporting are specified in Module VI (Groundwater Monitoring).

I.R.4.e. Annual Land Treatment Units Monitoring Report

I.R.4.e.i. The Permittee shall submit, by April 30, an annual land treatment units monitoring report for the previous calendar year. The report must contain the information for operations, closure, and post-closure of the land treatment units and groundwater monitoring specified in the Conditions below:

I.R.4.e.ii. Analytical reports for all LTU monitoring conducted in accordance with Module II, III, and IV.

I.R.4.e.iii. All groundwater monitoring analytical reporting requirements specified in Module VI (Groundwater Monitoring);

I.R.4.e.iv. Determination of the groundwater flow rate and direction in the uppermost aquifer and submission of an updated groundwater contour map; and

I.R.4.e.v. Measurements of the depth to the bottom of each monitoring well.

I.R.4.f. Planned Changes and Anticipated Non-Compliance

The Permittee shall comply with the reporting requirements of Conditions I.J.12.a. and I.J.12.b. for planned changes to the Permitted Units specified in Condition I.C.2. or any anticipated non-compliance with Permit Conditions.

I.R.4.g. Twenty-Four Hour Reporting

The Permittee shall comply with the reporting requirements in Condition I.J.12.f. for any non-compliance which may endanger health and/or the environment.

I.S. Confidential Information

The Permittee may claim confidential any information required to be submitted by this Permit in accordance with ARM 17.53.208.

I.T. Dispute Resolution

I.T.1. DEQ and Permittee shall work by consensus and when a dispute arises concerning specific activities required by this Permit, shall first attempt to resolve the matter informally.

I.T.2. Remedy approval as set forth in Condition VII.K. may not be included in the formal dispute resolution process. To ensure public comment and involvement on remedy approval, DEQ shall modify the Permit. The Permittee may choose to comment on the remedy selection through the modification process.

I.T.3. Review Period: If no resolution is reached and the Permittee further objects or if the Permittee objects in whole or in part to any DEQ notice of disapproval or other decision or directive made pursuant to this Permit, the Permittee shall notify DEQ in writing of its objections within ten (10) calendar days after its receipt of DEQ's notification. This notification must include the reasons for the objection with any supporting documentation, and the Permittee's preferred alternate solutions.

I.T.4. Negotiation Period: DEQ and the Permittee shall endeavor to meet promptly and work in good faith for a period of fourteen (14) calendar days from DEQ's receipt of the Permittee's written notification of objection, in an effort to reach a mutually agreeable resolution of the dispute. If the dispute is resolved, the Permittee shall submit a revised submission or implement the agreed-upon action(s) in accordance with an agreed-upon schedule.

I.T.5. If agreement is not reached within the negotiation period, DEQ shall, within twenty-one (21) calendar days of receipt of the Permittee's written objection, provide a written statement of its decision and the reasons therefore to the Permittee signed by the Director of DEQ. Within ten (10) calendar days after receiving the written statement of decision from DEQ, if the Permittee continues to disagree with the decision, the Permittee may seek, by written request, a meeting with DEQ. If the Permittee request such a meeting with DEQ, such request shall stay enforcement actions or determinations of noncompliance until a decision is rendered or for up to fourteen (14) calendar days following the date of receipt by DEQ of the request, whichever occurs first.

I.T.6. During the negotiation period, the Permittee shall be excused from performing only the requirement under this Permit that is specifically the subject of such dispute. DEQ's consideration of matters placed into dispute shall not excuse, toll, or suspend any compliance obligation or deadline required pursuant to this Permit. The Permittee shall take any actions required by this Permit that DEQ determines are not substantially affected by the dispute.

I.T.7. Notwithstanding the other provisions of this Permit, any agreement or decision made by DEQ pursuant to Condition I.T. shall be reduced to writing, shall be deemed incorporated into this Permit without further order or process, and shall be binding to the parties. Nothing herein precludes the Permittee's right to notice and hearing before the Board of Environmental Review or to judicial review after attempting resolutions pursuant to Conditions I.T.1 through I.T.4.

I.U. Force Majeure

I.U.1. The Permittee shall perform the requirements of this Permit within the time limits set forth herein, unless the performance is prevented or delayed by events which constitute a force majeure. A force majeure is defined as any unforeseeable event such as a flood over which the Permittee has little or no control and for which there is not a reasonably available remedy.

I.U.2. If any event occurs or has occurred that may delay the performance of any obligation under this Permit, whether or not caused by a force majeure event, the Permittee shall notify DEQ in writing within ten (10) calendar days thereafter, including the reasons for the delay, the anticipated duration of the delay, all actions taken or to be taken to prevent or minimize the delay and a schedule for the implementation of any measure to be taken to mitigate the effect of the delay. Failure to comply with the notice provisions of this section as to any individual event will constitute a waiver of the Permittee's right to assert a force majeure claim as to that event.

I.V. State and Federal Laws

Nothing in this Permit may be construed to preclude the institution of any legal action or to relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 3009 of the RCRA, as amended.

Attachment I.1

Regulation Cross Reference Table

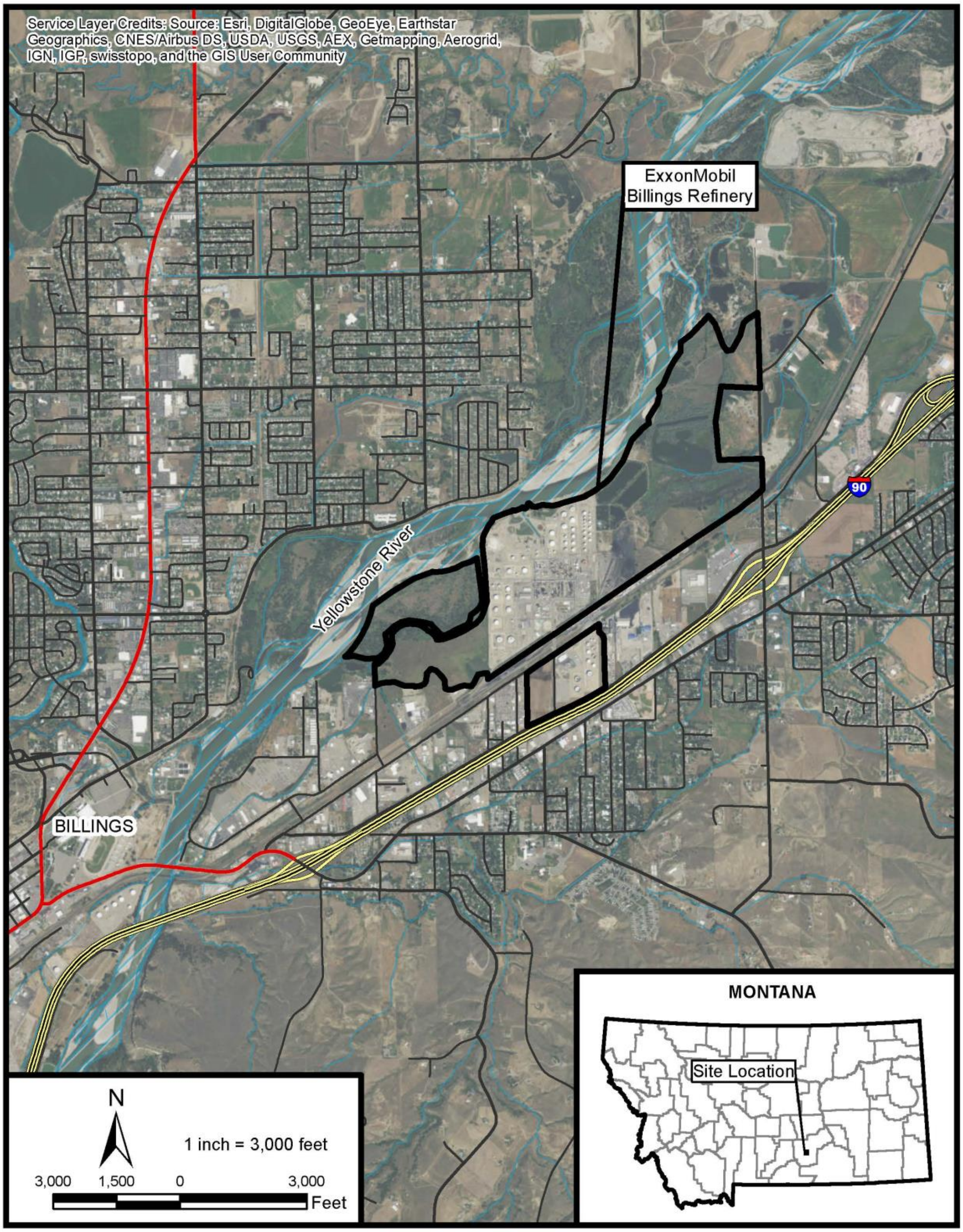
Attachment I.1

CFR to ARM Cross Reference Table

Federal Citation Incorporated by Reference Code of Federal Regulations (CFR)	**State Citation Administrative Rules of Montana (ARM)**
40 CFR 124	17.53.1201 17.53.1202
40 CFR 260	17.53.105 17.53.402 17.53.403
40 CFR 261	17.53.501 17.53.502
40 CFR 262	17.53.111 17.53.601 17.53.602
40 CFR 263	17.53.111 17.53.701 17.53.702
40 CFR 264	17.53.801 17.53.802
40 CFR 265	17.53.901 17.53.902
40 CFR 266	17.53.1001 17.53.1002 17.53.1003 17.53.1004
40 CFR 267	17.53.1501
40 CFR 268	17.53.1101 17.53.1102
40 CFR 270	17.53.1201 17.53.1202
40 CFR 273	17.53.1301 17.53.1302
40 CFR 279	17.53.1401

Attachment I.2

Regional and Facility Location Map



REGIONAL AND FACILITY LOCATION MAP

AECOM

Attachment I.3

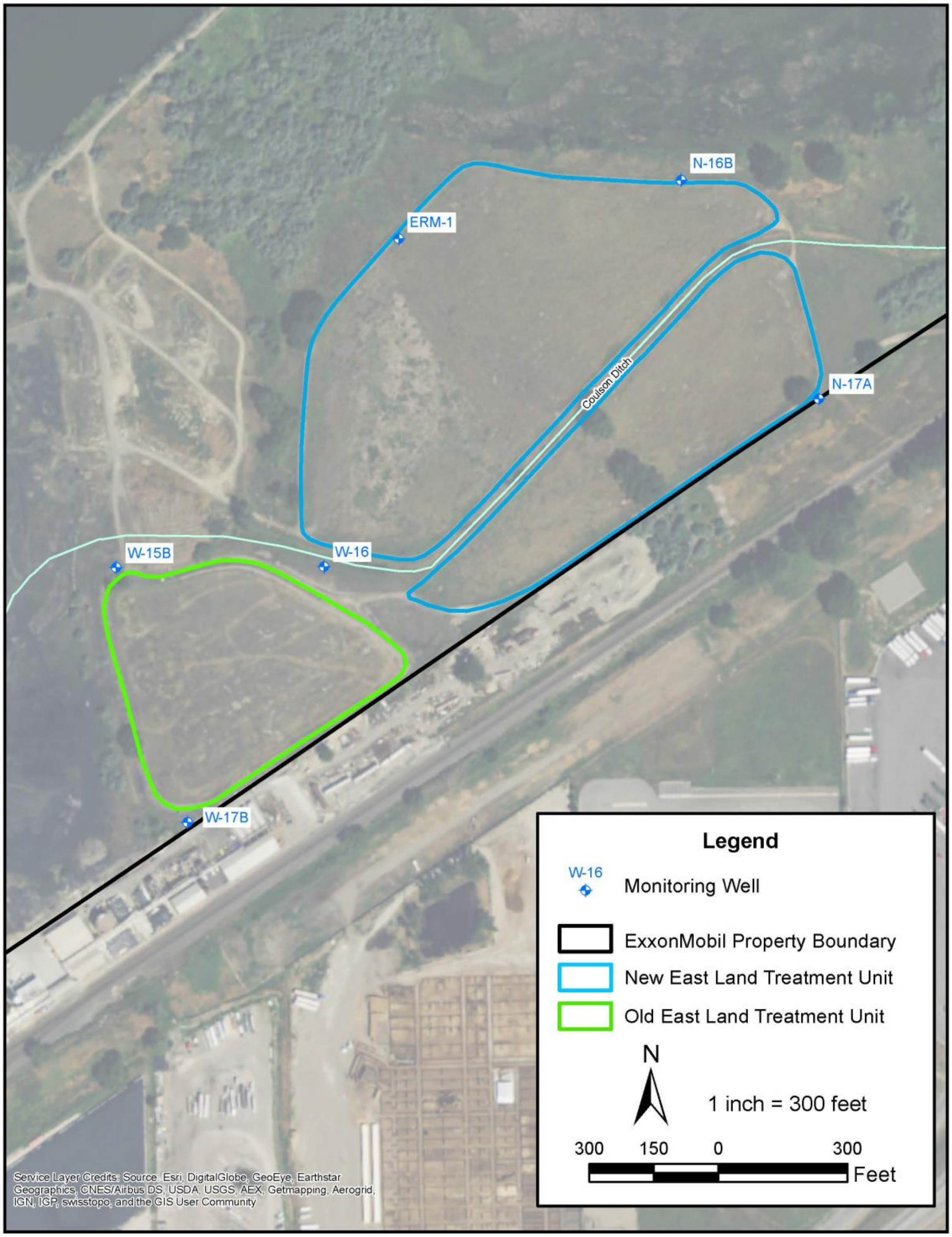
South Land Treatment Unit
Location Map

SOUTH LAND TREATMENT UNIT
LOCATION MAP

AECOM

Attachment I.4

New East Land Treatment Unit
And
Old East Land Treatment Unit
Location Map



NEW EAST LAND TREATMENT UNIT AND OLD EAST LAND TREATMENT UNIT LOCATION MAP

AECOM

Attachment I.5

Waste Staging Area
Location Map

WASTE STAGING AREA LOCATION MAP

AECOM

Attachment I.6

Closure Letter
For Lead Weathering Tank

Montana Department of
ENVIRONMENTAL QUALITY

Marc Racicot, Governor

P.O. Box 200901 • Helena, MT 59620-0901 • (406) 444-2544 • E-mail: www.deq.state.mt.us

April 3, 2000

CERTIFIED MAIL
RETURN RECEIPT REQUIRED

Brian Harrison
ExxonMobil
700 Exxon Road
P.O. Box 1163
Billings, MT 59103

Subject: **Approval of the Closure Certification and Release of Financial Assurance Requirements for Lead Weathering Tank (LWT)**

Dear Mr. Harrison:

DEQ received the revised ExxonMobil closure certification for the Lead Weathering Tank (LWT) at the ExxonMobil Billings Refinery on March 30, 2000. DEQ found the LWT closure certification documents to be complete and adequate.

In accordance with ARM 17.54.820 (1), DEQ hereby notifies ExxonMobil that the company is no longer required to maintain financial assurance for final closure of the LWT. As noted in the certification, closure of the LWT has met the closure performance standards of Permit Condition IIIb.F.2.; therefore, the regulated unit is not subject to post-closure care.

If you have any questions, please give me a call at 406/444-2876 or Adel Johnson at 406/444-1424.

Sincerely,

Rebecca Holmes

Rebecca Holmes
Solid & Hazardous Waste Specialist
Air and Waste Management Bureau
Permitting and Compliance Division

e-mail: Rholmes@state.mt.us

cc: Exxon Facility file: Closure and Post-Closure
Tina Diebold, EPA Region VIII – Montana Office

Attachment I.7

Contingency Plan
for the RCRA Regulated Units

RCRA CONTINGENCY PLAN

GENERAL INFORMATION (Subpart D)

The ExxonMobil Billings Refinery is a petroleum refinery located near Billings in Yellowstone County, Montana. RCRA units at the ExxonMobil Billings Refinery include the South Land Treatment Unit (SLTU), New East Land Treatment Unit (NELTU), Old East Land Treatment Unit (OELTU), Waste Staging Area (WSA) and less-than-90-day waste accumulation areas such as the Container Storage Area (CSA) when used for hazardous waste.

PURPOSE (Subpart D 265.51)

The purpose of this plan is to outline the actions to be taken by the ExxonMobil Billings Refinery to minimize hazards to human health or the environment from fires, explosions, or any unplanned release of hazardous waste to the air, soil, or surface water. These actions will be implemented as necessary if an emergency or release of hazardous waste could threaten human health or the environment. Many of the requirements of the RCRA Contingency Plan are found in the ExxonMobil Billings Facility Response Plan (FRP), including the Emergency Response Action Plan (ERAP), and therefore are referenced as applicable but not repeated in this document due to a potential for creating conflicting information in the future if these documents are updated.

IMPLEMENTATION (Subpart D 265.51)

The decision to implement the RCRA Contingency Plan depends on whether an imminent or actual incident at one of the RCRA units could threaten human health or the environment. The following criteria are considered by the Incident Commander in deciding on whether to implement RCRA Contingency Plan actions. Small spills or releases that do not pose a threat to human health or the environment will not result in implementation of the RCRA Contingency Plan.

- Fire and/or Explosion at a RCRA Unit
    - A fire causes a release of toxic fumes
    - The fire spreads and could possibly ignite materials at other locations on-site or could cause heat-induced explosions
    - The fire could possibly spread to off-site areas
    - Use of water and chemical fire suppressant could result in contaminated run-off
    - An imminent danger exists that an explosion could occur, causing a safety hazard because of flying fragments or shock waves
    - An imminent danger exists that an explosion could ignite other hazardous waste at the facility
    - An imminent danger exists that an explosion could result in release of toxic material

- Spills or Material Release from a RCRA Unit
    - The spill could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard
    - The spill could cause the release of toxic liquids or fumes
    - The spill can be contained on-site, but the potential exists for ground-water contamination
    - The spill cannot be contained on-site, resulting in off-site soil contamination and/or ground or surface water pollution
- Floods
    - The potential exists for surface water contamination

RCRA CONTINGENCY PLAN CONTENT (Subpart D 265.52) - Emergency Response Procedures (Subparts D 265.52 (a) & 265.56)

<u>Notification (Subpart D 265.56 (a))</u>
In the event of an emergency situation at one of the RCRA units involving a fire, explosion, vapor release, or hazardous material spill which requires activation of the RCRA Contingency Plan, the notification procedures detailed in the ERAP will be implemented, as necessary, under the direction of the Incident Commander.

The Incident Commander shall determine outside assistance is needed and assign responsibilities to appropriate personnel for contacting these outside agencies. The ERAP identifies the contacts at the regulatory agencies and other fire or emergency response organizations. The following information must be given to the caller when contacting outside agencies for emergency assistance:

- Caller name and telephone number
- Name and address of the facility
- Time and type of incident
- Type and quantity, if known, of material involved
- Injuries involved
- Potential for hazards to human health or the environment outside the facility.

<u>Identification of Hazardous Wastes (Subpart D 265.56 (b))</u>
The Incident Commander will be responsible for identifying, or directing personnel with the expertise to identify the character, source, amount, and aerial extent of any material release or spill which involves hazardous waste. Initially, the identification will be made by visual inspection and/or reports of process facility operations, knowledge of the location of the release, and knowledge of the processes and types of materials utilized, produced, or stored in that

RCRA Unit. A monthly waste inventory is conducted at the WSA and a copy of the most recent inventory is available to the Incident Commander.

Environmental Staff called out as part the Incident Command system will serve as a resource to the Incident Commander in hazardous waste identification.

As needed and as soon as is practical, samples of the material will be taken and analyzed in accordance with the Waste Analysis Plan to determine the nature of the material, and the handling procedures to be used to manage disposal of the waste.

Assessment of Hazards (Subpart D 265.56 (c))
The Incident Commander will be responsible for assessing the potential hazards which could result from the emergency situation, both direct and indirect, to human health or the environment. The Billings Refinery Industrial Hygienist will serve as a resource for the Incident Commander in the process of hazard assessment.

Control Procedures (Subpart D 265.56 (e))
The Incident Commander will take reasonable measures to ensure that fires, explosions, and release do not occur, reoccur, or spread. This may include collecting and containing released wastes and removing or isolating containers.

Potential accidents at the refinery fall under three categories: (1) fire and/or explosions, (2) vapor release and/or material spills, and (3) floods. Procedures which will be followed for the control the release of hazardous materials, as they relate to hazardous wastes, to the human or outside environment are discussed below for each of these categories.

Fire and Explosion
The firefighting capability of the ExxonMobil Billings Refinery consists of the appropriate equipment, trained process personnel, and a Volunteer Fire Brigade. Trained on-shift process personnel will provide initial response to an incipient fire or potential fire immediately upon notification of the incident. The Volunteer Fire Brigade consists of ExxonMobil employees, who may or may not be at the refinery at the time of the alarm. There are three Fire Brigade Teams as well as two Rescue Squad Teams and two Spill Response Teams. This brigade will be summoned when Process personnel need support. Additional firefighting equipment and people are available from the mutual aid partners.

Spills or Material Release
If an employee discovers a hazardous waste release that could threaten human health or the environment, the employee will report the release to their supervisor or to the Shift Superintendent. If the supervisor is notified he or she will then contact the Shift Superintendent. The Shift Superintendent will then obtain information pertaining to the following:

- The material spilled or released
- Location of the release or spillage of hazardous material
- An estimate of quantity released and the rate at which it is being released

- Determination if the spilled material is hazardous waste
- Hazards associated with the spill
- The direction in which the spill or vapor or smoke release is heading
- Any injuries involved
- Fire and/or explosion or possibility of these events.

This information will help the Incident Commander (Shift Superintendent) assess the magnitude and potential seriousness of the spill or release. The Incident Commander will invoke the Oil Spill Response Team (OSRT) as necessary to address any releases or spills of hazardous waste or materials to the ground or surface water. The OSRT acts as the primary responders to releases of oil and other potentially hazardous materials, including hazardous waste. The OSRT procedures are detailed in the ERAP and FRP.

The initial response to any emergency will be to protect human health and safety, following these steps will be those necessary to protect the environment. Identification, containment, treatment, and disposal assessment, as discussed below, will constitute the secondary response for any type of hazardous wastes or hazardous waste constituents involved in spills.

1. <u>Waste Staging Area</u> - To contain leaks, spills, and precipitation, a concrete curb wall, six inches higher than the concrete floor, surrounds the pad. The floor of the WSA and the WSA sump is inspected at least weekly for evidence of waste leakage. The waste containers are inspected on a weekly basis. If waste leakage is noted, the source of the leak is identified. Waste remaining in a leaking container will be transferred to a container in good condition or placed into an overpack container. Leaked material will be removed from the exterior of the drums, pallets, floor, and the sump and placed in a container. The containers will be labeled appropriately. In the event of a large spill, the wastes will be collected directly via vacuum truck, loader, or other means, analyzed (if necessary), and disposed of appropriately. Hazardous wastes are transported to the WSA from various locations throughout the refinery. Should an accident occur during transportation, any spilled material may be a hazardous waste and appropriate steps for spill clean-up are taken as described under the "Facility Drainage and Spill Recovery" in this section.
2. <u>Other Areas</u> - Most hazardous waste spills occurring in other areas are anticipated to be of smaller proportions and in most cases will be collected in existing area surface drains. In areas not serviced by surface drains, the spilled materials will be recovered by vacuum trucks. Any contaminated soil from a hazardous waste/material spill is collected and disposed appropriately. If a spill extends laterally to the drain ditch at the southern part of the refinery the spilled material will be retained via two underflow/overflow weirs in the west drainage ditch arm and diverted into a sewer drain system located at the southeast corner of Avenue G and 4th Street in the refinery.
3. <u>Facility Drainage and Spill Recovery</u> - When the refinery was constructed the entire site was leveled with a light pitch toward the river. The slope, side ditches, dikes, and area drains are constructed so surface water will not reach the river without prior collection and treatment. The 24-inch inch toe walls around the west and south margins of the

refinery provide additional control in preventing spill or run-off from reaching the Yellowstone River. Hazardous waste is not stored in areas where a release would reach facility boundaries. Most of the off-site area (i.e. non process unit area), including the diked areas depend on evaporation for disposing of the runoff from precipitation. The waste water treating facility, including the sewer system, API Separator, and lagoons are sized to handle surges that may contain hazardous waste or hazardous waste constituents caused by precipitation without creating system overloading, wash-through, or overflow.

If a hazardous waste spill is not contained within a dike or sump area, an area of isolation will be established around the spill. The aerial extent of the spill will generally depend on the size of the spill and materials involved. The initial isolation area around a spill would be sized to address the degree of hazard associated with the spill. Considerations include allowing clean-up and repair and to prevent exposure to workers without appropriate Personal Protection Equipment (PPE). When any spill occurs, only personnel trained in overseeing or performing emergency operations will be allowed within the designated hazard area. If needed, the area will be cordoned off to prevent unauthorized access. Further evacuation will be enforced if the hazardous waste spill results in the formation of a toxic vapor cloud. Evacuation and vapor release procedures are detailed in the ERAP.

The area surrounding the refinery is comprised primarily of industrial facilities and large greenbelts. It is unlikely that evacuation of the nearby population would be necessary in the event of a release of hazardous waste. The ExxonMobil Industrial Hygienist will provide monitoring at the refinery perimeter if necessary in the event of a release of toxic material and to keep the Incident Commander informed on potential risk to the community. Should the release, fire, or explosion threaten human health or the environment outside the facility appropriate public emergency response agencies will be notified.

Most hazardous waste spills and leaks will be contained by the dikes, sumps, and waste water drainage treatment systems in place at the refinery. These containment systems provide for the necessary control of a spill and facilitate its recovery and clean-up, as previously discussed. However, for large spills of hazardous wastes or hazardous waste constituents, the following procedures are to be implemented:

- Person discovering the spill or discharge is to immediately contact the employee's supervisor or the Shift Superintendent. If the employee's supervisor was the initial contact the supervisor will immediately contact the Shift Superintendent, giving:
    - Status of the spill or leak and any resultant injuries;
    - Spill or leak location, material involved, and source;
    - Approximate amount released and direction of movement; and
    - Potential for fire and/or explosion.

- The Shift Superintendent will assume duties as the Incident Commander and ensure the following steps are completed:
    - Assess the degree of the hazard;
    - Initiate the evacuation of the hazard area if needed;
    - Dispatch emergency personnel; and
    - Contact outside agencies and/or organizations, if required.
    - Make sure all unnecessary personnel are evacuated from the hazard area;

Emergency response personnel will respond to the release by following the appropriate procedures in the ERAP. Recovered material will be evaluated to determine if it is hazardous waste and handled appropriately.

Flooding

All of the RCRA-permitted hazardous waste treatment, storage, and disposal units at the ExxonMobil Billings refinery are located outside the 100-year floodplain and are therefore unlikely to be subject to flooding.

Prevention of Recurrence of Fire, Explosion, or Release (Subpart D 265.56 (e) and (f))

Actions to be considered to prevent the occurrence, recurrence or spread of fires, explosions, or releases include stopping processes and operations, collecting and containing released waste, and recovering or isolating containers. The on-site training addresses the specific actions to be taken by emergency response personnel during an emergency. If the facility stops operations in response to an emergency, the Operations Control Center (OCC) will, as appropriate, monitor valves, pipes, and other equipment for leaks, pressure build up, gas generation, or rupture.

Storage and Treatment of Released Material (Subpart D 265.56 (g))

Immediately after an emergency, the Incident Commander will direct environmental staff at the refinery to make arrangements for treatment, storage, or disposal of recovered waste, contaminated soil, surface water, or in accordance with procedures and applicable regulations.

Incompatible Waste, Post-Emergency Equipment Maintenance (Subpart D 265.56 (h)

The Incident Commander will work with environmental staff to ensure that wastes which may be incompatible with the released material are treated, stored, or disposed appropriately until cleanup procedures are completed.

The Incident Commander will make sure that all emergency equipment contaminated by a hazardous waste is adequately decontaminated and fit for service before directly affected hazardous waste management unit operations resume. The EPA Region VIII Administrator shall be notified as to when this post-emergency maintenance is completed, that the affected areas cleanup has been accomplished, and that no waste that may be incompatible with the released material has been treated, stored, or disposed of in the affected areas subsequent to cleanup activities.

Reporting (Subpart D 265.56 (i))

As soon as possible after an accident for which the RCRA Contingency Plan is implemented, appropriate authorities will be contacted to inform them of cleanup and emergency equipment status and readiness. Within 15 days of the incident a written report will be submitted to the EPA Region VIII Administrator. This report will include:

- Name, address, and telephone number of the operator/owner
- Date, time, and type of incident
- Name, address and telephone number of the facility
- Any injuries involved
- Assessment of actual or potential hazards to human health or the environment
- Notifications made
- The quantity and disposition of the material recovered from the accident.

COORDINATION AGREEMENTS (Subpart D 265.52 (c))

Coordination agreements with local agencies, organizations, and hospitals which may be involved are discussed in the ERAP.

INCIDENT COMMANDERS (Subparts D 265.52 (d) & 265.55)

If an emergency situation develops at one of the RCRA units at the Billings Refinery, the person discovering the problem must contact the OCC. OCC will invoke the notification, communication, and coordination procedures as outlined in the ERAP. The Incident Commander is the Shift Superintendent on duty at the time of the incident. The Incident Commander has complete authority to commit all the necessary and appropriate resources of the Billings Refinery in the event of an emergency. The Incident Command System is discussed in the ERAP. In addition to ExxonMobil trained personnel, the Incident Commander can call on outside resources as detailed in the ERAP.

The Incident Commander is supported by the Crisis Manager who is the Refinery Manager or the Refinery Manager's stand-in. A formal designated stand-in is identified during any occasion in which the Refinery Manager would be unavailable for call-out during a crisis. The Refinery Manager stand-ins are selected from among the Refinery Department Heads. The Crisis Manager has available support of all the refinery's resources both in personnel and equipment. The organization command and specific duties of each command position are detailed in the ERAP.

EMERGENCY EQUIPMENT (Subpart D 265.52 (e))

The WSA has a fire monitor on the south side of the pad. The CSA has a fire monitor on the south side of the CSA gate. Both are up to 500 gpm monitors. There is a fire extinguisher at the WSA shed for dealing with incipient fires in that area. The communications system for reporting emergencies is plant radios carried by personnel and/or mounted in vehicles.

The Refinery has emergency equipment at a centralized location (e.g., the refinery firehouse), near each waste management facility, and on operations support vehicles. Emergency equipment available at the ExxonMobil Billings Refinery is listed in the ERAP. Emergency equipment is not staged at the SLTU given its proximity to the refinery and the low probability of an emergency.

EVACUATION PLAN (Subpart D 265.52 (f))

In the case of an emergency requiring evacuation, the ERAP will be followed.

RCRA CONTINGENCY PLAN COPIES (Subpart D 265.53)

Current copies of the ERAP are available from the Incident Commander at the OCC. Copies of this manual are not distributed to local emergency responders; rather, the notification, communication, and coordination procedures with mutual aid partners and local responders provided in the ERAP are implemented by the Incident Command System if an emergency occurs. A copy of the RCRA Contingency Plan has been provided to local emergency responders.

RCRA RESPONSE CONTINGENCY PLAN AMENDMENTS (Subpart D 265.54)

The RCRA Contingency Plan will be updated by the RCRA Environmental Coordinator in the event any of the following occur:

- RCRA regulations are revised necessitating a change
- The RCRA Contingency Plan fails in an emergency
- The facilities change in a way that increases the potential for fires, explosions, or release of hazardous wastes
- The list of Incident Commanders changes
- The necessary response to an emergency changes
- Emergency equipment at the RCRA unit changes.

Changes to the list of emergency equipment will be documented in the ERAP. When the RCRA Contingency Plan is updated the changes will be transmitted to the persons having copies of the plan and to the DEQ. The plan will be updated annually for administrative changes, such as change in Incident Commanders. For changes in the facility or if the plan fails in an emergency, the plan will be updated within 60 days.

Attachment 1 - List of Incident Commanders

The Incident Commander is always the acting shift superintendent on duty at the facility and can be reached at:

Phone	Name	Address	City, State	Zip
(406) 657-5320	Incident Commander	700 ExxonMobil Road	Billings, MT	59101

To reach an Incident Commander the contact information above must be used.

As required by 40 CFR 264.52 (d) the following information is provided.

Home Phone	Name	Home Address	City, State	Zip
696-8050	ANDERSON, RICK	1930 CARROLL HEIGHTS CIR	BILLINGS, MT	59105
321-0836	GOLDEN, CORY	6814 COPPER RIDGE LOOP	BILLINGS, MT	59106
321-1401	HUSTON, BRIAN	681 S 22nd ST W	BILLINGS, MT	59102
323-1020	MACINTYRE, CLINT	5010 JOHN HOGAN TRAIL	SHEPHERD, MT	59079
794-8883	MAVITY, MONTE	10737 C.A. RD	SHEPHERD, MT	59079
245-7846	MOORE, RANDY	2274 W SKOKIE DR	BILLINGS, MT	59105
672-4034	NAUMAN, RUSSELL	501 3RD AVE	LAUREL, MT	59044
628-2446	NIELSEN, TRENT	2400 PRAIRIE ROSE CIR	LAUREL, MT	59044
690-0242	ROBILLARD, JOE	1606 MARY STREET	BILLINGS, MT	59105
672-5758	WEST, DALE	3311 HARLOU DRIVE	BILLINGS, MT	59102

Note: All home phones are area code 406

Module II

South Land Treatment Unit
And
Vehicle Decontamination Facility
Operations

Module II
South Land Treatment Unit
And
Vehicle Decontamination Facility Operations

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Attachments

Module II
South Land Treatment Unit Operations

II.A. **Applicability**

II.A.1. The requirements of this Permit Module apply to the operation of the South Land Treatment Unit (SLTU) defined in Condition I.C.2. The Permittee must operate and maintain a land treatment program in accordance with this Permit and applicable requirements in 40 CFR 264 Subpart M.

II.A.2. The SLTU will only operate as a land treatment unit for non-hazardous waste from and after the date of the Permit Reissuance. A No Migration Variance was granted to ExxonMobil Billings Refinery by EPA on July 27, 1993, for the SLTU. The No Migration Variance will terminate as of the date of the Permit Reissuance.

II.A.3. Groundwater Monitoring requirements for the SLTU are not included in this module. The monitoring schedule, sample collection and analysis, and evaluation requirements for groundwater are contained in Module VI (Groundwater Monitoring).

II.B. **Definitions Applicable to Land Treatment Units**

II.B.1. *Treatment Zone*

II.B.1.a. The treatment zone is the portion of the unsaturated zone, below and including the land surface, in which the conditions necessary for effective degradation, transformation, or immobilization are maintained. The horizontal dimension of the treatment zone is the area within the application area dikes shown in Attachment II.1 (SLTU Site Plan).

II.B.1.b. The vertical dimension of the treatment zone is from the land's surface to approximately five (5) feet below the land's surface. The maximum depth of the treatment zone must be a minimum of three (3) feet above the seasonal high water table.

II.B.2. *Zone of Incorporation (ZOI)*

II.B.2.a. Wastes shall be applied only in a defined portion of the treatment zone, called the zone of incorporation (ZOI). The ZOI consists of a soil layer within the treatment zone measuring from the land surface to approximately twelve (12) inches below the land surface.

II.B.3. *Below Treatment Zone (BTZ)*

II.B.3.a. The BTZ consists of a soil layer from the bottom of the treatment zone to 6 inches below the treatment zone. Determining the BTZ depth is provided in Condition II.F.4.c. (Determining BTZ Sample Depth).

II.C. **Permitted Wastes**

II.C.1. *General*

II.C.1.a. All wastes applied to the SLTU are subject to the waste analysis requirements of Condition II.D.3. (Waste Sampling and Analysis) and waste application is limited by the loading rates specified in Condition II.D.6. (Rate of Waste Application).

II.C.2. *Non-Hazardous Waste Placement on the SLTU*

II.C.2.a. ExxonMobil is permitted to apply the following non-hazardous wastes on the SLTU in accordance with conditions in this Permit:

- Non-Hazardous DEA Filter Cartridge Sludge;
- Asphaltic Residues;
- Cooling Tower Sludge;
- Lime Sludge;
- Process Vessel Sludge;
- Wastewater Treatment Pond Sediments (Ponds 3,4,5,6)
- River Dredge Spoils Including Pond 1 and Back Bay Sediment
- Intermediate Tank Bottoms;
- Oxidation Pond Waste;
- Unleaded Tank Bottoms;
- Soil or gravel contaminated through spillage of petroleum products, residues, etc. except those prohibited from land treatment under 40 CFR Part 268; or
- Other non-hazardous wastes from the ExxonMobil Billings Refinery which are determined by DEQ to be suitable for land treatment.

II.C.2.b. The Permittee may not place on the SLTU any wastes, contaminated soils, or contaminated debris that is prohibited from land disposal.

II.C.2.c. The Permittee must not place incompatible wastes, or incompatible wastes and materials, in or on the same treatment cell, unless the requirements of 40 CFR 264.17 are met.

II.C.3. *Hazardous Waste Placement on the SLTU*

II.C.3.a. After the date of Permit Reissuance, no hazardous waste, listed or characteristic, may be applied to the SLTU.

II.D. **Operation of the SLTU**

II.D.1. *General Requirements*

II.D.1.a. The Permittee must operate and maintain the SLTU to maximize the degradation, transformation, and immobilization of hazardous constituents in the treatment zone in accordance with the methods described in this Permit.

II.D.1.b. The Permittee shall use the records identified in Condition II.I.2. (Recordkeeping) to evaluate the operation of the SLTU.

II.D.2. *Loading, Transporting, and Unloading*

II.D.2.a. The Permittee must limit risk of spills during loading, transport, and unloading operations.

II.D.2.b. Vehicles transporting waste to the SLTU must not be loaded over carrying capacity.

II.D.2.c. The Permittee must follow the vehicle decontamination requirements found in Condition II.J. (Vehicle Decontamination Facility Requirements).

II.D.3. *Waste Sampling and Analysis*

II.D.3.a. The Permittee must ensure that representative waste samples are obtained from wastes destined to be treated on the SLTU.

II.D.3.b. The Permittee shall follow procedures for waste sampling outlined in Attachment II.2 (Waste Analysis Plan).

II.D.3.c. The Landfarm Waste Determination Form provided in Attachment II.2 (Waste Analysis Plan) shall be completed for each waste managed at the SLTU. The completed Waste Analysis Determination Form will become part of the SLTU operating record as required in Condition II.I. (Reporting and Recordkeeping).

II.D.4. *Method of Waste Application*

II.D.4.a. The Permittee must use a method for applying the waste that ensures uniform spreading as soon as the wastes are applied.

II.D.4.b. The Permittee shall observe the ZOI soils closely to check for non-uniform incorporation of wastes into the soils. To improve uniformity of waste application, the Permittee may consider mixing, grinding, or screening non-hazardous wastes prior to placement.

II.D.4.c. Wastes must be spread evenly across each plot. Volume of wastes applied to each plot must be limited, such that, when uniformly spread across the plot, the waste depth does not exceed twelve (12) inches. This volume is considered to be the treatment lift. Before application of additional treatment lifts, the standards set forth in Condition II.D.6. (Rate of Waste Application) must be met.

II.D.4.d. Waste applications shall be made first to those sectors with the lowest concentrations of oil and grease within the ZOI, as defined in Condition II.D.6. (Rate of Waste Application).

II.D.5. *Prohibition of Waste Application During High Winds*

II.D.5.a. A system capable of measuring and transmitting wind conditions at the refinery during waste application at the SLTU must be maintained to ensure compliance with the requirements in Condition II.D.5.b.

II.D.5.b. Waste application must be stopped during the following conditions:

II.D.5.b.i. The average hourly wind speed exceeds ten (10) miles per hour for any fifteen (15) consecutive minute period; or

II.D.5.b.ii. Maximum daily wind gusts exceed twenty (20) miles per hour for a five (5) consecutive minute period.

II.D.5.b.iii. Waste application at the SLTU cannot be initiated or resumed if either Conditions II.D.5.b.i. or II.D.5.b.ii. has occurred during a period of sixty (60) consecutive minutes prior to the time of waste application.

II.D.6. *Rate of Waste Application*

II.D.6.a. <u>Oil and Grease</u>

II.D.6.a.i. Percent oil and grease, as determined by EPA Method 413.2, or an equivalent DEQ-approved method, will define the rate limit (RL), and will define limiting conditions for applying non-hazardous waste. The rate limit is two-fold, with a limit for weight percent oil and grease found in the ZOI at any point of time, and the mass of oil and grease applied per unit area per year. Neither requirements of the rate limit can be exceeded. The limits are:

- 5 percent oil and grease (dry weight) in soil samples taken from the ZOI; and
- 70 metric tons of oil and grease/hectare/year, total for both hazardous and non-hazardous wastes.

II.D.6.a.ii. The dry weight percent of oil and grease in the ZOI shall be determined through annual monitoring of each application area, as described in Condition II.F.3. (ZOI Soil Sampling).

II.D.6.a.iii. The Permittee shall demonstrate annually compliance with the rate limit of 70 metric tons oil and grease/hectare/year in the SLTU by preparing a Waste Application Table. The table must list all non-hazardous wastes that have been applied during the previous calendar year, and the following:

- The mass based on operating records;
- The weight percent average of oil and grease based on waste analysis records; and
- The mass of oil and grease based on waste analysis records.

II.D.6.a.iv. The total mass of oil and grease applied during the year shall be divided by the total land area used to demonstrate compliance with the rate limit.

II.D.6.b. Metals

II.D.6.b.i. The Permittee shall collect ZOI soil samples annually and at closure, as described under Condition II.F.3.a. (ZOI Soil Sampling Frequency) and Attachment II.3 (Soil Sampling Procedures), to demonstrate the metals loading limits provided in Attachment II.4 (ZOI Loading Limits) and Condition II.D.6.b.ii.

II.D.6.b.ii. The soil samples must be analyzed for the following metals shown below. The metals loading limits must not be exceeded. If the metals loading limits are exceeded, the Permittee may only place wastes on the sector(s) for which the metals concentrations are less than or equal to the metals loading limits. Metals must be analyzed by the methods noted below or by an equivalent SW-846 method approved by DEQ.

Metal Analyte	**Loading Limit**	**EPA Analytical Method**
Antimony	31 ppm	6010
Arsenic	15 ppm	6010
Barium	500 ppm	6010
Beryllium	2 ppm	6010
Cadmium	3 ppm	6010
Chromium	140 ppm	6010
Cobalt	200 ppm	6010
Copper	250 ppm	6010
Lead	400 ppm	6010
Mercury	7 ppm	7470/7471/7473
Nickel	100 ppm	6010
Selenium	5 ppm	6010
Vanadium	500 ppm	6010
Zinc	500 ppm	6010

II.D.7. *Measures to Control Soil pH*

II.D.7.a. Non-hazardous wastes shall be measured for pH in accordance with Attachment II.2 (Waste Analysis Plan). In no event shall a waste be applied which has a pH of less than 5 or greater than 11.

II.D.7.b. ZOI soil shall be measured for pH as described in Condition II.F.3.a.ii.

II.D.7.c. The average pH in the ZOI in all treatment areas shall be maintained between 6.5 and 9.0, with a target pH of 8.0. The Permittee shall determine the amount of lime or other DEQ approved soil amendment needed to increase soil pH and add lime or other DEQ approved soil amendment to the soil, if testing shows that it is necessary, according to the method described in Attachment II.5 (pH Control).

II.D.7.d. When soil pH exceeds the 9.0 limitation, the Permittee shall submit a plan to DEQ for approval, describing how the soil pH will be reduced to established target levels.

II.D.8. *Nutrient Addition*

II.D.8.a. The Permittee shall collect ZOI samples annually at the beginning of the waste application season, as described in Condition II.F.3. (ZOI Soil Sampling), in order to determine the fertilizer needs in the SLTU. The soil shall be analyzed in accordance with Condition II.F.3.a.ii.

II.D.8.b. Nutrients must be maintained at the following levels:

- 340 Kg/hectare as nitrogen;
- 45 Kg/hectare as phosphorous; and
- 225 Kg/hectare as potassium

II.D.8.c. If the available soil nitrogen is below 340 Kg/hectare as nitrogen, then nitrogen must be added in the form of agricultural fertilizer to raise it above this level. If the nitrogen content is above 340 Kg/hectare, then a minimum of 60 Kg/hectare may be added in the spring to provide readily available nitrogen until the soil has warmed and mineralization has reached a sufficient level to release adequate nitrogen from soil humus.

II.D.8.d. If the available phosphorous is below 45 Kg/hectare as phosphorous, then phosphorous shall be added in the form of agricultural fertilizer to raise it above this level.

II.D.8.e. If the available potassium is below 225 Kg/hectare as potassium, then potassium shall be added in the form of agricultural fertilizer to raise it above this level.

II.D.8.f. Fertilizer addition must be accomplished using an agricultural applicator to ensure uniform application.

II.D.9. *SLTU Tilling*

II.D.9.a. The Permittee shall till the ZOI portion of the treatment zone to enhance microbial degradation of the applied wastes.

II.D.9.b. All active portions of the SLTU shall be tilled at least monthly during the application season, if Conditions II.D.10. through II.D.12. are met.

II.D.10. *Measures to Control Soil Moisture in the Treatment Zone*

II.D.10.a. Moisture content, as determined by using a DEQ-approved method, shall be measured monthly during the application season, as described in Condition II.F.3.a.i.

II.D.10.b. Moisture content in the treatment zone must be controlled by the Permittee to maximize waste degradation and minimize blowing of wastes and surficial soils in accordance with Attachment II.6 and conditions in this Permit.

II.D.10.c. Tilling must not be done when the soil is excessively wet or dry.

II.D.10.d. Soil moisture shall be controlled by applying wastes at higher aerial loading rates during arid periods while ensuring the rate limits in Condition II.D.6. (Rate of Waste Application) are not exceeded.

II.D.11. *Control of Wind Dispersal*

II.D.11.a. The Permittee shall ensure that airborne dispersal of wastes and surficial soils will be kept to a minimum. Tilling shall be avoided during excessively dry or windy periods.

II.D.11.b. The Permittee shall note in the operating record incidents of blowing soils or wastes, and document efforts made to control wind dispersal.

II.D.11.c. The Permittee may use soil stabilization methods both inside and outside the treatment areas to control airborne dispersal of wastes and surficial soils.

II.D.12. *Odor Control*

II.D.12.a. The Permittee shall ensure that odor releases from the SLTU areas are kept to a minimum. The following steps shall be taken routinely to minimize odor releases:

II.D.12.a.i. Avoid land application of wastes during times when the prevailing wind could carry odors to nearby land owners; and

II.D.12.a.ii. Till wastes with the potential for odor releases into soil as soon as soil is workable after waste application. If soil conditions allow, each application area shall be tilled the same day as waste application. Tilling shall continue for as long as odors remain a problem.

II.D.13. *Food Chain Crops*

II.D.13.a. No food chain crops or commercial forage shall be grown on the SLTU.

II.D.14. *Run-On and Run-Off Control Systems*

II.D.14.a. The SLTU dikes are constructed of a series of dikes located as indicated by dashed lines in Attachment II.1 (SLTU Site Plan and Topographic Map).

II.D.14.b. The Permittee shall operate and maintain dike systems around the SLTU that will:

II.D.14.b.i. Prevent run-on flow onto the treatment zone during peak discharge from a 24-hour, 25-year storm. For run-on control, drainage swales may also be required; and

II.D.14.b.ii. Collect and control run-off resulting from at least the water volume resulting from a 24-hour, 25-year storm.

II.D.14.c. The Permittee shall perform repairs or maintenance as necessary to ensure dike heights and performance are maintained. Repairs must be made within one week of the time damage is noted on the SLTU inspection log, unless conditions do not allow access to the damaged area. If conditions are such that repairs cannot be made in that timeframe, the reason must be noted on the inspection log.

II.E. **Inspection of the SLTU**

II.E.1. The Permittee shall complete inspections of the SLTU items listed below on the following schedule:

Item	Check	Frequency
Fence	Fence secure	Daily
Warning Signs	Signs visible and in place	
Dikes	Leakage, erosion, deterioration	1. Weekly 2. After storm events great than 0.3" precipitation in less than 3 hours. 3. Daily when waste is applied to the unit
Monitoring wells, Quadrant markers, Lysimeters	Damage by tilling equipment	
Gate	Locked when not in use	

II.E.2. A facility inspection log form shall be completed when inspecting the gate, dikes, warning signs, quadrant markers, lysimeters, and monitoring wells. The facility inspection log form must include, at a minimum, the items listed in the table in Condition II.E.1.

II.E.2.a. Unusual conditions, such as ponded water or wind-blown soils shall also be noted in the inspection log.

II.E.3. All inspection activities shall be noted and made part of the operating record, as outlined in Condition II.I.2. (Recordkeeping).

II.F. **SLTU Sampling Requirements**

II.F.1. *General Sampling Requirements*

II.F.1.a. The Permittee shall ensure all sampling equipment is pre-cleaned and decontaminated between samples as necessary.

II.F.1.b. The soil sampling procedures provided in Attachment II.3 must be followed.

II.F.1.c. All samples are to be collected in accordance with the methods outlined in *Test Methods for Evaluating Solid Wastes, Physical Chemical Methods, EPA 1986* (SW-846), Attachment II.3 (Soil Sampling Procedures), or as otherwise specified in this Permit.

II.F.1.d. Required core samples must be collected as described in the Permittee's soil sampling procedures provided in Attachment II.3.

II.F.1.e. All samples must be iced or preserved, as specific analytical methods dictate, at the time of collection and during transport to the laboratory.

II.F.1.f. A chain-of-custody from the field to the laboratory must be maintained and documented.

II.F.1.g. Results of all land treatment monitoring activities shall be noted and maintained in the operating record.

II.F.1.h. If circumstances do not allow for sampling within the required timeframes in this Permit (e.g., the SLTU is too wet and muddy), a justification letter explaining the circumstances must be mailed to DEQ within 7 days past the required sampling deadline.

II.F.2. *Soil-Pore Liquid Sampling*

II.F.2.a. Two lysimeters are installed in the SLTU, and one is installed in a background area as shown in Attachment II.7 (SLTU Lysimeter Locations).

II.F.2.b. Whenever an individual lysimeter is damaged or ceases to function, within a timeframe approved by DEQ and as soon as practical, the Permittee shall install additional lysimeters to maintain the established number of lysimeters. All new installations will be completed below the treatment zone, as specified in 40 CFR 264.278. The background lysimeter must be located where collected soil-pore liquid is unaffected by leakage from the land treatment. Lysimeters installed within the land treatment unit must be placed where soil-pore liquid from within or below the treatment zone can be captured.

II.F.2.c. Monthly, during the application season, the Permittee shall check each lysimeter for the volume of soil pore liquid collected and for visible oil sheen on the liquid's surface. The results shall be recorded in the operating record as specified in Condition II.I.2. (Recordkeeping).

II.F.2.d. Sampling shall be completed at least semi-annually, preferably in the spring and fall.

II.F.2.d.i. If there is greater than 40 ml sample volume in the lysimeters, the Permittee must follow the analysis procedures specified in Condition II.G.3.b.

II.F.2.d.ii. If there is less than 40 ml sample volume in the lysimeters, the Permittee shall document the volume in the annual report submitted to DEQ as required in Condition II.I.1.

II.F.3. *ZOI Soil Sampling*

II.F.3.a. ZOI Soil Sampling Frequency

II.F.3.a.i. Monthly, during the application season, a composite sample composed of a minimum of five randomly selected soil cores shall be collected from each sector of the SLTU in accordance with Attachment II.3 (Soil Sampling Procedures). The samples shall be analyzed for oil and grease, percent solids, and moisture content as described in Condition II.G.4. (ZOI Analytical Requirements).

II.F.3.a.ii. Annually, between March 1 and June 1, at least one composite soil sample must be collected from the SLTU and analyzed for pH, nitrogen, phosphorous, potassium, and metals as described in Condition II.G.4. (ZOI Analytical Requirements).

II.F.3.a.ii.1. The composite sample shall be comprised of the following procedure:

- A total of five randomly selected ZOI soil cores must be taken from each sector.
- A portion of soil from each sector's composite soil sample shall be collected and thoroughly mixed
- One soil sample shall be collected from the mixture for analysis.

II.F.3.b. ZOI Sample Collection and Locations

II.F.3.b.i. The fourteen sectors for the SLTU have been assigned a coordinate system as shown in Attachment II.8 (SLTU Sectors). The procedures for random selection of sampling sites within application sectors must be performed for each soil sampling event, as described in the Permittee's Soil Sampling Procedures provided in Attachment II.3. (Soil Sampling Procedures).

II.F.3.b.ii. A random number generator will be used to select five sample locations within each sector as provided in Attachment II.3. (Soil Sampling Procedures).

II.F.3.b.iii. When selecting sample sites, any point that falls within 10 feet of the sector boundary will be disregarded, and another point selected.

II.F.4. *Below Treatment Zone (BTZ) Soil Core Sampling*

II.F.4.a. <u>BTZ Sampling Frequency</u>

II.F.4.a.i. Annually, between April 1 and June 1, five uncomposited BTZ samples must be collected from the SLTU. The samples shall be analyzed in accordance with Condition II.G.5.

II.F.4.b. <u>BTZ Sample Collection and Location</u>

II.F.4.b.i. To allow for maximum spatial distribution of sampling points, the procedures for random selection of sampling sites within application cells must be performed for each soil sampling event, as described in the Permittee's Soil Sampling Procedures provided in Attachment II.3. (Soil Sampling Procedures).

II.F.4.b.ii. When selecting sampling sites, any point that falls within 10 feet of the sector boundary must be discarded to avoid edge effects, and another random point shall be selected.

II.F.4.c. <u>Determining BTZ Sampling Depth</u>

II.F.4.c.i. The BTZ consists of a soil layer from the bottom of the treatment zone to 6 inches below the treatment zone.

II.F.4.c.ii. Determining the location of the BTZ must be conducted in the field at each sample point and must follow the procedures specified in the soil sampling procedures provided in Attachment II.3.

II.F.4.c.iii. Determining the BTZ location must include, at a minimum, evaluation of soil lithology, color, staining, and photoionization detector measurements.

II.G. SLTU Analytical Requirements

II.G.1. *General Analytical Requirements*

II.G.1.a. The Permittee must be able to routinely report analysis results at a concentration equal to or less than the EQL for organic constituents and MDL for metal constituents for that parameter and sample type/matrix. The Permittee shall ensure that EQLs (for organics) and MDLs (for metals) specified for given analytical methods, constituents, and media in SW-846 are routinely achieved in all analyses.

II.G.1.b. A different analytical method from the ones provided in this Permit may be used, with DEQ approval, if the laboratory cannot attain the required EQL or MDL using the permit-specified method. Any change in the analytical method used shall be noted in the annual soil monitoring report submitted to DEQ.

II.G.1.c. If the laboratory is unable to meet any of the EQL (for organics) and MDLs (for metals) required by this Permit, a written justification must be provided by the laboratory with the analytical results. DEQ reserves the right to review the justification and to accept, reject, or require further justification. DEQ also reserves the right to require further sampling if required EQLs (for organics) and MDLs (for metals) are not met.

II.G.1.d. The Permittee shall submit to DEQ, upon request, the Quality Assurance Plan and the name of a contact person for each analytical laboratory used by the Permittee.

II.G.1.e. Any field, trip, or laboratory blanks exceeding the EQL (for organics) and MDL (for metals) shall require an explanation in writing by the Permittee to DEQ. This explanation shall be included in the annual soil monitoring report required in Condition II.I. (Reporting and Recordkeeping).

II.G.1.f. The criteria for accepting or rejecting analytical data shall follow the requirements of SW-846.

II.G.1.g. If the Permittee is routinely unable to meet the requirements of Condition II.G.1.a. the Permittee shall perform an MDL study for the problem sample types/matrices and parameters. The Permittee shall perform the MDL study according to the method described in Chapter One (definitions) of SW-846, 3rd edition. The Permittee shall report to DEQ the results of the MDL study and all supporting information requested by DEQ to verify the study. Based on the results of the MDL study, the Permittee shall propose to DEQ an alternative quantitation limit (AQL) to be used under the Permit instead of the reporting limit for the particular problem sample type/matrix and parameter. DEQ reserves the right to review the MDL study and the proposed AQL and to accept or reject the MDL study or the proposed AQL, specify a different AQL, or to require further information or testing.

II.G.1.h. Analytical reports shall contain the information outlined in Condition II.I.1. (Reporting Requirements)

II.G.1.h.i. An equivalent analytical method may be used for any analyte if approved by DEQ.

II.G.2. *Principal Hazardous Constituents*

II.G.2.a. Pursuant to 40 CFR 264.278, DEQ has specified principal hazardous constituents (PHCs) in lieu of hazardous constituents specified under 40 CFR 264.271(b). The PHCs are hazardous constituents contained in the waste that was applied to the land treatment unit. The PHCs should provide a reliable indication of the presence of hazardous constituents in groundwater, surface water, soil-pore liquid, and the unsaturated soil monitoring zone, i.e. the below treatment zone (BTZ). The PHC list is provided in Attachment II.9.

II.G.2.b. The Permittee may be required to analyze for an extended list of hazardous constituents if PHCs are detected in the environmental media listed above. The extended list may include the hazardous constituents included on the modified Skinner's list in Attachment II.10. [40 CFR 270.32]

II.G.3. *Soil-Pore Liquid Analytical Requirements*

II.G.3.a. The parameters required for soil pore liquid analyses are provided in Attachment II.11 (Lysimeter Analytes and Permit Concentration Limits).

II.G.3.b. If there is insufficient sample volume for analysis of all parameters provided in Attachment II.11, volatile organics will be analyzed first, followed by metals, pH and specific conductance, and semi-volatile organics. Summarized below are the methods and minimum volumes required for the required analyses:

Parameter	Method	Minimum Volume Required
Volatiles • Benzene • Toluene • Ethyl Benzene • Xylene	8260	40 ml
Metals • Lead • Chromium	6010	50 ml
pH/Specific Conductance		50 ml
Semi-Volatiles	8270	1000 ml

II.G.4. *Zone of Incorporation (ZOI) Analytical Requirements*

II.G.4.a. Monthly ZOI soil samples as required by Condition II.F.3.a.i. shall be analyzed for oil and grease as described in Condition II.D.6.a., percent solids, and moisture content as described in Condition II.D.10.

II.G.4.b. Annual ZOI soil samples as described in Condition II.F.3.a.ii. shall be analyzed for metals; pH; and nitrogen, phosphorous, potassium, as described in Condition II.D.6.b., II.D.7., and II.D.8, respectively.

II.G.4.b.i. The analytical method for metals is included in Condition II.D.6.b. Nitrogen, phosphorous, and potassium analytical procedures must be performed in accordance with procedures in *"Methods of Soil Analysis" Publication Number 9 in the series Agronomy, published by the American Society of Agronomy, or an equivalent method approved by DEQ.*

II.G.5. *BTZ Analytical Requirements*

II.G.5.a. Annual BTZ soil samples as required by Condition II.F.4.a. shall be analyzed for PHCs, pH, Oil and Grease, Percent Solids, Moisture Content, and Specific Gravity, as outlined in Attachment II.12.

II.H. Monitoring Evaluations

II.H.1. *Waste Analysis Evaluation*

II.H.1.a. The Permittee shall use procedures outlined in Attachment II.2 (Waste Analysis Plan), and all requirements for waste determination in ARM 17.54, Sub-Chapter 3 to determine whether a waste is non-hazardous or hazardous. No hazardous waste may be placed on the SLTU.

II.H.2. *Soil Pore Liquid Monitoring Evaluation*

II.H.2.a. Lysimeter concentration limits are provided in Attachment II.11 (Lysimeter Analytes and Permit Concentration Limits).

II.H.2.b. If one or more constituent is detected at or above its Permit Concentration Limit in any lysimeters, then DEQ must be notified in writing within fifteen (15) days after receipt of the analytical information by the Permittee. The Permittee must re-sample the lysimeter(s) that show concentrations above detection and only for those constituents detected.

II.H.2.c. During this period, the Permittee may investigate the possibility that a source other than the SLTU is causing the appearance of the hazardous constituent(s), or that the results represent an error in sampling, analysis, or evaluation.

II.H.2.d. If the repeat sampling detects at least one constituent at or above its Permit Concentration Limit, it is considered a statistically significant increase. DEQ shall be notified in writing within seven (7) after receipt of the analytical results by the Permittee.

II.H.2.e. If a statistically significant increase has occurred, another sample shall be taken immediately, when sufficient volume is available, at the affected lysimeters or lysimeters for the Modified Skinner List constituents shown in Attachment II.10 (Modified Skinner List). DEQ shall be notified in writing of the results within seven (7) days after receipt of the analytical results by the Permittee.

II.H.2.f. After review of the analytical results required in Conditions II.H.2.d. and II.H.2.e., DEQ may require the Permittee submit an application for a permit modification. The permit modification shall describe changes in operating practices at the SLTU that will maximize the success of degradation, transformation, or immobilization processes in the treatment zone.

II.H.2.g. If the Modified Skinner List analysis required by Condition II.H.2.e. detects an analyte not included in the analytes in Attachment II.11 (Lysimeter Analytes and

Permit Concentration Limits), DEQ may add the analyte to the analyte list in Attachment II.11 for future sampling events and/or require re-sampling for the detected analyte. An analyte is detected when its concentration is at or above the MDL (for an inorganic analyte) or EQL (for an organic analyte).

II.H.2.h. If hazardous constituents listed in Attachment II.11 (Lysimeter Analytes and Permit Concentration Limits) appear in both background and land treatment unit lysimeters during the same sampling event, an appropriate, DEQ-approved, statistical procedure may be used to determine statistical significance. Other statistical approaches, such as tolerance intervals, may be used. Statistically significant concentrations will require the notification and response procedures outlined in Conditions II.H.2.d. through II.H.2.g. above.

II.H.2.i. Lead and chromium concentrations in land treatment unit lysimeters samples will be evaluated by comparison to background concentrations, using appropriate statistical procedure from Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. Statistically significant concentrations will require the notification and response procedures outlined in Conditions II.H.2.d. through II.H.2.f. above.

II.H.3. *Zone of Incorporation (ZOI) Soil Monitoring Evaluation*

II.H.3.a. ZOI oil and grease analytical results will be evaluated to verify that the 5% dry weight basis application limit in Condition II.D.6.a. (Oil and Grease) is not being exceeded.

II.H.3.b. ZOI nutrient and pH analysis results shall be evaluated annually to determine the liming and fertilizer requirements of each application area, as described in Conditions II.D.7. (Measures to Control Soil pH) and II.D.8. (Nutrient Addition).

II.H.3.c. ZOI metals analysis results shall be evaluated in accordance with Condition II.D.6.b. to determine appropriate rates of waste application.

II.H.4. *Below Treatment Zone (BTZ Soil Monitoring Evaluation*

II.H.4.a. BTZ soil analytical results for organic constituents listed in Attachment II.12 (BTZ Analytes and Permit Concentration Limits) shall be evaluated by the following method:

II.H.4.b. If one or more organic constituent is detected at or above the Permit Concentration Limit (PCL) provided in Attachment II.12 in any BTZ soil core, DEQ must be notified within fifteen (15) days after receipt of the analytical information by the Permittee.

II.H.4.c. The Permittee's notification must include an evaluation of all laboratory analytical results equal to or greater than the PCL using the most current EPA Soil Screening Levels for soil-to-groundwater migration, using a DAF of 20.

II.H.4.d. If any laboratory analytical results equal to or greater than the PCL discussed in Condition II.H.4.b. are also greater than the limits specified in Condition II.H.4.c., it is considered a statistically significant increase.

II.H.4.e. The Permittee may investigate the possibility that a source other than the land treatment unit is causing the appearance of hazardous constituents, or that the results represent an error in sampling, analysis, or evaluation.

II.H.4.f. If a statistically significant increase has occurred, samples shall be taken from the ZOI and BTZ near the original core within 7 (seven) days, unless a different schedule is approved by DEQ. These samples shall be analyzed for modified Skinner List constituents listed in Attachment II.10 (Modified Skinner List). DEQ shall be notified of the results within seven (7) days after receipt of analytical results by the Permittee.

II.H.4.g. After review of the analytical results required in Condition II.H.4.f., DEQ may require the Permittee submit an application for a permit modification. The modification shall describe changes in operating practices at the land treatment unit that will maximize the success of degradation, transformation, or immobilization processes in the treatment zone.

II.H.4.h. If the Modified Skinner List analysis required by Condition II.H.2.e. detects an analyte not included in the PHC list in Attachment II.12 (BTZ Analytes and Permit Concentration Limits), DEQ may add the analyte to the list in Attachment II.12 for future sampling events and/or require re-sampling for the detected analyte. An analyte is detected when its concentration is at or above the MDL (for an inorganic analyte) or EQL (for an organic analyte).

II.H.4.i. Lead and chromium concentrations in land treatment unit BTZ soil samples will be evaluated by comparison to background concentrations established in *Background Concentrations of Inorganic Constituents in Montana Surface Soils*, prepared for DEQ in September 2013.

II.H.4.i.i. The fine soil fraction of the soil sample must be used for analysis as required in *Background Concentrations of Inorganic Constituents in Montana Surface Soils*, prepared for DEQ in September 2013.

II.I. Reporting and Recordkeeping Requirements

II.I.1. *Reporting Requirements*

II.I.1.a. General reporting requirements for the LTU are specified in Condition I.R (Recordkeeping and Reporting). Annual reports for the previous calendar year shall be submitted to DEQ by April 30 as specified in Condition I.R.4.e.

II.I.1.b. Analytical reports as required in this module must contain the following information:

II.I.1.b.i. Analytical methods used, including method number references;

II.I.1.b.ii. Estimated quantitation limits (EQLs) for every parameter in each sample actually achieved the test method used by the laboratory;

II.I.1.b.iii. Quality control information pertinent to analysis including blanks, duplicates, matrix spike recoveries and acceptance limits for the inorganic parameters analyzed; surrogate compound identity, recovery, and acceptance limits for the organic parameters analyzed and calibration verification results.

II.I.1.b.iv. Laboratory used and name of laboratory contact person;

II.I.1.b.v. Method detection limits (MDL) for every parameter tested;

II.I.1.b.vi. Low concentration data shall be reported as follows:

Analyte Concentration	**Report**
<MDL	Provide MDL value for analyte
≥ MDL but < EQL	Detected but not quantified
≥ EQL	Numerical concentration quantified

II.I.1.b.vii. Any compound not listed in Attachment II.12 (BTZ Analytes and Permit Concentration Limits), but detected during analysis;

II.I.1.b.viii. A determination of whether there has been a statistically significant increase as defined in Condition II.H. (Monitoring Evaluations), including all required data collection; and

II.I.1.b.ix. A description of any deviations from the permit requirements and/or method guidelines or laboratory Quality Assurance Plan (QAP). This must include any change in analytical methods used to meet permit-required EQLs for organic constituents and/or MDLs for metal constituents.

II.I.2. *Recordkeeping Requirements*

II.I.2.a. The Permittee shall keep written records of the following LTU activities for each LTU sector:

II.I.2.b. Waste Applications

- Types of waste applied
- Waste volumes
- Application dates
- Areas to which wastes are applied
- Waste sampling and analytical records
- Computation and update of total waste applied to each treatment area year to date with corresponding oil loading rates

II.I.2.c. Land Treatment Unit Operations

- Tillage dates and areas
- Nutrient and pH control testing, application dates and amounts
- Any activities taken to control wind dispersal or ponding on land treatment units
- Records of all routine inspections
- Monitoring records including sampling logs or notes, analytical results, evaluations, and required reports for wastes, soil-pore liquid, ZOI and BTZ soils, and groundwater samples

II.I.2.d. Other Documents

- Valid permit
- Closure plan and closure cost estimates (as updated or revised)
- Copies of requests for permit modifications or changes in practices or procedures.

II.I.2.e. All records required under this Condition must be furnished upon request and made available, at all reasonable times, for inspection by any duly designated representative of DEQ.

II.J. Vehicle Decontamination Facility (VDF) Requirements

II.J.1. *General VDF Requirements*

II.J.1.a. The requirements of this section apply to the operation of a vehicle decontamination facility (VDF) located within and at the south end of the SLTU.

II.J.1.b. The Permittee must follow the requirements in this Condition for decontamination of waste application equipment, personal protective equipment, and any other equipment used during sampling, waste application, tilling, or other activities conducted on the SLTU.

II.J.1.c. The Permittee must operate the VDF to minimize the potential for any leakage from the system.

II.J.1.d. The VDF shall only be used to decontaminate equipment that has been exposed to the wastes within the SLTU.

II.J.1.e. Waste application vehicles leaving the SLTU must stop on the sloped concrete pad. The undercarriage of the waste application vehicle will be hosed down with water to remove any waste. The wash pad will then be washed down, allowing material to drain to the VDF sump.

II.J.1.f. The Permittee must ensure wastes that are incompatible with the sump's fiberglass liner are not washed into the VDF sump.

II.J.2. *Wash water and sludge generation and management*

II.J.2.a. To assure sufficient freeboard in the sump at all times, the Permittee must empty the sump before 1900 gallons are accumulated in the sump, or at the end of each working day, whichever comes first. A fill line or marking clearly indicating the volume of 1900 gallons in the sump must be present.

II.J.2.b. Wash water and sludge generated at the VDF may be applied to the active portions of the SLTU.

II.J.2.c. The Permittee must manage and properly dispose of all decontamination-derived waste in accordance with applicable hazardous and non-hazardous waste regulatory requirements.

II.J.3. *VDF Inspection and Leak Detection Monitoring*

II.J.3.a. The VDF shall be inspected at least once during any week waste has been applied at the SLTU and at least once a month throughout the year. Inspections must include checking for contaminated fluid in the leak detection monitoring standpipe, free liquid in the sump, cracks or damage to the sump, and cracks in the washpad. Condensation or moisture that are clearly from sources external to the VDF are not considered evidence of a leak.

II.J.3.b. Within 24 hours of detecting a leak the Permittee shall:

- Notify DEQ;
- Sample the fluids in the secondary containment sump and analyze for the PHC list of analytes in Attachment II.12 (BTZ Analytes and Permit Concentration Limits); and
- Remove the fluids in the secondary containment sump and apply them to the SLTU.

II.J.3.c. After a leak is detected, the leak detection system will be inspected after the next vehicle decontamination to verify that leakage has occurred. If leakage has occurred, the Permittee shall:

- Remove the fluids in the secondary containment sump and apply them to the SLTU;
- Determine the source of the leak;
- Submit to DEQ within 30 days of leak detection, a permit modification addressing either liner or sump repair or replacement; and
- Suspend activity at the VDF until the permit modification becomes final.

II.J.3.d. Records of inspections, maintenance, leaks detected, permit modifications, and temporary vehicle decontamination plans shall be maintained as a part of the operating record.

II.K. Closure and Post-Closure Requirements for the SLTU and VDF

II.K.1. The Permittee shall follow requirements set forth in Module III (Closure Requirements) and Module IV (Post-Closure Requirements) for closure and post-closure care of the SLTU and the associated VDF.

Attachment II.1

SLTU Site Plan and Topographic Map

SOUTH LAND TREATMENT UNIT
LOCATION MAP

AECOM

Attachment II.2

Waste Analysis Plan

EXXONMOBIL BILLINGS REFINERY
WASTE ANALYSIS PLAN

1.0 INTRODUCTION

This plan serves to document procedures used to ensure that RCRA permit required analyses for hazardous wastes are conducted in an appropriate manner at the ExxonMobil Billings Refinery.

At the ExxonMobil Billings Refinery, emphasis is placed on the characterization and analysis of a waste to determine whether it is a non-hazardous or hazardous waste. Waste characterization data is also used to determine the best methods of handling and treatment.

Minimum Personal Protective Equipment (PPE) to be worn during any sampling event includes: Fire Resistant Clothing, steel-toed safety shoes, safety glasses with side shields, and hard hat. In addition, prior to initiating sampling, nitrile or other suitable gloves will be donned to protect skin from dermal contact with wastes. Additional PPE may be required based on the specific waste being sampled. ExxonMobil Billings Refinery Industrial Hygiene should be consulted when sampling of infrequently generated or newly generated wastes.

2.0 CHEMICAL AND PHYSICAL ANALYSES

The hazardous wastes, which are commonly stored or disposed of at the ExxonMobil Billings Refinery, are listed in Table 1. Also presented in this table, is the hazard presented by the waste and the method of handling each waste. These wastes are generated from sources typical of petroleum refining processes and operations.

TABLE 1

HAZARDOUS WASTES COMMONLY HANDLED

AT THE EXXONMOBIL BILLINGS REFINERY

Waste	Basis for Designation	Method of Handling
Slop Oil Emulsion Solids	Listed Waste (K049)	Off-Site Treatment(1)
API Separator Sludge	Listed Waste (K051)	Off-Site Treatment(1)
Primary Oil/Water/Solids Separation Sludges	Listed Waste (F037)	Off-Site Treatment(1)
Crude Storage Tank Bottoms	Listed Waste (K169)	Off-Site Treatment
Clarified Slurry Oil Storage Tank Bottoms	Listed Waste (K170)	Off-Site Treatment
Crude Tank Sludge	Listed Waste (K169)	Off-Site Treatment
TC Tank Bottoms	Characteristic Waste	Off-Site Treatment
Benzene Characteristic Filters	Characteristic Waste (D018)	Off-Site Treatment
Spill Clean-Up Wastes	Determined Case by Case	Off-Site Treatment
DEA Filter Cartridges(3)	Determined Case by Case	Off-Site Treatment
Waste Catalysts	Listed Waste (K171) or as Determined Case by Case	Reclamation or Off-Site Disposal
Process Vessel Sludges	Determined Case by Case	Off-Site Treatment
VDF(2) Sump Wash Waters	Mixture of Hazardous Wastes Applied On The Landfarm	On-Site Treatment in Wastewater system or Off-Site Treatment(1)
VDF(2) Sump Sludge	Mixture of Hazardous Wastes Applied On The Landfarm	Off-Site Treatment(1)
Waste Solvents and Solvent Sludges	Determined Case by Case	Off-Site Treatment

(1) These materials may be treated at the South Land Treatment Unit the current permit (MTHWP-99-02) and the No Migration Variance expire.
(2) VDF is Vehicle Decontamination Facility
(3) Typically non hazardous

Determination of whether a waste is RCRA hazardous or not is follows 40 CFR Part 261. The identification of the appropriate method of treatment or disposal specific to each waste type is done using 40 CFR Part 268.

Wastes treated at the South Land Treatment Unit (SLTU) are those determined to be suitable for this type of treatment based on analysis and permitted by the current ExxonMobil Billings Refinery RCRA Part B Permit and the ExxonMobil Billings Refinery Variance from Land Disposal Restrictions for the SLTU. Hazardous wastes will no longer be applied to the SLTU when the current RCRA Part B Permit and No Migration Variance are superceded by a new permit.

3.0 PARAMETERS AND RATIONALE

The frequency and analytical suite specified for commonly generated wastes at the ExxonMobil Billings Refinery are discussed below. The specific analytical methods used by contract laboratories in completing these analyses are discussed in Section 4.0 – Analytical Methods.

3.1 API SEPARATOR SLUDGE (K051), SLOP OIL EMULSION SOLIDS (K049), PRIMARY OIL/WATER/SOLIDS SEPARATION SLUDGE (F037), AND TOXICITY CHARACTERISTIC CONTAMINATED SOILS (D018)

Samples of these listed hazardous wastes are collected and analyzed for parameters specified by the off-site disposal facility for waste profiling. Some of these wastes (K051, K049 and F037) may be utilized as oil bearing secondary material for recovery of oil prior to disposal.

3.2 DEA FILTER CARTRIDGES

Although historical analyses have designated that DEA Filter Cartridges are hazardous waste based on the selenium content, recent analyses have not shown these wastes to be hazardous. Therefore, DEA Filter Cartridges will be analyzed via Toxicity Leaching Characteristic

Procedure (TCLP) for metals on a minimum cycle of every other year to assess the waste characteristic and subsequent treatment or disposal.

3.3 VEHICLE DECONTAMINATION FACILITY SUMP WASH WATERS AND SLUDGE

A sample of the sludge will be analyzed for the parameters required by the disposal facility for waste profiling. These analyses may be required to ensure compatibility with the treatment/disposal method.

A grab sample of the wash water will be analyzed via TCLP analysis to determine if the wash water is a hazardous or non-hazardous waste. If the wash water is determined to be non-hazardous waste, the water will be disposed of in the refinery's sewer system via vacuum truck. If the wash water is determined to be hazardous waste, it will be disposed of off-site or of in the refinery's sewer system via vacuum truck. Any additional analyses performed are those required by off-site disposal facilities to ensure compatibility with the treatment/disposal method.

3.4 SPILL CLEAN-UP WASTES

The analysis of spill clean-up wastes will be determined on a case-by-case basis depending on the nature of the spill and the materials involved in the spill and spill clean-up. These wastes will be disposed of off-site or may be eligible for landfarming if deemed nonhazardous. These wastes are typically analyzed for benzene and oil and grease.

Past sampling activities have shown that metals content of these spill clean-up wastes are controlled more by the metals content of the spill affected soils than by the spilled hydrocarbon material. As such, ExxonMobil will analyze for select metals the first time the specific waste type is generated.

3.5 TANK BOTTOMS

Tank bottom sludges will be analyzed at generation via the Toxicity Leaching Characteristic Procedure (TCLP) to determine whether or not the waste is hazardous by characteristic. The TCLP analyses will occur until sufficient history exists to provide a regulatory basis for successive waste generations. In addition to the TCLP analysis for first generation samples, a sample of the waste may be analyzed for volatile organic compounds, semi-volatile organic compounds, oil and grease, pH, and moisture content. Generator knowledge may be used in place of any of these analyses, such as for Crude Storage Tank Sediment. Once characterized, tank bottom sludges will be shipped to an approved off-site disposal facility. The waste characterization sequence will start anew if the tank switches hydrocarbon service or if there is reason to believe that there has been a change is waste characteristic.

3.6 WASTE SOLVENTS AND SLUDGES

Containerized waste solvents and sludges that are designated for off-site disposal at a hazardous waste disposal facility are stored on the Waste Staging Area pad. ExxonMobil uses Safety Data Sheets (SDS), generator knowledge and/or analytical data for proper characterization. Any additional analyses performed are those required by off-site disposal facilities to ensure compatibility with the treatment/disposal method.

3.7 WASTE CATALYSTS

All waste catalysts at the ExxonMobil Billings Refinery are sent off-site either for disposal, treatment/reclamation or regeneration. To determine whether or not the waste catalyst is a hazardous waste or not, ExxonMobil Billings Refinery will normally use the definitions in 40 CFR 261.32. If a catalyst is not scheduled for regeneration, a TCLP analysis is run to verify the classification of the spent catalyst. Generator knowledge may be used in place of collecting analytical data. Any additional analysis conducted is that requested by the permitted receiving facility to provide the necessary waste profile information for treatment or disposal. K171 waste catalysts are identified based on process knowledge.

3.8 PROCESS VESSEL SLUDGES

The determination of whether a waste process vessel sludge is a hazardous waste will be necessary for any sludges, which have not previously been generated at the ExxonMobil Billings Refinery, or if there is a change in process where the sludges are generated. ExxonMobil Billings Refinery will normally use those techniques described in 40 CFR 261.3 to make such a determination. However, if engineering knowledge of the waste process vessel sludge is sufficient to determine the wastes' classification, this engineering knowledge may be used in lieu of laboratory analytical techniques. Any determination of waste classification via engineering knowledge will be appropriately documented.

3.9 NEWLY GENERATED WASTES

The hazardous waste determination will be necessary for any wastes that have not been previously generated at the ExxonMobil Billings Refinery. ExxonMobil Billings Refinery will normally use those techniques described in 40 CFR 261.3 to determine whether or not the waste is classified as a hazardous waste. However, if engineering knowledge of the process generating the waste or waste material is sufficient to determine the specific waste classification, this engineering knowledge will be used. Any determination of waste classification via engineering knowledge will be appropriately documented.

3.10 NON-HAZARDOUS WASTES

Small volumes of non-hazardous wastes may be generated, and these wastes may be stored in drums or combined with other non-hazardous wastes. Wastes are identified using process knowledge and/or testing for characteristics, as appropriate.

3.11 REMEDIATION WASTES

In the process of conducting a RCRA Corrective Action program at the Billings Refinery, ExxonMobil may generate a number of remediation wastes associated with historic waste management activities. ExxonMobil Billings Refinery will normally use those techniques described in 40 CFR 261.3 to determine whether or not the waste is legally classified as a hazardous waste. However, if engineering knowledge of the process generating the waste or waste material is sufficient to determine the specific waste classification, this engineering knowledge may be used. Any determination of waste classification via engineering knowledge will be appropriately documented.

4.0 ANALYTICAL METHODS

Unless otherwise noted, the analytical methods used for waste analysis, to aid in hazardous waste determination, are those from the most current version of “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods” (USEPA, SW-846). Other analytical methods used are all

EPA-approved or RCRA Permit approved analytical methods. Some of the test/analytical methods currently in use for waste characterization are detailed in Table 2 and Table 3. ExxonMobil uses the specific containers, preservation methods, and operates within the holding times specified for each respective analytical method listed in Tables 2 and 3 and as detailed in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (USEPA, SW-846) or other appropriate guidance.

TABLE 2

TEST METHODS FOR SOLID WASTE ANALYSIS

PARAMETER	TEST METHOD	REFERENCE
pH	Electrometric Method 9040C *or* Soil and Waste pH 9045D	Test Methods For Evaluating Solid Waste. U. S. EPA SW-846
Flash Point	Pensky-Martens Closed-Cup Tester Method 1010A	U. S. EPA SW-846
Corrosivity	Corrosivity Toward Steel - Method 1110A	U. S. EPA SW-846
Toxicity	Toxicity Characteristic Leaching Procedure (TCLP) - Method 1311	U. S. EPA SW-846
Free Liquids	Method 9095B	U. S. EPA SW-846
Oil and Grease (Freon Extractables)	Modified Method 413.2 *or* Methods 9070A/9071B	U. S. EPA 600/4-79-020 U. S. EPA SW-846
Percent Solids	Method 3540C with Gravimetric Analysis of Solid Residue	U. S. EPA SW-846
Percent Moisture	Carl Fischer Titration or Dean Stark Method 209A	ASTM Standard Methods
Organic Lead	Solvent Wash Sludge Then Method 6010C on Solvent Wash	U. S. EPA SW-846

TABLE 3

TEST METHODS FOR SOLID WASTE ANALYSIS

PARAMETER	TEST METHOD	REFERENCE
Tier III Constituents*		
Metals	Method 6000 Series or 7000 Series as appropriate	U. S. EPA SW-846
Volatile Organic Compounds	Method 8260	U. S. EPA SW-846
Semi-Volatile Organic Compounds (Base/ Neutral Extractables)	Method 8270	U. S. EPA SW-846
Semi-Volatile Organic Compounds (Acid Extractables)	Method 8270	U. S. EPA SW-846

* Pretreatment usually required. Depending on matrix to be analyzed: 1330 for sludges; 3540 for solids; and 3520 for liquids.

Analytical methods for the various tests will be updated as new methods are introduced or updated, and old methods become obsolete.

Samples are transported to a laboratory in a cooler as soon as possible after the sample has been collected or are placed in a refrigerator. ExxonMobil requires the contract laboratory meet all laboratory quality control/quality assurance requirements for each respective method. ExxonMobil does not normally collect duplicate samples, field blanks, or trip blanks, as waste sampling usually involves collection of one sample from a respective waste during each sampling event.

5.0 SAMPLING METHODS

Unless a specific reason exists to the contrary, ExxonMobil collects composite waste samples in the attempt to maximize the representativeness of the analytical results. Methods described in either 40 CFR Part 261 Appendix I, the most recent version of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (USEPA, SW-846), or an equivalent, are used for sampling wastes.

6.0 REQUIREMENTS FOR WASTES GENERATED OFF-SITE

The ExxonMobil Billings Refinery is not a commercial waste handling facility and only handles solid wastes that have been generated by the ExxonMobil Billings Refinery. All ExxonMobil Billings Refinery wastes go through the analysis procedures described above. Therefore, requirements for wastes received from off-site generators do not apply.

7.0 SAMPLE CUSTODY

The sample custody program described below will allow for the tracking of possession and handling of individual samples from the time of field collection through laboratory analysis. The ExxonMobil Billings Refinery sample custody procedures are designed to comply with USEPA requirements for sample control.

7.1 FIELD CUSTODY

Sample containers will be labeled at the time of sampling with a sample label containing the information listed below:

- Sampling date and time.
- Sample identification.
- Preservatives.
- Initials of sample collector.

Sample containers will be placed on ice in a cooler if shipping is to occur the same day as sample collection. However, if shipping will be delayed into succeeding days, samples will either be maintained on ice in coolers or may be stored in the designated sample refrigerator in the on-site laboratory at the ExxonMobil Billings Refinery. If the samples have been stored in the sample refrigerator at the ExxonMobil Billings Refinery analytical laboratory, the samples will be placed on ice in coolers at the time of shipping/delivery.

7.2 CHAIN-OF-CUSTODY RECORD

The Chain-of-Custody (COC) record is used to document the transfer of samples from the sampler to the laboratory. An original and at least one copy of the form are completed for each cooler shipped to the laboratory. The original COC is placed, along with an ExxonMobil

Billings Refinery analysis authorization, in a waterproof container and sent in the cooler with the samples. A copy of the COC record is retained for the project files.

The COC record contains the following information:

- Laboratory identification.
- Sample identity.
- Date of sampling.
- Signature of persons involved in the transfer of the samples, and the date and the time of possession.
- Sample container description.
- Sample analysis request.

In some cases, an indication of sample characteristics, such as suspected high waste concentrations, may be noted on the COC record by the sampling team. The reason for warning the laboratory of such samples is that instruments, particularly those for organic analyses, can be overloaded by high concentrations, which may result in laboratory down-time or the need for repeat analyses.

The sampler(s) is responsible for maintaining custody of the samples until they are delivered to the ExxonMobil Billings Refinery laboratory waste sample storage refrigerator and the COC record is signed and dated by the sampler(s). The COC is left with the sample. The containers must be stored either in the ExxonMobil Billings Refinery laboratory waste sample refrigerator or on ice in sealed coolers. The samples will be maintained at the proper temperature at all times.

If the contract laboratory selected for sample analysis is located in Billings, Montana, the samples will be delivered by vehicle to the contract laboratory. If the selected contracted laboratory is located elsewhere, sample containers will be shipped by common carrier in sealed coolers to the designated contract laboratory. The laboratory will note time of receipt and sample condition upon receipt of the samples.

Landfarm Waste Determination Form

Waste Common Name: **Waste Container #:**
Waste Source: **Waste Container type:**
Filled out by (Name): **Date:** If bulk container arrange LDAR monitoring

Process Knowledge:

General Information	Yes or No (complete each line)	Basis/Comments (*where analysis or generators knowledge is used and how)*
Does analytical data exist for this material?		
If yes, what analysis have been conducted on this material?		
If yes, what is sample ID of analytical data)		
Is there an MSDS for this material? (What is MSDS number)		
Listed Wastes	**If waste is hazardous it may not be landfarmed**	
Is the waste a Listed Hazardous Waste (40 CFR 261 Subpart D)? If yes, identify the listed waste code(s).		
Characteristic Wastes	**If waste is hazardous it may not be landfarmed**	
Does the material exhibit any of the following characteristics		
TC Benzene (D018)? Is this based on analytical data or generator knowledge?		
TC Volatiles/Semi-volatiles (40 CFR 261.24)? If yes, for what constituent(s)/waste code(s)? Is this based on analytical data or generator knowledge?		
TC Metals (40 CFR 261.24)? If yes, for what constituent(s)/waste code(s)? Is this based on analytical data or generator knowledge?		
Ignitable (40 CFR 261.21)? Is this based on analytical data or generator knowledge?		
Corrosive (40 CFR 261.22)? Is this based on analytical data or generator knowledge?		
Reactive (40 CFR 261.23)? Is this based on analytical data or generator knowledge?		
If the material exhibits a hazardous characteristic, does it have any UHCs above the UTS? Is this based on analytical data or generator knowledge?		
Final Disposition (All hazardous wastes must be profiled and meet LDR		

Will material be landfarmed? Y / N If yes, ensure requirements are met:

Permit sampling requirements Y / N Waste Placement Evaluation Y / N Landfarm Ticket Y / N

If any permits limits are exceeded waste may not be landfarmed. Only non hazardous waste may be landfarmed.

Sample Information Form

Sampler: ___________________________

Sample Date: ______________________ Time: _____________________________

Where sample was stored (if stored): ____

Material sampled: ____

____

(Specific location the waste was generated or vessel waste was removed from. Be as specific and as much detail as possible)

Notable contaminants (PCBs, pesticides, herbicides, etc: ____

Container type(s): ____

(typically it is wide mouth 1 quart clear glass. RCRA coordinator will let sampler know if other containers required.)

Sample Matrix (Circle): Solid Liquid Solid/Liquid

If free liquid is present estimate how much: ______% Water ______% Solid ______% Oil

Sample Type (circle): GRAB COMPOSITE

Sampled from: ____

(specify: drum, waste pile, bulk container such as roll off, etc. Use multi increment sample if from bulk)

Chain of Custody filled out: Y / N Sample Preservative added (*typically no*): Y / N

Sampling Method ____

(scoop, thief, bailer, etc)

Sample Comments: ____

____

____

(note any unusual properties of material being sampled eg. strong aroma, self-heating, etc)
(note if sample is from is from special event eg. Cleanup of leak and what leaked)

If a sample is required for a large area, such as a pile of sandblast or excavation consult with the RCRA advisor.

Attachment II.3

Soil Sampling Procedures for Monitoring at the ExxonMobil Billings Refinery Land Treatment Units

Attachment II.3
Soil Sampling Procedures for Monitoring
at the ExxonMobil Billings Refinery Land Treatment Units

Introduction

These soil sampling procedures are for the collection of Zone of Incorporation (ZOI) and Below Treatment Zone (BTZ) samples at the South Land Treatment Unit (SLTU) and BTZ samples at the East Land Treatment Unit (ELTU) as specified in the pre-draft Hazardous Waste Permit (Permit) issued by the Montana Department of Environmental Quality (MDEQ) on May 20, 2016.

II.L. **Background**

The SLTU is located in Yellowstone County, Section 25, Township 1 North, Range 26 and is an on-site active hazardous land treatment unit at the ExxonMobil Billings Refinery(**Figures 1** and **2**). The SLTU consists of 14 sectors for waste application (Sectors 1 through 14), with a total size of approximately 15.1 acres (**Figure 3**). The limits of each sector are defined in the field by corner markers located around the perimeter of the SLTU. The SLTU soil monitoring requires annual ZOI soil sampling between March 1 and June 1 and monthly ZOI soil sampling during the waste application season, generally April through October of each calendar year. BTZ soil sampling is required annually at the SLTU between April 1 and June 1.

The ELTU consists of the Old East Land Treatment Unit (OELTU) and the New East Land Treatment Unit (NELTU), located in Yellowstone County, within portions of Section 24 and 25, Township 1 North, Range 26 East and portions of Section 19, Township 1 North, Range 27 East (**Figures 1** and **2**). The OELTU consists of eight sectors (Sectors 15 through 22), with a combined total size of approximately 15.8 acres (**Figure 4**). The NELTU consists of 17 sectors (Sectors 23 through 39), with a total combined size of approximately 19 acres (**Figure 4**). The limits of the OELTU and NELTU sectors are defined in the field by corner markers.

A vegetation survey was performed in 2010 to assess the establishment of a vegetative cover on the ELTU (Hydrometrics, Inc. 2011a). Based on the 2010 survey results, the MDEQ acknowledged in a letter dated June 15, 2011, that vegetative cover on the ELTU was sufficiently established to meet closure requirements (MDEQ 2011a). Following closure proceedings, an independent certification of closure was submitted to the MDEQ (Terra 2011). Based on the 2010 vegetation survey results and information provided in a closure certification report (Hydrometrics, Inc. 2011b) and an independent soil scientist's certification report submitted to the MDEQ, all closure requirements were met. ExxonMobil Billings Refinery received closure of the ELTU in 2011, as referenced in a letter submitted by the MDEQ dated September 14, 2011 (MDEQ 2011b) and post-closure care was initiated as required in the Permit.

Because of the post-closure status of the ELTU, ZOI sampling is no longer required, and BTZ sampling is performed during the summer months at the minimum frequency outlined by Condition IV.E.2 of the Permit. BTZ sampling was performed at 6 months, 1 year, 2 years, and 4 years after closure certification per conditions IV.E.2.a.i. through IV.E.2.a.iv. BTZ sampling will be performed at 8 years, 16 years, and 30 years after closure certification per conditions IV.E.2.a.v. through IV.E.2.a.vii. of the Permit.

SLTU - ZOI Sampling Procedures

An annual ZOI sampling event at the SLTU is performed between March 1 and June 1 per Condition II.F.3.a.ii of the Permit. Monthly ZOI sampling is conducted at the SLTU when waste is applied, generally between April and October per Condition IIF.3.a.i of the Permit.

ZOI sample collection and locations requirements are described in Condition II.F.3.b of the Permit. The procedures for the collection of ZOI samples from the SLTU are as follows:

1. Five ZOI soil sample locations shall be generated within each sector using random point generation software or similar method. Sample locations shall be located greater than 10 feet from the closest sector boundaries.

2. A hand auger or equivalent soil coring tool shall be used to collect a soil core sample from the ground surface to a depth of 9 inches below ground surface (bgs).

3. The five soil samples collected from each sector shall be composited by mixing the soil in a stainless steel bucket, or equivalent. An aliquot of the composited soil sample shall then be placed in a sample container as directed by the laboratory.

4. Annual ZOI samples shall be analyzed for metals, pH, nitrogen, phosphorous, and potassium as summarized in Condition II.G.4.b. and Attachment II.4 of the Permit.

5. Monthly ZOI samples shall be analyzed for oil and grease, percent solids, and moisture content as summarized in Condition II.G.4.a. and Attachment II.4 of the Permit.

All non-disposable equipment used to collect ZOI samples, including the hand auger, stainless steel bucket, and similar will be decontaminated prior to a sampling event. The procedures for decontamination of equipment in the field between ZOI sample collections are as follows:

1. Remove gross contamination from the equipment by brushing and then rinse with tap or distilled water.

2. Wash the sampling equipment with detergent (i.e., Alconox) and tap or distilled water.

3. Rinse the sampling equipment with tap or distilled water.

4. Rinse the sampling equipment with deionized or distilled water.

5. Repeat the entire procedure or any parts of the procedure as necessary.

6. After decontamination procedure is completed, avoid placing equipment directly on ground surface to avoid re-contamination.

SLTU and ELTU BTZ Soil Sampling Procedures

BTZ sampling is conducted at the SLTU and the ELTU per Conditions II.F.4 and IV.E.3 of the Permit. The BTZ sampling frequency for the SLTU is annually between April 1 and June 1 per Condition II.F.4.a.i of the Permit. The BTZ sampling frequency for the ELTU is outlined in Condition IV.E.2 of the Permit and the sampling is to occur during the summer months, between June 1 and September 30.

BTZ samples collected from each soil boring are used to monitor the soil quality immediately below the treatment zone (TZ) and further develop information on the lithology, thickness, and moisture content (saturated versus unsaturated conditions) of the unconsolidated deposits. The BTZ consists of a soil layer from the bottom of the TZ to a half foot below the TZ. **Figure 5** shows the approximate depth of the base of the TZ.

The procedures for the selection of BTZ sample locations are as follows:

1. SLTU and ELTU: BTZ soil sample coordinates shall be generated using a random point generation software or similar method. If a random location falls within the developed railway track area, a new location will be generated.

2. SLTU: Five random soil boring locations shall be generated for the SLTU. Two soil boring locations will be within the area of Sectors 1 through 8, two soil boring locations will be within the area of Sectors 9 through 14, and one soil boring location will be within the area of Sectors 1 through 14.

3. ELTU: Up to Seven~~Five~~ random soil boring locations shall be generated for the ELTU. ~~Two~~ Three soil boring locations will be within the ~~area of the OELTU, two soil boring locations will be within the~~ northern portion of the NELTU, and ~~one~~ two soil boring locations will be within the southern portion of the NELTU. Two soil boring locations will be within the OELTU.

4. SLTU: BTZ sample locations must be located at a distance of 10 feet or greater from any sector boundary. Sample locations that fall within 10 feet from the sector boundaries will be discarded and another set of sample location coordinates will be generated using the random point generator.

5. ELTU: BTZ sample locations must be located at a distance of 20 feet or greater from any sector boundary. Sample locations that fall within 20 feet from the sector

boundaries will be discarded and another set of sample location coordinates will be generated using the random point generator.

The procedures for the collection of BTZ samples are as follows:

1. At each sample location, a boring will be advanced from ground surface to approximately 4 feet bgs. Boreholes shall be drilled by using a hollow-stem-auger drilling rig or with a drilling rig capable of collecting continuous core samples (e.g., split-spoon and/or dry core barrel) from the ground surface to the bottom of each sample location. If the drill rig is unable to advance to the desired soil boring depth, the boring will be attempted again in close proximity to the original location. In the event that drilling the second boring is unsuccessful, an alternate location may be chosen.

2. During drilling of all borings, a continuous descriptive lithologic log shall be prepared based on an examination of soil core samples. The lithologic description includes major and minor soil components using the Unified Soil Classification System, relative percentage of each soil component, color, consistency, density, moisture content, texture, staining, and any other observations.

3. Using a split-spoon or similar method, samples will be collected continuously from approximately 4 feet bgs to 9 feet bgs. The purpose of the sampling to 9 feet bgs is to identify the TZ/BTZ contact during field activities.

4. The depth of the TZ/BTZ contact will be determined in the field and on the basis of lithology, color, hydrocarbon staining, the presence of coke dust, and photoionization measurements. ~~For BTZ samples collected at the OELTU, the attached TZ/BTZ contact map (Figure 5) shall be used as a baseline for aiding in the determination of the TZ/BTZ contact in the field.~~

5. Soil samples will be collected extending from the base of the field-defined TZ/BTZ contact downward 6 inches. A second sample will also be collected approximately 5 feet below the field-defined BTZ and placed on hold with the laboratory. Should anomalous concentrations be present in the field-defined BTZ sample, the additional sample taken approximately 5 feet below the BTZ sample will be analyzed to confirm protection of groundwater.

6. Photographs will be taken of the TZ/ BTZ contact prior to collecting soil samples for each sample location. Upon completion of the drilling, the boring will be abandoned by backfilling with bentonite material to ground surface.

7. BTZ soil samples for the SLTU and ELTU will be submitted for laboratory analysis in accordance with Conditions II.G and IV.E.4 of the Permit. The BTZ samples will be analyzed for Principal Hazardous Constituents (PHCs), pH, oil and grease, percent solids, moisture content, and specific gravity as specified in Condition II.G.5.a. and Attachments II.9 and II.12 of the Permit. If the BTZ samples are collected as a repeat sample because of an exceedance, as described

in Condition II.H.4.f of the Permit, then the samples will be analyzed for Modified Skinner List constituents listed in Attachment II.10.

The procedures for decontamination of the drill rig and equipment area are as follows:

1. The drill rig and sampling equipment will be decontaminated upon its arrival at the site and prior to initiation of drilling activities. Decontamination of the drill rig will take place at an area designated by ExxonMobil Billings Refinery. The decontamination will be performed either by steam-cleaning or high-pressure, hot-water washing equipment.

2. The drill rig will be examined for leaks of fuel, hydraulic fluid, transmission fluid, and oil, prior to mobilizing onto any of the land treatment areas.

3. Subsequent decontamination will focus on pieces of equipment that come in contact with soil or groundwater. Decontamination procedures will be performed using either steam-cleaning or high-pressure, hot-water/detergent washing equipment. The effectiveness of this decontamination procedure will be demonstrated by the use of field equipment rinsate blanks. Split-spoon soil samplers and associated drill rods used to obtain soil samples during the drilling of soil borings will be decontaminated in the same manner as other drilling equipment.

4. Upon completion of drilling activities and prior to the drilling rig leaving the land treatment unit, the rig will be decontaminated to prevent residual contamination from leaving the land treatment units.

Quality Assurance and Quality Control

This section describes quality assurance and quality control (QA/QC) procedures for ZOI and BTZ sample collection activities. Laboratory QA/QC procedures are summarized in Condition II.I.1. of the Permit.

1. A field blank and equipment rinse blank sample will be collected to evaluate the validity and representativeness of the laboratory analytical results. The field blank is collected by pouring distilled water into the laboratory-supplied sample containers. The rinse equipment blank is collected by pouring distilled water over the hand auger, split-spoon sampler, or similar sampling device after decontamination and collecting the residual water into laboratory-supplied sample containers.

2. Trip blanks will be provided by the laboratory and will be included in each cooler.

3. Sample containers will be labeled at the time of sampling with a sample label containing the date, time, identification number, preservatives, and initials of the personnel collecting the sample.

4. Appropriate sample containers, labels, and packing material will be provided by a Montana state-certified laboratory. Samples will be put on ice and secured. Soil samples will be submitted under standard chain-of-custody procedures to a Montana state-certified laboratory.

Figures

Figure 1 – Site Vicinity Map
Figure 2 – Land Treatment Units Area Location Map
Figure 3 – SLTU Sector Locations Map
Figure 4 – ELTU Sector Map
~~Figure 5 – Depth to Observed TZ/BTZ Zone Contact (Below Ground Surface) at OELTU~~

References

Hydrometrics, Inc. 2011a. 2010 Vegetation Survey Results, ExxonMobil Billings Refinery, East Land Treatment Units.

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Montana Department of Environmental Quality (MDEQ). June 15, 2011a. Vegetative Cover on the ExxonMobil Billings Refinery East Land Treatment Units.

Montana Department of Environmental Quality (MDEQ). September 14, 2011b. Beginning of Post-Closure Care Period for the ExxonMobil Billings East Land Treatment Units, ExxonMobil Billings Refinery.

Terra Soil and Environmental Solutions, LLC. (Terra). 2011. Closure Evaluation and Certification for the ExxonMobil Billings Refinery, Old East Land Treatment Unit (OELTU) and New East Land Treatment Unit (NELTU), Billings, Montana, ExxonMobil Billings Refinery.

Attachment II.4

ZOI Analytical Requirements, Loading Limits, and Analytical Methods

Attachment II.4
Zone of Incorporation (ZOI)
Analytical Requirements, Loading Limits, and Analytical Methods

Analyte	Loading Limit	EPA Analytical Method
pH	6.5 to 9.0[3]	
Oil and Grease	5 % (dry weight) and 70 metric tons/hectare/year	413.2 (modified) or method approved by DEQ
Percent Solids	N/A	
Moisture Content	N/A	
Metals		
Antimony	31 ppm[4]	6010
Arsenic	15 ppm[4]	6010
Barium	500 ppm[1]	6010
Beryllium	2 ppm[4]	6010
Cadmium	3 ppm[2]	6010
Chromium	140 ppm[4]	6010
Cobalt	200 ppm[2]	6010
Copper	250 ppm[2]	6010
Lead	400 ppm[4]	6010
Mercury	7 ppm[4]	7340/7341/7343
Nickel	100 ppm[2]	6010
Selenium	5 ppm[2]	6010
Vanadium	500 ppm[2]	6010
Zinc	500 ppm[2]	6010
Nutrients		
Nitrogen	>340 Kg/hectare[3]	
Phosphorous	>45 Kg/hectare[3]	
Potassium	>225 Kg/hectare[3]	

1 Value established from SW-874, Hazardous Waste Land Treatment, EPA 1983, Table 6.52. The levels have been converted from Kg/ha – 30cm units to ppm, assuming a soil density of 1.35 g/cm^3.
2 Values established from SW-874, Hazardous Waste Land Treatment, EPA 1983, Table 6.47. The values are compiled from a literature review in SW-874 and are "based microbial and plant toxicity limits, animal health considerations, and soil chemistry which reflects the ability of the soil to immobilize the metal elements" (page 272).
3 Adjusted annually to these levels according to the conditions under II.D.8.
4 Risk based loading limit contained in the No-Migration Variance from Land Disposal Restrictions for ExxonMobil Corporation, Billings, MT South Land Treatment Unit. Federal Register: July 20, 2000 (Volume 65, Number 140), Pages 45052-45055.

Attachment II.5

pH Control at the South Land Treatment Unit

Attachment II.5
pH Control

Measures to Control Soil pH

The soil average pH in the land treatment unit shall be maintained between 6.5 and 9.0, which has been shown to be the optimal range for microbial activity while minimizing the leaching of metals. Powdered lime or lime sludge from the boiler feedwater treatment unit, or another equivalent source approved by DEQ, shall be used for pH control.

Soil pH shall be monitored in the following manner. At least three composite soil samples shall be collected each spring from each uniform active area. Composite samples shall be collected by using a soil sampling tube (approximately 2 cm diameter). For each composite sample, a total of approximately ten individual core samples shall be taken at random locations over the entire sampling area. The top 23 cm of soil in each core shall be selected. The ten individual core samples shall be placed in a bucket and thoroughly mixed to form one composite sample. A portion of the sample shall then be mixed with an equal mass of distilled water, and the pH shall be measured using a pH meter.

To determine the amount of lime needed to increase the soil pH, 25, 50, 100, 200, and 300 mg of lime shall be added to 10 gram samples of soil. The samples shall then be placed in beakers, mixed, covered, and allowed to equilibrate for one week at room temperature. The pH of each sample shall then be determined. The proportion of lime required to elevate the soil pH to 7.0 shall then be added to the respective land treatment areas. Lime application shall be accomplished by using the most cost effective means to ensure uniform coverage.

Attachment II.6

SLTU Soil Moisture Control
During Waste Application
Standard Operating Procedure

ExxonMobil

Billings Refinery

South Land Treatment Unit Soil Moisture Control During Waste Application Standard Operating Procedure

Attachment II.6

ExxonMobil Billings Refinery	South Land Treatment Unit Soil Moisture Control During Waste Application Standard Operating Procedure
Montana Hazardous Waste Permit Number MTHWP-16-02	Attachment II.6

SCOPE

Provide a detailed explanation of the steps required to comply with Condition II.D.10.b. of Montana Hazardous Waste Permit Number MTHWP-16-02

Requirement

Adjust soil moisture levels in the treatment zone to maximize degradation and control the blowing of waste and surficial soils onto areas outside of the unit boundary.

South Land Treatment Unit Waste Application Soil Moisture Control Procedure

Terragator waste application rates will be maximized during the historically dryest months of the application season (July through October). Application rates are a function of sludge pumpability, Terragator speed and Terragator holding tank air pressure. Terragator application rates will be maximized using the following steps:

1.) Maximum application rates for a given waste material are limited by the combination of Terragator speed and Terragator holding tank air pressures that exceed the ability of the Terragator furrow closers to cover the waste being applied in order to control odors. The lower the Terragator speed and higher the Terragator holding tank air pressure, the higher the application rate.

Goal: Maximize application rates by minimizing Terragator speed and maximizing the Terragator holding tank air pressure while still allowing the Terragator furrow closers to cover the waste material in order to control odors.

2.) Maximum application rates will be determined by:

a) First determine the combination of Terragator speed and holding tank air pressure (for a given waste material) at which the Terragator furrow closers do not cover the waste being applied. See Step (1) above for specific details

b) Second, decrease Terragator speed and/or holding tank air pressure to a point where the furrow closers just start covering the waste being applied. This is the maximum application rate that allows the Terragator furrow closers to cover the waste while controlling odors.

c) Maintain the Terragator speed and holding tank air pressure determined from (b) above for the remainder of the day or until there is a change in the type of waste being applied or until the furrow closers are no longer closing and covering the waste material.

Attachment II.7

SLTU Lysimeter Locations

SOUTH LAND TREATMENT UNIT
LYSIMETER LOCATIONS

AECOM

Attachment II.8

SLTU Unit Sectors

SOUTH LAND TREATMENT UNIT
UNIT SECTORS

AECOM

Attachment II.9

Principal Hazardous Constituent (PHC) List

Attachment II.9
Principal Hazardous Constituents
For the ExxonMobil Billings Refinery

Volatiles
Benzene
Ethylbenzene
Toluene
Xylenes (m,o,p)
Semi-Volatile Organic Compounds
Anthracene
Benzo(a)anthracene
Benzo(b)fluoranthene
Benzo(a)pyrene
Chrysene
Fluoranthene
1-Methylnaphthalene
Naphthalene
Phenanthrene
Pyrene
Cresols
2-4-Dimethyl phenol
Phenol
Metals
Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Lead
Mercury
Nickel
Selenium
Vanadium
Zinc

Attachment II.10

Modified Skinners List
for Hazardous Constituents Found in Refinery Wastes

Attachment II.10

Modified Skinner List for Hazardous Constituents in Petroleum Refining Wastes

Metals	
Antimony	Lead
Arsenic	Mercury
Barium	Nickel
Beryllium	Selenium
Cadmium	Silver
Chromium	Vanadium
Cobalt	Zinc
Copper	
Volatiles	
Benzene	Ethyl benzene
Carbon disulfide	Ethylene dibromide
Chlorobenzene	Methyl ethyl ketone
Chloroform	Styrene
1,2-Dichloroethane	Toluene
1,4-Dioxane	Xylene
Semi-Volatile Organic Compounds	
Anthracene	Di(n)octyl phthalate
Benzo(a)anthracene	Fluoranthene
Benzo(b)fluoranthene	Indene
Benzo(k)fluoranthene	Methyl chrysene
Benzo(j)fluoranthene	1-Methyl naphthalene
Benzo(a)pyrene	Naphthalene
Bis(2-ethylhexyl) phthalate	Phenanthrene
Butyl benzyl phthalate	Pyrene
Chrysene	Pyridine
Dibenz(a,h)acridine	Quinoline
Dibenz(a,h)anthracene	Benzenethiol
Dichlorobenzenes (o-, m-, and p-dichlorobenzene)	Cresols (o-, m-, and p-cresol)
Dimethyl phthalate	2,4-Dimethylphenol
7,12-Dimethylbenz(a)anthracene	2,4-Dinitorphenol
Dimethyl phthalate	4-Nitrophenol
Di(n)butyl phthalate	Phenol

Attachment II.11

Lysimeter Analytes, Permit Concentration Limits, and EPA Analytical Methods

Attachment II.11
Lysimeter Analytes, Permit Concentration Limits, and EPA Analytical Methods

Analyte	Water Required EQL/MDL µg/L	Water Permit Concentration Limit µg/L	EPA Analytical Method
pH	N/A	N/A	N/A
Specific Conductance	N/A	N/A	N/A
Volatiles			
Benzene	5	5	8240 or 8260
Ethylbenzene	5	5	8240 or 8260
Toluene	5	5	8240 or 8260
Xylenes (m,o,p)	10	10	8240 or 8260
Semi-Volatile Organic Compounds			
Anthracene	10	10	8270
Benzo(a)anthracene	0.1[1]	10	8270
Benzo(b)fluoranthene	0.1[1]	10	8270
Benzo(a)pyrene	0.2[1]	10	8270
Chrysene	1.2[1]	10	8270
Fluoranthene	10	10	8270
1-Methylnaphthalene	10	10	8270
Naphthalene	10	10	8270
Phenanthrene	10	10	8270
Pyrene	10	10	8270
Cresols	10	10	8270
2-4-Dimethyl phenol	10	10	8270
Phenol	10	10	8270
Metals			
Chromium	10	10	6010
Lead	0.3	15	6010

[1] Value is an EQL derived from a risk based standard. These EQLs are below the low-level quantification limit for the routine analytical method listed. Typical quantification limits would be: SW-846 Method 8260 – 5 µg/L aqueous and 5 µg/kg clean soils and Method 8270 - 10µg/L aqueous and 300 µg/kg clean soil. Therefore, these EQLs cannot be met using current EPA analytical methods. As EPA accepted methods improve, and lower EQLs can be achieved, the lower EQLs will be given in analytical reports.

Attachment II.12

BTZ Analytes, Permit Concentration Limits, and EPA Analytical Methods

Attachment II.12
Below Treatment Zone (BTZ)
Analytes, Permit Concentration Limits, and EPA analytical Methods

Analyte	Soil Required EQL/MDL (µg/kg unless otherwise noted)	Soil Permit Concentration Limit (µg/kg unless otherwise noted)	EPA Analytical Method
pH			
Oil and Grease			413.2 (modified) or method approved by DEQ
Percent Solids			
Moisture Content			
Specific Gravity			
Volatiles			
Benzene	2	5	8240 or 8260
Ethylbenzene	5	5	8240 or 8260
Toluene	5	5	8240 or 8260
Xylenes (m,o,p)	10	10	8240 or 8260
Semi-Volatile Organic Compounds			
Anthracene	330	330	8270
Benzo(a)anthracene	80[1]	330	8270
Benzo(b)fluoranthene	250[1]	330	8270
Benzo(a)pyrene	330	330	8270
Chrysene	330	330	8270
Fluoranthene	330	330	8270
1-Methylnaphthalene	330	330	8270
Naphthalene	330	330	8270
Phenanthrene	330	330	8270
Pyrene	330	330	8270
Cresols	330	330	8270
2-4-Dimethyl phenol	330	330	8270
Phenol	330	330	8270
Metals			
Chromium	5 mg/kg	41.7	6010 or 6020[2]
Lead	5 mg/kg	29.8	6010 or 6020[2]

1 Value is an EQL derived from a risk based standard. These EQLs are below the low-level quantification limit for the routine analytical method listed. Typical quantification limits would be: SW-846 Method 8260 – 5 µg/L aqueous and 5 µg/kg clean soils and Method 8270 - 10µg/L aqueous and 300 µg/kg clean soil. Therefore, these EQLs cannot be met using current EPA analytical methods. As EPA accepted methods improve, and lower EQLs can be achieved, the lower EQLs will be given in analytical reports.

2 Equivalent methods under SW-846 may be used in cases where the lower reporting limit cannot be achieved by third-party analytical services due to poor sample quality.

Module III

South Land Treatment Unit
and
Vehicle Decontamination Facility
Closure

Module III
South Land Treatment Unit and Vehicle Decontamination Facility Closure

Table of Contents

Module III
South Land Treatment Unit and Vehicle Decontamination Facility Closure

III.A. **Applicability**

III.A.1. The requirements of this Module apply to closure for the following regulated units:

III.A.1.a. South Land Treatment Unit (SLTU) as defined in Condition I.C.2.a.

III.A.1.b. Vehicle Decontamination Facility (VDF) as defined in Condition I.C.2.a.

III.B. **Closure Plan**

III.B.1. Module III is considered the Closure Plan for the SLTU and VDF.

III.C. **Timing and Notification of Closure of the SLTU**

III.C.1. SLTU closure shall commence:

III.C.1.a. Upon request by the Permittee;

III.C.1.b. Upon direction of DEQ for violation of the permit, ARM Rules, or State statutes;

III.C.1.c. Upon suspension, cancellation, or revocation of the terms and conditions of this permit concerning the authorization to store or treat waste materials;

III.C.1.d. Upon abandonment of the site;

III.C.1.e. Upon direction of DEQ for failure to secure and maintain adequate financial assurance as required in Condition I.G. (Financial Assurance); or

III.C.1.f. When necessary to comply with Module II (SLTU & VDF Operations), Module III (SLTU and VDF Closure), and Module VI (Groundwater Monitoring).

III.C.2. *Notification of Partial Closure and Final Closure*

III.C.2.a. The Permittee shall notify DEQ in writing at least sixty (60) days prior to the date on which the Permitee expects to begin partial or final closure of the SLTU.

III.C.2.b. The date when the Permittee “expects to begin closure” shall be either:

III.C.2.b.i. No later than thirty (30) days after the date on which the SLTU receives the known final volume of non-hazardous wastes; or

III.C.2.b.ii. If there is a reasonable possibility that the SLTU will receive additional non-hazardous waste, no later than one (1) year after the date on which the unit received the most recent volume of non-hazardous waste.

III.C.2.b.ii.1. If the Permittee can demonstrate to DEQ that the SLTU has the capacity to receive additional non-hazardous wastes and the Permittee has taken, and will continue to take, all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements, DEQ may approve an extension to this one-year limit.

III.C.2.c. If this facility's permit is terminated, or if the Permittee is otherwise ordered, by judicial decree or final order under 75-10-413, MCA, to cease receiving non-hazardous wastes or to close, then the requirements under Condition III.C.2. (Notification of Partial Closure and Final Closure) do not apply. However, the Permittee shall close the facility in accordance with the deadlines established in Condition III.I.3.e. (Extension of the Phase I Closure Period).

III.D. **General Requirements during Closure of the SLTU**

III.D.1. *Reporting and Recordkeeping Requirements*

III.D.2. The Permittee shall follow the reporting and recordkeeping requirements of Condition I.R. (Recordkeeping and Reporting) and this condition during closure of the SLTU.

III.D.2.a. <u>Annual SLTU Soil and Groundwater Report:</u> The Permittee shall submit an annual soil and groundwater report by April 30 of each year. The annual report must include the reporting requirements of Condition I.R.4.e. (Annual Land Treatment Units Monitoring Report).

III.D.3. *Cost Estimates and Financial Assurance*

III.D.3.a. The Permittee shall follow the requirements of Condition I.G.2. (Cost Estimates for Closure and Post-Closure Care) for closure cost estimates and financial assurance.

III.D.4. *Food Crop Prohibition*

III.D.4.a. No food crops or commercial forage may be grown on the SLTU during the closure or post-closure periods.

III.D.5. *Security, Inspection, and Emergency Planning*

III.D.5.a. <u>Security</u>

III.D.5.a.i. The Permittee shall comply with security requirements set forth in 40 CFR 264.14(b)(2) and (c), and the ExxonMobil Billings Refinery Emergency Response Plan.

III.D.5.a.ii. A perimeter fence must surround the SLTU and control entry at all times to the SLTU.

III.D.5.a.iii. Signs with the following warnings and instructions must be maintained on the perimeter fence adjacent to the SLTU: “Danger – Unauthorized Personnel Keep Out”.

III.D.5.a.iii.1. The signs must be posted at each entrance to the SLTU, and at other locations, in sufficient numbers to be seen from any approach to the SLTU.

III.D.5.a.iii.2. The signs must be legible from a distance of at least 25 feet.

III.D.5.b. Inspection Requirements

III.D.5.b.i. The Permittee shall record inspections on an inspection log form. Log notations must include, at a minimum, the date and time of inspection, name of inspector, observations, and date and nature of any repairs or other remedial actions.

III.D.5.b.ii. Inspection records must be kept as required by 40 CFR 264.15(d).

III.D.5.b.iii. The Permittee shall inspect the SLTU on the following schedule during closure:

III.D.5.b.iii.1. Monthly; and

III.D.5.b.iii.2. After each rainfall event in which greater than one-half inch of precipitation has fallen in less than 12 hours.

III.D.5.b.iv. The Permittee shall remedy any deterioration or malfunction of equipment or structures within a specified time frame approved by DEQ to ensure the problem does no lead to an environmental or human health hazard.

III.D.5.b.v. Where a hazard is imminent or has already occurred, remedial action must be taken immediately.

III.E. Maintenance Procedures During Closure

III.E.1. The Permittee must continue all operations specified in this Permit necessary to maximize degradation, transformation, or immobilization of hazardous constituents within the treatment zone, to the extent they are consistent with other closure activities.

III.E.2. *Tilling*

III.E.2.a. The SLTU must continue to be tilled on a monthly basis from April through October.

III.E.3. *Nutrient Additions*

III.E.3.a. Nutrient applications, as described in Condition II.D.8. (Nutrient Addition), must be applied, as appropriate, to maintain soil pH between 7 and 8.

III.E.4. *Measures to Control Soil Moisture and Wind Dispersal*

III.E.4.a. Moisture content in the treatment zone must be controlled to minimize blowing of wastes and surficial soils.

III.E.4.b. The Permittee may use soil stabilization methods both inside and outside the treatment areas to control airborne dispersal of wastes and surface soils.

III.E.4.c. The Permittee shall note in the operating record incidents of blowing soils or wastes, and document efforts made to control wind dispersal.

III.E.5. *Run-On and Run-Off Control Systems*

III.E.5.a. The SLTU run-on/run-off system is comprised of a series of berms. The Permittee shall operate and maintain a system around the SLTU that will:

III.E.5.a.i. Prevent flow onto the treatment zone during peak discharge from a 24-hour, 25-year storm; and

III.E.5.a.ii. Collect and control the run-off or volume of water resulting from a 24-hour, 25-year storm.

III.E.5.b. The Permittee shall perform repairs or maintenance as necessary to ensure berm heights and performance are maintained.

III.E.5.b.i. Repairs must be made within one week of the time damage is noted on the SLTU inspection log, unless conditions do not allow access to the damaged area. If conditions are such that repairs cannot be made in that timeframe, the reason must be noted on the inspection log.

III.F. **Groundwater Monitoring During Closure**

III.F.1. The Permittee shall follow the groundwater monitoring requirements of Module VI (Groundwater Monitoring) for the duration of the closure period.

III.G. **ZOI Sampling and Evaluation During Closure**

III.G.1. ZOI sampling and evaluation shall continue on an annual basis until the closure standards required in this Permit module are met.

III.G.2. The following composite ZOI samples must be collected and analyzed for the constituents shown in Attachment II.10 (Modified Skinners List of Hazardous Constituents Found in Refinery Wastes):

Closure Sampling – ZOI Samples	
Composite Numbers	Sectors for Randomly Selected Subsamples
1	1, 3, 5
2	7, 9, 11, 13
3	2, 4, 6, 8
4	10, 12, 14

III.H. **BTZ and Soil Pore Liquid Sampling and Evaluation During Closure**

III.H.1. The Permittee shall continue BTZ and soil pore liquid monitoring and evaluation in compliance with applicable conditions under Conditions II.F. (SLTU Sampling Requirements) and II.G. (SLTU Analytical Requirements), and II.H. (Monitoring Evaluations) with the following exceptions:

III.H.2. Soil-pore liquid monitoring may be terminated not less than ninety (90) days following the last application of waste.

III.I. **Closure Performance Standard**

III.I.1. The Permittee shall close the SLTU in a manner that:

III.I.1.a. Minimizes the need for further maintenance;

III.I.1.b. Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and

III.I.1.c. Complies with the closure requirements of this Permit.

III.I.2. *Closure Process*

III.I.2.a. Closure of the SLTU is to be conducted in two phases:

III.I.2.b. Phase I closure, as set forth in Condition III.I.3. is attainment of closure standards in ZOI, TZ, and BTZ soils; and

III.I.2.c. Phase II closure, as set forth in Condition III.I.4. is establishment of a protective cover.

III.I.3. *Phase I Closure*

III.I.3.a. <u>Phase I Closure Requirements</u>

The SLTU must meet either Option 1 Closure Standards provided in Condition III.I.3.a.i. or Option 2 Closure Standards provided in Condition III.I.3.a.ii.

III.I.3.a.i. Option 1

III.I.3.a.i.1. The closure standard for Option 1 is considered met if one of the following three standards are met:

- Concentrations of organic and inorganic constituents are non-detectable in ZOI sampling from each application area; and oil and grease sampling of the TZ and BTZ does not indicate vertical migration of oil and grease; or

- There is no change in constituent concentrations, (including oil and grease in the ZOI, TZ, and BTZ) greater than ± 20% over a period of two years; or

- The Permittee has continued land treatment operations and soil and groundwater monitoring requirements for five years. DEQ reserves the right to require continued land treatment past five years, if sampling results indicate the need.

III.I.3.a.i.2. After the closure standards of Option 1 have been demonstrated, the Permittee shall meet Phase II closure requirements set forth in Condition III.I.4. (Phase II Closure Requirements).

III.I.3.a.ii. Option 2

III.I.3.a.ii.1. Closure of the SLTU under Option 2 must be consistent with any facility-wide corrective measures implemented through Module VII (Facility-Wide Corrective Action).

III.I.3.a.ii.2. The closure standard for Option 2 is considered met if hazardous constituent concentration levels present in the SLTU soils result in:

- A cumulative lifetime carcinogenic risk not to exceed a range of between 10^{-6} to 10^{-5} for an industrial exposure scenario;

- A hazard index for non-carcinogenic effects not exceeding one (1); and

- No migration of hazardous constituents from the soil to air, surface water, or groundwater in excess of protective risk-based concentrations as allowed in Condition III.I.3.a.ii.3 below.

III.I.3.a.ii.3. Allowable numeric action levels that may be used to meet Option 2 closure standards include published risk-based numeric values such as:

- Numeric screening levels published by EPA for direct contact and potential leaching to groundwater;

- Montana-specific risk standards and action levels, as approved by DEQ;

- Site-specific background concentrations;

- Site-specific values for protection of groundwater from Synthetic Precipitation Leaching Procedure testing; and

- Other numeric action levels as proposed by the Permittee and approved by DEQ.

III.I.3.a.ii.4. Allowable measures that may be used to attain Option 2 closure standards are continued land treatment practices, phytoremediation, and removal of contaminated soil. The Permittee may use other measures upon approval by DEQ.

III.I.3.a.ii.5. After the closure standards of Option 2 have been demonstrated, the Permittee shall follow requirements for Phase II closure as set forth in Condition III.I.4. (Phase II Closure Requirements).

III.I.3.b. Phase I Closure Work Plan

III.I.3.b.i. Option 1

III.I.3.b.i.1. No work plan for Option 1 Closure is required. The Permittee shall follow requirements set forth in Condition III.I.3.a.i. (Option 1) for Option 1 Closure.

III.I.3.b.ii. Option 2

III.I.3.b.ii.1. An Option 2 Work Plan must be submitted to DEQ for approval ninety (90) days prior to implementation. The closure plan must include, but not be limited to:

- Method or methods for evaluating whether concentrations of constituents of concern in soil and groundwater to meet Option 2 closure standard set forth in Condition III.I.3.a.ii. (Option 2);
- Action levels to be used for soil and protection of groundwater that meet the requirements of Condition III.I.3.a.ii.;
- Soil and groundwater sampling locations, analytes, and analytical methods, detection limits; and
- Measures, such as soil removal or further land treatment, which will be taken to meet closure standards.

III.I.3.c. Phase I Closure Report

III.I.3.c.i. A Phase I Closure Report must be submitted to DEQ sixty (60) days following completion of Phase I closure. The Phase I Closure Report must include, but not be limited to:

- A description of the closure standards used;
- Soil and groundwater sample locations, and sample analytical results; and
- A demonstration showing how closure standards were met.

III.I.3.c.ii. Upon DEQ approval of the Phase I Closure Report, the Permittee must begin Phase II closure requirements, as provided in Condition III.I.4.

III.I.3.d. Time Allowed for Phase I Closure

III.I.3.d.i. Unless DEQ has approved an extension of the closure period under Condition III.I.3.e. (Extension of the Phase I Closure Period), the Permittee shall complete phase I closure of the SLTU five (5) years after the last placement of non-hazardous waste on the SLTU.

III.I.3.e. Extension of the Phase I Closure Period

III.I.3.e.i. DEQ may approve an extension to the time allowed for Phase I closure if the Permittee complies with all applicable requirements for requesting a modification to the Permit and demonstrates that:

III.I.3.e.i.1. The activities required to comply with closure will, of necessity, take longer; or

III.I.3.e.i.2. The SLTU has the capacity to receive remediation wastes; or

III.I.3.e.i.3. Additional time is needed to establish a vegetative cap; and

III.I.3.e.i.4. The Permittee must have taken, and must continue to take, all steps to prevent threats to human health and the environment from the unclosed, inactive SLTU or unclosed, inactive portions of the SLTU, including compliance with all applicable Permit requirements.

III.I.3.e.ii. The demonstration for extension of the closure period must be made at least thirty (30) days prior to expiration of the closure timeframes set forth in Condition III.I.3.d. (Time Allowed for Phase I Closure).

III.I.4. *Phase II Closure Requirements*

III.I.4.a. Once DEQ has approved Phase I closure, the Permittee shall establish a protective cover on the SLTU.

III.I.4.b. General Cover Requirements

The protective cover must:

III.I.4.b.i. Be designed by a Montana-licensed professional engineer or, in the case of a vegetative cover, a qualified professional soil scientist or vegetation specialist. The design must be based on current and expected future industrial use by the facility;

III.I.4.b.ii. Provide long-term minimization of migration of hazardous constituents through soils of the closed SLTU.

III.I.4.b.iii. Function with minimal maintenance;

III.I.4.b.iv. Promote drainage and minimize erosion or abrasion of the final cover;

III.I.4.b.v. Accommodate settling and subsidence so that the cover's integrity is maintained; and

III.I.4.b.vi. Have a permeability less than or equal to the permeability of natural subsoil.

III.I.4.c. <u>Vegetative Cover Requirements</u>

III.I.4.c.i. No redevelopment may occur in portions of the SLTU on which a vegetative cover has been established during the closure period.

III.I.4.c.ii. The vegetative cover must be capable of maintaining substantial growth without extensive supplemental irrigation. Composted amendments may be used to aid in vegetative growth.

III.I.4.c.iii. The Permittee shall determine which plant species must be used to establish a final vegetative cover that satisfies the conditions of this Permit. Choice of plant species for the cover is contingent upon approval by DEQ. Plant species used in the final vegetative over may not include species which bioaccumulate organics or inorganics in amounts toxic to wildlife or other animals.

III.I.4.d. <u>Engineered Cover Requirements</u>

III.I.4.d.i. Allowable engineered hard covers are asphalt, concrete, or other impermeable materials;

III.I.4.d.i.1. Tank structures may be allowed; however, the design of the tank secondary containment must prevent or limit migration of hazardous constituents in the subsurface.

III.I.4.d.ii. Other materials, such as road base, may only be used after approval by DEQ.

III.I.4.e. <u>Phase II Closure Work Plan</u>

III.I.4.e.i. A Phase II Closure Work Plan must be submitted to DEQ for approval within sixty (60) calendar days following DEQ approval of completion of Phase I closure.

III.I.4.e.ii. The Phase II Closure Work Plan must include, but not be limited to:

III.I.4.e.ii.1. A compilation of metals analytical results for ZOI soils, including soil monitoring data from the previous five years of monitoring and background soil data.

III.I.4.e.ii.2. A description of the cover type and how the cover will meet Phase II closure requirements set forth in Condition III.I.4. (Phase II Closure Requirements).

III.I.4.e.ii.3. Engineering and design specifications for an engineered cover.

III.I.4.e.ii.4. Engineering and design specifications for a vegetative cover, including:

- A description of plant species, seeding rate and application method, fertilizer type and requirements; and

- Protocol for quantifying vegetation, overall groundcover, and ecological conditions to determine final establishment of a vegetative cap. The Permittee shall use DEQ guidance or other guidance as approved by DEQ.

III.I.4.e.ii.5. Implementation schedule, including timeframe for establishing a vegetative cover.

III.I.5. *Final Closure Report*

III.I.5.a. The Permittee shall submit a final closure report for DEQ approval sixty (60) calendar days after Phase II closure has been completed. The report must include, at a minimum, sample locations, sample analysis results, and a description of closure activities. The report must adequately demonstrate that closure of the SLTU has met the applicable Phase I and II closure standards of Condition III.I.3. (Phase I Closure) and III.I.4. (Phase II Closure Requirements).

III.I.6. *Certification of Closure*

III.I.6.a. Within sixty (60) calendar days after DEQ approval of the final closure report required in Condition III.I.5. (Final Closure Report), the Permittee shall submit to DEQ, by registered mail, a certification that the SLTU has been closed in accordance with the conditions of this Permit. The certification must be signed by the Permittee and by a registered professional engineer, a qualified professional soil scientist, or both in the case a vegetative cover has been established on portions of the SLTU. Documentation supporting the registered professional engineer's and/or soil scientist's certification must be furnished to DEQ upon request until the Permittee is released from the financial assurance requirements for closure under Condition III.K.3. (Release from Financial Assurance for Final Closure). Documentation supporting the qualifications of the qualified professional soil scientist must be included in the closure certification submitted to DEQ.

III.I.7. *Post-Closure Requirements*

III.I.7.a. If, after closure, hazardous constituents remain in the soil of the SLTU at a level which poses a risk to human health or the environment, the Permittee shall perform post-closure care in accordance with Module IV.

III.I.7.b. The post-closure period will begin with the receipt and approval by DEQ of the closure certification for the SLTU.

III.I.8. *Amendment of Closure Conditions*

III.I.8.a. The Permittee shall submit a written request for permit modification in accordance with 40 CFR 264.112(c) for any changes in closure plans, SLTU design, or Module III and associated attachments. The modification request must be in accordance with 40 CFR 270.42 and Condition I.M.3. (Permit Modification at the Request of the Permittee).

III.I.8.b. The Permittee may submit a written request to DEQ for a permit modification to amend permit closure conditions at any time prior to the notification of partial or final closure of the facility.

III.I.8.c. The Permittee shall submit a written request for a permit modification to authorize a change in permit closure conditions whenever:

III.I.8.c.i. Changes in operating plans or facility design affect permit closure conditions;

III.I.8.c.ii. There is a change in the expected year of closure; or

III.I.8.c.iii. In conducting partial or final closure activities, unexpected events require a modification of permit closure conditions.

III.I.8.d. The Permittee shall submit a written request for a permit modification for approval at least sixty (60) calendar days prior to the proposed change in closure conditions, or no later than sixty (60) calendar days after an unexpected event has occurred which has affected closure conditions in this module.

III.I.8.d.i. The written request must include a copy of proposed changes to Module III and associated attachments, and revised cost estimates as required under Condition I.G.2. (Cost Estimates for Closure and Post-Closure Care).

III.I.8.d.ii. If in an unexpected event occurs during the partial or final closure period, the Permittee shall request a permit modification no later than thirty (30) calendar days after the unexpected event.

III.I.8.d.iii. DEQ will approve, disapprove, or modify the proposed changes in accordance with the procedures in Condition I.M.2. (Modification or Revocation and Reissuance).

III.I.8.e. DEQ may require modification to this Permit under the conditions described under Condition III.I.8.c.

III.I.8.e.i. The Permittee shall submit the modification within sixty (60) calendar days after DEQ's request or within thirty (30) calendar days if the change in facility conditions occurs during partial or final closure.

III.I.8.e.ii. Any modifications requested by DEQ shall be conducted in accordance with the procedures in 40 CFR 270 Subpart D.

III.I.9. *Removal of Wastes and Decontamination or Dismantling of Equipment*

III.I.9.a. Nothing in this Module shall preclude the Permittee from removing hazardous wastes and decontaminating or dismantling equipment in accordance with the approved partial or final closure plan at any time before or after notification or partial or final closure.

III.I.10. *Disposal or Decontamination of Equipment, Structures and Soils*

III.I.10.a. During the closure period, all contaminated equipment, structures, and soils must be properly disposed or decontaminated.

III.I.10.b. By removing any hazardous wastes or hazardous constituents during closure, the Permittee may become a generator of hazardous waste and shall handle that waste in accordance with all applicable generator requirements of Title 17, Chapter 53, Subchapter 6, ARM.

III.J. **Closure of the Vehicle Decontamination Facility**

The requirements of this section apply to the closure of the vehicle decontamination facility (VDF) located within and at the south end of the land treatment unit.

III.J.1. *Notification of Closure*

III.J.1.a. The Permittee shall notify DEQ at least forty-five (45) days prior to the date closure is expected to begin, in accordance with 40 CFR 264.112(d).

III.J.2. *Time Allowed for Closure*

III.J.2.a. In accordance with 40 CFR 264.113, within ninety (90) days after receiving the final known volume of non-hazardous waste on the SLTU, the Permittee shall remove all waste from the VDF; and

III.J.2.b. Within one hundred eighty (180) days after receiving the final known volume of non-hazardous waste on the SLTU, the Permittee must complete the final closure activities as outlined in Conditions III.J.3. through III.J.4., below.

III.J.3. *Performance Standard*

III.J.3.a. After final decontamination of the till and tractor at the VDF, the Permittee must conduct a hazardous waste determination of the VDF wash water in accordance with 40 CFR 262.11 to determine its proper final disposal.

III.J.3.b. Once the final wash water from decontamination of the till and tractor has been removed, any remaining sludge in the sump must be removed and a hazardous waste determination must be conducted on the sludge in accordance with 40 CFR 262.11 to determine proper final disposal.

III.J.3.c. After removal of any remaining sludge in the sump, the VDF pad and sump must be washed down once more. The Permittee must conduct a hazardous waste determination of the VDF wash water in accordance with 40 CFR 262.11 to determine its proper final disposal method.

III.J.3.d. The VDF pad and sump must continue to be rinsed until, upon visual inspection, the pad and sump appear to be decontaminated.

III.J.3.e. After the VDF pad and sump have been visually determined to be free of contaminants, the pad and sump may be disposed as construction debris.

III.J.3.f. After removal of the VDF, a soil core sample must be obtained from within the footprint of the sump and analyzed to determine if soil contamination is present.

III.J.3.g. If soil contamination is present, the Permittee must prepare an investigation or remediation plan and submit the plan to DEQ for approval.

III.J.4. *Certification of Closure of the VDF*

III.J.4.a. The Permittee shall certify that the VDF has been closed in accordance with the specifications in this Permit, as required by 40 CFR 264.115.

III.K. **Financial Assurance Requirements for Closure**

III.K.1. *Cost Estimates for Closure*

III.K.1.a. The Permittee must develop cost estimates for closure care in accordance with Condition I.G.2.

III.K.2. *Financial Assurance for Closure Costs*

III.K.2.a. The Permittee shall demonstrate continuous compliance with 40 CFR 264.146 by providing documentation of financial assurance, as required by 40 CFR 264.151 and Condition I.G. (Financial Assurance) in at least the amount of the cost estimates required by Condition I.G.2. and III.K.1.

III.K.3. *Release from Financial Assurance for Final Closure*

III.K.3.a. In accordance with 40 CFR 264.143(i), within sixty (60) days after receiving certifications from the Permittee and a qualified professional engineer or an independent qualified soil scientist, as applicable, that final closure has been complete in accordance with the closure requirements set forth in this Permit, DEQ shall notify the owner or operator in writing that he/she is no longer required by this section to maintain financial assurance for final closure of the SLTU, unless DEQ has reason to believe that final closure has not been in accordance with this Permit. DEQ shall provide the Permittee a detailed written statement of any such reason to believe that closure has not been in accordance with the approved closure plan.

Module IV

Post-Closure Care
for the
South Land Treatment Unit,
New East Land Treatment Unit, and
Old East Land Treatment Unit

Module IV
Post-Closure Care for the
South Land Treatment Unit (SLTU),
New East Land Treatment Unit (NELTU), and
Old East Land Treatment Unit (OELTU)

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Attachments:

Attachment IV.1 Post-Closure Care Facility Contact(s)

Module IV
Post-Closure Care for the SLTU, NELTU, and OELTU

IV.A. **Applicability**

IV.A.1. The requirements of this Module apply to post-closure for the following regulated units:

IV.A.1.a. South Land Treatment Unit (SLTU) as defined in Condition I.C.2.a.

IV.A.1.a.i. The post-closure period for the SLTU will begin with the receipt and approval by DEQ of the closure certification of the SLTU as required in Condition III.I.6. (Certification of Closure).

IV.A.1.b. New East Land Treatment Unit (NELTU) and Old East Land Treatment Unit (OELTU), as defined in Condition I.C.2.b. and I.C.2.c. respectively.

IV.A.1.b.i. The NELTU and OELTU began post-closure in September, 2011, and must continue post-closure care requirements as set forth in Module IV.

IV.B. **Post-Closure Plan**

IV.B.1. Module IV is considered the Post-Closure Plan for the SLTU, NELTU, and OELTU.

IV.C. **Post-Closure Care and Use of Property**

IV.C.1. In accordance with 40 CFR 264.117, post-closure care must begin after closure is completed and must continue for thirty (30) years after the closure date, unless otherwise specified in Condition IV.C.2., below.

IV.C.2. In accordance with 40 CFR 264.117(2), at any time preceding partial closure of a land treatment unit subject to post-closure care requirements or final closure, or any time during the post-closure period, DEQ, in accordance with the permit modification procedures in Condition I.M.2. (Modification or Revocation and Reissuance), may:

IV.C.2.a. Shorten the post-closure care period applicable to the SLTU, OELTU, and NELTU if DEQ finds that the reduced period is sufficient to protect human health and the environment (e.g., soils or groundwater monitoring results, characteristics of the hazardous wastes, application of advanced technology, or alternative disposal, treatment, or re-use techniques indicate that the SLTU, OELTU, or NELTU is secure); or

IV.C.2.b. Extend the post-closure care period applicable to the SLTU, OELTU, or NELTU if DEQ finds that the extended period is necessary to protect human health and the environment (e.g., soils or groundwater monitoring results indicate a potential for migration of hazardous wastes at levels which may be harmful to human health and the environment).

IV.C.3. *Security*

IV.C.3.a. DEQ may require, at partial and final closure, continuation of any of the security requirements provided below when:

IV.C.3.a.i. Hazardous wastes may remain exposed after completion of partial or final closure; or

IV.C.3.a.ii. Access by the public or domestic livestock may pose a hazard to human health.

IV.C.3.b. Where required by Condition IV.C.3.a., the Permittee shall comply with security requirements set forth in 40 CFR 264.14(b)(2) and (c), and the ExxonMobil Billings Refinery Emergency Response Plan.

IV.C.3.c. A perimeter fence must surround each LTU and control entry at all times.

IV.C.3.d. Signs with the following warnings and instructions must be maintained on the perimeter fence adjacent to each LTU: "Danger – Unauthorized Personnel Keep Out".

IV.C.3.d.i. The signs must be posted at each entrance to the LTUs, and at other locations, in sufficient numbers to be seen from any approach to the LTU.

IV.C.3.d.ii. The signs must be legible from a distance of at least 25 feet.

IV.C.4. Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover or any other components of the containment system, or the function of the unit's monitoring systems, unless DEQ finds that the disturbance:

IV.C.4.a. Is necessary to the proposed use of the property, and will not increase the potential hazard to human health and the environment; or

IV.C.4.b. Is necessary to reduce a threat to human health or the environment.

IV.C.5. All post-closure care activities must be in accordance with the provisions of the post-closure conditions as specified in Module IV.

IV.D. General Post-Closure Requirements

IV.D.1. The Permittee shall monitor the SLTU, OELTU, and NELTU throughout the post-closure care period in a manner that will ensure detection of a release of hazardous waste, hazardous waste constituents, leachate, contaminated run-off or waste decomposition products to the groundwater or surface water from the closed unit. The Permittee shall maintain all monitoring equipment throughout the post-closure care period in a manner that will ensure detection of a release from the closed unit.

IV.D.2. *Post-Closure Contact*

IV.D.2.a. Personnel listed in Attachment IV.1 (Post-Closure Facility Contact) shall be the contact(s) concerning the SLTU, OELTU, and NELTU during the post-closure care period.

IV.D.3. *Location of Permit during Post-Closure*

IV.D.3.a. Until final closure of the facility, a copy of the Permit must be furnished to DEQ upon request, including request by mail. After final closure has been certified, the Permit must be kept at the ExxonMobil Billings Refinery offices during the remainder of the post-closure period.

IV.D.4. *General Post-Closure Requirements*

IV.D.5. During the post-closure period, the Permittee shall:

IV.D.5.a. Continue all maintenance activities specified in this Permit necessary to maximize degradation, transformation, or immobilization of hazardous constituents within the treatment zone, to the extent they are consistent with other post-closure activities;

IV.D.5.b. Maintain the run-on/run-off control system that will:

IV.D.5.b.i. Prevent flow onto the treatment zone during peak discharge from a 24-hour, 25-year storm; and

IV.D.5.b.ii. Collect and control the run-off or volume of water resulting from the 24-hour, 25-year storm;

IV.D.5.c. Perform repairs or maintenance as necessary on the run-on/run-off control system to ensure berm heights and performance are maintained. Repairs must be made within one week of the time damage is noted on the LTU inspection log, unless conditions do not allow access to the damaged area. If conditions are such that repairs cannot be made in that timeframe, the reason must be noted on the inspection log;

IV.D.5.d. Control and minimize noxious weeds. Migration of noxious weeds off-site must be prevented;

IV.D.5.e. Maintain the protective cover; and

IV.D.5.f. Prohibit food crops or commercial forage from being grown on the SLTU, NELTU, and OELTU during the post-closure period.

IV.D.6. *Amendment of Post-Closure Conditions*

IV.D.6.a. The Permittee may request a permit modification in compliance with 40 CFR 270.41 and Condition I.M.3. (Permit Modification at the Request of the Permittee) to change the post-closure conditions in this Permit.

IV.D.6.b. The Permittee may submit a written request to DEQ for a permit modification to amend post-closure conditions in Module IV at any time during the active life of the facility or during the post-closure care period.

IV.D.6.c. The Permittee shall submit a written request for a permit modification to authorize a change in post-closure conditions in Module IV whenever:

IV.D.6.c.i. Changes in operating plans or facility design affect post-closure;

IV.D.6.c.ii. There is a change in the expected year of final closure; or

IV.D.6.c.iii. There are events that occur during the active life of the facility, including partial and final closures, that affect post-closure management and monitoring requirements.

IV.D.6.d. The Permittee shall submit a written request for a permit modification at least sixty (60) calendar days prior to the proposed change in facility design or operations, or no later than sixty (60) calendar days after an unexpected event has occurred which has affected post-closure conditions.

IV.D.6.e. DEQ may require modifications to post-closure conditions under Condition IV.D.6.c. and IV.D.6.d. The Permittee shall submit the modified post-closure plan no later than ninety (90) calendar days after DEQ's request. Any modifications to Module IV shall be conducted in accordance with the procedures in 40 CFR 270 subpart D and Condition I.M.2. (Modification or Revocation and Reissuance).

IV.D.6.f. 2021 Permit Modification Request

~~IV.D.6.e.~~ On January 19, 2021, ExxonMobil submitted a Class 2 permit modifcation request to DEQ. The permit modification request was to install rail track across the OELTU and NELTU, which will require movement of soil within the OELTU and NELTU to accommodate necessary changes in surface elevation for the track laydown. A final workplan must be submitted to DEQ for approval prior to construction. The workplan must detail any changes to the OELTU and NELTU soil and cap, including any replacement of groundwater monitoring wells. The workplan must also include any increase in BTZ sampling and groundater monitoring after construction completion. The workplan must adhere to the approved permit modification request.

IV.E. **Below Treatment Zone Soil Monitoring During the Post-Closure Period**

IV.E.1. *General BTZ Sampling Requirements*

IV.E.1.a. The Permittee shall collect and analyze BTZ samples according to the methods and procedures established in this Section, including criteria established for quality assurance and quality control measures; and

IV.E.1.b. Follow evaluation requirements established in Condition IV.E.5. (BTZ Monitoring Results Evaluation).

IV.E.1.c. Results of all BTZ monitoring activities must be noted and maintained in the operation record, in accordance with Condition I.R.1. (Operating Record).

IV.E.1.d. The Soil Sampling Procedures provided in Attachment II.3 must be followed. Any changes to the Soil Sampling Procedures must be approved by DEQ.

IV.E.1.e. Portions of each LTU covered by an impermeable cap are exempt from BTZ soil monitoring unless:

IV.E.1.e.i. The impermeable cap is compromised and a release of hazardous constituents occurs or is suspected to have occurred, or other information indicates sampling of BTZ soils beneath the cap is warranted.

IV.E.1.f. The Permittee will no longer be subject to Condition IV.E. if the Permittee can demonstrate to DEQ that levels of hazardous constituents, including inorganic constituents, in the treatment zone soil do not exceed the background value of those constituents by an amount that is statistically significant when using a test as specified in 40 CFR 264.280(d)(3).

IV.E.2. *BTZ Sampling Frequency*

IV.E.2.a. BTZ soil must be sampled after growing season to minimize damage to vegetation on the following schedule:

IV.E.2.a.i. One-half year after closure certification;

IV.E.2.a.ii. One year after closure certification;

IV.E.2.a.iii. Two years after closure certification;

IV.E.2.a.iv. Four years after closure certification;

IV.E.2.a.v. Eight years after closure certification;

IV.E.2.a.vi. Sixteen years after closure certification; and

IV.E.2.a.vii. Thirty years after closure certification.

IV.E.2.b. During the post-closure period, DEQ may decide more frequent BTZ soil monitoring is necessary, at which time DEQ will notify the Permittee in writing. Examples of conditions warranting more frequent BTZ sampling would be, but are not limited to, the appearance of hazardous constituents in groundwater immediately downgradient of the SLTU, OELTU, or NELTU or inadvertent damage to the engineered cover.

IV.E.3. *BTZ Sampling Locations and Collection*

IV.E.3.a. Selection of Random BTZ Sampling Sites

IV.E.3.a.i. Randomly selected un-composited BTZ core samples must be taken from each land treatment unit based on the procedures specified in the Sampling and Analysis Plan and at the following frequency:

- Five BTZ soil samples must be collected from the SLTU
- Five BTZ soil samples must be collected from the NELTU
- Two BTZ Soil Samples must be collected from the OELTU from any remaining portion of the LTU that meets BTZ selection criteria in Condition IV.E.3.a.

IV.E.3.a.ii. The procedure for random selection of sampling sites within application cells must be performed for each soil sampling event, as described in the Permittee's Soil Sampling Procedures provided in Attachment II.3.

IV.E.3.a.iii. When selecting sampling sites, any point that falls within 20 feet of the cell boundary must be discarded to avoid edge effects, and another random point shall be selected.

IV.E.3.a.iv. Core samples must be collected with equipment as described in the Permittee's Soil Sampling Procedures.

IV.E.3.a.v. BTZ samples must not be composited.

IV.E.3.b. Determining BTZ Sample Depth

IV.E.3.b.i. The BTZ consists of a soil layer from the bottom of the treatment zone to 6 inches below the treatment zone.

IV.E.3.b.ii. Determining the location of the BTZ must be conducted in the field at each sample point and must follow the procedures specified in the Sampling and Analysis Plan provided in Attachment II.3.

IV.E.3.b.iii. Determining the BTZ location must include at a minimum, evaluation of soil lithology, color, staining, and photoionization detector measurements.

IV.E.3.c. BTZ Sample Collection Methods

IV.E.3.c.i. All samples are to be collected in accordance with methods outlined in SW-846, Attachment II.3 (Soil Sampling Procedures), and as otherwise specified in this Permit.

IV.E.3.c.ii. All samples will be iced or preserved, as specific analytical methods dictate, at the time of collection and during transport to the laboratory. A chain-of-custody from the field to the laboratory must be maintained and documented.

IV.E.3.c.iii. All sampling equipment must be cleaned and/or decontaminated between samples.

IV.E.3.c.iv. Records of all sampling methods and events must be incorporated into the operating record, in accordance with Condition I.R.1. (Operating Record).

IV.E.4. *BTZ Analytical Requirements*

IV.E.4.a. Samples must be analyzed for the analytes/principal hazardous constituents (PHC) provided in Attachment II.12 (BTZ Analytes and Permit Concentration Limits).

IV.E.4.b. The analytical methods shown in Attachment II.12. must be used unless DEQ approves an alternate analytical method.

IV.E.4.c. The Permittee shall follow analytical and reporting requirements as set forth in Condition I.J.10. (Monitoring, Sampling, and Analytical Requirements).

IV.E.4.d. The Permittee shall submit to DEQ, upon request, the Quality Assurance Plan and the name of a contact person for each analytical laboratory used by the Permittee.

IV.E.4.e. All analytical results must be maintained in the operating record as specified in Condition I.R.1. (Operating Record).

IV.E.4.f. If analysis detects an analyte not included in the monitoring parameters or Permit Concentration Limits in Attachment II.12. (BTZ Analytes and Permit Concentration Limits), DEQ may add the analyte to those lists for future sampling and/or require re-sampling for the detected analyte. An analyte is detected when its concentration is at or above the MDL (for inorganic analytes) or EQL (for organic analytes).

IV.E.5. *BTZ Monitoring Results Evaluation*

IV.E.5.a. Sample analytical results must not exceed the required Permit Concentration Limit provided in Attachment II.12.

IV.E.5.b. If one or more of the analytes provided in Attachment II.12 is detected at or above the Permit Concentration Limit (PCL) provided in Attachment II.12 in any BTZ sample, DEQ must be notified within fifteen (15) days after receipt of the analytical information by the Permittee.

IV.E.5.b.i. The Permittee's notification must include an evaluation of all laboratory analytical results equal to or greater than the PCL discussed in Condition IV.E.5.b. using the most current EPA Soil Screening Levels for soil-to-groundwater migration, using a DAF of 20.

IV.E.5.c. If any laboratory analytical results, equal to or greater than the PCL discussed in Condition IV.E.5.b. are also greater than the limits specified in Condition IV.E.5.b.i., it is considered a statistically significant increase. Within sixty (60) after notification to DEQ of a statistically significant increase, the Permittee shall propose an investigation program to validate the results, establish constituent leachability potential using site specific data and determine the lateral and vertical extent of soils with statistically significant concentrations.

IV.E.5.d. Lead and chromium concentrations in BTZ soil samples will be evaluated by comparison to background concentrations established in *Background Concentrations of Inorganic Constituents in Montana Surface Soils,* prepared for DEQ in September 2013. Statistically significant concentrations will require the notification and response procedures outlined in Conditions IV.E.5.f. (Modification Request).

IV.E.5.d.i. The fine soil fraction of the soil sample must be used for analysis as required in *Background Concentrations of Inorganic Constituents in Montana Surface Soils*, prepared for DEQ in September 2013.

IV.E.5.e. Annual groundwater sampling must also be conducted in downgradient monitoring wells according to the conditions in Module VI until BTZ samples return to levels below the Permit Concentration Limit.

IV.E.5.f. <u>Modification Request</u>

IV.E.5.f.i. If there has been a statistically significant increase on any analyte as described in Condition IV.E.5.c. or lead and chromium as described in Condition IV.E.5.d., within thirty (30) days after notification to DEQ as specified in Condition IV.E.5.b., the Permittee shall submit an application to DEQ for a permit modification to the post-closure plan. The modification shall:

IV.E.5.f.i.1. Propose changes in the Permit which will maximize the success of degradation, transformation, or immobilization in the treatment zone; and/or

IV.E.5.f.i.2. Propose a remediation plan for removal of migrated waste in the zone(s) showing the statistical increase in analytes.

IV.E.6. *Demonstration of Contamination from Another Source*

IV.E.6.a. The Permittee may demonstrate that a source other than the LTU caused the increase or that the increase resulted from error in sampling, analysis, or evaluation. The Permittee is not relieved of the burden of submitting notification and reports under Condition IV.E.5. unless the demonstration successfully shows that a source other than the LTU caused the increase or that the increase resulted from error in sampling, analysis, or evaluation. In making a demonstration, the Permittee shall:

IV.E.6.b. Notify DEQ in writing within fifteen (15) days after determining an increase in analytes exists under Condition IV.E.5.b., that the Permittee intends to make a demonstration under this paragraph;

IV.E.6.c. Within ninety (90) days after a determination under Condition IV.E.5.b., submit a report to DEQ which demonstrates that a source other than the LTU caused the increase, or that the increase resulted from error in sampling, analysis or evaluation;

IV.E.6.d. Within ninety (90) days after the determination under IV.E.5.b., submit to DEQ a permit modification request and plan to make any appropriate changes to the operation of the LTU; and

IV.E.6.e. Continue to monitor in accordance with the monitoring requirements of this Module until permit modifications are approved by DEQ.

IV.E.7. *Other Analytes*

IV.E.7.a. If analysis detects an analyte not included in the PHC lists in Attachment II.9, DEQ may add the analyte to the PHC list for future sampling events and/or require re-sampling for the detected analyte. An analyte is detected when its concentration is at or above the MDL (for an inorganic analyte) or EQL (for an organic analyte).

IV.F. Groundwater Monitoring During the Post Closure Period

IV.F.1. The Permittee shall continue groundwater monitoring in accordance with Module VI (Groundwater monitoring) throughout the post-closure period.

IV.F.2. During the post-closure period, SLTU groundwater monitoring shall be conducted annually at low water levels. The Permittee may modify the sampling frequency upon written approval from DEQ.

IV.F.3. During the post-closure period, the NELTU and OELTU groundwater monitoring shall be conducted with the following sampling schedule:

IV.F.3.a. At the beginning of the post-closure period;

IV.F.3.b. 6 months after the beginning of the post-closure period;

IV.F.3.c. One year after the beginning of the post-closure period;

IV.F.3.d. Two years after the beginning of the post-closure period;

IV.F.3.e. Four years after the beginning of the post-closure period;

IV.F.3.f. Eight years after the beginning of the post-closure period;

IV.F.3.g. Sixteen years after the beginning of the post-closure period;

IV.F.3.h. Thirty years after the beginning of the post-closure period.

IV.F.4. During or before the post-closure period, DEQ may decide more frequent post-closure groundwater monitoring is necessary, at which time DEQ will notify the Permittee in writing. Conditions that may warrant more frequent groundwater monitoring include a history of repeat PHC sampling during operation or closure or a significant change in groundwater elevation or flow direction. The Permittee may also choose to sample more frequently during the post-closure period.

IV.G. **Post-Closure Notices**

IV.G.1. The Permittee shall ensure that all requirements for institutional and land use controls, as set forth in Condition I.L. are current for the SLTU, NELTU, and OELTU during and at termination of post-closure care.

IV.G.2. In accordance with 40 CFR 264.119(c), if the Permittee or any subsequent Permittee of the land upon which a hazardous waste disposal unit is located wishes to remove hazardous wastes, hazardous waste residues, or contaminated soils, he or she shall request a modification to this Permit in accordance with Condition I.M.3. (Permit Modification at the Request of the Permittee). The Permittee shall demonstrate that the removal of hazardous wastes will satisfy Condition IV.C.4. By removing hazardous waste, the Permittee may become a generator of hazardous waste and shall manage such waste in accordance with all applicable requirements of Title 17, Chapter 53, Subchapter 6, ARM. If the Permittee is granted a permit modification or otherwise granted approval to conduct such removal activities, the Permittee may request DEQ approval for either:

IV.G.2.a. The removal of the notation on the deed to the facility property or other instrument normally examined during title search; or

IV.G.2.b. The addition of a notation to the deed or instrument indicating the removal of the hazardous waste.

IV.H. **Certification of Completion of Post-Closure Care**

IV.H.1. No later than sixty (60) calendar days after completion of the established post-closure care period for the LTU, the Permittee shall submit to DEQ, by registered mail, a certification that the post-closure care period for the LTU was performed in accordance with the specifications in the Permit. [40 CFR 264.120]

IV.H.1.a. The certification must be signed by the Permitee and registered qualified Professional Engineer.

IV.H.1.b. The certification must state that the Permittee has recorded notations on all instruments of conveyance and submitted a survey plat to the authority with jurisdiction over local land use, in accordance with Condition I.L. (Institutional Controls).

IV.H.1.c. The certification must include copies of the document in which the notations have been placed, and the survey plat.

IV.H.2. Documentation supporting the Professional Engineer's certification must be furnished to DEQ upon request until the Permittee is released from financial assurance requirements for post-closure under Condition IV.I.3. (Release from Post-Closure Care Financial Requirements).

IV.I. **Financial Assurance Requirements**

IV.I.1. *Cost Estimates for Post-Closure Care*

IV.I.1.a. The Permittee must develop cost estimates for post-closure care in accordance with Condition I.G.2.

IV.I.2. *Financial Assurance for Post-Closure Care*

IV.I.2.a. The Permittee shall demonstrate continuous compliance with 40 CFR 264.146 by providing documentation of financial assurance, as required by 40 CFR 264.151 and Condition I.G. (Financial Assurance) in at least the amount of the cost estimates required by Condition I.G.2. and IV.I.1.

IV.I.3. *Release from Post-Closure Care Financial Requirements*

IV.I.3.a. In accordance with 40 CFR 264.145(i), within sixty (60) days after receiving certifications from the Permittee and a qualified Professional Engineer that the post-closure care period has been completed for the LTU in accordance with Module IV, DEQ shall notify the Permittee in writing that he/she is no longer required to maintain financial assurance for those regulated unit(s) that have completed post-closure care, unless DEQ has reason to believe that post-closure care has not been in accordance with the post-closure conditions in Module IV. DEQ shall provide the Permittee with a detailed written statement of any such reason to believe that post-closure care has not been in accordance with Module IV.

Attachment IV.1

Post-Closure Care Facility Contact(s)

Attachment IV.1
Post-Closure Care Facility Contact(s)

ExxonMobil Billings Refinery Environmental Services Director
700 ExxonMobil Road
P.O. Box 1163
Billings, Montana 59103-1163

Phone:
406-657-5380 (main refinery office)

Module V

Waste Staging Area

Module V
Waste Staging Area

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Attachments:

Module V
Waste Staging Area

V.A. Applicability

V.A.1. The requirements of this Permit Module apply to the operation and closure of the waste staging area at the facility, as defined in Condition I.C.2.d., at which hazardous wastes are allowed to be stored in containers for more than 90 days. The Permittee must operate and maintain the waste staging area in accordance with this Permit, applicable requirements in Title 17, Chapter 54, ARM, and as specified in the Application.

V.B. Permitted Unit

V.B.1. The waste staging area is located within the ExxonMobil Billings Refinery, Yellowstone County, Montana, T.1N, R.26E, Section 25. Attachment I.5 indicates its location within the Refinery.

V.B.2. Within the waste staging area there is a palletized drum storage pad with a non-discharging sump, a drum crusher pad with a non-discharging sump, and a safety building.

V.B.3. Any changes to the waste staging area that would affect hazardous waste management practices must be approved by DEQ and may require a permit modification as described in ARM 17.54.126 or ARM 17.54.128.

V.C. Permitted Wastes

V.C.1. The Permittee may, in accordance with this Module, store any on-site generated hazardous waste at the waste staging area. The Permittee shall keep records of the types, volumes, and manifests for hazardous waste stored at the waste staging area, as required by Condition V.K.1. (Recordkeeping).

V.D. Off-Site Wastes

V.D.1. The Permittee shall not receive, store, or process off-site generated hazardous wastes at the waste staging area.

V.E. Waste Analysis

V.E.1. The Permittee is not required to perform routine waste analysis on those listed and characteristic wastes that are routinely generated, and subsequently stored at the waste staging area.

V.E.2. Waste infrequently generated and wastes resulting from spilled substances shall be reviewed as generated to determine their waste status in accordance with 40 CFR 262.11. The waste shall be stored at the waste staging area while the waste determination is being made.

V.E.3. Analyses shall be performed in accordance with the Waste Analysis Plan presented in Attachment II.2. In all cases, test methods must conform to the most recent addition of Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA, (SW-846) or other equivalent methods as approved by DEQ.

V.E.4. Records of all analyses performed either as a random check by the Permittee or as requested on a case-by-case basis by a hazardous waste transporter or receiving facility, shall be kept as part of the operating record. Waste material profile sheets required by the Permittee's hazardous waste contractor shall also be incorporated into the operating record, as required under Condition I.R.1. (Operating Record).

V.F. **Containment Design and Liquid Removal**

V.F.1. The containment system shall be operated as described in Attachment V.1 (Containment Design and Operation). At a minimum, the system shall meet the following requirements:

V.F.1.a. A base must underlie the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed (40 CFR 264.175(b)(1));

V.F.1.b. The base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids (40 CFR 264.175(b)(2));

V.F.1.c. The containment system must have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container, whichever is greater. Containers that do not contain free liquids need not be considered in this determination (40 CFR 264.175(b)(3);

V.F.1.d. Run-on into the containment system must be prevented unless the collection system has sufficient excess capacity, in addition to that described in Condition V.F.1.c. above, to contain any run-on which might enter the system (40 CFR 264.175(b)(4);

V.F.1.e. Spilled or leaked waste and accumulated precipitation must be removed from the collection area in as timely a manner as is necessary to prevent overflow of the collection system (40 CFR 264.175(b)(5);

V.F.1.f. The Permittee shall empty the sumps after each rainstorm event which has greater than 0.3 inches of precipitation;

V.F.1.g. The Permittee shall follow the procedures of Attachment V.1 (Containment Design and Operation) for determining the potential hazard of collected liquids and shall dispose of them accordingly; and

V.F.1.h. The operating record must show the results of the tests and the actions taken to dispose of any residual waste staging area containment system liquids, as required by Condition I.R.1. (Operating Record).

V.G. **Operation of the Waste Staging Area**

V.G.1. *General Conditions*

V.G.1.a. The Permittee shall maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous constituents to air, soil, or surface water which could threaten human health or the environment.

V.G.2. *Condition of Containers*

V.G.2.a. If a container holding waste is not in good condition (e.g., severe rusting, bulging, apparent structural defects) or if it begins to leak, the Permittee must transfer the hazardous waste from this container to a container that is in good condition or manage the waste in some other way that complies with the conditions of this Permit. (40 CFR 264.171)

V.G.3. *Compatibility of Waste with Containers*

V.G.3.a. The Permitee must use a container made of or lined with materials which will not react with, and are otherwise compatible with, the hazardous waste to be stored, so that the ability of the container to contain the waste is not impaired. (40 CFR 264.172)

V.G.4. *Management of Containers*

V.G.4.a. All hazardous wastes stored at the waste staging area shall be stored in areas with secondary containment as described in Attachment V.1 (Containment Design and Operation), unless otherwise approved by DEQ.

V.G.4.b. A container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste. (40 CFR 264.173(a))

V.G.4.c. A container holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak. (40 CFR 264.173(b))

V.G.4.d. In accordance with 40 CFR 264, Subpart CC, Air Emission Standards for Tanks, Surface Impoundments, and Containers, the Permittee shall ensure all drums are equipped with a cover and closure devices that form a continuous barrier over the container openings.

V.G.5. *Prohibitions on Storage of Restricted Wastes*

V.G.5.a. In accordance with 40 CFR 268.50, the Permittee shall not store restricted wastes at the waste staging area unless the wastes are stored solely to accumulate such quantities of waste to facilitate proper recovery, treatment, or disposal. If restricted wastes are stored at the waste staging area for more than one year, the Permittee bears the burden of proving such storage was solely to accumulate such quantities of waste to facilitate proper recovery, treatment, or disposal.

V.G.6. *Specific Operations*

V.G.6.a. Operations for management of hazardous wastes at the waste staging area shall be performed as follows:

V.G.6.a.i. Concrete or asphalt ramps must be provided in good condition so vehicles can enter the area and operate with maximum safety, thus minimizing the hazards during loading and unloading operations.

V.G.6.a.ii. A forklift or equivalent equipment shall be used to transport properly labeled, DOT-approved waste containers both to and within the WSA. Containers shall be placed on pallets after being filled at the respective point of waste generation. The palletized drums shall then be picked up by the forklift or equivalent equipment and transported to the WSA.

V.G.6.a.iii. When a sufficient quantity of waste is accumulated in the WSA for off-site shipment, a hazardous waste transporter shall transport the wastes for proper disposal.

V.H. Special Requirements for Ignitable or Reactive Waste

V.H.1. The Permittee must locate containers holding ignitable or reactive wastes at least 15 meters (50 feet) from the facility's property line (40 CFR 264.176) and within 10 feet of other containerized wastes.

V.H.2. All ignitable waste shall be stored in the WSA's northwest corner that is delineated by letters and striping.

V.I. Special Requirements for Incompatible Waste

V.I.1. In accordance with 40 CFR 264.177:

V.I.1.a. Incompatible wastes must not be placed in the same container;

V.I.1.b. Hazardous waste must not be placed in an unwashed container that previously held an incompatible waste or material; and

V.I.1.c. A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby must be separated from the other materials or protected from them by means of a dike, berm, wall, or other device.

V.J. Inspection of the Waste Staging Area

V.J.1. The waste staging area shall be inspected weekly, daily when loading and unloading activities are in progress, and after storms.

V.J.2. At a minimum, the Permittee shall inspect fencing, warning signs, proper container labeling, leaking containers, closed containers, spills, concrete pad, curb walls, and sump condition.

V.J.3. Results of all inspections shall be incorporated into the operating record, as required by Condition I.R.1. (Operating Record).

V.K. **Recordkeeping and Reporting**

V.K.1. *Recordkeeping*

V.K.1.a. A written operating record of hazardous waste management activities at the waste staging area must be maintained. Records shall be kept of:

V.K.1.a.i. Types and volumes of hazardous wastes stored at the waste staging area;

V.K.1.a.ii. Results of waste analyses;

V.K.1.a.iii. Waste material profile sheets for wastes stored at the facility and shipped off-site;

V.K.1.a.iv. Hazardous waste manifests for wastes stored at the facility and shipped off-site;

V.K.1.a.v. Results of all inspections; and

V.K.1.a.vi. Results of tests and actions taken to dispose of residual liquid from the waste staging area containment system.

V.K.1.b. All records required under this Condition must be furnished upon request and made available at all reasonable times for inspection by any duly designated representative of DEQ.

V.K.2. *Reporting*

V.K.2.a. The Permittee shall report to DEQ, within 24 hours of the discovery of an occurrence, any leaks, spills, or other non-compliances at the waste staging area that may endanger health or the environment. Details of reporting are outlined in Condition I.J.12.f. (Twenty-Four Hour Reporting).

V.L. **Closure**

V.L.1. *General Closure Requirements*

V.L.1.a. Within ninety (90) days after receiving the final known volume of hazardous waste at the waste staging area, the Permittee shall remove all hazardous waste from the unit.

V.L.2. *Closure Performance Standard*

V.L.2.a. The Permittee shall close the facility as required by 40 CFR 264.111, and in accordance with this Permit. The intent of the waste staging area closure is to leave no wastes, residuals, or contamination in place. If the Waste Staging Area is closed in accordance with Module V and Attachment V.2 (WSA Closure Plan), post-closure care will not be required.

V.L.3. *Closure Plan*

V.L.3.a. Requirements in this Module and Attachment V.2 (WSA Closure Plan) shall constitute as the Closure Plan for the Waste Staging Area.

V.L.4. *Notification of Closure*

V.L.4.a. The Permittee must notify DEQ in writing at least forty-five (45) days prior to the date closure of the WSA is expected to begin, in accordance with 40 CFR 264.112(d).

V.L.4.b. Closure must begin no later than thirty (30) days after the date on which the WSA receives the known final volume of hazardous wastes, or if there is a reasonable possibility that the WSA will receive additional hazardous wastes, no later than one year after the date on which the WSA received the most recent volume of hazardous wastes. (40 CFR 264.112(d)(i))

V.L.4.c. If the Permittee can demonstrate to DEQ that the WSA has the capacity to receive additional hazardous wastes and the Permittee has taken all steps to prevent threats to human health and the environment, including compliance with all applicable Permit requirements, DEQ may approve an extension to this one year limit. (40 CFR 264.112(d)(i))

V.L.5. *Time Allowed for Closure*

V.L.5.a. Within ninety (90) days after receiving the final volume of hazardous wastes, the Permittee must remove all hazardous wastes from the waste staging area (40 CFR 264.113(a); and

V.L.5.b. Within one-hundred eighty (180) days after receiving the final known volume of hazardous waste, the Permittee must complete the final closure activities outlined in Condition V.L. (Closure) (40 CFR 264.113(b))

V.L.5.b.i. In accordance with 40 CFR 264.113, DEQ may approve a longer period for closure if the Permittee complies with all applicable requirements for requesting a modification to the Permit in accordance with Condition I.M.3. (Permit Modification at the Request of the Permittee) and demonstrates that:

V.L.5.b.i.1. The activities required to comply with Condition V.L. will, of necessity, take longer than ninety (90) days to complete; or

V.L.5.b.i.2. The WSA has the capacity to receive additional hazardous wastes and there is a reasonable likelihood that he or another person will recommence operation of the WSA within one year; and

V.L.5.b.i.3. Closure of the WSA would be incompatible with continued operation of the site and the Permittee has taken and will continue to take all steps to prevent threats to human health and the environment, including compliance with all applicable Permit requirements.

V.L.5.c. To receive an extension of the hazardous waste removal period, the Permittee must make the demonstration in Condition V.L.5.b.i. at least thirty (30) days before the expiration of the 90 day removal period.

V.L.6. *Disposal or Decontamination of Equipment and Structures*

V.L.6.a. The Permittee shall decontaminate and/or dispose of all waste staging area equipment as required by 40 CFR 264.114, the closure plan in Attachment V.2, and according to Permit Condition V.L.6. and V.L.7.

V.L.6.b. During the closure period, all contaminated equipment, structures and soils must be properly disposed of or decontaminated. By removing any hazardous wastes or hazardous constituents during closure, the Permittee may become a generator of hazardous waste and must handle that waste in accordance with all applicable requirements 40 CFR Part 262. (40 CFR 264.114)

V.L.7. *Disposal of Containment System Hazardous Waste and Waste Residues*

V.L.7.a. At closure, all hazardous waste and hazardous residues must be removed from the containment system. Remaining containers, liners, bases, and soil containing or contaminated with hazardous waste or hazardous residues must be decontaminated or removed. (40 CFR 264.178)

V.L.8. *Certification of Closure*

V.L.8.a. The Permittee shall certify that the facility has been closed in accordance with the specifications in the closure plan, as required by 40 CFR 264.115.

V.L.8.b. Within sixty (60) days of completion of closure of the waste staging area the Permittee must submit to DEQ, by registered mail, a certification that the waste staging area has been closed in accordance with the specifications in the Permit and the closure plan in Attachment V.2. The certification must be signed by the owner or operator and by a qualified Professional Engineer. Documentation supporting the Professional Engineer's certification must be furnished to DEQ upon request until DEQ releases the Permittee from the financial assurance requirements for closure under 264.143(i)

V.L.9. *Cost Estimate for Closure*

V.L.9.a. In accordance with 40 CFR 264.142, The Permittee must have a detailed written estimate, in current dollars, of the cost of closing the waste staging area in accordance with requirements in this Permit.

V.L.9.a.i. The cost estimate must equal the cost of final closure at the point in the facility's active life when the extent and manner of its operation would make closure the most expensive, as indicated by its closure plan located in Attachment V.2 and this Permit; and

V.L.9.a.ii. The closure cost estimate must be based on the costs to the Permittee of hiring a third party to close the unit. A third party is a party who is neither a parent nor a subsidiary of the Permittee.

V.L.9.a.iii. The closure cost estimate may not incorporate any salvage value that may be realized with the sale of hazardous wastes, or non-hazardous wastes if applicable under 40 CFR 264.113(d), that might have economic value.

V.L.9.b. The Permittee must adjust the closure cost estimate for inflation within 30 days after the close of the Permittee's fiscal year. This annual inflation adjustment must be calculated using the procedure outlined in 40 CFR 264.142(b).

V.L.9.c. The Permittee must revise the closure cost estimate no later than 30 days after DEQ has approved a request to modify the closure plan if the change in the plan increases the cost of closure. This Condition is subject to the permit modification requirements of Condition I.M. (Changes to the Permit).

V.L.10. *Financial Assurance for Closure*

V.L.10.a. The Permittee must establish financial assurance for closure of the waste staging area as required in Condition I.G. (Financial Assurance).

V.L.10.b. The financial assurance amount must be in at least the amount of the cost estimates required by Condition V.L.9.

Attachment V.1

Waste Staging Area
Containment Design and Operation

Attachment V.1
Waste Staging Area Containment and Operations
(Section 13.3 of ExxonMobil's Part B Permit Application, modified July 2016)

13.3 DRAINAGE AND STANDING LIQUIDS REMOVAL

13.3.1 Waste Staging Area

The Waste Staging Area (WSA) contains the Hazardous Waste Container Storage Pad and the Drum Crusher Pad. The entire WSA is sloped toward three catch basins that discharge into the refinery sewer system. Water from precipitation events that has not come into contact with hazardous waste containers collects in the catch basins and is discharged into the waste water treatment system via the sewers. The only time that this precipitation run-off could contain hazardous wastes would be in the event of a spill during transport to or removal of containers from the hazardous waste container storage pad. In the event a spill occurred the spilled material would be immediately cleaned up and handled appropriately.

Hazardous Waste Container Storage Pad

The hazardous waste container storage pad has been designed to store containers with and without free liquids. Since both types of wastes are stored, all containers will be handled as if the contained wastes held free liquids. Past waste management inventories, however, show that the majority of containers do not contain free liquids. The 100' by 100' concrete pad is surrounded by a six-inch high curb wall and the pad slopes toward a non-discharging sump. All liquids collected inside the curbed area will drain to the sump. Liquids are collected from the sump via vacuum truck for disposal. Contact of run-off with hazardous waste containers is minimized by storage of all containers on four-inch high pallets.

The pad is inspected weekly by warehouse or waste handling personnel. During both loading and unloading operations the pad is inspected by waste handling personnel. If leakage or spillage were to occur, the material would be cleaned up. Any leakage that would get on the pallets, pad floor, or into the sump will be removed and disposed of appropriately.

Drum Crusher Pad

The Drum Crusher Pad is a 30' by 30' concrete pad surrounded by a six-inch high curb wall. During drum crushing, "empty" drums will be crushed and made ready for disposal. Since de minimus quantity of liquid may remain in an empty drum, the Drum Crusher Pad is surrounded by a six-inch high curb wall and slopes toward a non-discharging sump. All liquids will collect in the sump and be removed via vacuum truck for appropriate disposal.

13.4 SECONDARY CONTAINMENT SYSTEM DESIGN AND OPERATIONS

13.4.1 Waste Staging Area

Hazardous Waste Container Storage Area

Hazardous wastes are stored in containers placed on four-inch high pallets on an uncracked concrete floor. The floor has a nominal slope of approximately one-third inch per foot from curb wall to the center of the pad. The container placement plan permits adequate aisle space for inspection of all containers for leaks. Any waste which has leaked from a container will be apparent either on the pallet itself or the concrete flooring. Any liquids which have leaked will be collected in the centrally located sump. The non-discharging sump has a capacity of eight cubic feet (60 gallons). Waste liquids collected from the sump will be disposed of appropriately.

The floor of the concrete pad, the sump and all containers are inspected weekly for any evidence of leakage. If any leakage were to be encountered, the source of the leak will be identified. Waste remaining in a leaking container will be transferred to a container in good condition. Leaked material will be removed from the exterior of the drum, pallets, floor, and sump and will be placed into the container.

To contain leaks, spills, and precipitation, a concrete curb wall six inches higher than the concrete floor surrounds the pad. Basic containment data are as follows:

- Maximum number of containers: 250 – 55 gallon drums
- Total containment volume: 37,500 gallons
- Sum volume: 60 gallons
- 24 hour, 25 year storm event: 3 inches
- Total storm event volume: 18,750 gallons
- Total quantity of stored waste: 13,750 gallons
- Total quantity waste and storm: 32,500 gallons
- Depth of total quantity of stored waste and total storm event: 32,500 gal/(6250 gal/in) = 5.2 inches
- Depth of water from storm: 18,750 gal/(6250 gal/in) = 3 inches

Based on worse case conditions, (e.g., spill of all stored waste plus the 24 hour, 25 year storm event) the secondary containment system will contain all the material on and added to the WSA pad. Also, during the any storm event, all containers would be above the storm water level as the waste containers are stored on four-inch high pallets.

13.5 RUN-ON CONTROL

The curbs surrounding both the hazardous waste container storage pad and the Drum Crusher Pad are one foot higher than the asphalt paving at the Waste Staging Area (WSA). During a 24 hour, 25 year storm event, a maximum of three inches of water could accumulate on the asphalt paving, if the catch basins and sewer were totally blocked. Since the curb height is 12 inches above the asphalt paving, no water would run onto the hazardous waste container storage pad or Drum Crusher Pad. It should be noted that most water falling at the WSA during a precipitation event will drain to the refinery sewer, with the exception of that amount that falls directly on the two curbed pads.

13.6 REMOVAL OF COLLECTED LIQUIDS

At both the hazardous waste container storage pad and the drum crusher pad, liquids either from leakage, spillage, or precipitation will be collected in the sumps. These liquids will be removed from the sumps via vacuum trucks. If the liquids are a result of spillage or leakage, ExxonMobil will assume that the material is the same as the stored waste and the materials will be handled accordingly. However, if liquids leak from more than one drum and consists of a mix of different waste materials, necessary precautions including waste liquid analyses as well as confirming compatibility with drum material will be performed to ensure proper re-containerizing prior to disposal. The sumps will be emptied after each rainstorm event in excess of 0.30 inches of precipitation and whenever any waste liquids are encountered. In addition, the sumps will not be allowed to fill up from small volume precipitation events.

13.7 CONTAINERS WITH FREE LIQUIDS

Both the hazardous waste container storage pad and the Drum Crusher Pad are designed as though all containers contained 100% fee liquids. ExxonMobil does not routinely attempt to determine if the containers holding wastes contain free liquids when the waste is brought to the Waste Staging Area. However, prior to shipment for off-site disposal hazardous waste drums are inspected to determine the condition of the waste. Based on the WSA operating history, the majority of wastes entering the WSA are solid materials.

13.8 CONTAINERS HOLDING IGNITABEL OR INCOMPATIBLE WASTES

ExxonMobil makes every effort to place like hazardous wastes together when placing containers on the Waste Staging Area (WSA) pad. The refinery, to date, has not identified any reactive or incompatible wastes being generated by refining processes. All ignitable wastes are placed in the northwest corner of the hazardous waste container storage pad. This area is identified by appropriate lettering and striping on the concrete floor. No other waste containers are allowed within 10 feet of the boundaries of this segregated portion of the pad. The segregated portion of the container storage pad is located in excess of 50 feet from any refinery property line.

13.9 APPLICABILITY OF AIR EMISSIONS STANDARDS FOR CONTAINERS

Air Emissions Standards for Tanks, Surface Impoundment, and Containers under RCRA are defined in 40 CFR 264 Subpart CC. These containers at the WSA meet the General requirements for Container Level 1 as specified in 40 CFR 264.1086(b)(i) for containers between 0.1 m3 (26.4 gal) and 0.46 m3 (122 gal). A container in the WSA meets Container Level 1 controls set forth in 40 CFR 264.1086(c)(1)(ii) because each is a "container equipped with a cover and closure devices that form a continuous barrier over the container openings such that when the cover and closure devices are secured in the closed position there are not visible holes, gaps, or other open spaces into the interior of the container." Therefore, the containers in the WSA meet the standards to control emissions from containers and no further controls are required under 40 CFR 264 Subpart CC.

Attachment V.2

Waste Staging Area Closure Plan

Attachment V.2
Waste Staging Area (WSA) Closure Plan
(Sections 11.1.4 and 11.1.5 of ExxonMobil's Part B Permit Application, modified July 2016)

11.1.4 Decontamination of Equipment and Structures

Waste Staging Area

Equipment at the palletized drum storage pad and the drum crushing pad will be decontaminated as necessary after the final inventory of wastes has been removed or the operational life has ceased. This closure effort will be accomplished as follows:

1. The pads will be thoroughly decontaminated by water/steam cleaning.

2. Fork lift, drum crusher, and miscellaneous tools thoroughly decontaminated by water/steam cleaning. Effectiveness of decontamination will be determined through visual inspection.

3. Re-clean as necessary to ensure visual decontamination of all equipment.

4. Sump waters will be tested via DEQ approved analysis to determine whether decontamination waters require disposal as hazardous waste. If non-hazardous, the decontamination waters will be placed in the refinery sewer system via vacuum truck. If hazardous, the decontamination waters will be disposed in accordance with applicable regulations.

5. Following decontamination, sump materials will be checked via TCLP analysis to determine waste designation (e.g., hazardous or non-hazardous). The remainder of the pad will be disposed of as construction debris, or

6. The Waste Staging Area may be used as a 90 day storage area if the decontamination has been completed as described above and analysis shows the pad and sump material to be non hazardous.

11.1.5 Closure and Post-Closure of Permitted Units

Waste Staging Area

The following procedures will be used to close the Waste Staging Area (WSA):

1. Cease operation, allowing no more wastes to be staged.

2. Crush all empty drums.

3. Prepare and ship all wastes for appropriate disposal.

4. Decontaminate equipment and structures as described in Section 11.1.4 (above).

5. Remove drum crusher.

6. Remove concrete pads, asphalt, and liner unless the WSA will be used as a 90 day storage area. Dispose of materials in an appropriate manner.

7. Obtain a soil core sample from under WSA pad sump and have analyzed via TCLP.

8. If soil contamination present, prepare an investigation or remediation plan and submit plan to Montana Department of Environmental Quality for approval.

Based on the nature of the hazardous wastes stored on the WSA pad, the construction materials used to build the facility, the operating program used to limit or eliminate releases, and the decontamination/closure procedures no hazardous wastes are expected to remain. However, TCLP analysis of sump construction material and underlying soils will be performed at closure. No post-closure care at the Waste Staging Area will be required because all hazardous wastes and hazardous waste residues will be removed from the site.

Module VI

Groundwater Monitoring

Module VI
Groundwater Monitoring

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Module VI
Groundwater Monitoring

VI.A. Applicability

VI.A.1. The requirements of this module shall pertain to the following regulated units:

VI.A.1.a. South Land Treatment Unit (SLTU) as defined in Condition I.C.2.a.

VI.A.1.b. New East and Old East Land Treatment Units (NELTU and OELTU) as defined in Conditions I.C.2.b. and I.C.2.c. respectively.

VI.A.1.b.i. The New East and Old East Land Treatment Units fall within a single groundwater monitoring system and will be referred to jointly in this Module.

VI.A.2. As required in 40 CFR 264.90(c) and 270.14(c), the regulations under 40 CFR, Subpart F and the conditions in Module VI apply during the active life of the regulated unit, including the closure period and post-closure period.

VI.B. SLTU Groundwater Monitoring

VI.B.1. *SLTU Detection Monitoring*

DEQ has determined that monitoring evidence does not indicate groundwater contamination from the SLTU at this time and therefore maintenance of a detection monitoring system [40 CFR 264.98] at the SLTU is currently appropriate.

VI.B.2. *SLTU Monitoring Well Network*

VI.B.2.a. The monitoring well network for the SLTU is provided in Attachment IV.1 and includes the following:

VI.B.2.a.i. Point of Compliance Wells: N-9R, N-9AR, ERM-6R;

VI.B.2.a.ii. Background Wells: N-7A and N-7AX.

VI.B.3. *SLTU Sampling Schedule*

The SLTU groundwater monitoring well network, as described in Condition VI.B.2. must be monitored semi-annually in the spring and fall.

VI.B.4. *SLTU Closure/Post-Closure*

During the closure and post-closure periods for the SLTU, the Permittee shall follow the requirements set forth in Modules III, IV, and VI for groundwater monitoring.

VI.C. **NELTU and OELTU Groundwater Monitoring**

VI.C.1. *NELTU/OELTU Post-Closure Groundwater Monitoring*

The NELTU and OELTU have been in post-closure care since September 14, 2011. During the post-closure care period, the Permittee shall continue groundwater monitoring in compliance with Conditions VI.A. through VI.L.

VI.C.2. *NELTU/OELTU Monitoring Well Network*

VI.C.2.a. The monitoring well network for the NELTU and OELTU must be approved by DEQ in writing, and must include at a minimum:

VI.C.2.b. Pursuant to 40 CFR 264.97(a), the groundwater monitoring system must consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that:

VI.C.2.b.i. Represent the quality of background water that has not been affected by leakage from the NELTU and/or OELTU;

VI.C.2.b.ii. Represent the quality of groundwater passing the point of compliance for the NELTU and OELTU; and

~~VI.C.2.a.~~VI.C.2.b.iii. Allow for the detection of contamination when hazardous waste or hazardous constituents have migrated from the NELTU and/or OELTU to the uppermost aquifer. ~~is provided in Attachment VI.2 and includes the following:~~

~~VI.C.2.b. Point of Compliance Wells: ERM-1, W-15b, and N-16B;~~

~~VI.C.2.c. Background Wells: W-17b MW20-01 and N-17A~~

VI.C.3. *NELTU/OELTU Sampling Schedule*

VI.C.3.a. The Permittee shall monitor groundwater on the following schedule:

VI.C.3.a.i. At the beginning of the post-closure period;

VI.C.3.a.ii. 6 months after the beginning of the post-closure period;

VI.C.3.a.iii. One year after the beginning of the post-closure period;

VI.C.3.a.iv. Two years after the beginning of the post-closure period;

VI.C.3.a.v. Four years after the beginning of the post-closure period;

VI.C.3.a.vi. Eight years after the beginning of the post-closure period;

VI.C.3.a.vii. Sixteen years after the beginning of the post-closure period;

VI.C.3.a.viii. Thirty years after the beginning of the post-closure period.

VI.C.3.b. During or before the post-closure period, DEQ may decide more frequent post-closure groundwater monitoring is necessary, at which time DEQ will notify the Permittee in writing. Conditions that may warrant more frequent groundwater monitoring include a history of repeat PHC sampling during operation or closure or a significant change in groundwater elevation or flow direction. The Permittee may also choose to sample more frequently during the post-closure period.

VI.D. **Groundwater Protection Standard**

VI.D.1. DEQ shall establish groundwater protection standards for each hazardous constituent that have been detected in groundwater in the uppermost aquifer underlying a regulated unit and that are reasonably expected to be in or derived from waste contained in the regulated unit. DEQ shall also determine at such time:

VI.D.1.a. The hazardous constituents to which the groundwater protection standard applies as defined in 40 CFR 264.93;

VI.D.1.b. The concentration limits as defined in 40 CFR 264.94;

VI.D.1.c. The points of compliance under 40 CFR 264.95; and

VI.D.1.d. The compliance period under 40 CFR 264.96.

VI.D.2. *Groundwater Protection Standard for the SLTU, OELTU, and NELTU*

VI.D.2.a. The groundwater protection standard, as established by DEQ, is comprised of Hazardous Constituents, Permit Concentration Limits, Point of Compliance Wells, and Assessment Wells, described as follows:

VI.D.2.a.i. **Principal Hazardous Constituents (PHC)**

Principal Hazardous Constituents (PHCs) are listed in Attachment VI.3. Any additional hazardous constituents detected in groundwater after this permit is issued may be added to the PHC list.

VI.D.2.a.ii. **Permit Concentration Limits (PCL)**

Permit Concentration Limits (PCL) for the PHCs are listed in Attachment VI.3.

VI.D.2.a.iii. **Point of Compliance Wells**

If, in any sampling event, analysis shows concentrations of any PHC higher than its PCL concentrations listed in Attachment VI.3, the concentration limit will be considered exceeded.

VI.D.3. *Other Requirements and Standards*

VI.D.3.a. If a PHC listed in Attachment VI.3 is identified and the difference between the permit concentration limit and the background value of that constituent is not statistically significant, the background value of the constituent will be used as the concentration limit.

VI.D.3.b. If analysis shows detection of an analyte not included in the PHC list in Attachment VI.3, DEQ may add the analyte to the PHC list for future sampling events and/or require re-sampling for the detected analyte. An analyte is detected when its concentration is at or above the MDL (for an inorganic analyte) or EQL (for an organic analyte).

VI.D.3.c. The Permittee may request a modification to eliminate any compound from the list of PHCs in Attachment VI.3, if the Permittee can demonstrate through sampling that elimination of a specific PHC is warranted.

VI.E. **Required Programs**

VI.E.1. *Monitoring and Response Program Requirements*

In accordance with 40 CFR 264.91, the Permittee shall conduct a monitoring and response program as follows for all units subject to these provisions:

VI.E.1.a. Whenever one or more hazardous constituents under 40 CFR 264.93 are detected at or above the permit concentration limits at the compliance point(s) defined in Conditions VI.B.2.a.i. and VI.C.2.b., the Permittee shall institute a compliance monitoring program, as defined in 40 CFR 264.99.

VI.E.1.b. Whenever the groundwater protection standard under 40 CFR 264.92 and Condition VI.D.2. (Groundwater Protection Standard for the SLTU, OELTU and NELTU) is exceeded, the Permittee shall institute a corrective action program under 40 CFR 264.100;

VI.E.1.c. Whenever hazardous constituents under 40 CFR 264.93 exceed permit concentration limits under Condition VI.D.2. (Groundwater Protection Standard for the SLTU, OELTU and NELTU) in groundwater between the compliance point(s) defined in Condition VI.B.2.a.i. and VI.C.2.b. and the downgradient facility property boundary, the Permittee shall institute a corrective action program under 40 CFR 264.100; or

VI.E.1.d. In all other cases, the Permittee shall institute and maintain a detection monitoring program under 40 CFR 264.98.

VI.E.2. *Response Program at Permit Issuance*

VI.E.2.a. At the time of permit issuance, DEQ has determined that monitoring evidence does not indicate groundwater contamination from the SLTU. The Permittee is required to maintain a detection monitoring program as set forth in 40 CFR 264.98 and Conditions VI.B.1. (SLTU Detection Monitoring).

VI.E.2.b. At the time of permit issuance, DEQ has determined that monitoring evidence does not indicate groundwater contamination from the OELTU and ELTU. The

Permittee is required to maintain a post-closure detection monitoring program as set forth in 40 CFR 264.98 and Condition VI.C.1. (NELTU/OELTU Post-Closure Groundwater Monitoring).

VI.F. **Sampling Requirements**

VI.F.1. *Sampling and Analysis Plan (SAP)*

VI.F.1.a. The Permittee must adhere to the sampling and analysis plan (SAP) provided in Attachment VI.4. The SAP and all modifications to the SAP must be approved by DEQ. The SAP must incorporate the requirements of Module VI. [40 CFR 264.91(b)]

VI.F.2. *Water Quality Indicator Parameters*

VI.F.2.a. Water Quality Indicator Parameters provide additional information regarding evidence of possible groundwater contamination. The parameters are as follows:

- pH, (must be between 5 and 11);
- Temperature;
- Specific Conductance;
- Depth to Groundwater;
- Total Well Depth; and
- Total Suspended Solids, (Standard Method 2540D or EPA Method 160.2, most current version, maximum limit 100 mg/L).

VI.F.2.b. Water quality indicator parameters must be measured at each well that is sampled during each groundwater monitoring event.

VI.F.2.c. The results of the water quality indicator parameter measurements shall serve as a basis for comparison in the event modifications are required in the monitoring network or unusual changes are noted in groundwater quality.

VI.F.3. *Groundwater Elevation, Flow Rate, and Flow Direction*

VI.F.3.a. The Permittee shall determine the groundwater surface elevation of all monitoring wells identified as part of monitoring well networks in this permit whenever the wells are sampled, and no less frequently than semi-annually, unless otherwise instructed by DEQ.

VI.F.3.b. The Permittee shall, on a semi-annual basis, determine the groundwater flow rate and direction of the uppermost aquifer using procedures and methods approved by DEQ.

VI.F.3.c. The Permittee shall use the groundwater surface elevations and flow direction to construct a contour map of the potentiometric surface.

VI.F.3.d. Groundwater surface elevations, groundwater flow rate, groundwater flow direction, and potentiometric surface maps must be submitted annually to DEQ as part of the annual report, as specified in Conditions VI.I.3.b. (Annual Report) and I.R.4.e. (Annual Land Treatment Units Monitoring Report).

VI.F.4. The Permittee shall maintain a consistent sampling program that ensures reliable monitoring results. The sampling program must include consistent sampling procedures defined in 40 CFR 264.97(d) and Conditions of this permit.

VI.F.5. The sampling methods must be appropriate for groundwater sampling and must accurately measure hazardous constituents in media and waste samples.

VI.F.6. Samples must be collected, preserved, and transported, and a chain of custody record maintained in accordance with procedures specified in the most up-to-date version of *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846). Quality assurance and quality control (QA/QC) procedures for field sampling must be followed as specified in SW-846.

VI.F.7. At least one set of field replicates, one field blank, one laboratory blank, and one trip blank when sampling for volatiles, per twenty (20) field samples, for the period spanning the time of analysis, must be taken during each sampling event.

VI.F.8. *Minimum Sampling Procedures and Techniques*

The groundwater monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide a reliable indication of groundwater quality below the Permitted Units. [40 CFR 264.97(d)]

VI.F.8.a. At a minimum the groundwater monitoring program must follow procedures and techniques specified in this permit module.

VI.G. Analytical Requirements

VI.G.1. *Analytical Procedures*

VI.G.1.a. The groundwater monitoring programs must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide a reliable indication of groundwater quality below the regulated unit. [40 CFR 264.97(e)]

VI.G.2. *Analytical Definitions*

VI.G.2.a. **A reportable value** is defined as any measured concentration for an analyte which equals or exceeds the method detection limit as determined by the analytical laboratory.

VI.G.2.b. **Background value** represents the quality of groundwater from a hydrogeologically equivalent source upgradient from the facility.

VI.G.2.c. **The estimated quantitation limit (EQL)** is the lowest concentration of a parameter in water and soil that can be reliably determined within specified limits of precision and accuracy by the indicated methods under routine laboratory operating conditions. EQLs are based on a general estimate for the method and are generally 5 to 10 times greater than the method detection limit. Analytical laboratories may also refer to this term as the Practical Quantitation Limit (PQL) or Reporting Limit (RL).

VI.G.2.d. **A critical value** for a given compound is any measured concentration that is equal to or above the permit concentration limit for the regulated units as established by DEQ.

VI.G.2.e. **An exceedance** is defined as statistically significant evidence of increased contamination (40 CFR 264.98(f)).

VI.G.2.f. **Permit Concentration Limit** for a given compound is a concentration value established by DEQ for permit compliance. The permit concentration limit for each Principal Hazardous Constituent (PHC), as applied to the LTUs, is listed in Attachment VI.3. For the purposes of detection groundwater monitoring, the permit concentration limits for each organic compound included in the list were established by DEQ from the EQL found in SW-846. Permit concentration limits for inorganic compounds are equal to the maximum concentration limits established by the EPA in Attachment VI.3, as set forth in 40 CFR 264.94(a)(2).

VI.G.2.g. **The method detection limit (MDL)** is defined as the sample and method-specific concentration at which there is a specified assurance of the presence and identity of a given parameter in a sample. The analytical laboratory follows the procedures in SW-846 to obtain the method detection limit. Based on nationwide laboratory experience, EPA has developed estimated method detection limits for specific parameters and methods in SW-846.

VI.G.2.h. **A reportable value** is defined as any measured concentration for an analyte which equals or exceeds the method detection limit as determined by the analytical laboratory.

VI.G.3. *Reporting Limits*

VI.G.3.a. The reporting limits for groundwater analytical measurements shall routinely be equal to or less than the EQL for that parameter and sample type/matrix. The Permittee shall ensure that the EQLs specified for given analytical methods, constituents, and media in SW-846 are routinely achieved in all analyses.

VI.G.3.b. A different SW-846 analytical method from that specified in the DEQ approved sampling workplan may be used in the laboratory cannot attain the required EQL using the specified method. Any change in the SW-846 method used must be approved by DEQ and must be noted in the corresponding analytical report submitted to DEQ. No permit modification is required for such a change in methods.

VI.G.3.c. If the laboratory is unable to meet any of the EQLs required by this permit, a written justification must be provided by the laboratory with the analytical results. DEQ reserves the right to review the justification and to accept it, reject it, or require further justification. DEQ also reserves the right to require further sampling if required EQLs are not met.

VI.G.4. *Quality Assurance/Quality Control (QA/QC)*

VI.G.4.a. The Permittee shall submit, on request by DEQ, the Quality Assurance Plan and the name of a contact person for each analytical laboratory used by the Permittee.

VI.G.4.b. The Permittee shall ensure that all laboratory analyses undertaken as part of the permit contain adequate QA/QC. The laboratory must be capable of evaluating quality control procedures as specified in SW-846. The laboratory must also have quality control and backup information available for specific analyses, which can be assessed if necessary.

VI.G.4.c. Any field, trip, or laboratory blanks exceeding the MDL for metal constituents and EQL for organic constituents must require an explanation in writing by the Permitee to DEQ. This explanation must be included in the resulting report.

VI.G.4.d. Data must be accepted or rejected according to criteria meeting the requirements of SW-846.

VI.G.4.e. If the Permittee is routinely unable to meet the requirement of Condition VI.G.3. (Reporting Limits), the Permittee shall perform an MDL study for the problem sample types/matrices and parameters. The Permittee shall perform the MDL study according to the method described in Chapter One (definitions) of SW-846, 3rd edition. The Permittee shall report to DEQ the results of the MDL study and all supporting information requested by DEQ to verify the study.

VI.G.4.e.i. Based on the results of the MDL study, the Permittee shall propose to DEQ an alternative quantitation limit (AQL) to be used under the permit instead of the reporting limit for the particular problem sample type/matrix and parameter. DEQ reserves the right to review the MDL study and the proposed AQL and to accept or reject the MDL study or the proposed AQL, specify a different AQL, or to require further information or testing.

VI.G.5. *Analytical Reporting Requirements*

All groundwater analytical reports submitted to DEQ must at a minimum include the following:

VI.G.5.a. The name of the laboratory used and the name of the laboratory contact person;

VI.G.5.b. The date of sample receipt, extraction, and/or analysis;

VI.G.5.c. A copy of the signed chain-of-custody document;

VI.G.5.d. The designation of the sample matrix (water, soil, etc.);

VI.G.5.e. The laboratory sample preservation, preparation and/or analytical method(s) used by the laboratory, including method number references;

VI.G.5.f. The analytical data results provided by the laboratory;

VI.G.5.g. The estimated quantitation limit (EQL) for every parameter in each sample actually achieved by the test method used by the laboratory;

VI.G.5.h. The method detection limit (MDL) for every parameter tested;

VI.G.5.i. Low concentration groundwater data reported as follows:

Analyte Concentration	Report
< MDL	Provide MDL value for analyte
> MDL but < EQL	Detected and reported as an estimate value
> EQL	Numerical concentration quantified

VI.G.5.j. Quality control information pertinent to analysis including blanks, duplicates, matrix spike recoveries, and acceptance limits for the inorganic parameters analyzed; surrogate compound identity, recovery and acceptance limits for the organic parameters analyzed and calibration verification results; and

VI.G.5.k. A description of any deviations from the permit requirements and/or method guidelines or laboratory Quality Assurance Plan (QAP).

VI.G.6. *Principal Hazardous Constituents (PHCs)*

VI.G.6.a. The PHCs for groundwater monitoring consist of organic and inorganic constituents listed in Attachment VI.3. PHCs include constituents on the Modified Skinner List commonly found in refinery waste, light non-aqueous phase liquids (LNAPL) and other compounds detected during groundwater monitoring of the regulated unit and during facility-wide corrective action activities required under Module VII.

VI.G.6.b. In the event PHCs are detected in soils below the treatment zone or in groundwater, DEQ may require the Permittee to analyze for a more extensive list of constituents.

VI.G.7. *Water Quality Indicator Parameters*

VI.G.7.a. Water Quality Indicator Parameters must be measured during each monitoring event as specified in Condition VI.G.7. (Water Quality Indicator Parameters). The results shall serve as a basis for comparison in the event modifications are required in the monitoring network or unusual changes are noted in groundwater quality.

VI.G.7.b. Upon written approval from DEQ, a different SW-846 method or other analytical method from those listed in Attachment VI.3 may be used. [40 CFR 264.91(b)]

VI.G.8. *Exceedances of Permit Concentration Limits*

VI.G.8.a. Any well where one or more hazardous constituents are found at or above permit concentration limits (a critical value) must be re-sampled for PHCs within thirty (30) days after the Permittee receives the information, unless DEQ has determined re-sampling is unnecessary.

VI.G.8.a.i. The Permittee may choose to re-sample immediately upon receipt of initial data results that indicate that concentration(s) of PHC(s) have reached a critical value. Re-sample data must be provided to DEQ within thirty (30) days after the Permittee receives the analysis results.

VI.G.8.a.ii. Re-sampling need only take place at those wells where critical values are indicated.

VI.G.8.a.iii. Re-sampled media need only be analyzed for those compounds exceeding critical values.

VI.G.8.a.iv. Water Quality Indicator Parameters provided in Condition VI.G.7. and static water levels must also be measured during every repeat sampling event. [40 CFR 264.98(f)]

VI.G.8.b. Whenever one or more hazardous constituents are detected at the compliance point(s), the Permittee must institute a compliance monitoring program as defined in 40 CFR 264.99. Detected is defined as statistically significant evidence of contamination as described in 40 CFR 264.98(f). [40 CFR 264.91(a)(1)]

VI.G.9. *Modification of Parameters or Methods of Analysis*

VI.G.9.a. DEQ may approve changes in parameters or methods of analysis, including statistical analysis, for any samples, upon written notice to the Permittee. Situations requiring such changes may include maintaining or upgrading the quality or type of data produced by the Permittee to account for background conditions, future conditions such as availability of improved analytical methods, the presence of better indicators, or more easily detectable parameters.

VI.G.9.b. DEQ may prescribe in writing additional sampling and analysis for wastes or leachate deemed appropriate to determining whether a hazardous constituent may have originated from a unit, to establish appropriate monitoring parameters, or for other reasons.

VI.H. **Background Groundwater Quality**

Background groundwater quality represents the quality of groundwater that has not been affected by waste management activities at the ExxonMobil Billings Refinery.

VI.H.1. For the purposes of this permit, all background concentrations for PHCs listed in Attachment VI.3 are equal to or below the estimated quantitation limit (EQL) or Method Detection Limit (MDL), established in SW-846.

VI.H.2. Background levels for all other hazardous constituents are assumed to be below or equal to the EQL or MDL for that method.

VI.H.3. The Permittee may petition DEQ to modify the background values, based on future detection monitoring results obtained after the date of Permit Reissuance.

VI.H.4. If hazardous constituents appear in both background groundwater samples and groundwater samples within the facility boundary during the same sampling event, a statistical procedure described at 40 CFR 264.280(d)(3) must be used to determine statistical significance.

VI.I. **Recordkeeping and Reporting**

VI.I.1. The Permittee shall enter all monitoring, testing, and analytical data into the operating record as required by Condition I.R.1. (Operating Record).

VI.I.2. *Monitoring Records*

VI.I.2.a. The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, the certification required by 40 CFR 264.73(b)(9) and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, certification, or application, or until corrective action is completed, whichever date is later. This period may be extended by request of DEQ at any time.

VI.I.2.b. The Permittee shall maintain records for all groundwater monitoring wells associated groundwater surface elevations, for the active life of the facility, and for disposal facilities for the post-closure care period as well. [40 CFR 270.30(j)(2)]

VI.I.3. The Permittee shall report information required in this condition in accordance with the following schedule:

VI.I.3.a. <u>Groundwater Monitoring Reporting</u>

The Permittee shall report analytical results of sampling events and static water level readings to DEQ within thirty (30) days after the date the Permittee (or any representative of the Permittee contracted to process or evaluate analytical data) receives the analytical results. Analytical reports must contain the information listed in Condition VI.G. (Analytical Requirements).

VI.I.3.b. Annual Report

An annual report must be submitted by April 30 of every year. Content requirements of the annual report are specified in Condition I.R.4.e. (Annual Land Treatment Units Monitoring Report).

VI.J. **Maintenance of Wells**

VI.J.1. Monitoring wells must be maintained at full operation for the duration of this permit.

VI.J.2. Well integrity must be monitored by the Permittee and reported to DEQ according to the following schedule:

VI.J.2.a. Well depths must be measured at least once a year; and

VI.J.2.b. A visual well inspection for evidence of well damage must be performed every sampling event.

VI.J.3. The Permittee must notify DEQ in writing when a well is no longer functioning properly, including a change in pumping rate, the presence of sand or silt materials, or cracked or broken casing. Written approval is required from DEQ prior to abandonment, replacement, and/or correction of improperly operating well(s).

VI.J.4. Access to the monitoring wells must be controlled at all times. Monitoring well caps must be locked and secure when wells are not being sampled or maintained.

VI.J.4.a. Changes to the monitoring networks for the regulated units must be approved by DEQ in writing, and must include at a minimum:

VI.J.4.a.i. Pursuant to 40 CFR 264.97(a), the groundwater monitoring system must consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that:

VI.J.4.a.i.1. Represent the quality of background water that has not been affected by leakage from the regulated unit;

VI.J.4.a.i.2. Represent the quality of groundwater passing the point of compliance for the regulated unit; and

VI.J.4.a.i.3. Allow for the detection of contamination when hazardous waste or hazardous constituents have migrated from the regulated unit to the uppermost aquifer.

VI.K. **Requirements for New Wells**

VI.K.1. Installation of new monitoring wells for the SLTU, OELTU, and NELTU must be approved by DEQ. The Permittee shall submit well plans and specifications to DEQ for approval. The number and location of new wells and monitoring requirements for new wells must be approved by DEQ in writing prior to installation.

VI.K.2. All new monitoring wells must be constructed in accordance with the provisions in 40 CFR 264.97(c).

VI.K.2.a. All new monitoring wells must be constructed, developed, and maintained pursuant to the techniques described in the Technical Enforcement Guidance Document (TEGD), OSWER-9950-1, September 1986, unless DEQ approves an alternative technique. [40 CFR 264.91(b)]

VI.K.2.b. All monitoring wells must be cased in a manner that maintains the integrity of the monitoring well bore hole. This casing must be screened or perforated and packed with gravel or sand, where necessary, to enable collection of groundwater samples. The annular space (i.e. that space between the bore hole and the well casing) above the sampling depth must be sealed to prevent contamination of samples and groundwater. [40 CFR 264.97(c)]

VI.K.3. *Submittal Requirements After Well Installation*

The Permittee shall submit monitoring well completion reports which include boring logs, sieve analysis (grain size) (if performed), standard penetration tests (if performed), results from all analytical tests performed on soils (Atterberg limits, etc.), water level elevations, water contour maps (including the latest surveyed wellhead reference elevations), well development results (including recharge rates), cross sections or fence diagrams, and all other pertinent data within 90 days after completion of well installation.

VI.K.4. *Monitoring Requirements for New Monitoring Wells*

VI.K.4.a. The Permittee must conduct at least one evaluation of the hazardous constituents listed in Attachment VI.3 and/or constituents required by DEQ immediately following completion of the well. Monitoring for hazardous constituents must begin the next sampling event following well installation. If hazardous constituents are detected above Permit Concentration Limits, the Permittee must follow the repeat sample procedures in Condition VI.G.8.a.

VI.K.4.b. The Permittee must conduct one year of quarterly sampling for all water quality indicator parameters listed in Condition VI.F.2. [40 CFR 264.91(b)]

VI.L. **Closure of Existing Wells**

The Permittee shall notify DEQ when a well is no longer properly functioning (including a marked change in pumping rate, presence of sandy or silty materials, and cracked or broken casings) or when the Permittee intends to close one or more wells associated with a monitoring well network required in this Permit. DEQ may specify the conditions for replacement or correction of improperly operating well(s).

VI.M. **Permit Modification**

VI.M.1. Permit modification provisions under Condition I.M. (Changes to the Permit) must be followed for modifications to groundwater monitoring requirements, including specific monitoring well placement.

VI.M.2. If the Permittee or DEQ determines a compliance monitoring program as described in Condition VI.E.1.a. or a corrective action program as described in Condition VI.E.1.b. and c. is necessary, the Permittee shall, within ninety (90) calendar days after the determination, submit an application for a permit modification to make appropriate changes to the program.

VI.M.3. The Permittee shall take monitoring and corrective action measures necessary to achieve compliance with the groundwater protection standard under Condition VI.D. (Groundwater Protection Standard) during the term of permit modification and any approval by DEQ.

Attachment VI.1

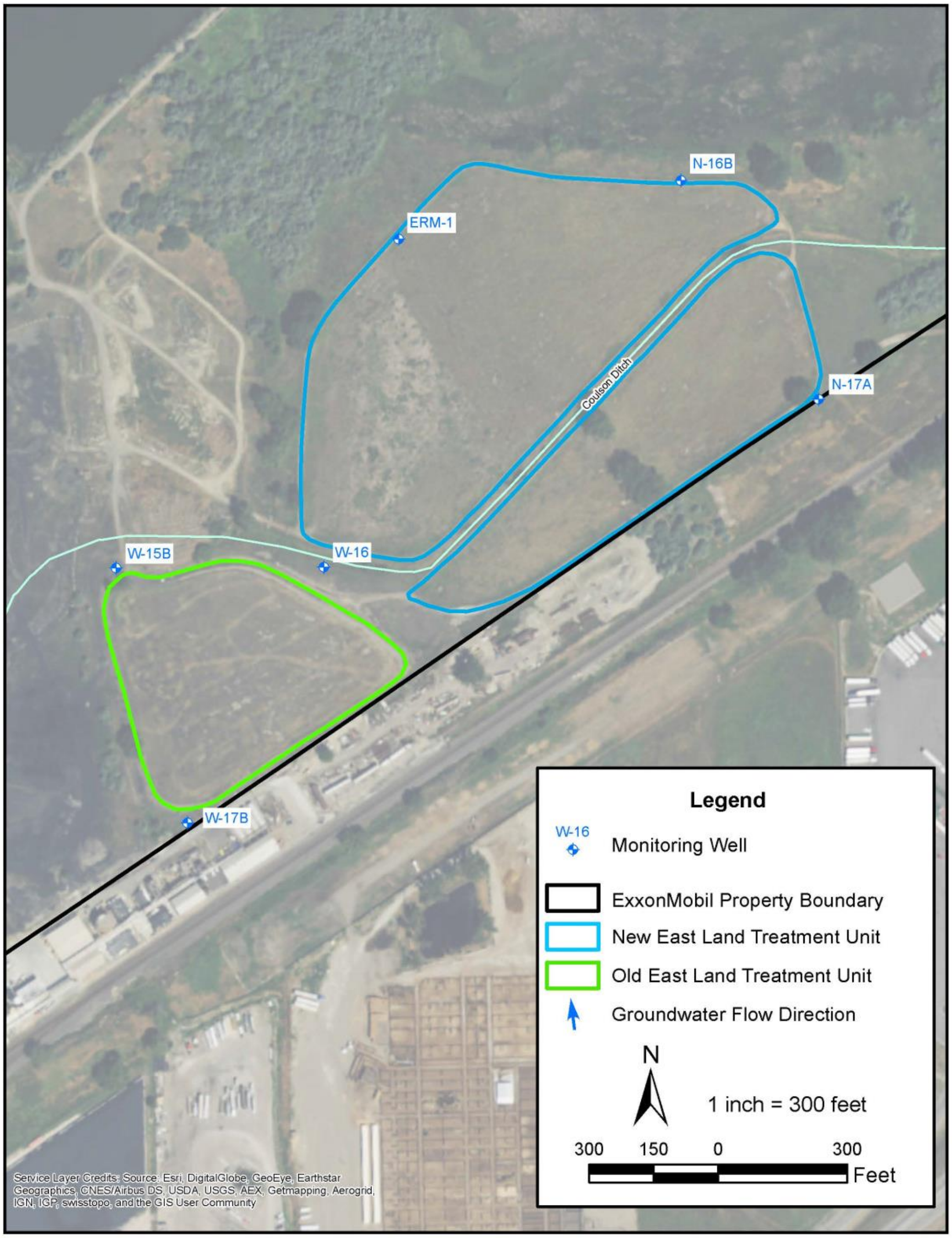
South Land Treatment Unit
Monitoring Well Network

SOUTH LAND TREATMENT UNIT
GROUNDWATER MONITORING
WELL NETWORK

AECOM

Attachment VI.2

Old East Land Treatment Unit and New East Land Treatment Unit Monitoring Well Network



NEW EAST LAND TREATMENT UNIT AND OLD EAST LAND TREATMENT UNIT LOCATION MAP

AECOM

Attachment VI.3

Land Treatment Unit

Groundwater PHCs/Analytes, Permit Concentration Limits, and Test Methods

Attachment VI.3
Land Treatment Unit Groundwater PHCs/Analytes, Permit Concentration Limits, and Test Methods

Analyte	Water Required EQL/MDL µg/L	Water Permit Concentration Limit µg/L	EPA Analytical Method*
pH	N/A	N/A	
Specific Conductance	N/A	N/A	
Volatiles			
Benzene	5	5	8260
Ethylbenzene	5	5	8260
Toluene	5	5	8260
Xylenes (m,o,p)	10	10	8260
Semi-Volatile Organic Compounds			
Anthracene	10	10	8270
Benzo(a)anthracene	10	10	8270
Benzo(b)fluoranthene	10	10	8270
Benzo(a)pyrene	10	10	8270
Chrysene	10	10	8270
Fluoranthene	10	10	8270
1-Methylnaphthalene	10	10	8270
Naphthalene	10	10	8270
Phenanthrene	10	10	8270
Pyrene	10	10	8270
Cresols	10	10	8270
2-4-Dimethylphenol	10	10	8270
Phenol	10	10	8270
Metals			
Chromium	50	50	6010
Lead	50	50	6010

*** Permittee must use the method noted in the table or an equivalent method that has already been approved under SW-846. Any equivalent method must also be approved by DEQ.**

Attachment VI.4

Land Treatment Unit

Groundwater Sampling and Analysis Plan

Attachment VI.4

GROUNDWATER SAMPLING PROCEDURES (SAMPLING AND ANALYSIS PLAN)

These procedures are to be used for compliance with Module VI of the Permit. In lieu of a Waterra inertial pump, sampling equipment may be used which meets recommendations of the Montana DEQ Technical Guidance Document for Groundwater Sampling Methodologies.

Unless otherwise noted, required observations and measurements are recorded on a field log.

Minimum PPE is worn based on what is required by the permit writer for sampling. This includes steel toe safety shoes, Nomex clothing, safety glasses with side shields, and hard hat. Hand protection is worn based on field conditions and sample method recommendations (see SW 846 methods). Gloves worn during actual sampling shall prevent sample contamination (per SW 846) and protect sampler. Additional PPE may be required based on field conditions.

1.0 WELL EVACUATION PROCEDURES

1) Record name of well to be sampled on sample log form.
2) Don appropriate gloves and unlock well.
3) Remove well cap.
4) Use a photo-ionization meter to measure the air space at the well head. Record PID reading.
5) Measure the depth to ground water from the designated measuring point on the well casing or the surface casing. Measure again to confirm the first measurement. Record the readings on sample log. Measure the total depth of the well. A comparison of this measurement with the depth of the well at the time the well was completed will indicate if significant sedimentation is occurring in the well.
6) Calculate the volume of water in the well based on total depth of well, diameter of well casing, and height of water column in the well.
7) Remove 3-5 volumes of water using a bailer, Waterra inertial pump or low flow pump. Inspect the first gallon of water removed and note if there is hydrocarbon sheen present.
   Low yielding wells should be purged until dry and then sampled with the next appearance of water in the well.
8) Record field parameters, such as pH, specific conductance, and temperature, at approximately equal time intervals during purging. Record field parameters at least 4 times for each well. Record prior to purging and then with each casing volume. Stable consecutive reading should be obtained (less than 20% variation between readings) for all the parameters above.
9) Change PPE as needed to prevent sample contamination.

2.0 GROUND-WATER SAMPLING PROCEDURES

1) Prior to beginning sample collection don clean gloves.
2) Collect samples using either disposable, polyethylene, bottom filling bailers, a dedicated Waterra inertial pump, or Low-flow (micropurge) sampling.
    a) If a bailer is used, lower the bailer into the well in a manner which minimizes disturbance to the water table. Remove the bailer carefully to minimize volatilization of organic compounds.
    b) If a Waterra pump is used operate it in a manner which minimizes disturbances to the water table. Minimize volatilization of organic compounds by filling sample containers under low flow operations.
    c) If low flow sampling is done it will follow MT DEQ guidance below:

       Low-Flow or Micropurging

       Low-flow or Micropurge sampling is the preferential methodology for groundwater sampling. Low-flow sampling allows wells to be purged and sampled without causing excess agitation within the water column and reduces concerns associated with turbidity. It also allows for greater sample consistency. Specially designed pumps and equipment should be used for true low-flow sampling protocol. Pre-cleaned or dedicated, low-flow bladder pumps should be used for purging and sampling. The disposable tubing and pump should be lowered gently and set at approximately the upper third or fourth of the screened interval. If the static water level is below the top of the screen, then the pump will be lowered to the upper third or fourth of the water column. In either case, the pump intake will be placed a sufficient distance above the bottom of the well to avoid mobilization of any accumulated sediment. Well purging should begin at a rate of 0.2 to 0.5 L/min while continuing under a maximum purge rate of 1.0 L/min. The optimum pumping rate should be determined with continuous water level measurements using an electronic water-level indicator. The appropriate rate must be equal to or less than the natural recovery rate of the well. Drawdown in the well should be minimized. The pump intake may be adjusted as the water level responds to pumping. During low-flow purging, pH, specific conductance, dissolved oxygen and temperature will be monitored approximately every three to five minutes using a flow through cell. Well purging should be considered complete when at least three consecutive readings of pH, temperature, dissolved oxygen and specific conductance have been collected and have stabilized to within ten percent of the last series of measurements (or one tenth of a unit in the case of pH). Once field parameters have stabilized, samples should be collected directly from the end of the discharge tube after disconnecting the flow-through cell.

3) Once the sample has been collected, prepare and preserve them in accordance with EPA recommended procedures. Filter the samples that will be analyzed for metals through a disposable 45 micron filter before acidifying. If filter becomes clogged replace as needed.
4) Collect ground water by first filling sample containers for volatile organic analysis, then fill containers for semi-volatile analysis and finally metals sample containers.
5) Upon completion of sampling, lock the well and remove the sampling material from around the well.
6) Contain and dispose of purge/development water on the land treatment unit associated with the well that is being sampled.
7) Bag waste disposable items and dispose of into a drum designated for the waste.

2.1 COLLECTION OF DUPLICATE AND BLANK SAMPLES

Duplicate samples should be collected at a frequency of 10-20 percent and submitted blind to the laboratory.

1) TRIP BLANKS – Trip blanks for VOC analyses will be shipped along with clean sample bottles from the laboratory that will conduct analyses. One trip blank will included per individual sample shipment cooler containing samples for volatile analysis and will be submitted to the laboratory for volatile analysis.
2) FIELD AND EQUIPMENT BLANKS – Field blanks will be prepared to determine whether atmospheric sources of waste constituents may be biasing the data. Field blanks will consist of laboratory grade analyte free water. The analyte free water will be poured into the appropriate sample containers and preservatives added as appropriate.

   If sampling equipment comes into contact with more than one individual well, equipment blanks will be prepared using site sampling equipment. Equipment blanks will consist of analyte free water poured over the decontaminated sampling tools and collected in basins, and then transferred to sample containers for shipment to the laboratory.

   The number of field and equipment blanks will be between 10-20% of the number of locations sampled.

3.0 WELL EVACUATION AND GROUND-WATER SAMPLING EQUIPMENT

Field equipment must meet the requirements of these procedures. All reagents and equipment used must be that required by the approved methods.

4.0 DECONTAMINATION OF SAMPLING EQUIPMENT

The purging of monitoring wells in preparation for sampling will be done using equipment from Part 1.0 above. If this equipment is used on more than one individual well, the following steps will be used for sampling equipment used for collecting VOC samples:

- Thoroughly scrub with non phosphate detergent and grease cutting agent. If equipment is heavily contaminated with product, this step can be preceded by an isopropanol wash.
- Rinse the equipment several times with water of tap quality or better.
- Conduct a final rinse with at least three flushes using distilled water.

When decontamination is being done, the effectiveness of the decontamination will be demonstrated by conducting field equipment rinsate blanks. Decontamination wash solutions and rinsate will be collected and disposed of on the land treatment unit being sampled or by placing into the waste water treatment plant upstream of the API separator.

5.0 FIELD EQUIPMENT CALIBRATION

Field equipment, such as photo-ionization detectors, pH meters, specific conductance meters, will be calibrated and operated in accordance with the manufacturer’s instructions and manuals. Copies of these instructions and manuals will be available on-site. Field calibrations will be documented on the field log.

6.0 SAMPLE CUSTODY

The sample custody program described below allows for tracking the possession and handling of individual samples from the time of field collection through laboratory analysis. These procedures are designed to comply with USEPA sample control requirements.

1) Field Custody
   Sample containers will be labeled at the time of sampling with a sample label containing the information listed below:
   - Sample date and time collected.
   - Sample Identification (sample well number).
   - Preservatives, if any, and whether sample was filtered.
   - Initial of sample collector.

   Sample containers will be placed on ice, in a cooler, if sample(s) is to be shipped the same day as it was collected. If shipping will be done on following day(s) the sample will be maintained on ice in coolers or may be stored in the sample refrigerator in the on-site laboratory at ExxonMobil Billings Refinery. Samples stored in the refrigerator will be placed on ice in a cooler at the time of shipping.

2) CHAIN OF CUSTODY

The Chain-of-Custody (COC) record is used to document the transfer of samples from the sampler to the laboratory. An original COC and at least one copy are completed for each set of samples shipped to the laboratory. The COC, and any sampling instructions, is placed in a waterproof bag and placed in a cooler with the samples. A copy of the COC is retained for project files.

The COC contains, at least, the following information:

- Sample identification and location
- Laboratory identification
- Date and time of sampling
- Signature of sampler and anyone who accepts the samples or relinquishes them. Also the date and time samples received or relinquished.
- Sample type (typically water)
- Sample analysis request

In some cases, indications of unusual sample characteristics, such as suspected high organic concentration, maybe noted on the COC. These are used to communicate with the receiving laboratory that dilution or other sample preparation steps may be needed.

The sampler is responsible for maintaining custody of the samples until they are delivered to the analyzing laboratory or to a sample shipper. If the samples are stored in the ExxonMobil on-site laboratory the COC should be signed that sample was received by a laboratory supervisor or a member of the Environmental section. The person who has received these samples is responsible to ensure the samples are maintained at the correct temperature at all times.

If the contract laboratory conducting analyses is located in Billings, Montana the samples will be delivered to that laboratory by a member of the Environmental section or by a designated courier. If the laboratory conducting analyses is located outside of Billings, Montana a common courier will be used to ship sealed containers to that laboratory. The receiving laboratory will note on the COC date and time of sample receipt and sample condition.

Module VII

Facility-Wide Corrective Action

Module VII
Facility-Wide Corrective Action

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Attachments

Module VII
Facility-Wide Corrective Action (FWCA)

The framework for corrective action requirements in this Module is based upon the guidance contained in the Federal Registers dated July 27, 1990 (55 FR No. 145, pp 30797-30884), and May 1, 1996 (61 FR No. 85, pp 19431-19464), both titled Corrective Action for Releases From Solid Waste Management Units at Hazardous Waste Management Facilities, as amended in the Federal Register dated October 7, 1999 (64, FR No. 194, pp 54604-54607).

The guidance encourages a facility-specific approach to corrective action. The Permittee may proceed with corrective action using a phase-by-phase approach or use alternative approaches, such as combining corrective action phases, grouping areas of contamination, prioritizing areas for remediation, or other facility specific approaches. Any approach taken will be dependent upon site-specific conditions and remediation objectives. The corrective action approaches must be developed through work plans and reports that must be submitted to DEQ for approval.

VII.A. **Applicability**

VII.A.1. *General*

The Permittee must institute corrective action as necessary to protect human health and the environment for all releases of hazardous waste or constituents from any solid waste management unit (SWMU), area of concern (AOC), or from any other source of contamination at the facility, regardless of the time at which waste was placed in such unit. [MCA 75-10-406(7) and 40 CFR 264.101(a)]

VII.A.2. *Off-Site*

The Permittee must implement corrective actions beyond the facility property boundary, where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of DEQ that, despite the Permittee's best efforts, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis. [MCA 75-10-406(7) and 40 CFR 264.101(c)]

VII.A.3. *Specifics*

The Conditions of this Module apply to:

VII.A.3.a. The SWMUs and AOCs identified in Attachment VII.1 of this Module;

VII.A.3.b. Newly discovered SWMUs and AOCs discovered during the course of ground water monitoring, field investigations, environmental audits, or by other means; and

VII.A.3.c. Newly identified releases from previously identified SWMUs or AOCs discovered during the course of ground water monitoring, field investigations, environmental audits, or by other means.

VII.A.4. *Description and Status of SWMUs and AOCs*

Attachment VII.1 lists and describes the status of SWMUs and AOCs that have been identified by DEQ and the Permittee.

VII.A.4.a. DEQ will update Attachment VII.1 when changes to the status of SWMUs and/or AOCs occur or when new SWMUs and/or AOCs are identified. DEQ will send revisions to Attachment VII.1 to the Permittee for inclusion in all copies of the Permit.

VII.A.5. *Reportable Spills and Releases*

Spills and releases that occur at any time within the Facility boundaries must be reported to DEQ as required by the Comprehensive Environmental Cleanup and Responsibility Act (§75-10-701, et seq., MCA); Hazardous Waste Act (§75-10-401, et seq., MCA); Solid Waste Management Act (§75-10-201, et seq., MCA); Underground Storage Tank Act (§75-11-501, et seq., MCA); and the Water Quality Act (§75-5-101, et seq., MCA). Spills to soil, surface water, and groundwater must be remediated to DEQ approved risk-based levels or Montana water quality standards that are protective of human health and the environment.

VII.A.5.a. Spills and releases not remediated within a reasonable timeframe may be designated by DEQ as a new SWMU or AOC under Condition VII.D., or a release from an existing SWMU or AOC under Condition VII.E.

VII.A.5.a.i. DEQ will notify the Permittee of its determination in writing. If DEQ determines that additional investigation is needed, the Permittee shall be required to prepare an RFI Work Plan as outlined in Condition VII.D.3.a. or VII.E.2.a.

VII.A.6. *Compliance Schedule*

The Permittee shall follow the Compliance Schedule of Attachment VII.7. [40 CFR 264.101(b)]

VII.A.7. *Modifications*

Permit modifications to Module VII include selection of any corrective measures as outlined in Conditions VII.I.2. (Public Participation) and VII.K. (Remedy Approval and Permit Modification) and any subsequent significant changes to any selected corrective measures previously incorporated into this Permit by modification.

VII.B. **Status of Corrective Action at Permit Issuance**

At the time of the Permit Reissuance, the Permittee has completed a RCRA Facility Investigation (RFI), a Corrective Measures Study (CMS), and Corrective

Measures Implementation Work Plan (CMIWP) at the Facility as listed in Attachment VII.1.

VII.B.1. A RCRA Phase I RFI, which investigated 21 SWMUs/AOCs at the Refinery was completed in 1993;

VII.B.2. A RCRA Phase II RFI which further investigated the lateral and vertical extent of contaminants in soil and groundwater was completed in 1998;

VII.B.3. A site-wide risk assessment was conducted as part of the RFI. ExxonMobil consolidated the SWMUs/AOCs into six distinct areas of the Refinery for the risk assessment. ExxonMobil completed a site-wide risk assessment in 1998;

VII.B.4. A CMS Report was completed in 2005. With increasingly refined characterization of the Refinery, the six areas from the risk assessment were further refined into four remediation areas in the CMS. The four remediation areas were called the Fire Training Area, Interior Refinery Area, NAPL Accumulation Area, and the River Boundary Area. In 2000, the Fire Training Area was singled out by the USEPA for a focused risk assessment. The results of the risk assessment indicated no unacceptable risk to human health and corrective measures were not considered further in the CMS.

VII.B.5. Corrective Measures Selection was completed in 2009. Attachment VII.2 provides the statement of basis for the selected corrective measures.

VII.B.6. The Corrective Measures Implementation Work Plan for the selected corrective measures was approved in 2010.

VII.B.6.a. The Permittee must complete a 5-year review on the selected corrective measures as required in Condition VII.L.6. of this Permit.

VII.B.7. Attachment VII.1 presents a summary of the status of each SWMU and AOC in the corrective action process. Attachment VII.1 will be updated by DEQ as described in Condition VII.A.4.a. when changes in SWMU or AOC status occur.

VII.C. Financial Assurance and Liability Coverage

The Permittee shall provide financial assurance and liability coverage for all aspects of facility-wide corrective action, as required by Condition I.G. (Financial Assurance) of this Permit. The purpose of financial assurance and liability coverage is to guarantee performance of and payment for the RFI, IM, CMS, and CMI activities and to provide liability insurance coverage for third-party injury and property damage claims resulting from sudden and non-sudden accidental occurrences arising from any activity performed in accordance with the corrective action provisions of this Permit.

VII.D. **New SWMUs and AOCs – Notification and Assessment Requirements**

VII.D.1. *Notification*

VII.D.1.a. In accordance with Condition VII.A.5.a.i., DEQ will notify the Permittee of its determination that a spill or release under Condition VII.A.5. (Reportable Spills and Releases) will be classified as a new SWMU or AOC.

VII.D.1.b. If required by Condition VII.A.5., the Permittee shall notify DEQ in writing within 15 calendar days of discovery of any new spill or release associated with a release of hazardous constituents from current facility activities or from a previously unknown historical source. The notification must include, at a minimum, the following:

VII.D.1.b.i. The location of the SWMU or AOC;

VII.D.1.b.ii. The available information pertaining to the nature of the wastes, including hazardous constituents, at the SWMU or AOC;

VII.D.1.b.iii. The known extent and magnitude of the release; and

VII.D.1.b.iv. The media(s) affected.

VII.D.2. *Assessment Report*

If further investigation of a newly identified SWMU or AOC is required by DEQ, the Permittee must prepare and submit to DEQ, within ninety (90) calendar days of the DEQ request, a written assessment report. At a minimum, this assessment report must include the following information:

VII.D.2.a. The location on a topographic map of appropriate scale as required under 40 CFR 270.14(b)(19);

VII.D.2.b. Designation of the type and function of the SWMU or AOC;

VII.D.2.c. General dimensions, capacities, and structural description (including any available plans/drawings);

VII.D.2.d. Dates of operation;

VII.D.2.e. Specification of all wastes (including any available data on hazardous constituents) that have been managed at the location; and

VII.D.2.f. All available information pertaining to any release of hazardous waste or hazardous constituents (including ground water, surface water, and soil analytical results).

VII.D.3. *DEQ Action*

VII.D.3.a. Based on the results of the assessment report, DEQ will determine the need for further investigations of the SWMU or AOC. If DEQ determines that additional investigation is needed, the Permittee will be required to prepare an RFI Work Plan as outlined in Condition VII.H.1. or an Interim Measures Work Plan as outlined in Condition VII.I.1.

VII.D.3.a.i. If contamination present in the SWMU(s) or AOC(s) is similar to units assessed in previous facility-wide corrective action activities, an equivalency demonstration report may be prepared in accordance with Condition VII.G. (Equivalency Demonstration)

VII.D.3.b. If DEQ requires further investigation of a newly identified SWMU or AOC and the Permittee is currently implementing an RFI Work Plan, the newly identified SWMU or AOC may be included in that Work Plan. The Permittee shall prepare an addendum to the RFI Work Plan for investigation of the newly identified SWMU or AOC. The addendum must meet the requirements of Condition VII.G.1. (Equivalency Demonstration Report).

VII.E. Existing SWMUs and AOCs – Notifications and Assessment Requirements

VII.E.1. *Notification*

VII.E.1.a. In accordance with Condition VII.A.5.a., DEQ may determine that a spill or release that occurs on an existing SWMU or AOC identified in Condition VII.A.4. (Description and Status of SWMUs and AOCs) must require additional investigation in accordance with VII.E.2. (DEQ Action).

VII.E.1.b. If the Permittee discovers a previously unknown release in an existing SWMU or AOC identified in Condition VII.A.4. during the course of groundwater monitoring, field investigations, environmental audits, site construction, or other means, the Permittee must notify DEQ in writing within fifteen (15) calendar days of discovery.

VII.E.1.b.i. The newly discovered releases may be from SWMUs and AOCs identified in Condition VII.A.4. for which further investigation and/or corrective action was not previously required.

VII.E.1.b.ii. The notification must include, at a minimum, the following:

VII.E.1.b.ii.1. The location of the SWMU or AOC;

VII.E.1.b.ii.2. The available information pertaining to the nature of the wastes, including hazardous constituents, at the SWMU or AOC;

VII.E.1.b.ii.3. The known extent and magnitude of the release; and

VII.E.1.b.ii.4. The media(s) affected.

VII.E.2. *DEQ Action*

VII.E.2.a. If DEQ determines that further investigation of the SWMU or AOC is needed, the Permittee shall be required to prepare an RFI Work Plan as outlined in Condition VII.H.1. or an Interim Measures Work Plan as outlined in Condition VII.I.1.

VII.E.2.b. If DEQ requires further investigation and the Permittee is currently implementing an RFI Work Plan, the newly identified release may be included in that Work Plan. The Permittee shall prepare an addendum to the RFI Work Plan for investigation of the newly identified SWMU or AOC. The addendum must meet the requirements of Condition VII.H.1. (RFI).

VII.F. **New Detections in Analytical Results**

VII.F.1. *Notification*

During activities undertaken as part of any future investigation, the Permittee shall notify DEQ within 15 calendar days after the Permittee's receipt or its representative's receipt of analytical results that detect any hazardous waste or hazardous constituent that were previously not detected. The new detections may be from either documented or unidentified sources.

VII.F.2. *DEQ Action*

DEQ may require further investigation of the new detections reported in Condition VII.F.1.

VII.G. **Equivalency Demonstration**

VII.G.1. *Equivalency Demonstration Report*

VII.G.1.a. If contamination present in the SWMU(s) or AOC(s) is similar to units assessed in previous facility-wide corrective action activities, DEQ may allow the Permittee to submit an equivalency demonstration report, within a timeframe specified by DEQ. The demonstration must include, as applicable:

VII.G.1.a.i. All information pertaining to the release or releases of hazardous waste or hazardous constituents, including analytical results, history of the release, and any interim corrective measures taken;

VII.G.1.a.ii. An evaluation of the information provided in Condition VII.G.1.a.i., above, including data quality reviews, and nature and extent of contamination;

VII.G.1.a.iii. An evaluation of the risk which follows the general methodology presented in the ExxonMobil Billings Refinery Risk Assessment Report, dated February 25, 1998, using the most current risk parameters and screening levels in the risk evaluation;

VII.G.1.a.iv. An evaluation of potential corrective measures which is consistent with the Final Corrective Measures Study for the ExxonMobil Billings Refinery, dated February, 2005; and

VII.G.1.a.v. A proposed corrective measure.

VII.G.2. *DEQ Action*

VII.G.2.a. DEQ will approve or disapprove the equivalency demonstration report of Condition VII.G.1. (Equivalency Demonstration Report). If the report is disapproved, DEQ will notify the Permittee in writing of the deficiencies and specify a due date for submission of a revised report.

VII.G.2.b. Upon approval of the equivalency demonstration report, DEQ will notify the Permittee that:

VII.G.2.b.i. No further action is required;

VII.G.2.b.ii. Further investigation is required;

VII.G.2.b.iii. Interim Measures must be implemented in accordance with Condition VII.I. (Interim Measures); or

VII.G.2.b.iv. A notification that the SWMU(s) and/or AOC(s) may be incorporated into the selected remedy currently being implemented as set forth in Condition VII.L. (Corrective Measures Implementation).

VII.G.2.b.iv.1. The notification shall include requirements for inclusion into the current Corrective Measures Implementation Work Plan.

VII.H. **RCRA Facility Investigation (RFI)**

VII.H.1. *Work Plan(s)*

VII.H.1.a. <u>Applicability</u>

As directed by DEQ under circumstances set forth in Conditions VII.D (New SWMUs and AOCs) and VII.E (Existing SWMUs and AOCs), the Permittee shall prepare and submit an RFI Work Plan(s). The Permittee shall submit the RFI Work Plan(s) within a timeframe specified by DEQ.

VII.H.1.b. <u>Contents</u>

The RFI Work Plan(s) should, at a minimum, address the elements as outlined in Attachment VII.3 (RFI Scope of Work) and must include:

VII.H.1.b.i. Schedules and a cost estimate for implementation and completion of specific actions necessary to determine the nature and extent of releases;

VII.H.1.b.ii. The potential pathways of contaminants releases to the air, land, surface water, and ground water; and

VII.H.1.b.iii. The risks to human health and the environment associated with the releases.

VII.H.1.c. Deviations

The Permittee shall provide sufficient justification and/or documentation to exclude particular units, media, or pathways associated with a unit (i.e. ground water, surface water, soil, subsurface gas, or air). Such deletions of a unit, media, or pathway from the RFI(s) are subject to the approval of DEQ. The Permittee should also provide sufficient written justification for any omission or deviation from the elements outlined in Attachment VII.3 (RFI Outline). Such omissions or deviations are subject to the approval of DEQ. In addition, the RFI Work Plan(s) must include all investigations necessary to ensure compliance with 40 CFR 264.101.

VII.H.1.d. Risk Assessment

VII.H.1.d.i. *Contents:* The Permittee shall include in the RFI Work Plan(s) a baseline risk assessment work plan as required in Attachment VII.3 (RFI Scope of Work). The baseline risk assessment should include the elements outlined in Attachment VII.3 (RFI Scope of Work) and VII.4 (Baseline RA Scope of Work).

VII.H.1.d.ii. *Deviation:* The Permittee may provide written justification for changes in the submittal schedule and contents of the baseline risk assessment. The Permittee may deviate from the requirements of submitting a baseline risk assessment with the RFI Work Plan(s) if prior written approval is obtain from DEQ.

VII.H.1.e. DEQ Action

The RFI Work Plan(s) must be approved in writing by DEQ prior to implementation. DEQ's letter approving the RFI Work Plan(s) will specify the start date of the RFI Work Plan(s) schedule.

VII.H.1.e.i. If DEQ does not approve the RFI Work Plan(s), DEQ shall either:

VII.H.1.e.i.1. Notify the Permittee in writing of the RFI Work Plan(s)'s deficiencies and specify a due date for submission of a revised RFI Work Plan(s); or

VII.H.1.e.i.2. Revise the RFI Work Plan(s) and notify the Permittee of the revisions and the start date of the schedule within the approved RFI Work Plan(s).

VII.H.2. *Implementation*

The Permittee shall implement the RFI in accordance with the approved Work Plan(s).

VII.H.3. *Notification*

The Permittee shall notify DEQ of investigation activities such as drilling, boring, or sampling undertaken pursuant to the RFI Work Plan(s), no less than fourteen (14) calendar days prior to implementation. Notification shall be made by electronic mail to the Hazardous Waste Section Project Manager for the ExxonMobil Billings Refinery.

VII.H.4. *Progress Reports*

The Permittee shall provide DEQ with RFI progress reports. The reporting schedule for the RFI progress reports must be established in the RFI Work Plan(s); however, progress reports must be submitted at least quarterly. RFI progress reporting will commence upon DEQ approval of the RFI Work Plan(s). Subsequent changes to the frequency and scope of the RFI progress reports must be approved in writing by DEQ. The progress reports must contain at a minimum the following information:

VII.H.4.a. A description of the portion of the RFI completed;

VII.H.4.b. Summaries of findings;

VII.H.4.c. Summaries of all deviations from the approved RFI Work Plan(s) during the reporting period;

VII.H.4.d. Summaries of all problems or potential problems encountered during the reporting period;

VII.H.4.e. Projected work for the next reporting period; and

VII.H.4.f. Copies of daily reports, inspection reports, laboratory/monitoring data, and other pertinent information.

VII.H.5. *Draft and Final Reports*

VII.H.5.a. <u>Schedule</u>

VII.H.5.a.i. The Permittee shall prepare and submit to DEQ a draft and final RFI Report(s) for the investigations conducted pursuant to the Work Plan(s). The Draft RFI Report(s) must be submitted to DEQ for review in accordance with the schedule in the approved RFI Work Plan(s).

VII.H.5.a.ii. The Final RFI Report(s) must be submitted within forty-five (45) calendar days after receipt of DEQ's comments on the Draft RFI Report(s), unless an alternative schedule is approved in writing by DEQ.

VII.H.5.b. <u>Contents</u>

VII.H.5.b.i. *General:* The RFI Report(s) must include an analysis and summary of all required investigations of those units included in the RFI Work Plan(s). The summary must describe the type and extent of contamination, including sources and migration pathways, and a description of actual or potential human or ecological receptors.

VII.H.5.b.ii. *Risk Assessment:* The RFI Report(s) must include a baseline risk assessment for both environmental and human receptors unless DEQ has approved in writing a deviation. The human health baseline risk assessment must include, but is not limited to, a residential exposure scenario. The baseline risk assessment should address the elements outlined in Attachment VII.4 (Baseline RA Scope of Work). The Permittee should provide written justification for any omissions or deviations from the elements outlined in Attachment VII.4.

VII.H.5.b.iii. *Background Information:* The RFI Report(s) must describe the extent of contamination (qualitative and quantitative) in relation to background levels. Background levels must be indicative of the area surrounding the facility and must not be impacted by facility operations.

VII.H.5.b.iv. *Data Quality:* The Permittee shall ensure that the data generated during the investigation are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support a Corrective Measures Study (CMS), if necessary.

VII.H.5.c. <u>DEQ Action</u>

VII.H.5.c.i. DEQ will review the Draft RFI Report(s) and approve the Draft RFI Report(s) and specify that the Final RFI Report(s) must be submitted pursuant to Condition VII.H.5.a. (Schedule), or disapprove the Draft RFI Report(s). If DEQ disapproves the Draft RFI Report(s), DEQ will notify the Permittee in writing of the Draft RFI Report's deficiencies and specify a due date for submission of a revised Draft RFI Report(s).

VII.H.5.c.ii. DEQ will review the Draft and/or Final RFI Report(s) and notify the Permittee of the need for further investigative action, the need for implementing Interim Measures as set forth in Condition VII.I. (Interim Measures), and/or the need for a CMS as set forth in Condition VII.J. (Corrective Measures Study).

VII.H.5.c.iii. DEQ will notify the Permittee if DEQ determines, upon review of the RFI Report(s), that no further action is required for SWMUs and AOCs described in the RFI Report(s).

VII.H.6. *Groundwater Monitoring*

Groundwater monitoring must continue as outlined in the RFI Work Plan(s) unless altered by implementation of a DEQ-approved Corrective Measures Implementation (CMI) Work Plan(s) pursuant to Condition VII.L. (Corrective Measures Implementation), or a DEQ approved revision is made to the RFI Work Plan(s) at the Permittee's or DEQ's request during the period between completion of the RFI Report(s) and the implementation of the CMI Work Plan(s).

VII.I. **Interim Measures**

VII.I.1. *Work Plan(s)*

VII.I.1.a. Applicability

As directed by DEQ under circumstances set forth in Conditions VII.D. (New SWMUs and AOCs) and VII.E. (Existing SWMUs and AOCs), the Permittee shall prepare and submit an IM Work Plan(s) for any unit that poses an immediate or potential threat to human health or the environment. The IM Work Plan(s) must be submitted within thirty (30) calendar days of receipt of such notification. If DEQ determines that immediate action is required, DEQ or an authorized representative may verbally direct the Permittee to act prior to the Permittee's receipt of DEQ's written notification. Interim measures may be conducted concurrently with other investigations required under the terms of this Permit.

VII.I.1.b. Contents

The IM Work Plan(s) must ensure that the interim measures are designed to mitigate any immediate or potential threat(s) to human health or the environment. The IM Work Plan(s) should address, at a minimum, the elements listed in Attachment VII.6 (CMI/IM Scope of Work). The Permittee must provide sufficient written justification for any omissions or deviations from the minimum requirements in Attachment VII.6. Such omissions or deviations are subject to written approval of DEQ.

VII.I.1.c. DEQ Action

The IM Work Plan(s) must be approved in writing by DEQ prior to implementation. DEQ shall specify the starting date of the IM Work Plan(s) schedule in its written approval.

VII.I.1.c.i. If DEQ disapproves the IM Work Plan(s), DEQ shall either:

VII.I.1.c.i.1. Notify the Permittee in writing of the IM Work Plan(s)'s deficiencies and specify a due date for submitting of a revised IM Work Plan(s); or

VII.I.1.c.i.2. Revise the IM Work Plan(s) and notify the Permittee of the revisions and the start date of the schedule within the approved IM Work Plan(s).

VII.I.2. *Public Participation*

DEQ may require a permit modification in accordance with Condition I.M.2. (Modification or Revocation and Reissuance) for the proposed IM to allow public participation on Draft IM Work Plan(s).

VII.I.3. *Implementation*

The Permittee shall implement the interim measures in accordance with the approved IM Work Plan(s).

VII.I.4. *Notification*

The Permittee shall notify DEQ of investigation activities (such as drilling, boring, or sampling) or remedial activities undertaken pursuant to the IM Work Plan(s) no less than fourteen (14) calendar days prior to implementation. Notification must be made by electronic mail to the Hazardous Waste Section Project Manager for the ExxonMobil Billings Refinery.

VII.I.4.a. The Permittee shall notify DEQ as soon as possible of any planned changes, deletions or additions to the IM Work Plan(s). Notification must be made by electronic mail to the Hazardous Waste Section Project Manager for the ExxonMobil Billings Refinery. Such changes, deletions, or additions are subject to DEQ approval.

VII.I.5. *Progress Reports*

The Permittee shall provide DEQ with IM progress reports. The reporting schedule for the IM progress reports must be established in the IM Work Plan(s); however, progress reports must be submitted at least quarterly. Subsequent changes to the frequency and scope of the IM progress reports must be approved by DEQ. The IM progress reports must contain at a minimum the following information:

VII.I.5.a. A description of interim measures implemented and/or completed;

VII.I.5.b. Summaries of progress and/or results;

VII.I.5.c. Summaries of deviations from the approved IM Work Plan(s), and problems encountered during the reporting period;

VII.I.5.d. Projected work for the next reporting period; and

VII.I.5.e. Copies of all daily reports, inspection reports, laboratory/monitoring data, and other pertinent information.

VII.I.6. *Final Report(s)*

The Permittee shall prepare and submit an IM Final Report(s) to DEQ within forty-five (45) calendar days after completion of interim measures. The IM Report(s) must contain at a minimum the following information:

VII.I.6.a. A description of interim measures implemented;

VII.I.6.b. Summaries of results;

VII.I.6.c. Summaries of all problems encountered; and

VII.I.6.d. Summaries of accomplishments and/or effectiveness of interim measures.

VII.J. **Corrective Measures Study (CMS)**

VII.J.1. *Work Plan(s)*

VII.J.1.a. Applicability

VII.J.1.a.i. The Permittee shall prepare and submit to DEQ a draft CMS Work Plan(s) for units that require a CMS. The Work Plan(s) must be after notification by DEQ that a CMS is required, within a timeframe specified by DEQ. The CMS Work Plan(s) must be developed to meet the requirements of Condition VII.I.1.b. (IM Contents).

VII.J.1.a.ii. As necessary, units requiring interim measures may be addressed in a CMS Work Plan and Report.

VII.J.1.b. Contents

VII.J.1.b.i. The CMS Work Plan(s) should, at a minimum, address the elements in Attachment VII.5 (CMS Outline). The CMS Work Plan(s) must include schedules of implementation and completion of specific actions necessary to complete a CMS.

VII.J.1.b.ii. The Permittee shall provide justification and/or documentation for any unit deleted from the CMS Work Plan(s). Such deletions of a unit are subject to the written approval of DEQ. The CMS must be conducted in accordance with the approved CMS Work Plan(s).

VII.J.1.b.iii. The Permittee should also provide sufficient written justification for any omissions or deviations from the minimum requirements of Attachment VII.5. (CMS Outline). Such omissions or deviations are subject to the written approval of DEQ.

VII.J.1.b.iv. The scope of the CMS Work Plan(s) must include all investigations necessary to ensure compliance with 40 CFR 264.101.

VII.J.1.c. DEQ Action

The CMS Work Plan(s) must be approved in writing by DEQ prior to implementation. DEQ shall either approve or disapprove in writing the CMS Work Plan(s).

VII.J.1.c.i. If DEQ disapproves the CMS Work Plan(s), DEQ shall either:

VII.J.1.c.i.1. Notify the Permittee in writing of the CMS Work Plan(s)’s deficiencies and specify a due date for submitting of a revised CMS Work Plan(s); or

VII.J.1.c.i.2. Revise the CMS Work Plan(s) and notify the Permittee of the revisions and the start date of the schedule within the approved CMS Work Plan(s).

VII.J.2. *Implementation*

The Permittee shall implement the CMS according to the schedules specified in the CMS Work Plan(s).

VII.J.3. *Notification*

VII.J.3.a. The Permittee shall notify DEQ of investigation activities (such as drilling, boring, or sampling) or remedial activities undertaken pursuant to the CMS Work Plan(s), no less than fourteen (14) calendar days prior to implementation. Notification must be made by electronic mail to the Hazardous Waste Section Project Manager for the ExxonMobil Billings Refinery.

VII.J.4. *Draft and Final Report(s)*

VII.J.4.a. <u>Schedule</u>

The Permittee shall prepare and submit to DEQ a draft and final CMS Report(s) for the study conducted pursuant to the approved CMS Work Plan(s).

VII.J.4.a.i. The Draft CMS Report(s) must be submitted to DEQ in accordance with the schedule in the approved CMS Work Plan(s).

VII.J.4.a.ii. The final CMS Report(s) must be submitted to DEQ within forty-five (45) calendar days after receipt of DEQ's comments on the draft CMS Report(s), unless an alternative schedule is approved by DEQ.

VII.J.4.b. <u>Contents</u>

The CMS Report(s) must include an evaluation of each remedial alternative and present all information gathered under the approved CMS Work Plan(s), including a summary of any bench scale or pilot test conducted. The CMS Final Report(s) must contain adequate information to enable DEQ to make a decision on remedy selection, as described under Condition VII.K. (Remedy Approval and Permit Modification).

VII.J.4.c. <u>DEQ Action</u>

VII.J.4.c.i. DEQ will review the Draft CMS Report(s), approve the Draft CMS Report(s), and specify that the Final CMS Report(s) must be submitted pursuant to Condition VII.J.4.a. (Schedule), or disapprove the Draft CMS Report(s). If DEQ does not approve the Draft CMS Report(s), DEQ shall notify the Permittee in writing of any deficiencies and specify a due date for submittal of a revised Draft CMS Report(s).

VII.J.4.c.ii. DEQ may require the Permittee to further evaluate additional remedies or particular elements of one or more proposed remedies.

VII.J.4.c.iii. The Permittee will be notified if DEQ determines, upon review of the CMS Report(s), that no further action is warranted for the unit(s) described in the CMS.

VII.K. **Remedy Approval and Permit Modification**

VII.K.1. *Approval*

DEQ shall select corrective action remedies for the site. DEQ may select a remedy from the Final CMS Report(s), reject any alternative in the Final CMS Report(s), or prescribe a different remedial alternative or remedy performance standard. DEQ will base its selection, at a minimum, on protection of human health and the environment, including site-specific human and ecological receptors, existing law and regulations, and guidance. The remedy and justification for selection of the remedy will be presented in a document called a Statement of Basis.

VII.K.2. *Permit Modification*

After selection of a remedy, DEQ will initiate a permit modification to incorporate into the Permit the remedy and the Statement of Basis in accordance with 40 CFR 270.41. The Permittee shall implement the requirements of Condition VII.L. (Corrective Measures Implementation) when DEQ issues the permit modification incorporating the selected remedy.

VII.L. **Corrective Measures Implementation (CMI)**

VII.L.1. *Work Plan(s)*

VII.L.1.a. <u>Applicability</u>

The Permittee shall prepare and submit a Draft CMI Work Plan(s) following modification of the Permit to incorporate the selected remedy. The Draft CMI Work Plan(s) must be submitted within ninety (90) calendar days after finalization of the permit modification.

VII.L.1.b. <u>Contents</u>

VII.L.1.b.i. The CMI Work Plan must, at a minimum, address the elements listed in Attachment VII.6 (CMI and IM Outline) and Condition I.L. (Institutional Controls). The Permittee should provide sufficient written justification of any omissions or deviations from the minimum requirements in Attachment VII.6.

VII.L.1.b.ii. An Institutional Control and Land Use Control Plan must be included in the CMI Work Plan. The Plan must include:

VII.L.1.b.ii.1. A description of the procedures used by the Permittee to ensure proper institutional and land use controls for SWMUs and AOCs listed in Attachment VII.1;

VII.L.1.b.ii.2. A plan for ensuring continuance of institutional and land use controls when ownership of SWMUs and AOCs listed in Attachment VII.1 is transferred;

VII.L.1.b.ii.3. A plan for execution and maintenance of deed notices, deed restrictions, and survey plats required in Condition I.L. (Institutional Controls); and

VII.L.1.b.ii.4. A schedule for submittal of survey plats to local authorities required in Condition I.L.4.b.

VII.L.1.c. <u>DEQ Action</u>

The CMI Work Plan(s) must be approved in writing by DEQ prior to implementation. The letter approving the CMI Work Plan(s) must specify the start date of the CMI Work Plan(s) schedule.

VII.L.1.c.i. If DEQ does not approve the CMI Work Plan(s), DEQ shall either:

VII.L.1.c.i.1. Notify the Permittee in writing of the CMI Work Plan(s)'s deficiencies and specify a due date for submitting of a revised CMI Work Plan(s); or

VII.L.1.c.i.2. Revise the CMI Work Plan(s) and notify the Permittee of the revisions and the start date of the schedule within the approved CMI Work Plan(s).

VII.L.2. *Implementation*

The Permittee shall implement the approved CMI Work Plan(s) in accordance with the schedule specified in the Work Plan(s).

VII.L.3. *Notification*

VII.L.3.a. The Permittee shall notify DEQ of investigation activities (such as drilling, boring, or sampling) or remedial activities undertaken pursuant to the CMI Work Plan(s), no less than fourteen (14) calendar days prior to implementation. Notification must be made by electronic mail to the Hazardous Waste Section Project Manager for the ExxonMobil Billings Refinery.

VII.L.3.b. The Permittee shall give verbal notice to DEQ as soon as possible of any planned changes, deletions or additions to the CMI Work Plan(s). Verbal notification shall be followed by formal written notification. Changes, deletions, or additions to the CMI Work Plan are subject to DEQ approval.

VII.L.3.c. For significant changes, the Permittee shall submit an amended CMI Work Plan(s) to DEQ for approval. The amended CMI Work Plan(s) must include, but is not limited to, a description of changes to the selected remedy and justification of the change(s).

VII.L.4. *Remedy Changes*

Changes to the selected remedy after permit modification may be made upon written approval from DEQ. DEQ may determine an additional permit modification is necessary if proposed changes to the selected remedy are substantial enough to warrant public participation.

VII.L.5. *Progress Reports*

VII.L.5.a. The Permittee shall provide DEQ with progress reports on implementation of the CMI Work Plan(s). The reporting schedule for the CMI progress reports must be established in the CMI Work Plan(s); however, reports must be submitted at least quarterly. Subsequent changes to the frequency and scope of the CMI progress reports must be approved by DEQ.

VII.L.5.b. All CMI progress reports must contain at a minimum the following information:

VII.L.5.b.i. A description of corrective measure implemented and/or completed;

VII.L.5.b.ii. Summaries of progress and/or results;

VII.L.5.b.iii. Summaries of deviations from the approved CMI Work Plan(s), and problems encountered during the reporting period;

VII.L.5.b.iv. Projected work for the next reporting period; and

VII.L.5.b.v. Copies of all daily reports, inspection reports, laboratory/monitoring results, and other pertinent information.

VII.L.6. *Five-Year Review*

Five years after the date of Permit Reissuance, the Permittee must evaluate the implementation and performance of the remedy in order to determine if the remedy continues to be protective of human health and the environment.

VII.L.6.a. <u>Applicability</u>

The Permittee shall review data and other pertinent site-specific information, including sampling and monitoring plans, analytical results, operation and maintenance reports, and/or other documentation of corrective measures performance to determine the following:

VII.L.6.a.i. Whether the remedy is functioning as intended as set forth in the Statement of Basis and Corrective Measures Work Plan;

VII.L.6.a.ii. Whether the exposure assumption, toxicity data, cleanup levels, and corrective measures objectives used at the time of the remedy selection are still valid; and

VII.L.6.a.iii. Whether new information indicates the corrective measures will not achieve the corrective measures objectives, or is not protective of human health or the environment.

VII.L.6.b. <u>Report</u>

The Permittee shall submit a report to DEQ which presents the findings and conclusions of the review, including identification of any issues, recommendations, follow-up actions, and a determination as to whether the corrective measures are protective. The report must contain the data and information necessary to support all findings and conclusions.

VII.L.6.b.i. The report must be submitted by April 30, 2022 and five years following that date, until permit reissuance, termination, or another enforceable mechanism is issued to the Permittee for the ExxonMobil Billings Refinery.

VII.L.6.c. Department Action

VII.L.6.c.i. DEQ will review the five-year review report, and determine what actions, if any, must be taken. Upon approval, DEQ will:

VII.L.6.c.i.1. Notify the Permittee by written letter of actions that must be taken to improve and/or enhance the current remedy and a schedule for implementation;

VII.L.6.c.i.2. Notify the Permittee by written letter that no action is required; or

VII.L.6.c.i.3. Change the remedy, as allowed in Condition VII.L.4. (CMI Remedy Changes).

VII.L.6.c.ii. If DEQ does not approve the report, DEQ shall either:

VII.L.6.c.ii.1. Notify the Permittee in writing of deficiencies and specify a due date for submitting of a revised report; or

VII.L.6.c.ii.2. Revise the report and notify the Permittee of the revisions and any actions that must be taken as set forth in Conditions VII.L.6.c.i.1., VII.L.6.c.i.2., and VII.L.6.c.i.3.

VII.M. **Completion of Corrective Measures**

VII.M.1. *Applicability*

Conditions under this section (VII.M.) apply to completion of facility-wide corrective measures, completion of corrective measures specific to a group of SWMUs/AOCs, or completion of corrective measures for a specific SWMU or AOC.

VII.M.2. *Corrective Measures Completion Certification Report*

VII.M.2.a. The Permittee shall prepare and submit a Corrective Measures Completion Certification Report to DEQ within forty-five (45) days of completion of corrective measures conducted under Condition VII.L. (Corrective Measures Implementation).

VII.M.2.b. The Corrective Measures Completion Certification Report must at a minimum contain the following information:

VII.M.2.b.i. A description of all corrective measures completed;

VII.M.2.b.ii. Summaries of results and documentation of attainment of performance requirement;

VII.M.2.b.iii. Summaries of all problems encountered;

VII.M.2.b.iv. Summaries of accomplishments and/or effectiveness of corrective measures;

VII.M.2.b.v. Copies of all instruments of conveyance with notices required by Conditions I.L.1. (Deed Notices and Restrictive Covenants) and I.L.4. (Survey Plat); and

VII.M.2.b.vi. Certification that corrective measures have been completed in accordance with the approved CMI Work Plan(s) as per Condition VII.L.1. (CMI Work Plans)., and/or Interim Measures Work Plan(s) as per Condition VII.I.1. (IM Work Plans), and institutional and land use controls have been implemented as per Condition I.L. (Institutional Controls). The certification must be signed by the Permittee and by an independent, registered professional engineer(s) skilled in the appropriate technical discipline(s). Documentation supporting the independent professional engineer(s) certification must be furnished to DEQ upon request until DEQ approval of the Corrective Measures Completion Certification Report.

VII.M.3. *DEQ Approval*

DEQ shall review the Corrective Measures Completion Certification Report and, if necessary, notify the Permittee in writing of any deficiencies and specify a due date for submitting of a revised report. DEQ shall approve the Corrective Measures Completion Certification Report when all deficiencies have been addressed to its satisfaction.

VII.M.4. *Permit Modification*

After approval of the Corrective Measures Completion Certification Report, DEQ will initiate a modification incorporating the completion of the corrective measures into the Permit. The modification will remove the unit(s) associated with the completed corrective measures from further permit action unless releases are discovered from those units as set forth in Condition VII.E. (Existing SWMUs and AOCs). The permit modification will be in accordance with 40 CFR 270.41.

VII.N. **Modification of the Corrective Action Compliance Schedule**

If at any time DEQ determines that modification of the Compliance Schedule in Attachment VII.7 is necessary, DEQ may initiate a modification to the schedule in accordance with the procedures contained in 40 CFR 270.41. The Permittee may also submit a request for modification in accordance with 40 CFR 270.42.

VII.O. **Plan and Report Requirements**

VII.O.1. All plans and schedules are subject to approval by DEQ prior to implementation. The Permittee shall revise and implement all submittals and schedules as specified by DEQ.

VII.O.2. Work plans, reports, and other required documentation must be submitted in accordance with the approved schedule. Extensions of the due date for submittals may be granted by DEQ based on the Permittee's demonstration that sufficient justification for the extension exists.

VII.O.3. The Permittee shall submit an amended RFI Work Plan or Plans to DEQ if the Permittee or DEQ determines that an Assessment Report required under Condition VII.D.2. (New SWMUs or AOCs Assessment Report) or RFI or IM Work Plan(s) required under Condition VII.H.1. or VII.I.1., respectively, no longer satisfies requirements under this Permit or 40 CFR 264.101.

VII.O.3.a. DEQ will notify the Permittee in writing of its determination.

VII.O.3.b. The amended RFI Work Plan(s) must be submitted to DEQ within ninety (90) calendar days of the Permittee's determination or DEQ's written notification.

VII.O.4. All reports must be signed and certified in accordance with 40 CFR 270.11.

VII.O.5. The Permittee shall provide one hard copy and one electronic copy of all work plans and reports to DEQ and one hard copy of all work plans and reports to the Environmental Protection Agency, Region 8.

VII.O.5.a. Copies sent to DEQ should be addressed to the current DEQ project manager for the ExxonMobil Billings Refinery.

VII.O.5.b. Copies sent to EPA, Region 8 should be addressed to the Program Director, Resource Conservation and Recovery Program.

Attachment VII.1

List and Location of
Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
and
Location Map

ExxonMobil Billings Refinery
Solid Waste Management Units and Areas of Concern (Current Status) March 2017

Area	RA Exposure Area	Description	Date Identified	RFA Status	RFI Status	CMS Status	CMI Status
SWMU 1	N/A	East Land Treatment Unit	May 1987	Regulated Unit			
SWMU 2	N/A	South Land Treatment Unit	May 1987	Regulated Unit			
SWMU 3	N/A	Waste Staging Area	May 1987	Regulated Unit			
SWMU 4	N/A	Lead Weathering Tank	May 1987	Regulated Unit			
SWMU 5	N/A	HF Neutralization Tanks	May 1987	**NFA**			
SWMU 6	1	API Separator	May 1987	C	Phase I: C Phase II: C RA: C - NFA SS	C	In Progress
SWMU 7	3	Product loading Area API Separator	May 1987	C	Phase I: C Phase II: C RA: C - NFA SS	C	In Progress
SWMU 8	N/A	Slop Oil Storage Tank 1	May 1987	**NFA**			
SWMU 9	N/A	Slop Oil Storage Tank 2	May 1987	**NFA**			
SWMU 10	N/A	Slop Oil Storage Tank 3	May 1987	**NFA**			
SWMU 11	N/A	Induced Air Flotation Unit	May 1987	**NFA**			
SWMU 12	N/A	IAF Wastewater Trench	May 1987	C	Phase I: C Phase II: **NFA**		
SWMU 13	2	Biological Oxidation Pond – Pond 3	May 1987	C	Phase I: C Phase II: C RA: C – NFA SS	C	In Progress
SWMU 14	2	Wastewater Stabilization Pond – Pond 4	May 1987	C	Phase I: C Phase II: C RA: C – NFA SS	C	In Progress
SWMU 15	2	Wastewater Stabilization Pond – Pond 5	May 1987	C	Phase I: C Phase II: C RA: C – NFA SS	C	In Progress
SWMU 16	2	Wastewater Stabilization Pond – Pond 6	May 1987	C	Phase I: C Phase II: C RA: C – NFA SS	C	In Progress
SWMU 17	1	Pond 1	May 1987	C	Phase I: C Phase II: C RA: C – NFA SS	C	In Progress

Area	RA Exposure Area	Description	Date Identified	RFA Status	RFI Status	CMS Status	CMI Status
SWMU 18	1	API Overflow Surface Impoundment	May 1987	C	Phase I: C Phase II: C RA: C – NFA SS	C	In Progress
SWMU 19	N/A	Clean Water Separator	May 1987	**NFA**			
SWMU 20	N/A	Clean Water Separator Ditch	May 1987	**NFA**			
SWMU 21	N/A	Pond 2	May 1987	C	Phase I: C Phase II: **NFA**		
SWMU 22	N/A	HF Sludge Settling Pond 1	May 1987	**NFA**			
SWMU 23	N/A	HF Sludge Settling Pond 2	May 1987	**NFA**			
SWMU 24	N/A	HF Sludge Drying Bed	May 1987	**NFA**			
SWMU 25	1	Oil Interceptor Trenches	May 1987	C	Phase I: C Phase II: C RA: C – NFA SS	C	In Progress
SWMU 26	1	Oil Interceptor Trenches	May 1987	C	Phase I: Complete Phase II: Complete RA: C – NFA SS	C	In Progress
SWMU 27	N/A	North Land Disposal Sites	May 1987	**NFA**			
SWMU 28	N/A	North Land Disposal Sites	May 1987	**NFA**			
SWMU 29	N/A	North Land Disposal Sites	May 1987	**NFA**			
SWMU 30	N/A	North Land Disposal Sites	May 1987	**NFA**			
SWMU 31	N/A	North Land Disposal Sites	May 1987	**NFA**			
SWMU 32	1	Northwest Land Disposal Area	May 1987	C	Phase I: C Phase II: C RA: NFA SS	C	In Progress
SWMU 33	1	Oily Waste Incineration Area	May 1987	C	Phase I: C Phase II: C RA: NFA SS	C	In Progress
SWMU 34	1	Old Surface Impoundment Site	May 1987	C	Phase I: C Phase II: C RA: NFA SS	C	In Progress
SWMU 35	1	Flare Gas Recovery Surface Impoundment Site	May 1987	C	Phase I: C Phase II: C RA: C - NFA - SS	C	In Progress
SWMU 36	4	Coke Storage Area Surface	May 1987	C	Phase I: C Phase II: C	C	In Progress

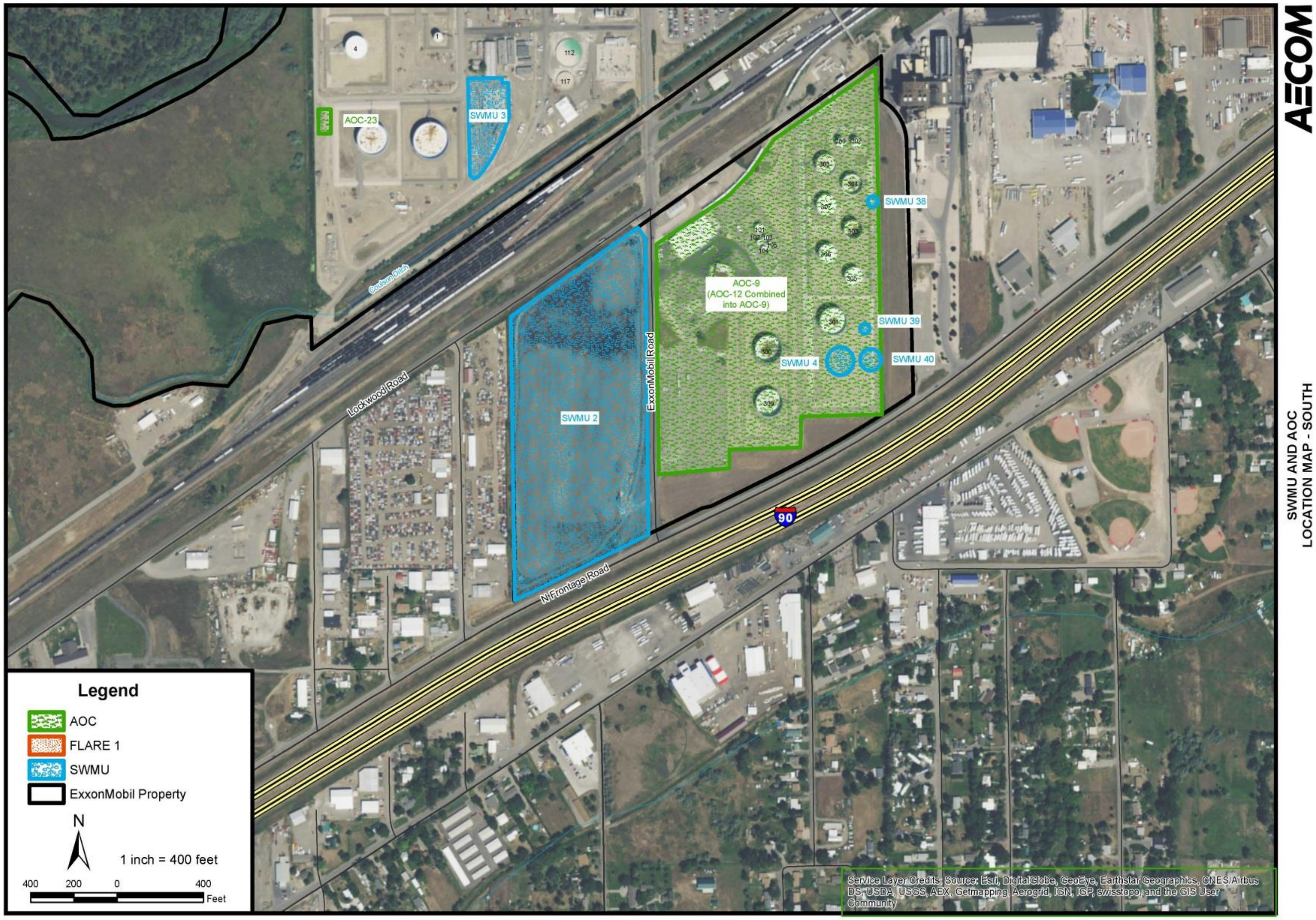
Area	RA Exposure Area	Description	Date Identified	RFA Status	RFI Status	CMS Status	CMI Status
		Impoundment Site			RA: C - NFA SS		
SWMU 37	5	East Land Disposal Area	May 1987	C	Phase I: C Phase II: C RA: C - NFA SS	C	In Progress
SWMU 38	N/A	South Land Disposal Site	May 1987	**NFA**			
SWMU 39	N/A	South Land Disposal Site	May 1987	**NFA**			
SWMU 40	N/A	Old Lead Weathering Area	May 1987	**NFA**			
SWMU 41	N/A	Rotary Kiln	May 1987	**NFA**			
AOC 1	N/A	River Water Intake Pond	May 1987	C	Phase I: **NFA**		
AOC 1A	N/A	Caustic Recovery Area	1990	C	Phase I: **NFA**		
AOC 2	N/A	Clean Rubble Area	May 1987	**NFA**			
AOC 3	N/A	Product Coke Storage Area	May 1987	**NFA**			
AOC 4	N/A	Flare Stack	May 1987	**NFA**			
AOC 5	N/A	Underground Storage Tanks	May 1987	**NFA**			
AOC 6	N/A	Underground Storage Tanks	May 1987	**NFA**			
AOC 7	N/A	Underground Storage Tanks	May 1987	**NFA**			
AOC 8	1	Fire Training Area	1991		Phase I: C Phase II: C RA: C	**NFA**	
AOC 9		Marketing Terminal / Tank 101 Spill / South Tank Farm	April 2000		Phase I: C	C: Incorporate into Facility CMS umbrella	In Progress
AOC 10		Intermediate Tank Farm	2001		Phase I: C Phase II: C	C	Soil – C Groundwater In Progress as part of Facility CMS Umbrella

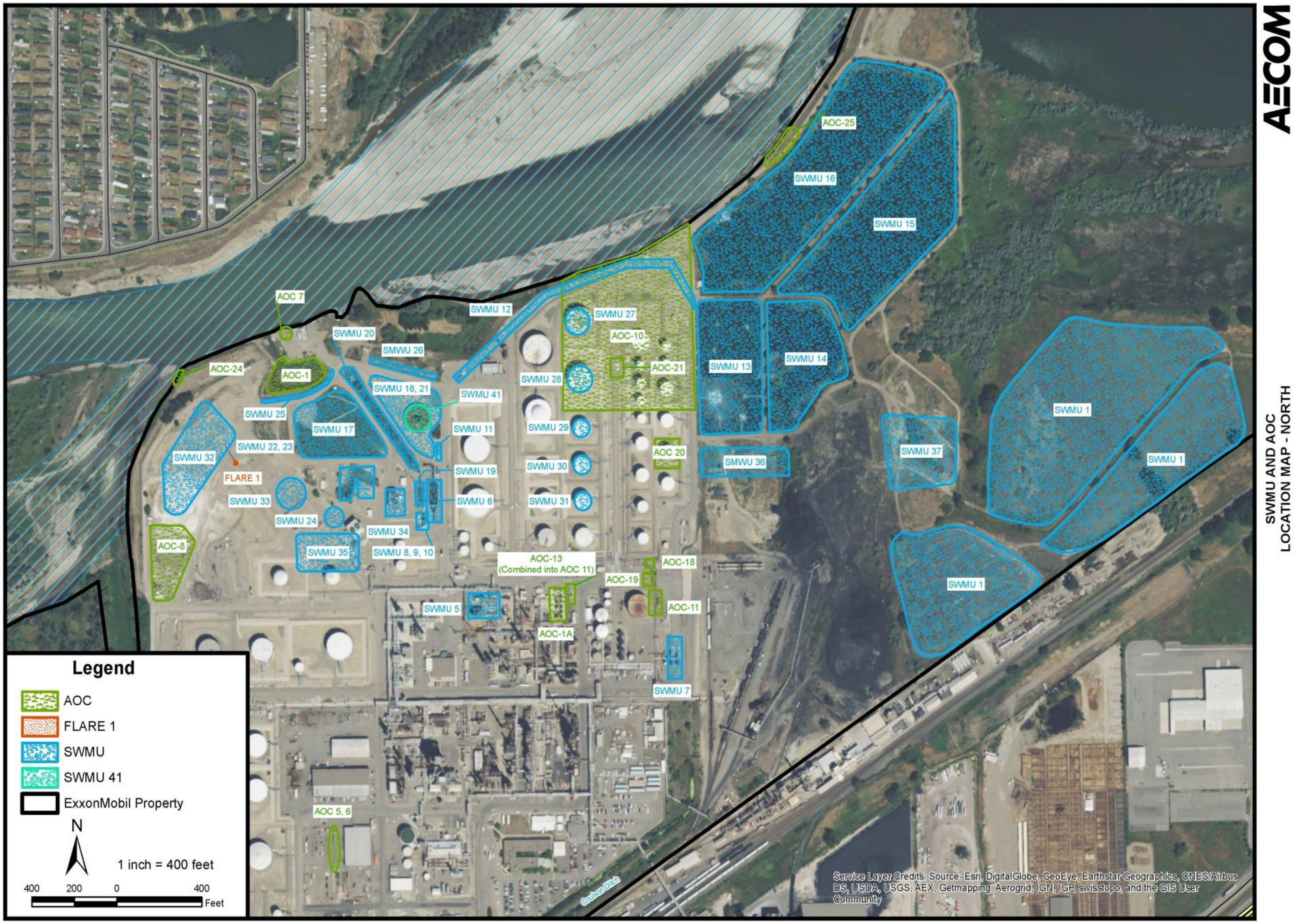
Area	RA Exposure Area	Description	Date Identified	RFA Status	RFI Status	CMS Status	CMI Status
AOC 11		Turbo Diesel Spill 2002 (CVID 5985)	February 2002		Phase II: C	Incorporated into Facility CMS umbrella	In Progress
AOC 12		Unleaded Gas Spill (CVID 7070)	March 2003		Combined into Marketing Terminal (AOC 9)		
AOC 13		Coker Naphtha Spill (CVID 6078)	March 2002		Combined into Turbo Diesel Spill (AOC 11)		
AOC 14*							
AOC 15		Light Virgin Naphtha Spill (CVID 7355)	July 2003		Phase I**: NFA**		
AOC 16		Scrapyard Areas	December 2005		Phase I: **NFA**		
AOC 17		Materials Laydown Area	December 2005		Phase I: **NFA**		
AOC 18		Alkylate Spill (CVID 8442)	August 2004		Phase I: C	Incorporated into Facility CMS umbrella	In Progress
AOC 19		Turbo Fuel Spill 2005 (CVID 9125)	May 2005		Phase I: C	Incorporated into Facility CMS umbrella	In Progress
AOC 20		No. 2 Diesel Fuel Spill (CVID 9845)	November 2005		Phase I: C	Incorporated into Facility CMS umbrella	In Progress
AOC 21		Light Cycle Oil Spill (CVID 10599)	September 2006		Phase I: C **NFA**		
AOC 22		Alkylation Unit Spill (CVID 10655)	October 2006		Phase I**: D**		
AOC 23		Crude Oil Inlet Spill (CVID 10414)	July 2006		Phase I: C	Incorporated into Facility CMS umbrella	In Progress

Area	RA Exposure Area	Description	Date Identified	RFA Status	RFI Status	CMS Status	CMI Status
AOC 24		Oily Substance Along River (CVID 11980)	March 2008		Phase I: C Phase II: C	C	C: **NFA**
AOC 25		Streambank Mercury Area	December 1998		Phase I: C Phase II: C	C	C: **NFA**

IDS = Independent Study
D = Deferred until plant closure or construction
NA = Not Applicable
NFA = No Further Action
IRA NW = Interior Refinery Area Northwest
IRA NE = Interior Refinery Area Northeast
C = Complete
SS = Surface Soil

*** Numbers not sequential because the Unleaded Gas Spill (CVID 7070) was inadvertently labeled twice (AOC 12 and AOC 14)**


AECOM
SWMU AND AOC
LOCATION MAP - SOUTH
AOC-23
SWMU 3
SWMU 2
SWMU 38
SWMU 39
SWMU 4
SWMU 40
AOC-9
(AOC-12 Combined
into AOC-9)
Lockwood Road
ExxonMobil Road
N Frontage Road
Coulson Ditch
90
Legend
AOC
FLARE 1
SWMU
ExxonMobil Property
N
1 inch = 400 feet
400
200
0
400
Feet
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Attachment VII.1
MTHWP-17-01
ExxonMobil Billings Refinery

March 2017

Attachment VII.2

Statement of Basis for Remedy Selection

FACT SHEET AND
STATEMENT OF BASIS

EXXONMOBIL REFINING AND SUPPLY COMPANY
BILLINGS REFINERY
BILLINGS, MONTANA

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
December 2008

OPPORTUNITIES FOR PUBLIC INVOLVEMENT

MDEQ Announces Proposed Decision for Treatment and Control of Contaminated

Subsurface Soils and Groundwater at the ExxonMobil Billings Refinery

PUBLIC COMMENT PERIOD: December 22, 2008 to February 13, 2009

SITE INFORMATION: Montana Department of Environmental Quality
1520 East Sixth Street
Helena, MT 59620

SEND COMMENTS TO:
Ann Kron
Permitting and Compliance Division
Waste and Underground Tank Management Bureau
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901
Fax: (406) 444-1374
Phone: (406) 444-5824

TABLE OF CONTENTS

DECISION SUMMARY

The Montana Department of Environmental Quality (MDEQ) has prepared this Statement of Basis to describe proposed remedies for groundwater and subsurface soil contamination at the ExxonMobil Billings Refinery, located in Billings, Montana. The Statement of Basis identifies the proposed corrective action remedies for contaminated groundwater and subsurface soils in three distinct areas and explains the rationale for remedy selection. In addition, this document briefly describes all other remedies considered during the remedy evaluation process.

MDEQ proposes to select remedies for groundwater and subsurface soil contamination that will include source control via vacuum enhanced recovery, capture zone wells, and two interceptor trenches; groundwater quality monitoring; institutional controls; phytoremediation plots; and air sparging. Also included in the proposed remedies is a requirement for future investigation and remediation of soils that are inaccessible at this time due to plant activity and operation.

MDEQ is soliciting public comment on the remedies during a public comment period, (December 22, 2008 through February 13, 2009). No public meeting is planned. However, during the public comment period, any interested person may request a public hearing. A request for a public hearing must be in writing and must state the nature of the issues proposed to be raised in the hearing. If a hearing is held, the MDEQ will provide notice of the public hearing date at least thirty days prior to the hearing.

MDEQ is issuing this Statement of Basis as a part of its public participation obligations under the Montana Hazardous Waste Act (MHWA). In addition, this document includes the fact sheet requirements in 40 Code of Federal Regulations (CFR) 124.8 as incorporated by reference in the Administrative Rules of Montana (ARM), Title, 17, Chapter 53, Subchapters 1 through 14.

I. SITE INFORMATION

The MDEQ is proposing remedies for the treatment and control of contaminated subsurface soil and groundwater at the site of the ExxonMobil Billings Refinery. The Refinery is located near Billings, Montana in the area known as Lockwood.

II. INTRODUCTION

1. *Site Description*

The ExxonMobil Billings Refinery (Refinery) located northeast of Billings, Montana has been in operation since July 1949. The Refinery has the capacity to process approximately 60,000 barrels per day of domestic and Canadian crude oil into refined petroleum hydrocarbon products, by-products, and intermediate products.

Refinery operations are conducted on 367 acres of 770 acres owned by ExxonMobil; leaving approximately 403 acres of undeveloped land surrounding the Refinery operations. The processing portion of the Refinery is bound to the south by railroad tracks and to the north by the Yellowstone River. To the east, the processing and operations portion of the Refinery is bound by the former coke storage pile area, the Refinery's wastewater treatment ponds, two inactive land treatment units, a former gravel quarry, and undeveloped land. To the west of the Refinery is undeveloped land and an island of the Yellowstone River. Beyond the property boundary are several businesses and residences. The site is currently zoned for heavy industrial use.

2. *Background*

In 1988, Exxon received permits for the Refinery from the State of Montana and the Environmental Protection Agency. The permits were issued for hazardous waste activities which included land treatment of oily hazardous wastes at three land treatment units (LTU), treatment of leaded tank bottoms in an open tank prior to off-site shipment, storage of hazardous waste in containers prior to off-site shipment, and facility-wide corrective action. The permits imposed requirements for operation of these activities, monitoring, reporting, and corrective action for releases of hazardous waste or hazardous constituents. Permits are issued for a term no longer than 10 years; ExxonMobil's Permit was reissued in 1999 and includes requirements for continued operation and/or closure of an operating land treatment unit and associated vehicle decontamination pad, an operating waste staging area, two land treatment units undergoing closure, and a lead weathering tank undergoing closure. MDEQ and the EPA jointly issued the modules of the Permit pertaining to facility-wide corrective action.

3. *Why A Remedy Is Required*

Because ExxonMobil managed hazardous waste on-site they were required to obtain a hazardous waste permit under the Resource Conservation and Recovery Act (RCRA) and the Montana Hazardous Waste Act (MHWA). RCRA is the federal law under which regulations concerning the management, treatment, storage, and disposal of hazardous waste are implemented. The MHWA is the state equivalent to RCRA. The Hazardous and Solid Waste Amendments of 1984 (HSWA) amended RCRA and included a requirement that owners and operators of hazardous waste facilities remediate releases of hazardous wastes or hazardous constituents from solid waste management units (SWMUs) and areas of concern (AOCs). A SWMU is any unit that was used at any time to manage waste, regardless of whether the unit was intended for that purpose. An AOC is any area at a facility having a probable release of a hazardous waste or hazardous constituent that may or may not be from a SWMU. The HSWA corrective action requirements are established in Section 3004(u) of RCRA and 75-10-406(7) of Montana Code Annotated (MCA) of MHWA. The requirements are codified in federal regulations at 40 Code of Federal Regulations (CFR) Section 264.101, as incorporated by reference in the Administrative Rules of Montana (ARM) 17.53.801. Through HSWA, Congress required that permits issued to hazardous waste facilities contain corrective action requirements for SWMUs/AOCs. The Montana Legislature directed the MDEQ to adopt a state equivalent program.

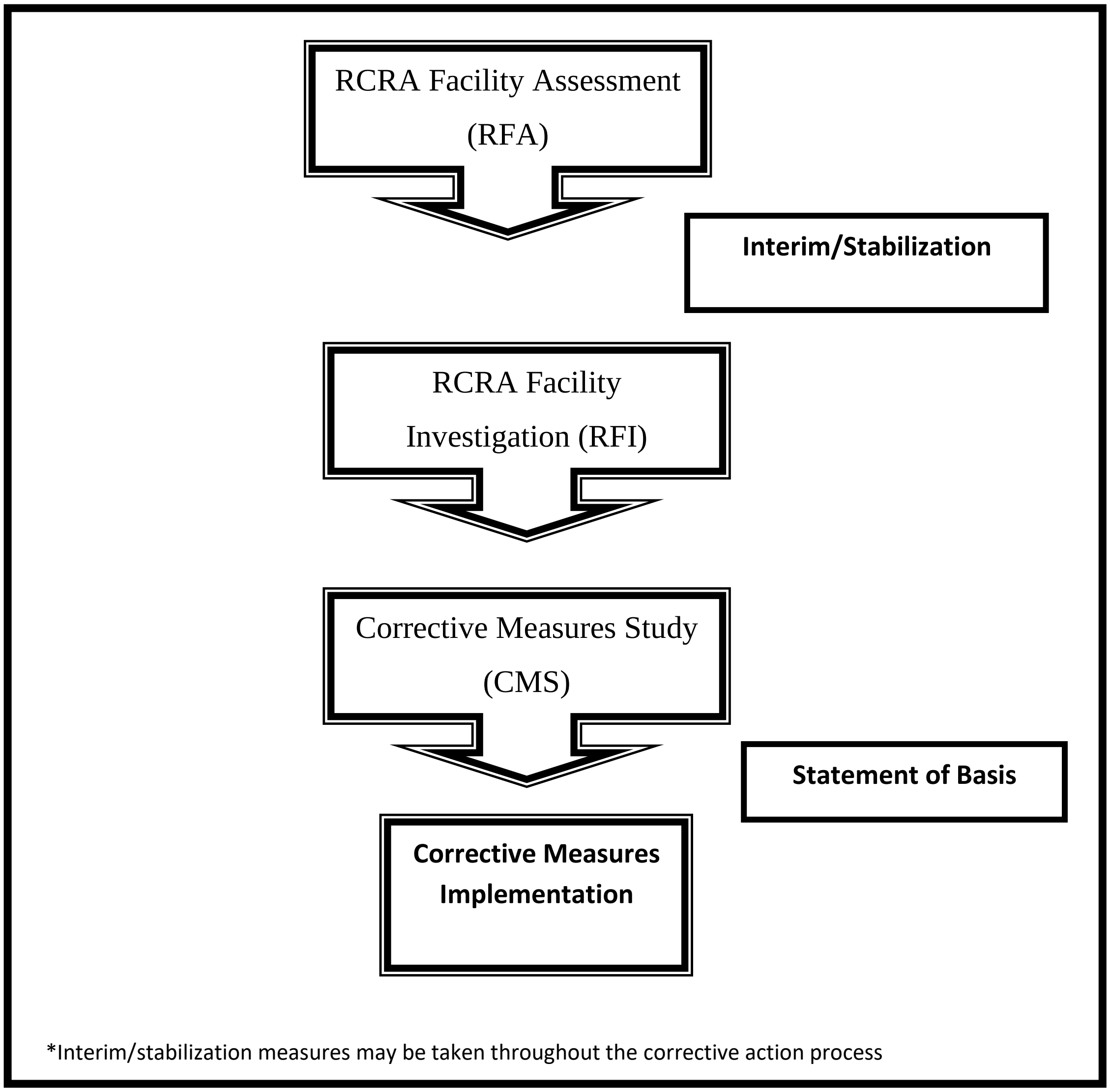
ExxonMobil managed wastes in a number of SWMUs/AOCs at the Billings Refinery. In 1999, the EPA along with MDEQ issued a HSWA Permit for the Refinery which required ExxonMobil to investigate all facility SWMUs/AOCs and develop a corrective measures study for the SWMUs/AOCs which are contaminated above acceptable levels. The MDEQ was authorized as the lead for corrective action in 2000.

III. CORRECTIVE ACTION

Corrective Action Process

The corrective action process generally comprises six activities. These activities are not always undertaken as a linear progression towards final facility cleanup, but can be implemented flexibly to most effectively meet site-specific corrective action needs. Figure A below shows a flowchart of the corrective action process:

Figure A. Flowchart of the RCRA Corrective Action Process



1. *RCRA Facility Assessment (RFA)*

Often the first activity in the corrective action process is the RFA. The objective of the RFA is to identify potential and actual releases from SWMUs/AOCs and make preliminary determinations about releases, the need for corrective action, and interim measures. The EPA completed the RFA for the Refinery in 1987.

2. *RCRA Facility Investigation (RFI)*

The RFI takes place when releases, or potential releases, have been identified and further investigation is necessary. The purpose of the RFI is to gather enough data to fully characterize the nature, extent, and rate of migration of contaminants to determine the appropriate response action.

A Phase I RFI at the Refinery investigated 21 SWMUs/AOCs and a report was completed in November 1993. The Phase I RFI was a preliminary study to develop a further understanding of the nature and extent of the contaminant releases at the Refinery. A Phase II RFI report, completed in December 1998, further investigated the lateral and vertical extent of contaminants in soil and groundwater.

A site-wide risk assessment is also conducted as part of the RFI. The risk assessment studies the health risks from potential exposure to the contaminants at the site. ExxonMobil completed a site-wide risk assessment in February 1999. Findings from the Risk Assessment are summarized below:

- *Summary of Site Risks*
  The risk assessment for the Refinery was conducted in two phases. In 1995, ExxonMobil produced a Risk Assessment Scoping Document for the Refinery. In 1998, ExxonMobil produced the Final Risk Assessment for the Refinery.

  For purposes of the risk assessment, the Refinery was divided into six exposure areas. Exposure areas 1-5 were located within the confines of the Refinery and were evaluated according to human health standards and potential impacts to terrestrial organisms. Exposure area 6 was the shoreline of the Yellowstone River and was evaluated using ecological criteria.

  The chemicals of concern in the risk assessment were based on site samples collected during the RFI. The chemicals of concern in the soil were arsenic, beryllium, lead, mercury, anthracene, benzene, chrysene, ethylbenzene, naphthalene, phenanthrene, toluene, and total xylenes. The chemicals of concern in the surface water were antimony, arsenic, and toluene. The chemicals of concern in the sediment were arsenic, lead, benzene, toluene, and xylenes.

- *Human Health Risk Characterization*
  In the human health evaluation in the risk assessment, ExxonMobil evaluated the potential risks to current and future on-site workers, future on-site construction workers, and current and future off-site residents for soil, groundwater, and sediment. ExxonMobil evaluated both cancer and non-cancer health risks from exposure to the site chemicals. Cancer risks are estimated as the increased change, over a lifetime, of a person developing cancer as a result of exposure to a potential cancer-causing chemical (carcinogen). Non-cancer health risks were

assessed by determining the hazard index (HI), or adverse affects of being exposed to several chemicals at one time.

The risk assessment stated that the potential site-wide cancer risks for the current on-site worker, future on-site worker, and future on-site construction workers at all exposure areas are well within or below the EPA acceptable range of one-in-ten-thousand (10^{-4}) to one-in-a-million (10^{-6}) probability of getting cancer. All potential noncancer risk estimates for current and future on-site workers were also found to be below the hazard index of 1, except for the future potential consumption of groundwater.

- *Ecological Risk Characterization*
  In the ecological risk evaluation in the risk assessment, both terrestrial and aquatic receptors that are likely to be found on the property were evaluated. In an ecological risk assessment, when the Hazard Quotient (HQ) is less than one, it indicates that exposure is below a threshold level for toxicity, and it is unlikely that any adverse effects would occur. When the HQ is above one, there is potential for adverse effects, although there is no linear dose-response relationship between the magnitude of the HQ and the observed or predicted effects.

  For surface soil, the HQs for terrestrial receptors potentially contacting soil in the Refinery are all less than 1.0. As a result, no adverse impacts would be expected to terrestrial wildlife residing on the Refinery proper.

  For surface water, there were no HQs above 1.0 for exposure of birds, mammals, or aquatic life (fish, benthic invertebrates, or plants) to surface water in the Yellowstone River. Therefore, it was determined that there is no potential impact to ecological receptors exposed to surface water near the Refinery.

- *Risk Assessment Conclusion for Surface Soils*
  Potential site-wide cancer risks estimated for the current on-site worker, future on-site worker, and future on-site construction workers at all of the Exposure Areas were all within or below the acceptable excess cancer risk range of 10^{-4} to 10^{-6} defined by USEPA. Potential site-wide non-cancer risks estimated for these receptors are all below the target threshold hazard index of 1.0 for non-carcinogenic effects.

For ecological receptors, it was concluded there is no apparent risk of adverse impacts to large or small terrestrial organisms potentially exposed to chemicals of concern in soil at each of the Exposure Areas.

Based on the findings from the Risk Assessment, site surface soils were determined to be within acceptable levels and were not evaluated further in the corrective action process.

- *Risk Assessment Conclusion for Groundwater*
  The potential risks associated with the consumption of groundwater by an on-site worker, using the limited assumptions provided in the risk assessment, give risk estimates greater than 1E-06 for chemicals with cancer effects and greater than 1.0 for non-carcinogenic effects. Therefore, groundwater corrective action continued to be evaluated in the corrective action process.

3. ***Corrective Measures Study (CMS)***
   After the RFI is completed and the regulatory agency determines that cleanup is necessary, the regulatory agency may require the owner/operator to conduct a CMS. The purpose of the CMS is to identify and evaluate cleanup alternatives, called corrective measures, for releases at the facility. The recommended measures are reviewed by the regulatory agency. The regulatory agency then selects what it believes is the best remedy, given the site-specific considerations. The CMS for the Refinery was completed in February 2005.

Media and Areas Evaluated for Corrective Action at the Refinery
With increasingly refined characterization of the ExxonMobil site, the six areas reviewed in the Risk Assessment were further refined into four remediation areas (the fire training area, interior refinery area, NAPL accumulation area, and river boundary area), see Figure 1, Appendix B. The refined grouping allowed for a more focused and efficient study and implementation of any necessary corrective actions.

In 2000, the Fire Training Area was singled out by the US Environmental Protection Agency (EPA) for a focused risk assessment. The results of the risk assessment indicated no unacceptable risk to human health based on current and expected future uses of the property. Therefore, corrective measures for the fire training area were not considered further in the CMS.

The proposed remedies for the three remaining areas (interior refinery area, NAPL accumulation areas, and river boundary area) were limited to the subsurface soils and groundwater and are described in further detail in Section IV below. Findings during the risk assessment determined surface soils at the Refinery are below unacceptable risk values and remediation is not required.

4. *Statement of Basis*

After review of the CMS, the Department produces a document which describes the basis for remedy selection and provides the public with an opportunity to comment on the proposed remedies. Following public input, the remedy is finalized and included in the permit. When selecting remedies the following are considered: short- and long-term reliability and effectiveness; reduction of toxicity, mobility, or volume of hazardous constituents; implementability; and costs. This statement of basis fulfills this step in the remedial process.

5. *Corrective Measures Implementation (CMI)*

Once a remedy has been selected, the facility enters the CMI phase of corrective action. During the CMI, the owner/operator of the facility implements the chosen remedy. General requirements for conducting the CMI for the Refinery are included in the permit.

6. *Interim/Stabilization Measures*

Stabilization measures can be implemented at any time in the corrective action process to address ongoing releases and environmental threats in the near-term. Stabilization measures are established in an effort to control or abate immediate threats to human health and the environment and prevent or minimize the further spread of contamination. The following stabilization measures have been implemented at the ExxonMobil Billings refinery and are on-going until the remedy selection is complete.

a. *Interior Refinery Area (IRA)*

Monitoring is conducted to identify changes in water quality in the IRA and is also used to monitor the thickness and changes in distribution for LNAPL. Groundwater quality monitoring is conducted semi-annually and water level monitoring is conducted quarterly.

b. *NAPL Accumulation Area*

Vacuum enhanced recovery, a technology that uses pumps to remove various combinations of contaminated groundwater, separate-phase petroleum product, and hydrocarbon vapor from the subsurface, is conducted monthly in 21 wells located throughout theLNAPL accumulation areas. NAPL thickness is also measured monthly in all 21 wells. ExxonMobil has removed a total of approximately 321,281 gallons of hydrocarbon/water mixture from the groundwater. Based on a 4.6% product to water ratio an estimated 14,749 gallons of NAPL has been recovered.

Five wells also currently pump groundwater in an effort to create a capture zone which is intended to prevent any contaminants from being released into the Yellowstone River. Pumping wells SR95-1 and ERM-9B has been in operation since 1995. Pumping wells SM95-2, MW06-2, MW06-4 were placed in operation in August 2006. Pumping well MW06-1was also installed in August 2006, but is not used unless needed. Fluids from the pumping wells are discharged to the refinery wastewater treatment system.

Two interceptor trenches have also been constructed, called the East Oil Interception Trench (EOIT) and West Oil Interceptor Trench (WOIT). Total fluids are pumped from the two interceptor trench sumps into an API Separator. Oil that accumulates on the water surface of the trenches that cannot be pumped to the API Separator is routinely removed as part of the vacuum enhanced recovery program.

c. *River Boundary Area*

ExxonMobil installed two pilot scale phytoremediation plots in May 2001. Phytoremediation utilizes plants to remediate soil and water. Phytoremediation works by utilizing photodegradation, enhanced rhizosphere biodegradation, hydraulic control, and phytovolatilization. Despite drought conditions, the trees in the phytoremediation plots were considered established at the end of the 2004 growing season. Monitoring and maintenance has been conducted each growing season since 2001.

A pilot air-sparge system was also installed in the River Boundary Area. The air-sparge system consists of injecting atmospheric air into the groundwater, which provides oxygen for biodegradation and also physically strips volatile compounds from the groundwater. The air-sparge system was installed directly upgradient of the West Phytoremediation Plot in March

1999 and operated continuously until November 2001. The system was shut down during the winter of 2002, and restarted in June 2002, after which it has operated continuously.

IV. REMEDIAL ALTERNATIVES AND EVALUATIONS

1. *Summary of Alternatives*

Remedial alternatives were separated into three categories to address each respective remediation area at the Refinery. The three categories are the Interior Refinery Area, NAPL Accumulation Area, and River Boundary Area.

a. *Interior Refinery Area (IRA) (Figure 1)*

Results of the RFI indicate that the only medium of concern within the IRA is groundwater. Concentrations of dissolved-phase benzene in groundwater have been detected at levels above Montana water quality standards listed in Circular DEQ-7. Other BTEX (benzene, toluene, ethylbenzene, and xylenes) compounds as well as naphthalene are present in detectable concentrations; however, those concentrations have not exceeded the Circular DEQ-7 standards in recent years. Therefore, the only target chemical of concern in groundwater in the IRA is benzene.

As groundwater levels fluctuate throughout the year, a smear-zone is created in the subsurface soils. The raising and lowering of the contaminated groundwater creates a zone where residual contaminants adhere to subsurface soils when the groundwater levels drop in the winter. Because of this smear-zone, subsurface soils are also included in the remedy evaluations for the IRA.

The corrective measures objective for the IRA, not including the NAPL accumulation areas, is to remediate groundwater to below Circular DEQ-7 standards. Nine alternatives were evaluated for the interior refinery area (Appendix A, Table 1), and are briefly described below.

i. No Action

This alternative provides a baseline by which other alternatives are compared. Under this alternative, groundwater impacts would be left in place and no remedial efforts made. No monitoring, operation, or maintenance activities would be implemented.

ii. Institutional Controls

This alternative involves the prevention of direct contact with contaminated groundwater by limiting access. Access would be limited through the use of physical barriers, security monitoring, or on-site deed restrictions. Deed restrictions would limit disturbance of the subsurface and prevent future residential development and water well installations.

iii. Air Sparging

This alternative consists of a series of wells, with screens submerged below the groundwater table, connected to a compressed air supply. Atmospheric air is injected into the groundwater, which provides oxygen for biodegradation and physically strips volatile compounds from the groundwater.

iv. Enhanced Anaerobic Biodegradation

This alternative relies on existing anaerobic (oxygen deprived) hydrocarbon-degrading bacteria to remediate groundwater impacts. Additional electron acceptors, such as sulfates, are added to the subsurface to stimulate these bacteria and enhance anaerobic activity.

v. Enhanced Aerobic Biodegradation

This alternative relies on existing aerobic (oxygen enriched) hydrocarbon-degrading bacteria to remediate groundwater impacts. Nutrients and/or oxygen are added to the subsurface to stimulate these bacteria and enhance aerobic activity.

vi. Monitored Natural Attenuation

This alternative utilizes naturally occurring physical, chemical, and/or biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. This alternative requires groundwater monitoring to ensure the natural attenuation process is working.

vii. Oxygen Release Compound

This alternative increases oxygen levels in groundwater to create a better environment for biodegradation. The oxygen release compound is typically placed inside existing or newly installed groundwater wells or it is injected as a slurry into the subsurface at a level just below the water table. The groundwater reacts with the oxygen release compound, which in turn increases the dissolved oxygen concentration in the groundwater. Increased dissolved oxygen would enhance the hydrocarbon-degrading bacteria in the subsurface.

viii. Soil Vapor Extraction

This alternative consists of removing volatile hydrocarbons from the vadose zone by drawing air through the subsurface under vacuum conditions. The process enhances the natural rate of volatilization, and has been used with success at other sites to remove gasoline, chlorinated solvents, and other petroleum hydrocarbons from the soil. The recovered vapor can then be treated. This technology addresses both free-phase hydrocarbons, and residual phase hydrocarbons present in the smear-zone.

ix. Thermal Desorption

This alternative consists of thermally treating impacted soils in the subsurface. Specially designed equipment is used to heat the subsurface soils to high temperatures, thus changing the hydrocarbons from a liquid to a vapor-state which is then recovered. This technology does not address free-phase product, but does address residual product in the smear-zone.

b. NAPL Accumulation Areas (Figure 1)

NAPL is defined as Non-Aqueous Phase Liquids. NAPL Accumulation Areas are areas where free-phase NAPL plumes have been identified floating on the surface of the groundwater at the Refinery. There are 5 separate NAPL accumulation locations at the Refinery, all five areas lie entirely within the interior refinery area.

The NAPL at the Refinery will not migrate vertically below the water table except under special circumstances. Based on several years of monitoring and recent evaluations, it appears the NAPL is not migrating and distribution is stable or decreasing in extent.

ExxonMobil previously calculated the volume of the NAPL underneath the site to be approximately 293,000 to 628,000 gallons based on NAPL thicknesses measured prior to 1999. Since that time, the thickness of NAPL has decreased, which is believed to be a result of both Monitored Natural Attenuation (MNA) and vacuum-enhanced recovery.

The corrective measures objective for the NAPL accumulation areas is to recover free-phase contaminants from the subsurface to the extent practicable. Ten alternatives were evaluated for the NAPL accumulation areas. (Appendix A, Table 2)

i. No Action

This alternative provides a baseline by which other alternatives are compared. Under this alternative, NAPL would be left in place and no remedial efforts made. No monitoring, operation, or maintenance activities would be implemented.

ii. Institutional Controls

This alternative involves the prevention of direct contact with the NAPL impacts by limiting access. Access would be limited through the use of physical barriers, security monitoring, or on-site deed restrictions. Deed restrictions would limit disturbance of the impacts under current site use and prevent residential development and water well installations.

iii. Chemical-Enhanced NAPL Recovery

This alternative consists of injecting chemical surfactants into the subsurface to help mobilize NAPL for recovery. Special injection points along with recovery wells and pumping systems are required for NAPL recovery with this technology.

iv. Heat-Enhanced NAPL Recovery

This alternative consists of thermally treating the subsurface to influence the flow of NAPL. Specially designed equipment is used to apply heat while standard recovery wells and pumping systems recover the NAPL.

v. In-Situ Soil Mixing

This alternative involves the use of specialized equipment to physically mix the impacted subsurface soil with a stabilizing agent where NAPL is present. Any NAPL present in the mixing area would be stabilized to prevent additional migration to groundwater. This technology may not address all NAPL present on the groundwater table.

vi. NAPL Recovery from Engineered Recovery Wells

This alternative could consist of several different technologies. Single-phase recovery is a method in which only hydrocarbon is extracted. This type of extraction is typically done by using skimmers, but it can also be performed by careful vacuum extraction. Dual-phase recovery consists of extraction of both hydrocarbon and water. In both cases, water and hydrocarbon are disposed of or recycled.

vii. NAPL Recovery from Trenches

This alternative consists of an excavated trench extending below the static water table at the down gradient end of a plume. The trench is typically backfilled with free-draining gravel to intercept groundwater and hydrocarbons. The intercepted liquids are routed to a collection sump for dual-phase or total fluids recovery. Fluids are then disposed of or recycled.

viii. Soil Vapor Extraction

This alternative consists of removing volatile hydrocarbons from the vadose zone by drawing air through the subsurface under vacuum conditions. The process enhances the natural rate of volatilization, and has been used with success at other sites to remove gasoline, chlorinated solvents, and other petroleum hydrocarbons from the soil. The recovered vapor can then be treated. This technology can address free-phase hydrocarbons, and it is effective in treating residual phase hydrocarbons.

ix. Vacuum-Enhanced NAPL Recovery

This alternative consists of placing an extraction tube in the well and applying a vacuum to remove LNAPL at an enhanced rate. The vacuum would pump both water and/or hydrocarbons from the well. In addition, the application of a vacuum to the subsurface also increases the rate of atmospheric air traveling through the subsurface soils, which provides an additional source of oxygen to enhance biodegradation of any impacts above the water table.

x. Water Flood Enhanced NAPL Recovery

This alternative consists of pumping groundwater from one area and reinjecting it into another area, via a trench or other method, to "mound" the groundwater table. This process induces a steeper hydraulic gradient that will enhance the flow of NAPL toward recovery wells or a trench.

c. *River Boundary Areas (Figure 1)*

The river boundary areas are discrete locations along the Refinery's river boundary at the northwest and northeast portions of the Refinery. Groundwater is the only media of concern in this area. The chemicals of concern in this area are benzene, arsenic, and lead, all of which have been detected in the groundwater adjacent to the river. Mercury has also been detected in soils in one location at the northeast area of the river boundary and was remediated under a separate corrective action process; therefore, it will not be further discussed in this statement of basis.

The corrective measures objective for the river boundary area is to prevent off-site migration of petroleum hydrocarbons at concentrations above Circular DEQ-7 standards. Eleven alternatives were evaluated for the river boundary area (Appendix A, Table 3).

i. No Action

This alternative provides a baseline by which other alternatives are compared. Under this alternative, groundwater impacts would be left in place and no remedial efforts made. No monitoring, operation, or maintenance activities would be implemented.

ii. Institutional Controls

This alternative involves the prevention of direct contact with the groundwater impacts by limiting access. Access would be limited through the use of physical barriers, security monitoring, and on-site deed restrictions. Deed restrictions would limit disturbance of the groundwater impacts under current site use and prevent residential development and water well installations.

iii. Air Sparging

This alternative consists of a series of wells, with screens submerged below the groundwater table, connected to a compressed air supply. Atmospheric air is injected into the groundwater, which provides oxygen for biodegradation and physically strips volatile compounds from the groundwater.

iv. Engineered Physical Barrier with Hydraulic Control

This alternative consists of a sheet piling or slurry wall installed to contain groundwater impacted with contaminants. Groundwater pumping wells would be strategically placed to recover groundwater and control the hydraulic gradient.

v. Engineered Treatment Barrier Wall

This alternative consists of a barrier wall or funnel and gate system constructed with a treatment zone. Contaminants are treated as groundwater flows through the treatment zone. The treatment zone would consist of a sparge zone where air would be injected to promote biodegradation and volatilization.

vi. Enhanced Anaerobic Biodegradation

This alternative relies on existing anaerobic hydrocarbon-degrading bacteria to remediate groundwater impacts. Additional electron acceptors, such as sulfates, are added to the subsurface to stimulate these bacteria and enhance anaerobic activity.

vii. Enhanced Aerobic Biodegradation

This alternative relies on existing aerobic hydrocarbon-degrading bacteria to remediate groundwater impacts. Nutrients and/or oxygen are added to the subsurface to stimulate these bacteria and enhance aerobic activity.

viii. Hydraulic Control

This alternative involves the installation of groundwater pumping wells set at strategic locations near the property boundary. Groundwater is pumped to manipulate the natural hydraulic gradient and prevent migration of contaminants off-site. The pumped groundwater is treated in the waste water treatment system before discharge.

ix. Monitored Natural Attenuation

This alternative utilizes naturally occurring physical, chemical, and/or biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. This alternative requires groundwater monitoring to ensure that the natural attenuation process is working.

x. Oxygen Release Compound

This is a low maintenance alternative that increases oxygen levels in groundwater for biodegradation. The oxygen release compound is typically placed inside existing or newly installed groundwater wells, or injected as a slurry into the subsurface at a level just below the water table. The groundwater reacts with the oxygen release compound, which increases the dissolved oxygen concentration in the groundwater.

xi. Phytoremediation

This alternative utilizes plants and their associated rhizospheric microorganisms to remediate groundwater. Phytoremediation can act in four ways, including phytodegradation, enhanced rhizosphere biodegradation, hydraulic control, and phytovolatilization. Phytoremediation can only work at sites where the concentration of contaminants is not toxic to the plants and where the groundwater impact is shallow enough for plant roots to intercept.

2. Selection Criteria

The alternatives listed above were evaluated for their ability to be implemented. If the alternatives were unreasonable for implementation, they were not further evaluated in the process. The alternatives that could be reasonably implemented were evaluated based on technical, environmental, human health, and institutional criteria (Appendix A Tables 4-6). A cost estimate was also developed for each alternative. Descriptions of the criteria used to evaluate each alternative are provided below.

a. *Technical*

The technical evaluation of the corrective measures alternative was based on performance, reliability, implementability, and safety. Performance was based on effectiveness of each alternative in performing its intended functions and the useful life of the alternative. Reliability of each alternative was evaluated in terms of the operation and maintenance requirements, and demonstrated reliability. Implementability of each alternative was evaluated in terms of constructability, time required to implement the measure, and time required to achieve beneficial results. Safety of each alternative was evaluated in terms of the potential threat to the safety of the surrounding community and site workers during its implementation.

b. Environmental

The environmental assessment focused on short- and long-term beneficial and environmental effects of the alternative and adverse effects on environmentally sensitive areas. The environmental assessment also addressed steps that must be taken to mitigate adverse effects.

c. Human Health

The human health assessment focused on protection of human health during implementation of each alternative as well as short- and long-term potential human health exposures to any residual impacts resulting from each alternative. The relative reduction of potential human health impacts from each alternative was compared with applicable criteria, standards, or guidelines.

d. Institutional

The effect of federal, state, and local environmental regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative was evaluated.

e. Cost Estimate

A cost estimate was completed for each alternative, which included labor costs, direct and indirect capital costs, and operation and maintenance costs.

V. PROPOSED REMEDIES

Proposed remedies are presented for the Interior Refinery Area, NAPL Accumulation Area, and River Boundary Area. Several technologies have been combined to create the proposed remedy for each area. A detailed evaluation of each of the proposed corrective measures alternatives is provided in Appendix A Tables 4-6.

1. Interior Refinery Area (IRA)

Monitored natural attenuation and institutional controls are the proposed remedies for the groundwater contamination in the IRA.

Natural attenuation is naturally occurring physical, chemical, and/or biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. Long-term monitoring in the interior refinery area has shown that chemicals of concern in the groundwater are being contained and remediated by natural attenuation processes. ExxonMobil will need to monitor natural attenuation to ensure it continues to be an effective remedy.

Institutional controls include the following:

- Site access restriction;
- An ExxonMobil prohibition preventing the installation of water supply wells and/or groundwater producing wells for any purpose in the impacted hydrostratigraphic units; and
- On-site deed restrictions.

Currently groundwater is not extracted from the impacted hydrostratigraphic units for beneficial uses and restrictions are in place to prevent such usage. Deed restrictions would limit disturbance of the subsurface impacts under current site use and would prevent residential development and water well installations in the future.

2. ***NAPL Accumulation Areas***

Vacuum-enhanced recovery using a mobile vacuum truck, the continued use of current recovery systems (capture zone wells and trenches), and institutional controls are the proposed remedies for the NAPL accumulation areas.

Vacuum-enhanced recovery consists of a mobile vacuum truck that applies a vacuum to wells or existing trench recovery systems to extract the NAPL from the well or trench. The process involves pumping out liquids (water and/or hydrocarbon) while extracting soil vapors from the same well.

ExxonMobil has been successfully using the vacuum-enhanced recovery method as an interim remedial measure at the Refinery. ExxonMobil will continue the operation of the current vacuum-enhanced NAPL recovery system, continue creating a capture zone with five total fluids recovery wells (SR95-1 ERM-9B, SM95-2, MW06-2, and MW06-4), and continue collecting contaminated groundwater from two interceptor trenches (EOIT and WOIT).

Institutional controls include the following:

- Site access restriction;
- An ExxonMobil Refinery prohibition preventing the installation of water supply wells and/or groundwater producing wells for any purpose in the impacted hydrostratigraphic units; and
- On-site deed restrictions.

Currently groundwater is not extracted from the impacted areas of the subsurface for beneficial uses, and restrictions are in place to prevent such usage. Deed restrictions would limit disturbance of the groundwater impacts under current site use and would prevent residential development and water well installations in the future.

Assessment of the effectiveness of the selected remedies will include groundwater level, NAPL depth, and NAPL thickness monitoring from the wells listed in the Facility CMS Monitoring Network. ExxonMobil will monitor the wells semi-annually and submit to MDEQ a semi-annual progress report for the monitored NAPL depth, NAPL thickness, and groundwater elevations.

3. River Boundary Area

Air sparging, monitored natural attenuation, phytoremediation, and institutional controls are the proposed remedies for this area.

A projected 32 air sparging wells will be installed to inhibit migration of impacted groundwater beyond the property boundary and enhance subsurface conditions for biodegradation. Air sparging will consist of installing specially designed wells to a depth several feet below the historic water table elevation. Atmospheric air will be injected through the wells to increase dissolved oxygen concentrations to the passing groundwater and strip volatile hydrocarbon compounds. Since hydrocarbon-degrading bacteria utilize oxygen as an energy source, air sparging should enhance subsurface conditions for biodegradation which will further reduce contaminant concentrations in the groundwater.

Natural attenuation is naturally occurring physical, chemical, and/or biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in the groundwater. ExxonMobil will need to monitor natural attenuation to ensure it continues to be an effective remedy. Phytoremediation has been used as an interim remedial measure and has shown success. The phytoremediation plots consist of planted vegetation along the river boundary to remediate dissolved phase constituents and perform limited hydraulic control. The phytoremediation system includes dense rows of trees (poplar and willow) planted parallel to the bank of the Yellowstone River. These rows of trees should provide in-situ remediation of impacted groundwater through contaminant removal, degradation, or containment.

21 wells in the River Boundary Area will continue to be sampled semi-annually to monitor the effectiveness of all proposed and interim measure remedies.

Institutional controls include the following:

- Site access restriction;
- An ExxonMobil Refinery prohibition preventing the installation of water supply wells and/or groundwater producing wells for any purpose in the impacted hydrostratigraphic units; and
- On-site deed restrictions.

Currently groundwater is not extracted from impacted hydrostratigraphic units for beneficial uses and restrictions are in place to prevent such usage. Deed restrictions would limit disturbance of the groundwater impacts under current site use and would prevent residential development and water well installations in the future.

VI. EVALUATIONS OF PROPOSED REMEDIES

Below is a description of each selection criteria that was evaluated for the proposed remedies at the Refinery. These evaluations can also be found in Appendix A Tables 4-6.

Alternatives that were evaluated using these criteria but were eventually rejected can also be found in Appendix A Tables 4-6 with a short description of the reason for their rejection.

1. ***Technical Performance***

   The proposed remedies are expected to reduce subsurface free-phase hydrocarbon mass through vacuum-enhanced recovery, natural attenuation, and phytoremediation. The air sparging system would cut off dissolved-phase hydrocarbon plumes at the river boundary.

2. ***Reliability***

   The proposed remedies include the use of wells, vacuum trucks, compressors, and other associated equipment. Reliability depends on meeting the multiple operational and maintenance requirements of the various wells and associated equipment.

3. ***Implementability***
   There are no substantive obstacles to the implementation of the proposed remedy. The vacuum-enhanced NAPL recovery and air sparging systems will use many existing wells. The installation of necessary new wells may be hindered by utilities and other structures. However, MDEQ and ExxonMobil believe suitable new well locations are available, if needed.

4. ***Safety***
   On-site workers would encounter common safety hazards during construction due to drilling equipment and construction activities. Risk to nearby communities and environmental receptors would be negligible during construction or operation. Slope stability near the riverbanks could be a serious safety hazard. Buried and overhead utilities would have to be located and avoided during construction.

5. ***Environmental Concerns***
   The proposed remedy should reduce subsurface free-phase hydrocarbon mass and should cut off dissolved-phase hydrocarbon plumes at the river boundary, which will reduce the long-term environmental exposure.

6. ***Human Health Concerns***
   The proposed remedy would have potential short- and long-term risks to site workers during construction and the routine operation and maintenance of the systems. Hazards can be reduced with proper use of personal protective equipment (PPE) and engineering controls.

7. ***Regulatory Compliance***
   No additional regulatory compliance issues have been identified relative to implementation of the proposed remedy. However, historical releases of petroleum hydrocarbons at ExxonMobil have resulted in some NAPL plumes. Samples from wells in the interior refinery area and river boundary area have contained benzene above Circular DEQ-7 standards. The proposed remedy should remediate impacted groundwater to below Circular DEQ-7 standards.

8. ***Cost***
   ExxonMobil used a 20-year timeframe to calculate costs for the remedial alternatives at the site in an effort to compare and evaluate the different remedies. Therefore, the total

cost of the proposed remedy ($5,935,296.00) is based on a total projected life of 20 years. However, ExxonMobil estimates that contaminant concentrations in the groundwater and subsurface soils in the three remediation areas will meet or exceed Circular DEQ-7 standards in 20 years and, therefore, a rolling 20-year timeframe will be required for financial assurance of the selected remedies.

VII. PUBLIC PARTICIPATION

MDEQ is seeking input from the public on both the selected remedies described in this Statement of Basis and the draft Permit Modification. MDEQ has set a public comment period from December 22, 2008 through February 13, 2009 to encourage public participation in the remedy selection process. The public, including interested citizens, MDEQ, EPA, other governmental agencies, and ExxonMobil are encouraged to review and comment on the draft permit modification and proposed corrective action remedies before a final decision is made by MDEQ.

The Statement of Basis, draft permit modification, and other associated documents will be available for review at the following locations:

Montana Department of Environmental Quality Permitting and Compliance Division Waste and Underground Tank Management Bureau 1520 E. 6th Ave. Helena, Montana 59620	Montana Department of Environmental Quality Airport Business Park, 1P-9 1371 Rimtop Drive Billings, Montana 59105

Only the changes proposed in the permit modification and remedies selected in the Statement of Basis are open for public comment (40 CFR 124.5(c)(2)). All persons wishing to comment on the draft permit and/or the proposed remedies should submit comments in writing to:

Ann M. Kron
Environmental Science Specialist
Waste and Underground Tank Management Bureau
Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

All comments must be received by the MDEQ on or before February 13, 2009 for consideration. Any supporting material that is submitted must be included in full and may not be referenced unless the material is a generally available reference material.

The MDEQ will prepare a Response to Comments after reviewing all comments. The Response to Comments will: 1) explain any changes to the draft permit modification including the proposed remedies; and 2) describe and respond to all significant comments. The MDEQ will then issue, issue with changes, or deny the permit modification and remedy selection.

When MDEQ makes a final decision on the draft permit modification and selected remedies, notice will be given to the applicant and each person who submitted written comments or requested a notice of the final decision. The final permit decision shall become effective thirty (30) days after the service of the notice of the decision unless a later date is specified. If no comments are received on the draft permit modification and selected remedies, the final permit decision and selected remedies shall become effective immediately upon issuance.

Please contact Ann Kron at (406) 444-5824 or at the address listed above for more information.

Appendix A

Table 1 Interior Refinery Area Evaluation of Technologies

Technology	Description	Screening Parameter			Decision
		Site Characteristics	Waste Characteristics	Technology Limitations	
No Action	No action provides a baseline by which other technologies are compared. With this technology, no remedial efforts, improvements, or enhancements would be made.	Not Applicable	Not Applicable	Does not remediate chemicals of concern (COC) in groundwater or soil. Does not remove free-phase hydrocarbons to prevent future releases to groundwater.	This technology will not be considered further.
Institutional Controls	Institutional controls would involve the prevention of direct contact with the COC by limiting access and ensuring long-term maintenance of the selected corrective measure(s). Site access and use would be limited through the use of physical barriers (e.g., fences, gate restrictions, etc.), security monitoring, and on-site deed restrictions.	Location of the Site would allow for access control. Site is in an industrial area which would reduce the chances for residential development.	Characteristics of the waste material and present location would encourage the use of institutional controls. Future Site development could result in the excavation of impacted soil or contact with impacted groundwater.	Does not remediate COC in groundwater or soil; however, could be combined with other technologies to provide a protective alternative.	This technology will be evaluated in combination with other technologies.
Air Sparging	Air would be mechanically injected into the groundwater zone to promote biodegradation and volatilization of hydrocarbons.	Though the Site lithology is conducive to the air sparging technology, implementing an effective system would be difficult. The Site is an active refining facility and constructing an air sparging system around existing piping, tanks, and other structures would be difficult.	Waste characteristics compatible.	Air sparging would be limited by well placement and venting of any vapors produced. Site piping, pavement, and structures would limit the placement and coverage of air sparging wells.	This technology will not be considered further.
Enhanced Anaerobic Biodegradation	Electron receptors, such as sulfate, would be added to the subsurface to enhance anaerobic biodegradation.	The Site is an active refining facility and enhancing biodegradation in the subsurface, in an efficient manner (considering obstructions such as piping, tanks, and other structures), would be difficult.	Waste characteristics compatible.	Enhancing anaerobic biodegradation is limited by injection point (well) placement. Site piping, pavement, and structures would limit the placement and coverage of the well points.	This technology will not be considered further.
Enhanced Aerobic Biodegradation	Native hydrocarbon-degrading bacteria would be stimulated, through the introduction of oxygen and nutrients, to promote and enhance biodegradation.	The Site is an active refining facility and enhancing biodegradation in the subsurface, in an efficient manner (considering obstructions such as piping, tanks, and other structures), would be difficult.	Waste characteristics compatible.	Enhancing aerobic biodegradation is limited by injection point (well) placement. Site piping, pavement, and structures would limit the placement and coverage of the well points.	This technology will not be considered further.
Monitored Natural Attenuation	Natural attenuation would remediate COC and prevent COC from reaching Site boundaries.	Current Site conditions would support natural attenuation. Site data indicate that natural attenuation is occurring.	Waste characteristics compatible.	No technology limitations.	This technology will be considered.

Table 1 (con't) Interior Refinery Area Evaluation of Technologies

Technology	Description	Screening Parameter Site Characteristics	Waste Characteristics	Technology Limitations	Decision
Oxygen Release Compound	An oxygen release compound would be injected into the subsuface to release oxygen to groundwater and enhance aerobic biodegradation.	Though the Site lithology is conducive to the oxygen release compound technology, implementing an effective system would be difficult. The Site is an active refining facility and installing oxygen release points around existing piping, tanks, and other structures would be difficult.	Waste characteristics compatible.	The oxygen release compound would be limited by injection point placement. Site piping, pavement, and structures would limit the placement and coverage of the injection points.	This technology will not be considered further.
Soil Vapor Extraction	A vacuum system would be installed to pull air through the subsurface and promote volatilization and recovery of hydrocarbons from soil.	Though the Site lithology is conducive to the soil vapor extraction technology, implementing an effective system would be difficult. The Site is an active refining facility and installing vapor extraction wells around existing piping, tanks, and other structures would be difficult.	Waste characteristics compatible.	The technology would be limited by vapor extraction well placement and paved surfaces and other structures. The technology relies on pulling air through the subsurface which would be inhibited by the impervious surfaces.	This technology will not be considered further.
Thermal Desorption	Thermal desorption consists of thermally treating impacted soils in the subsurface. Specially designed equipment heats the materials to high temperatures and recovers hydrocarbon vapors.	Though the Site lithology is conducive to remediation by soil vapor extraction or some type of pumping, thermal desorption would be difficult to implement. The Site is an active refining facility and use of the thermal technology could possibly create a dangerous situation.	Waste characteristics compatible.	The technology would be limited by remediation well placement and paved surfaces and other structures. The technology relies on thermally treating the subsurface which would be inhibited by the impervious surfaces and other Site structures.	This technology will not be considered further.

Note: COC = constituents of concern

Table 2 NAPL Accumulation Area
Evaluation of Technologies

Technology	Description	Screening Parameter			
		Site Characteristics	Waste Characteristics	Technology Limitations	Decision
No Action	No action provides a baseline by which other technologies are compared. With this technology, no remedial efforts, improvements, or enhancements would be made.	Not Applicable	Not Applicable	Does not remediate chemicals of concern (COC) in groundwater or soil. Does not remove free-phase hydrocarbons to prevent future releases to groundwater.	This technology will not be considered further.
Institutional Controls	Institutional controls would involve the prevention of direct contact with the COC by limiting access. Site access and use would be limited through the use of physical barriers (e.g., fences, gate restrictions, etc.), security monitoring, and on-site deed restrictions.	Location of the Site would allow for access control. Site is in an industrial area which would reduce the chances for residential development.	Characteristics of the waste material and present location would encourage the use of institutional controls. Future Site development could result in the excavation of impacted soil or contact with impacted groundwater.	Does not remediate COC in groundwater or soil; however, could be combined with other technologies to provide a protective alternative.	This technology will be considered in combination with other technologies.
Chemical-Enhanced NAPL Recovery	Chemical surfactants are used to mobilize NAPL for recovery.	The Site is an active refining facility and injecting chemicals to enhance recovery would be difficult.	Waste characteristics compatible.	Technology would require efficient dispersion of the chemicals and contact time with the NAPL. Site features would make addition of the chemicals difficult to complete.	This technology will not be considered further.
Heat-Enhanced NAPL Recovery	The subsurface would be thermally treated to enhance recovery of NAPL.	Heating the subsurface would be difficult due to site structures, paving, etc. The Site is an active refining facility and use of the thermal technology could possibly create a dangerous situation.	Waste characteristics compatible.	The technology would be limited by remediation equipment placement and paved surfaces and other structures. The technology relies on thermally treating the subsurface which would be inhibited by the impervious surfaces and other Site structures.	This technology will not be considered further.
In Situ Soil Mixing and Stabilization	Specially designed equipment (with stabilizing agent) would be used to mix and stabilize impacted soil in situ.	Addition of stabilizing agents and in situ mixing of impacted soil would be difficult within the refinery duke to site structures, paving, etc.	Waste characteristics compatible.	Mixing equipment would not be able to reach impacted soil beneath structures or near process piping. May not completely remove NAPL.	This technology will not be considered further.
NAPL Recovery from Wells	Recovery wells would be installed with pumps to recover NAPL. Recovered fluids would be managed by the Site water treatment system.	Site characteristics compatible.	Waste characteristics compatible.	Technology would be limited by water treatment capacity at the Site treatment plant.	This technology will be considered.

Table 2 (con't) NAPL Accumulation Areas Evaluation of Technologies

Technology	Description	Screening Parameter			Decision
		Site Characteristics	Waste Characteristics	Technology Limitations	
NAPL Recovery from Trenches	A recovery trench would be installed to recover NAPL. The trench would be backfilled with a permeable material to induce the flow of NAPL to the trench.	Construction of recovery trenches would be difficult due to site structures, paving, etc.	Waste characteristics compatible.	Technology would be limited by water treatment capacity at the Site treatment plant.	Two interceptor trenches already exist at the site and will continue to be utilitized. However, construction of new trenches will not be considered further.
Soil Vapor Extraction	A vacuum system would be installed to pull air through the subsurface and promote volatilization and recovery of hydrocarbons from soil.	Though the Site lithology is conducive to the soil vapor extraction technology, implementing an effective system would be difficult. The Site is an active refining facility and installing vapor extraction wells around existing piping, tanks, and other structures would be difficult.	COC which are weathered would be difficult to extract.	The technology would be limited by vapor extraction well placement and paved surfaces and other structures. The technology relies on pulling air through the subsurface which would be inhibited by the impervious surfaces.	This technology will not be considered further.
Vacuum-Enhanced NAPL Recovery	A vacuum would be applied to groundwater/NAPL recovery system (multiphase recovery system) to enhance recovery. Recovered fluids would be managed at the Site water treatment system.	Site characteristics compatible.	Waste characteristics compatible.	No technology limitations.	This technology will be considered.
Water Flood-Enhanced NAPL Recovery	Water would be used to flood the treatment area, saturate the subsurface, and flush NAPL toward down-gradient recovery wells.	The Site is an active refining facility and flooding the area with water to enhance recovery would be difficult.	Waste characteristics compatible.	Technology would require efficient dispersion of a large volume of water to mobilize NAPL. Site features would make flooding of the NAPL areas difficult to complete.	This technology will not be considered further.

Note: COC = constituents of concern
NAPL = non-aqueous phase liquid

Table 3 River Boundary Areas Evaluation of Technologies

Technology	Description	Screening Parameter: Site Characteristics	Screening Parameter: Waste Characteristics	Screening Parameter: Technology Limitations	Decision
No Action	No action provides a baseline by which other technologies are compared. With this technology, no remedial efforts, improvements, or enhancements would be made.	Not Applicable	Not Applicable	Does not remediate chemicals of concern (COC) in groundwater or soil. Does not remove free-phase hydrocarbons to prevent future releases to groundwater.	This technology will not be considered further.
Institutional Controls	Institutional controls would involve the prevention of direct contact with the COC by limiting access. Site access and use would be limited through the use of physical barriers (e.g., fences, gate restrictions, etc.), security monitoring, and on-site deed restrictions.	Location of the Site would allow for access control. Site is in an industrial area which would reduce the chances for residential development.	Characteristics of the waste material and present location would encourage the use of institutional controls. Future Site development could result in the excavation of impacted soil or contact with impacted groundwater.	Does not remediate COC in groundwater or soil; however, could be combined with other technologies to provide a protective alternative.	This technology will be considered in combination with other technologies.
Air Sparging	Air would be mechanically injected into the groundwater zone to promote biodegradation and volatilization of hydrocarbons.	Site characteristics compatible.	Waste characteristics compatible.	No technology limitations.	This technology will be considered.
Engineered Physical Barrier with Hydraulic Control	A physical barrier wall would be installed in combination with hydraulic control. Dissolved and free-phase constituents would be prevented from migrating off Site.	Site characteristics compatible.	Waste characteristics compatible.	Technology would be limited by water treatment capacity at the Site treatment plant.	This technology will be considered.
Engineered Treatment Barrier	A treatment trench with funnel and gate (using air sparging system) would be constructed to treat groundwater as it passes through.	Due to proximity of river, a physical barrier would be difficult to install. Hydraulic flow conditions at the gate may prevent sufficient treatment of COC.	Waste characteristics compatible.	Contact time for treatment of COC may be limited.	This technology will be considered.
Enhanced Anaerobic Biodegradation	Electron receptors, such as sulfate, would be added to the subsurface to enhance anaerobic biodegradation.	The addition of anaerobic degradation enhancing compounds would be difficult due to proximity to river and typical groundwater velocities.	Waste characteristics compatible.	Injected compounds would require contact time to stimulate anaerobic degrading bacteria. Groundwater and river flows would limit the contact time. Subsurface heterogeneities would prevent adequate distribution of amendments.	This technology will not be considered further.

Table 3 (con't) River Boundary Areas Screening of Technologies

Technology	Description	Screening Parameter: Site Characteristics	Waste Characteristics	Technology Limitations	Screening Decision
Enhanced Aerobic Biodegradation	Native hydrocarbon-degrading bacteria would be stimulated, through the introduction of oxygen and nutrients, to promote and enhance biodegradation.	The addition of aerobic degradation enhancing compounds would be difficult due to proximity to river and typical groundwater velocities.	Waste characteristics compatible.	Injected compounds would require contact time to stimulate aerobic degrading bacteria. Groundwater and river flows would limit the contact time. Subsurface heterogeneities would prevent adequate distribution of amendments.	This technology will not be considered further.
Hydraulic Control	Groundwater pumping wells would be installed and operated to control the hydraulic gradient and prevent migration of COC.	Site characteristics compatible.	Waste characteristics compatible.	Technology would be limited by water treatment capacity at the Site treatment plant.	This technology will be considered.
Monitored Natural Attenuation	Natural attenuation would be used to prevent COC from reaching Site boundaries.	Site characteristics compatible.	Waste characteristics compatible.	No technology limitations.	This technology will be considered.
Oxygen Release Compound	An oxygen release compound would be injected into the subsuface to release oxygen to groundwater and enhance aerobic biodegradation.	Site characteristics compatible.	Waste characteristics compatible.	Oxygen release compounds would not provide the area of influence that air sparging produces. The efficiency of oxygen transfer is also questionable.	This technology will not be considered further.
Phytoremediation	Specific plants and trees would be planted at strategic areas of the Site to remove dissolved hydrocarbons from groundwater and to help control the migration of COC.	Site characteristics compatible.	Waste characteristics compatible.	Effectiveness may be limited until vegetation is fully established.	This technology will be considered.

Note: COC = constituents of concern
NAPL = non-aqueous phase liquid

Table 4 **Interior Refinery Area (IRA)**
Evaluation of Corrective Measures Alternatives

Alternative description: Monitored natural attenuation (MNA) utilizes naturally occurring physical, chemical, and/or biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. This alternative typically requires groundwater monitoring to ensure compliance with site clean-up goals.

Remedial Decision: **This is the proposed alternative for remediation of the IRA.** To physically remediate groundwater of Montana Circular DEQ-7 Standards has been proven to be technically, physically, and financially infeasible. Investigations at the Refinery have led to the assumption that dissolved-phase plumes in the IRA are contained and being remediated at the Refinery by natural attenuation processes. A monitoring plan will be required to evaluate natural attenuation parameters and will continue until Montana Circular DEQ-7 Standards have been met. A more detailed evaluation of the proposed remedies can be found in Section VI of the Statement of Basis.

	Technical						
Evaluated Alternative	**Performance**	**Reliability**	**Implementability**	**Safety**	**Environmental**	**Human Health**	**Cost**
Monitored Natural Attenuation with Institutional Controls	Utilizes engineered and natural processes to remediate free- and dissolved phase hydrocarbon. May require years to complete. Entire extent of subsurface impacts would not be immediately addressed. Physical characteristics of the COC could potentially limit performance. Proper monitoring and sufficient groundwater chemistry is required.	Process occurs naturally and would have no O & M requirements. Long-term groundwater monitoring and sampling would be the only requirements to ensure natural attenuation is proceeding. Process has been used effectively at many sites.	Past monitoring events have indicated that natural attenuation is currently working to manage dissolved-phase constituents. Monitoring of the MNA process is already being performed.	Safety concerns would be minimal with the MNA alternative. Potential for exposure to organic vapors would exist during installation of any additional monitoring wells, and management of impacted soils soil to on-site construction workers. Contact with organic constituents would be a concern during groundwater monitoring.	MNA addresses dissolved-phase COC in the refinery interior. MNA presents no short- or long-term adverse effects to potentially sensitive areas or receptors. Short- and long-term beneficial effects include destruction of dissolved-phase hydrocarbons, and containment within the site boundaries.	MNA would reduce potential long-term exposures by remediating dissolved-phase constituents. Potential short- and long-term risks to site workers would exist during well construction and routine monitoring.	$973, 674

Note: COC means chemical of concern.
O and M means operation and maintenance.

Table 5 **NAPL Accumulation Areas**
Evaluation of Corrective Measures Alternatives

Alternative Description: NAPL Recovery from Engineered Wells is an alternative that would use existing and possibly new wells designed to allow recovery of non-aqueous phase liquid (NAPL) and groundwater. Each recovery well would be completed with a single-phase, total fluids, or dual-phase pumping system. Recovered fluids would be pumped to the existing refinery wastewater treatment system.

Remedy Decision: This alternative was rejected because, when compared with Vacuum-Enhanced NAPL Recovery, the remedial success was not as certain, there were many potential maintenance problems, and the cost of upgrading the water treatment facility was very high.

	Technical						
Evaluated Alternative	**Performance**	**Reliability**	**Implementability**	**Safety**	**Environmental**	**Human Health**	**Cost**
NAPL Recovery from Engineered Wells	Varying degrees of effectiveness at many other sites. Limitations are high permeability of soils, recoverability of NAPL, potentially limited zone of influence, and potential of increased smearing.	System is reliable given the proper O & M. The frequency and complexity of the O & M requirements would be greater than the other alternatives. Potential maintenance issues include biofouling of the well screens, clogging of pump intake screens, pump failure, float switch adjustment, and waste water treatment system maintenance.	New wells are easily constructed. Placement of wells and associated piping could be limited by exisitng structures in process areas. Existing water treatment facility would have to be upgraded to facilitate an aggressive system of this type.	On-site workers would encounter common safety hazards during construction due to drilling equipment and construction activities. Buried and overhead utilities would have to be located and avoided during construction. Moderate risk while monitoring recovery and fluid levels.	Free-phase hydrocarbon mass would be reduced limiting the amount of NAPL available for dissolution and decreasing the total time to complete remediation. Potential migration of dissolved-phase constituents would be inhibited. No short- or long-term adverse effects to potentially sensitive areas.	Reduces potential short- and long-term exposures by removing free-phase and groundwater for treatment. Potential short- and long-term risks to site workers exist during construction and routine operation and maintenance.	$3,757,068

Table 5 (con't) **NAPL Accumulation Areas**
Evaluation of Corrective Measures Alternatives

Alternative Description: The vacuum-enhanced NAPL recovery alternative would utilize vacuum to influence hydrocarbon recovery from new and existing refinery wells. Fluid recovery would be accomplished using a mobile vacuum truck or centrally located vacuum unit.

Remedy Decision: **This is a proposed alternative for remediation of the NAPL Accumulation Areas.** This alternative was selected because of its proven effectiveness and demonstrated success, the aggressive nature of the remedy, and the reasonable cost. A more detailed evaluation of the proposed remedies can be found in Section VI of the Statement of Basis.

	Technical						
Evaluated Alternative	**Performance**	**Reliability**	**Implementability**	**Safety**	**Environmental**	**Human Health**	**Cost**
Vacuum Enhanced NAPL Recovery and Institutional Controls	Vacuum-enhanced recovery is effective at remediating existing NAPL plumes due to the high vacuum nature of the recovery technique. Utilizing the mobile vacuum truck unit would allow for intermittent recovery and recharge of NAPL to the recovery wells. Recovery method has proven to be effective at similar sites. Mobility and other physical characteristics of NAPL could limit performance. The alternative would not be affected by large fluctuations in the groundwater table.	The frequency and complexity of the O & M requirements would be less than the other alternatives due to the simple nature of the operation. Potential maintenance issues include biofouling of the well screens, vacuum truck breakdown, vacuum pump failure, and waste water treatment system maintenance. The vacuum-enhanced recovery alternative has demonstrated success and reliability in similar situations.	Using the mobile vacuum truck would require less than other alternatives considered. Evacuation could begin immediately at existing wells and be expanded to new recovery wells if necessary. Final remediation would potentially require less time to complete due to the more aggressive nature of this NAPL recovery method.	On-site workers would encounter common safety hazards during construction due to drilling equipment and construction activities. Buried and overhead utilities would have to be located and avoided during construction. Risk to nearby communities and environmental receptors would be negligible during construction or operation. Additional hazards (uneven terrain, explosive vapors, and moving equipment) would exist with operation of the mobile vacuum truck unit.	Remediates free-phase NAPL. No short- or long-term adverse effects to potentially sensitive areas. Impacted soil generated as part of new recovery well construction or piping installation would be properly managed to prevent contact with storm water or clean surface soil. Short- and long-term beneficial effects include recovery and treatment of NAPL and impacted groundwater.	Reduces potential short- and long-term exposures by removing free-phase and groundwater for treatment. Potential short- and long-term risks to site workers exist during construction of new recovery wells, and recovery efforts.	$2,612,216 (combined with all proposed alternatives for the NAPL Accumulation Areas)

Table 5 (con't) **NAPL Accumulation Areas**
Evaluation of Corrective Measures Alternatives

Alternative Description: Use of five total fluids recovery wells and two interceptor trenches to create a capture zone for NAPL recovery. Descriptions of these alternatives can be found in Section IV.1.b.vi. and IV.1.b.vii. of this document.

Remedy Decision: **This is a proposed alternative for remediation of the NAPL Accumulation Areas.** This alternative was selected because of its proven effectiveness and demonstrated success, reasonable cost, and immediate protection of the potential of NAPL releasing to the Yellowstone River. However, expansion of these remedial alternatives was evaluated and found to be impractical.

	Technical						
Evaluated Alternative	**Performance**	**Reliability**	**Implementability**	**Safety**	**Environmental**	**Human Health**	**Cost**
Use of Existing Five Total Fluids Recovery Wells and Two Interceptor Trenches	Creates a diversion of groundwater away from it's preferred path toward the river. The Interceptor Trenches would further remove the contaminant's ability to flow off site. Recovery method has proven to be effective at similar sites. Mobility and other physical characteristics of NAPL could limit performance.	Potential maintenance issues include pump failure. The use of fluids recovery wells and interceptor trenches has demonstrated success and reliability in similar situations.	This alternative is already being implemented at the site as an interim measure.	Risk to workers, nearby communities, and environmental receptors would be negligible during operation.	No short- or long-term adverse effects to potentially sensitive areas. Short- and long-term beneficial effects include recovery and treatment of NAPL and impacted groundwater.	Reduces potential short- and long-term exposures by removing free-phase and groundwater for treatment.	$2,612,216 (combined with all proposed alternatives for the NAPL Accumulation Areas)

Table 6 **River Boundary Areas**
Evaluation of Corrective Measures Alternatives

Alternative description: Air sparging would consist of installing specially designed wells to a depth several feet below the historical water table elevation. Atmospheric air would be injected through the wells to increase the dissolved oxygen concentration to the passing groundwater and strip volatile hydrocarbon compounds. As hydrocarbon-degrading bacteria utilize oxygen as an energy source, air sparging would enhance subsurface conditions for biodegradation.

Remedy Decision: This is one of the proposed remedial alternatives for the River Boundary Areas. This alternative was selected because of its proven effectiveness at the Refinery through interim measures, because of the active treatment nature of the method, and because of the negligible risk to human health and the environment during operations. A more detailed evaluation of the proposed remedies can be found in Section VI of the Statement of Basis.

	Technical						
Evaluated Alternative	**Performance**	**Reliability**	**Implementability**	**Safety**	**Environmental**	**Human Health**	**Cost**
Air Sparging	Addresses dissolved-phase constituents through volatilization and bioremediation. Limited by high hydraulic conductivity and geologic heterogeneities. Method has been tested at the refinery with positive results. Final remediation of the dissolved-phase plumes would potentially require less time to complete due to the active treatment nature of the method.	Multiple O & M requirements including: compressor maintenance, manifold maintenance and repairs, piping repairs, and well screen cleaning. Potential for fouling problems.	New well and piping installation may be hindered by utilities and other structures. Electrical power would need to be installed to power the air compressor system. Piping may need to be routed underground.	On-site workers would encounter common safety hazards during construction due to drilling equipment and construction activities. Risk to nearby communities and environmental receptors would be negligible during construction or operation.	Remediates dissolved-phase COC present near the refinery river boundaries. No long-term adverse effects to potentially sensitive areas. Impacted soil generated would be properly managed to prevent contact with storm water or clean surface soil. Short- and long-term beneficial effects include treatment of dissolved hydrocarbon plumes to prevent further migration.	Reduces potential short- and long-term exposures by mass destruction of COC. Potential short- and long-term risks to site workers exist during construction and routine O & M. Hazards can be mitigated with proper use of PPE and engineering controls.	$1,095,742

Table 6 (con't) **River Boundary Areas**
Evaluation of Corrective Measures Alternatives

Alternative description: Phytoremediation would consist of planted vegetation along the river boundary to remediate dissolved-phase constituents and perform limited hydraulic control. Phytoremediation would include the direct use of living plants for in-situ remediation of impacted groundwater and soil through contaminant removal, degradation, or containment. Additionally, plant water uptake would act as nominal hydraulic control.

Remedy Decision: This is one of the proposed remedial alternatives for the River Boundary Areas. This alternative was selected because it has been proven effective, it provides a long-term option, and it has negligible effect on human health or the environment during remediation. A more detailed evaluation of the proposed remedies can be found in Section VI of the Statement of Basis.

	Technical						
Evaluated Alternative	**Performance**	**Reliability**	**Implementability**	**Safety**	**Environmental**	**Human Health**	**Cost**
Phytoremediation	Has been proven effective at other sites provided the method limitations are not exceeded. Conditions at the site are conducive to its effective use. A long-term option that would not produce immediate results.	Reliability depends on long-term maintenance of planted trees and favorable climatic conditions.	Planting of trees in sufficient quantity and density depends on availability of space, existing pavement and structures.	For phytoremediation the only safety concerns would be heavy equipment usage during planting of grown trees.	Phytoremediation would contribute to the destruction of dissolve-phase COC, reducing the mass of COC that could potentially migrate off-site.	Long-term option that would not produce immediate results. Once the plants and root systems were established results may become apparent. Impacted soil might be contacted during planting. Long-term effects would be to reduce exposure to receptors.	$743,706

Table 6 (con't) **River Boundary Areas**
Evaluation of Corrective Measures Alternatives

Alternative description: Monitored natural attenuation (MNA) utilizes naturally occurring physical, chemical, and/or biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. This alternative requires groundwater monitoring to ensure compliance with site clean-up goals and to ensure the natural attenuation is working.

Remedial Decision: This is one of the proposed remedial alternatives for the River Boundary Areas. MNA is a recommended alternative to supplement other corrective measure alternatives for the River Boundary Areas. Investigations at the Refinery have provided evidence that natural attenuation is occurring and effectively controlling the extent of dissolved-phase plumes at most of the Site boundary. A monitoring plan will be required to evaluate natural attenuation parameters and will continue until Montana Circular DEQ-7 Standards have been met. A more detailed evaluation of the proposed remedies can be found in Section VI of the Statement of Basis.

	Technical						
Evaluated Alternative	**Performance**	**Reliability**	**Implementability**	**Safety**	**Environmental**	**Human Health**	**Cost**
Monitored natural attenuation	Utilizes engineered and natural processes to remediate free- and dissolved phase hydrocarbon. May require years to complete. Entire extent of subsurface impacts would not be immediately addressed. Physical characteristics of the COC could potentially limit performance. Proper monitoring and sufficient groundwater chemistry is required.	Process occurs naturally and would have no O & M requirements. Long-term groundwater monitoring and sampling would be the only requirements to ensure natural attenuation is proceeding. Process has been used effectively at many sites.	Past monitoring events have indicated that natural attenuation is currently working to manage dissolved-phase constituents. Monitoring of the NA process is already being performed. Would continue in conjunction with other corrective measures.	Safety concerns would be minimal with the MNA alternative. Potential for exposure to organic vapors would exist during installation of any additional monitoring wells, and management of impacted soils soil to on-site construction workers. Contact with organic constituents would be a concern during groundwater monitoring.	MNA addresses dissolved-phase COC at the river boundary. MNA presents no short- or long-term adverse effects to potentially sensitive areas or receptors. Short- and long-term beneficial effects include destruction of dissolved-phase hydrocarbons, and containment within the site boundaries.	MNA would reduce potential long-term exposures by remediating dissolved-phase constituents. Potential short- and long-term risks to site workers would exist during well construction and routine monitoring.	$509,958

Table 6 (con't) **River Boundary Areas**
Evaluation of Corrective Measures Alternatives

Alternative description: An engineered barrier wall would consist of a slurry wall or sheet pile wall constructed from the ground surface to bedrock. The barrier wall would physically contain the COC present near the river boundaries to prevent migration. Groundwater extraction wells would be installed to control the groundwater gradient near the barrier.

Remedial Decision: This alternative was rejected because of the following reasons: 1) Barriers walls would create groundwater mounding behind the walls, thus creating groundwater diversion issues and potentially mobilizing NAPL toward the river boundary, 2) Constructability is limited by the steep banks of the river boundary, 3) The concentrations of contaminants are low enough that they do not pose a risk which warrants such an extreme remedial measure; 4) More cost effective and implementable alternatives are available, and 5) a barrier wall diverts groundwater, but does not effectively remediate the groundwater.

	Technical						
Evaluated Alternative	**Performance**	**Reliability**	**Implementability**	**Safety**	**Environmental**	**Human Health**	**Cost**
Engineered barrier with hydraulic control	May prevent migration of dissolved-phase plumes toward the river boundaries. Would create groundwater mounding behind the barrier and additional flow around the barrier, requiring significant pumping for hydraulic control. Pumping would continue indefinitely, at least many decades.	Barriers are reliable provided tie-in to bedrock is good and hydraulic control is sufficient to prevent migration around the barrier.	Construction may be difficult due to geologic materials, the ability to create a good seal at the bedrock, existing structures, and slope stability issues near steep riverbanks. The large volumes of groundwater to be managed would require a new waste water treatment facility to be constructed.	On-site workers would encounter common safety hazards during construction of the engineered barrier wall due to heavy equipment and construction activities. Buried and overhead utilities would have to be located and avoided during construction. Risk to nearby communities and environmental receptors would be minimal during construction or operation. Slope stability near the riverbanks could be a serious safety hazard.	Physically contains and prevents migration of dissolved-phase COC. Groundwater extraction for gradient control would also provide remediation of dissolved-phase constituents.	Reduces potential short- and long-term exposures by physically containing dissolved-phase constituents. Potential short- and long-term risks to site workers during construction and routine O & M. Additional hazards would include contact with impacted soil during excavation and wall construction.	$7,371,000

Table 6 (con't) **River Boundary Areas**
Evaluation of Corrective Measures Alternatives

Alternative description: An engineered treatment barrier consists of an engineered barrier wall, such as a sheet-pile or slurry wall, with an exit "gate" containing a permeable reactive material or air sparging system to create a zone where biodegradation or other form of degradation occurs. The engineered treatment barrier would physically contain the river boundary plumes but allow groundwater to migrate through the treatment zone for remediation. The wall would extend from the ground surface to the site confining layer.

Remedial Decision: This alternative was rejected because the high groundwater flow velocities created by the system through the treatment zone would limit the retention time of affected groundwater. Without sufficient retention time the biologically driven reactions may not be sufficiently effective in hydrocarbon mass reduction.

	Technical						
Evaluated Alternative	**Performance**	**Reliability**	**Implementability**	**Safety**	**Environmental**	**Human Health**	**Cost**
Engineered treatment barrier	A suitable reactive material is not presently available. A reactive zone using air sparging may be limited by high groundwater flows created by constriction of flow paths. The higher flows may decrease retention time within the gate portion of the system to the extent that air sparging would not be sufficiently effective.	Extended down-time of the system would result in potential discharge of COC to the river. Tie-in of barrier wall portion to bedrock could be problematic and would be an important factor in system ability to meet objectives. Dependant on ability to prevent fouling within the gate to maintain free flow.	Construction may be difficult due to geologic materials, the ability to create a good seal at the bedrock, existing structures, and slope stability issues near steep riverbanks.	On-site workers would encounter common safety hazards during construction due to heavy equipment and construction activities. Risk to nearby communities and environmental receptors would be minimal during construction or operation. Slope stability near the riverbanks could be a serious safety hazard.	Could eliminate discharge of, and treat, dissolved-phase COC near river boundaries. Presents no long-term adverse to potentially sensitive areas.	Reduces potential short- and long-term exposures by physically containing dissolved-phase constituents. Potential short- and long-term risks to site workers during construction and routine O & M. Additional hazards would include contact with impacted soil during excavation and wall construction.	$785,000

Table 6 (con't) **River Boundary Areas**
Evaluation of Corrective Measures Alternatives

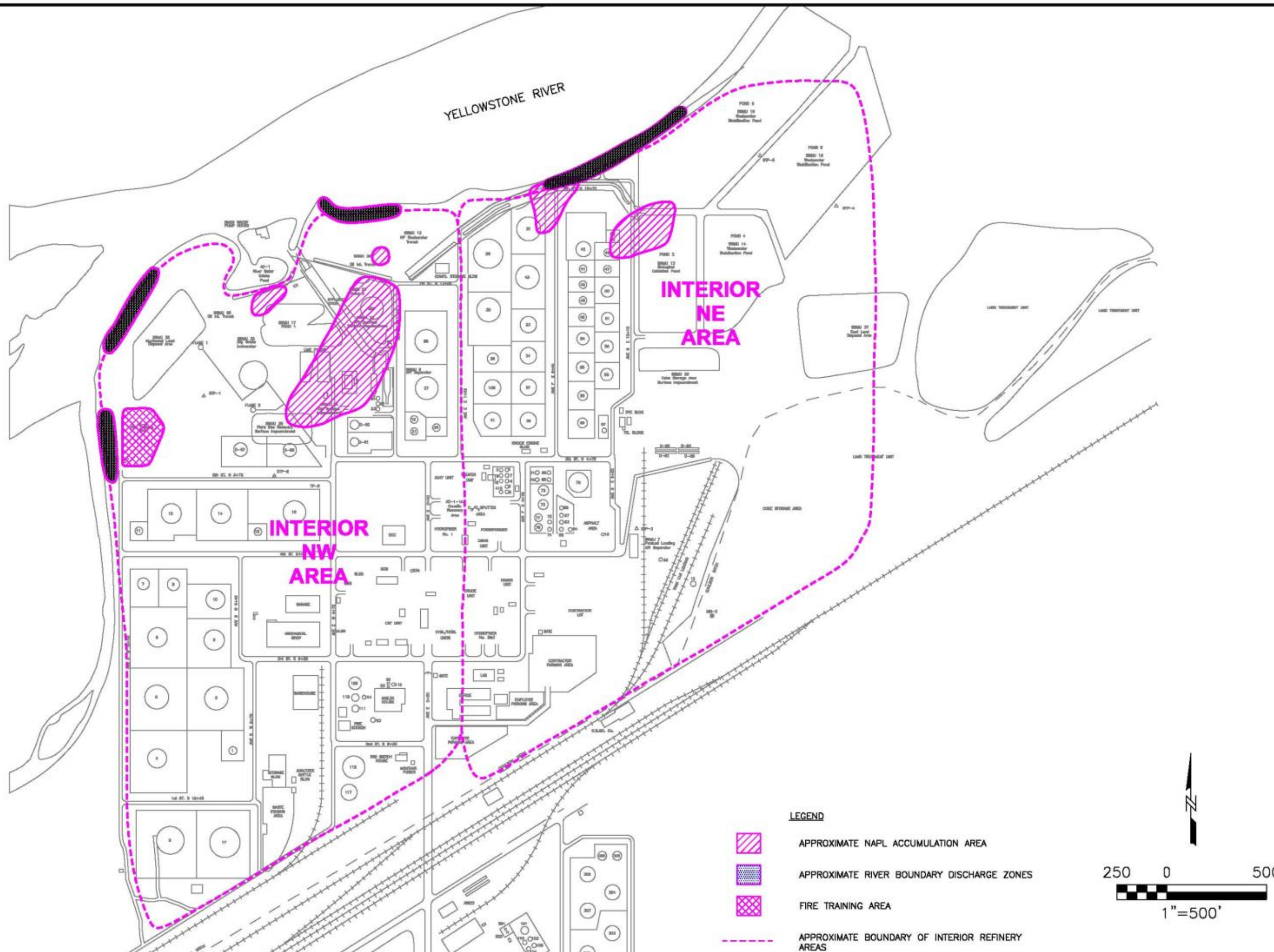
Alternative description: A hydraulic control system would consist of a series of groundwater pumping wells constructed along the river boundaries of the refinery. The groundwater pumping system would physically control the hydraulic gradient and help manage COC present near the river boundaries to prevent migration off-site.

Remedial Decision: This remedial alternative was rejected because controlling hydraulic gradients around the entire site river boundary would result in very large quantities of groundwater requiring treatment and would far exceed the capacity of water treatment facilities at the Site. Also, based on the geologic conditions in the subsurface, there are preferential pathways in which hydraulic control around the entire river boundary is not warranted.

	Technical						
Evaluated Alternative	**Performance**	**Reliability**	**Implementability**	**Safety**	**Environmental**	**Human Health**	**Cost**
Hydraulic control	Manages migration of dissolved-phase plumes toward the river boundaries by controlling the hydraulic gradient. Proven alternative at sites where hydrogeological conditions inhibit remediation by other methods.	Reliable assuming proper O & M of the pumps and wells.	Materials for pumping system construction are readily available. Construction of new waste water treatment facility would be necessary to manage the significant additional water flow.	On-site workers would encounter common safety hazards during construction due to drilling equipment and other heavy equipment and construction activities. Risk to nearby communities and environmental receptors would be minimal during construction or operation.	Manages the hydraulic gradient and migration of dissolved-phase COC. Presents no long-term adverse effects to potentially sensitive areas.	Reduces potential short- and long-term exposures by physically containing dissolved-phase constituents. Potential short- and long-term risks to site workers during construction and routine O & M.	$4,120,000

Appendix B

Figure 1

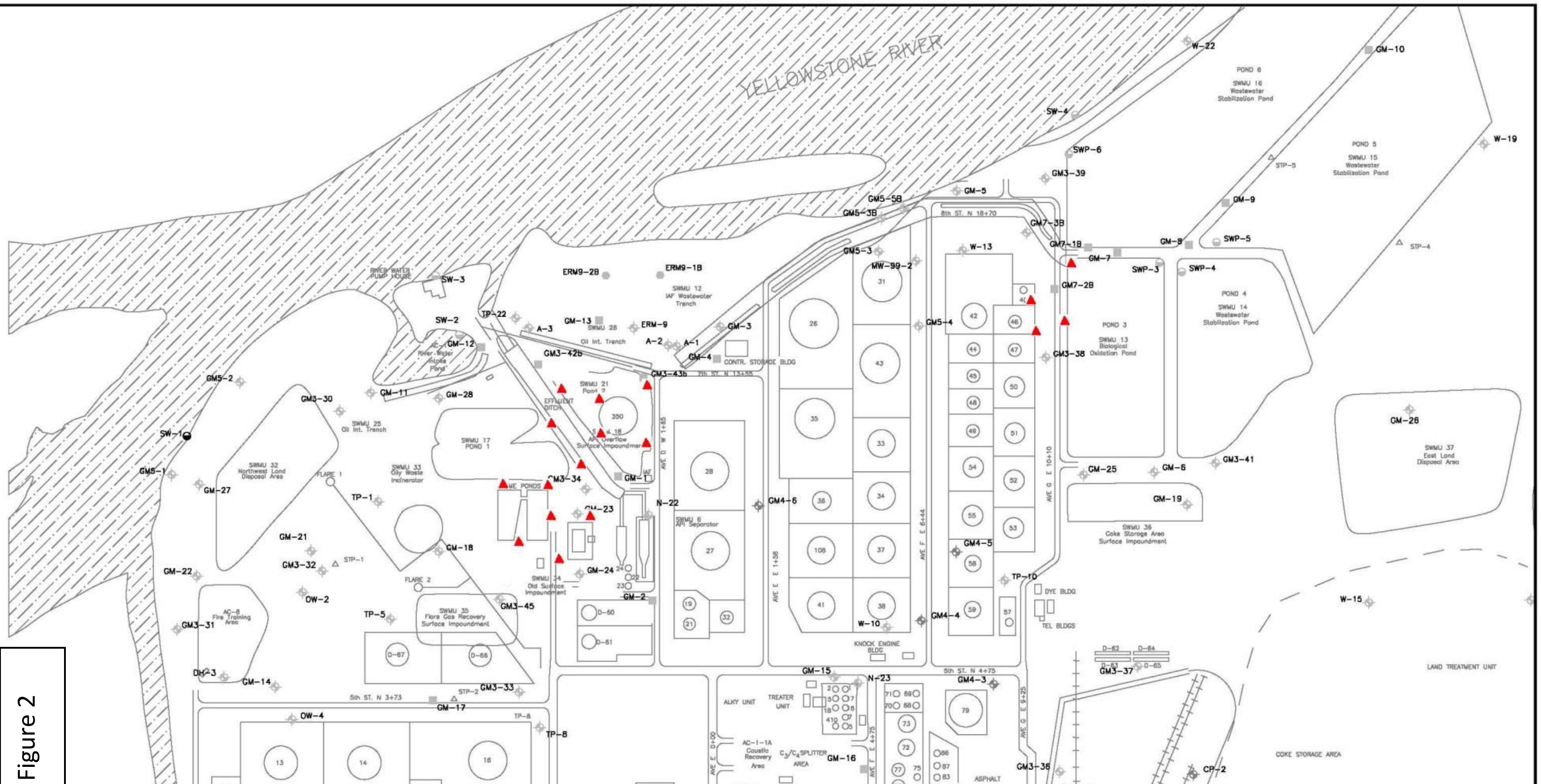


RETEC

ExxonMobil

EXXONMOBIL BILLINGS REFINERY BILLINGS, MONTANA EXXO5-15010			CORRECTIVE MEASURES STUDY APPROXIMATE BOUNDARIES OF REMEDIATION AREAS	
DATE: 2/23/05	DRWN: M.W./UKN	FILE: FIG1-2	LAYOUT: Retec-Bill	FIGURE 1-2

Figure 2



LEGEND

▲ POTENTIAL LOCATIONS OF NEW RECOVERY WELLS

NOTE: ACTUAL LOCATION WOULD BE DETERMINED DURING CMI PHASE.

150 0 300

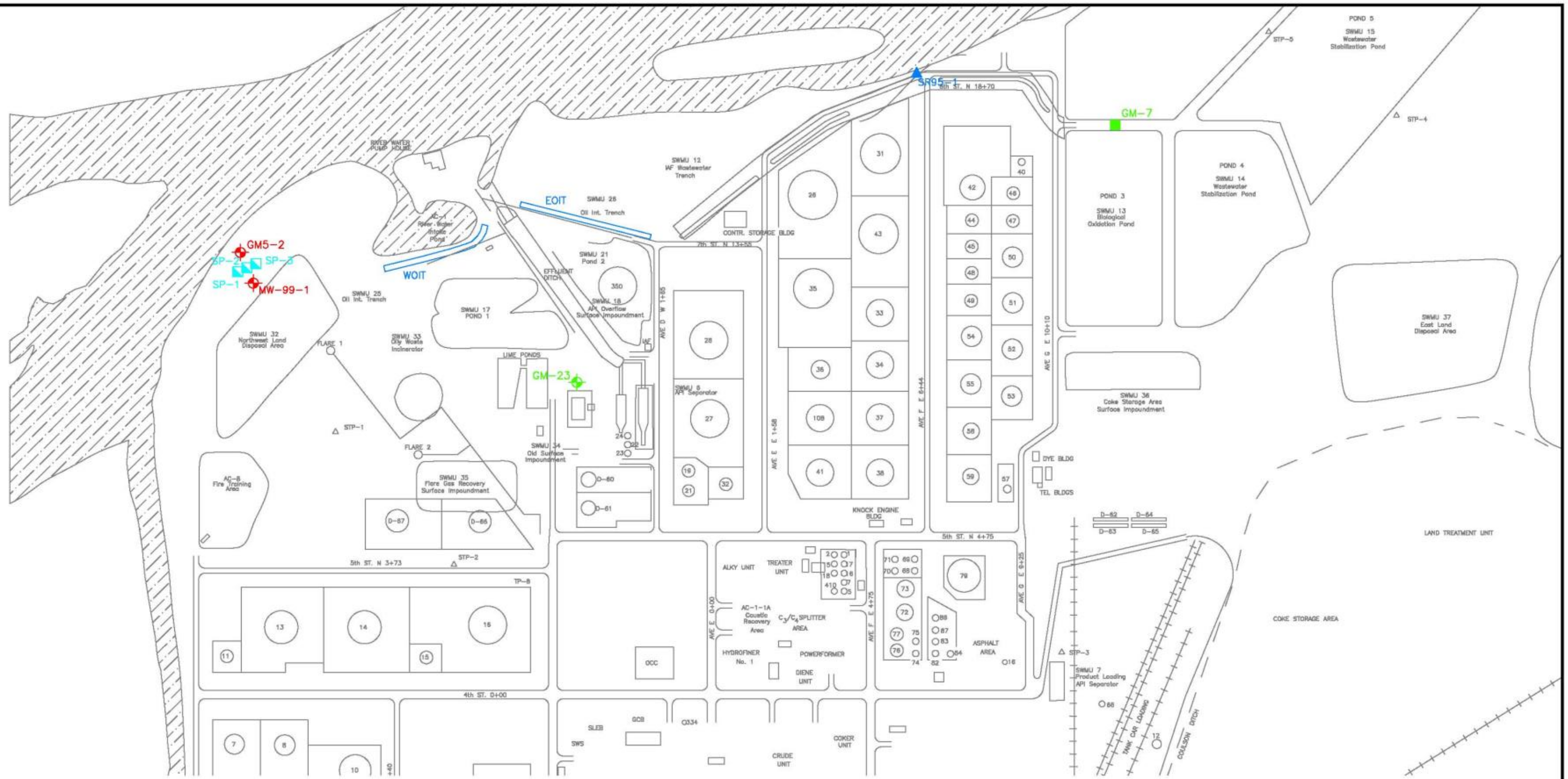
1"=300'

RETEC

ExxonMobil

EXXONMOBIL BILLINGS REFINERY BILLINGS, MONTANA EXXO5-15010	CORRECTIVE MEASURES STUDY NAPL ACCUMULATION AREAS AND NEW RECOVERY WELL LOCATIONS
DATE: 12/28/01 DRWN: M.W./BIL FILE: FIG5-1	LAYOUT: Layout1 FIGURE 5-1

Figure 3



LEGEND

EAST OIL INTERCEPTOR TRENCH (EOIT) WEST OIL INTERCEPTOR TRENCH (WOIT) SR95−1	TOTAL FLUIDS RECOVERY
GM−23 GM−7	SKIMMER RECOVERY
MW−99−1 GM5−2	SPARGE SYSTEM MONITORING WELL
SP−1, SP−2, SP−3	SPARGE WELLS

150 0 300

1"=300'

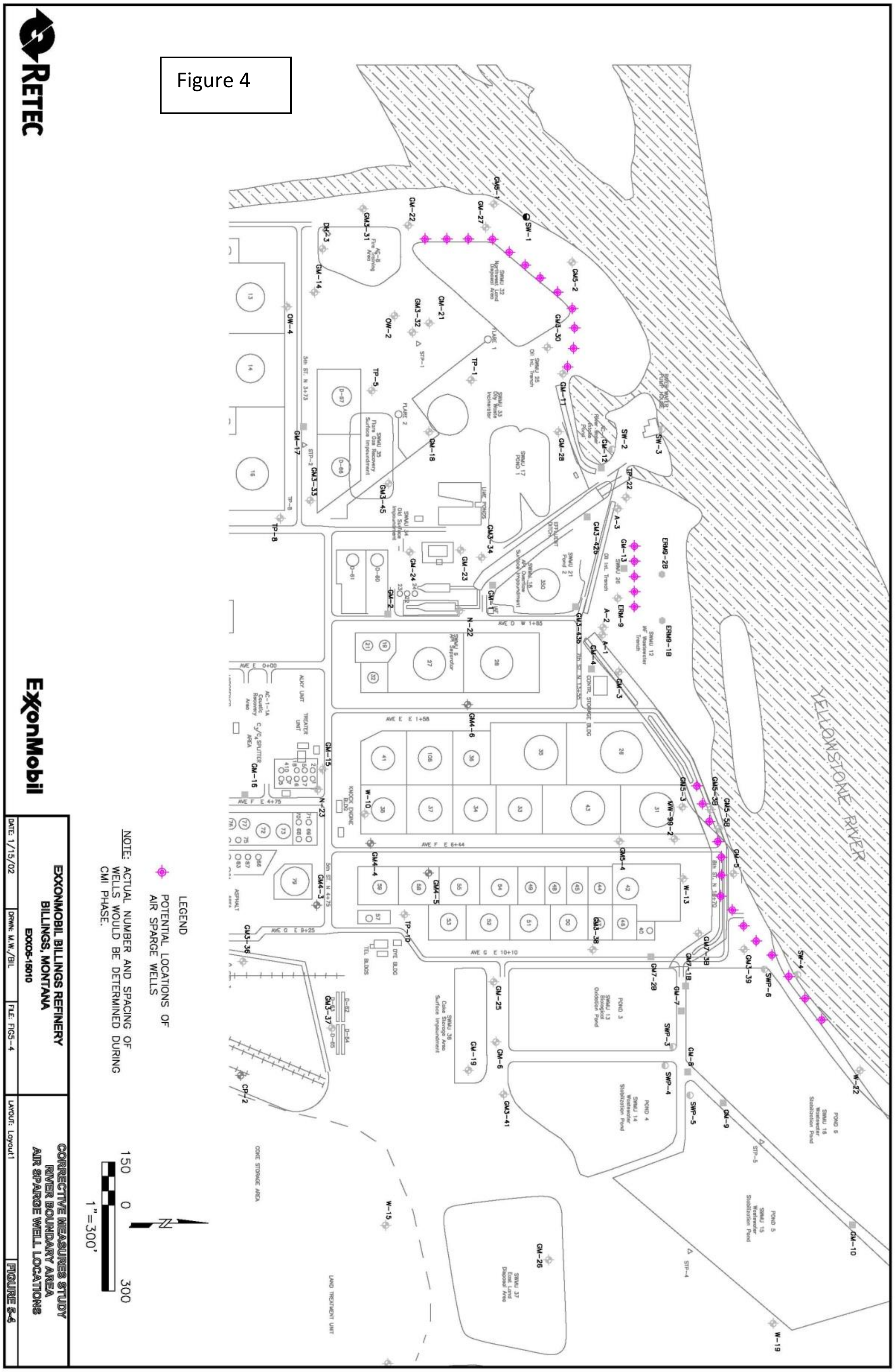
RETEC

ExxonMobil

EXXONMOBIL BILLINGS REFINERY BILLINGS, MONTANA EXXO5-15010	CORRECTIVE MEASURES STUDY PRESENTLY INSTALLED REMEDIAL SYSTEMS

DATE: 12/28/01	DRWN: M.W./UKN	FILE: FIG2−8	LAYOUT: Layout1	FIGURE 2-8

Figure 4


RETEC
ExxonMobil
YELLOWSTONE RIVER
LEGEND
POTENTIAL LOCATIONS OF AIR SPARGE WELLS
NOTE: ACTUAL NUMBER AND SPACING OF WELLS WOULD BE DETERMINED DURING CMI PHASE.
150 0 300
1"=300'
EXXONMOBIL BILLINGS REFINERY
BILLINGS, MONTANA
EXX06-15010
CORRECTIVE MEASURES STUDY
RIVER BOUNDARY AREA
AIR SPARGE WELL LOCATIONS
DATE: 1/15/02
DRWN: M.W./BIL
FILE: FIG5-4
LAYOUT: Layout1

Attachment VII.3

RCRA Facility Investigation (RFI)

Scope of Work

Attachment VII.3
RCRA Facility Investigation (RFI)
Scope of Work

Table of Contents

RCRA Facility Investigation
Scope of Work

1.0. Purpose

The purpose of the RCRA Facility Investigation (RFI) is to characterize contamination at the facility and evaluate potential risks of that contamination to human health and the environment. Components of the characterization include describing the environmental setting; defining contamination sources (source characterization), determining the degree, and extent of any release of hazardous constituents (contamination characterization); identifying actual or potential receptors; and determining associated risks to human health and the environment. The RFI Work Plan must be developed based on Condition VII.H. and should include the framework provided in this Attachment.

Respondent should establish preliminary facility-specific objectives for corrective action. Objectives should be based on public health and environmental criteria, information expected to be gathered during the RFI, EPA guidance, and the requirements of any applicable federal and state statutes.

The RFI investigations should result in data of adequate technical content and quality to support the development and evaluation of the corrective measures alternative(s) during the Corrective Measures Study, or to determine no further action is necessary.

2.0. Components

2.1. *Environmental Setting*

Information to supplement and/or verify existing information on the environmental setting at the facility should be collected. The following should be characterized as they relate to identified sources, pathways and areas of releases of hazardous constituents from the solid waste management units (SWMUs) and areas of concern (AOCs).

2.1.1. <u>Hydrogeology</u>

The hydrogeologic conditions at the facility should be evaluated. This evaluation should provide the following information:

2.1.1.1. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting groundwater flow beneath the facility, including:

- Regional and facility specific stratigraphy; description of strata including strike and dip, identification of stratigraphic contacts;
- Structural geology; description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);
- Depositional history;
- Regional and facility specific groundwater flow patterns;
- Identification, characterization, and quantification of recharge and discharge areas;

- Characterization of seasonal and temporal variations in the groundwater flow regime; and
- A map drawn at an appropriate scale to show the location of SWMUs and AOCs in Attachment VII.1.

2.1.1.2. An analysis of any topographic features that might influence the groundwater flow system.

2.1.1.3. Based on field data, tests, and cores, a representative and accurate classification and description of all hydrogeologic units which may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:

- Hydraulic conductivity and porosity (total and effective);
- Lithology, grain size, sorting, degree of cementation;
- An interpretation of hydraulic interconnections between saturated zones; and
- The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content, etc.).

2.1.1.4. Based on field studies and cores, structural geology and hydrogeological cross sections showing the extent (depth, thickness, and lateral extent) of hydrogeologic units which may be part of the migration pathways identifying:

- Sand and gravel deposits in unconsolidated deposits;
- Zones of fracturing or channeling in consolidated or unconsolidated deposits;
- Zones of higher permeability or lower permeability that might direct and restrict the flow of contaminants;
- The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells or springs; and
- Water bearing zones above the first confining layer that may serve as a pathway for contaminant migration including perched zones of saturation.

2.1.1.5. Based on data obtained from groundwater monitoring wells and piezometers installed upgradient and downgradient from the potential contaminant sources, a representative description of water level or fluid pressure monitoring including:

- Water level contour and/or potentiometric maps;
- Hydrologic cross sections showing vertical gradients and thickness of immiscibles and/or other known contaminants;
- The flow system, including the vertical and horizontal components of flow; and
- Any temporal changes in hydraulic gradients, for example, due to seasonal influences.

2.1.1.6. A description of manmade influences that may affect the hydrogeology of the site, including Interim Measure units or structures, identifying:

- Active and inactive local water supply and production wells with an approximate schedule of pumping; and
- Manmade hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

2.1.1.7. A description of the local geology and potential contaminant migration pathways. These should be determined by an appropriate number of borings and boring spacing. Borings should be located so that reasonably accurate cross-sections can be constructed.

2.1.2. Soils

Soil and rock units above the water table in the vicinity of contaminant release(s) should be characterized. Such characterization must include, but not be limited to, the following activities and information, as appropriate:

- SCS soil classification;
- Surface soil distribution;
- Soil profile, including ASTM classification of soils;
- Transects of soil stratigraphy;
- Hydraulic conductivity (saturated and unsaturated);
- Relative permeability;
- Bulk density;
- Porosity;
- Soil sorption capacity;
- Cation exchange capacity (CEC);
- Soil organic content;
- Soil pH;
- Particle size distribution;
- Depth of water table;
- Moisture content;
- Effect of stratification on unsaturated flow;
- Infiltration;
- Evapo-transpiration;
- Storage capacity;
- Vertical flow rate;
- Mineral content; and
- Redox potential (Eh).

2.1.3. Surface Water and Sediment

Surface water bodies in the vicinity of the facility should be characterized. Such characterization should include, but not be limited to, the following activities and information:

2.1.3.1. Description of the temporal and permanent surface water bodies including:

- For impoundments: location, elevation, surface area, depth, volume, freeboard, and construction and purpose;

- For streams, ditches, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, flooding tendencies (i.e., 100 year event), discharge point(s), and general contents;

- For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;

- Drainage patterns; and

- Evapo-transpiration rate.

2.1.3.2. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients, chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.

2.1.3.3. Description of sediment characteristics including:
- Deposition area;

- Thickness profile; and

- Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

2.1.4. Air

Information characterizing the climate in the vicinity of the facility should be provided in the RFI Report. Such information should include, but not be limited to:

2.1.4.1. A description of the following parameters:
- Annual and monthly rainfall averages;
- Monthly temperature averages and extremes;
- Wind speed and direction;
- Relative humidity/dew point;
- Atmospheric pressure;
- Evaporation data;
- Development of inversions; and
- Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.

2.1.4.2. A description of topographic and man-made features which affect air flow and emission patterns, including:
- Ridges, hills or mountain areas;
- Canyons or valleys;
- Surface water bodies (e.g. rivers, lakes, bays, etc.);

- Wind breaks and forests; and
- Buildings.

2.2. *Source Characterization*

To the degree possible without undue safety risks, analytical data should be collected to completely characterize the wastes and the areas where wastes have been placed, collected, or removed. The characterization should include type, quantity, physical form, disposition (containment or nature of deposits), and facility characteristics affecting release (e.g., facility security, and engineering barriers). Procedures used in making the following determinations should be documented. The source characterization should include quantification of the following specific characteristics, at each source area:

2.2.1. <u>Unit/Disposal Area Characteristics</u>

- Location of unit/disposal area;
- Type of unit/disposal area;
- Design features;
- Operating practices (past and present);
- Period of operation;
- Age of unit/disposal area;
- General physical conditions; and
- Method used to close the unit/disposal area.

2.2.2. <u>Waste Characteristics</u>

2.2.2.1. Type of wastes placed in the unit;

- Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);
- Quantity; and
- Chemical composition.

2.2.2.2. Physical and chemical characteristics such as:

- Physical form (solid, liquid, gas);
- Physical description (e.g., powder, oily sludge);
- Temperature;
- pH;
- General chemical class (e.g., acid, base, solvent);
- Molecular weight;
- Density;
- Boiling point;
- Viscosity;
- Solubility in water;
- Cohesiveness of the waste;
- Vapor pressure; and
- Flashpoint.

2.2.3. Migration and Dispersal Characteristics of the Waste

Procedures used in making the following determinations should be documented.

- Sorption capacity;
- Biodegradability, bioconcentration, biotransformation;
- Photodegradation rates;
- Hydrolysis rates; and
- Chemical transformations.

2.3. *Characterization of Releases of Hazardous Constituents*

Analytical data should be collected on groundwater, soils, surface water, sediment, subsurface gas, and air contamination in the vicinity of the facility in accordance with the Sampling and Analysis Plan. These data should be sufficient to define the extent, origin, direction, and rate of movement of contamination. Data should include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individuals performing the sampling and analysis. The following types of contamination at the facility should be addressed:

2.3.1. Groundwater Contamination

A groundwater investigation to characterize any plumes of contamination at the facility should be conducted. Procedures used in making all determinations (e.g., well design, well construction, geophysics, modeling, etc.) should be documented. The groundwater investigation should provide at a minimum the following information:

- A description of the horizontal and vertical extent of any plume(s) of hazardous constituents originating from or within the facility;

- The horizontal and vertical direction of contaminant movement;

- The velocity of contaminant movement;

- The horizontal and vertical concentration profiles of hazardous constituents in the plume(s);

- An evaluation of factors influencing the plume movement;

- An extrapolation of future contaminant movement; and

- All available monitoring data including sampling locations.

2.3.2. Soil Contamination

An investigation to characterize the contamination of the soil and rock units above the saturated zone in the vicinity of any contaminant release should be conducted. Procedures used in making the following determinations should be documented. The investigation should include the following information:

- A description of the vertical and horizontal extent of contamination;
- A description of appropriate contaminant and soil chemical properties within the contaminant source area and plume. This should include contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation;
- Specific contaminant concentrations;
- The velocity and direction of contaminant movement; and
- An extrapolation of future contaminant movement.

2.3.3. Surface Water and Sediment Contamination

A surface water investigation to characterize contamination in surface water bodies resulting from releases of hazardous constituents at the facility should be conducted. The investigation should include, at a minimum, the following information:

- A description of the horizontal and vertical extent of any plume(s) originating from the facility, and the extent of contamination in underlying sediments;
- The horizontal and vertical direction of contaminant movement;
- Contaminant velocity;
- An evaluation of the physical, biological and chemical factors influencing contaminant movement;
- An extrapolation of future contaminant movement; and
- A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, and contaminant concentrations, at a minimum. Analytical methods used to obtain the data should be specified.

2.3.4. Air Contamination

An investigation to characterize particulate and gaseous releases of hazardous constituents into the atmosphere should be conducted. Procedures used in making the following determinations should be documented. This investigation should provide the following information, if appropriate:

- A description of the horizontal and vertical direction and velocity of contaminant movement;

- The rate and amount of the releases; and

- The chemical and physical composition of the contaminant(s) released, including horizontal and vertical concentration profiles.

2.3.5. Subsurface Gas Contamination

An investigation to characterize subsurface gases emitted from buried hazardous wastes and constituents in the subsurface should be conducted. The investigation should include, but not be limited to, the following information:

- Horizontal and vertical concentration profiles of the subsurface gases being emitted;

- The chemical composition of the gases being emitted; and

- The rate, amount and density of the gases being emitted.

2.4. *Potential Receptors*

Data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility should be collected. Chemical analysis of biological samples and/or data on observable effects in ecosystems should also be obtained as appropriate. The following characteristics should be identified:

2.4.1. Current local uses and planned future uses of groundwater:

- Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial);

- Location of groundwater users, to include withdrawal and discharge wells, within one mile of the affected area; and

- The aquifer or hydrogeologic unit used and/or affected by the current and planned future local uses.

2.4.2. Current local uses and planned future uses of surface waters directly affected by the facility:

- Domestic and municipal (e.g., potable and lawn/gardening watering);
- Recreational (e.g. swimming, fishing);
- Agricultural;
- Industrial; and
- Environmental (e.g., fish and wildlife propagation).

2.4.3. Human use of or access to the facility and adjacent lands, including but not limited to:

- Recreation;
- Hunting;

- Residential;
- Commercial;
- Relationship between population locations and prevailing wind direction; and
- The potential impact on human health including demography, groundwater and surface water use and land use.

2.4.4. A general description of the biota in surface water bodies on, adjacent to, or affected by, the facility.

2.4.5. A general description of the ecology within the area adjacent to the facility.

2.4.6. A general demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to; age, sex, and sensitive subgroups.

2.4.7. A description of any known or documented endangered or threatened species near the facility.

2.5. *Investigation Analysis*

An analysis and summary of all facility investigations and their results should be prepared. This task should be adequate to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support a Corrective Measures Study. The Investigation Analysis should include:

2.5.1. <u>Data Analysis</u>

All facility investigation data should be analyzed and evaluated. A summary should be developed detailing the type and extent of contamination at the facility, including sources and migration pathways. The summary should describe the extent of contamination (qualitative/quantitative) in relation to background levels indicative for the area.

2.5.2. <u>Baseline Risk Assessment</u>

A baseline risk assessment should be developed, incorporating the elements listed in the "Outline for Baseline Risk Assessment" contained in Attachment VII.4 of this permit.

2.6. *Laboratory and Bench-Scale Studies*

Laboratory and/or bench scale studies should be conducted, if necessary, to determine the applicability of a corrective measure technology or technologies to facility conditions. Respondent should analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

If such studies are to be implemented, a testing plan should be developed identifying the type(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of the testing, testing results should be evaluated to assess the technology or technologies with respect to site-specific questions identified in the test plan. A report summarizing the testing program and its results, both positive and negative should be prepared for submission to the Department.

3.0. Description of Current Conditions

The Current Conditions Report provides background information pertinent to the facility. The Current Conditions Report may be submitted with the RFI Work Plan or in a separate document. The data gathered during any previous investigations or inspections and other relevant data should be included, along with a discussion of the quality of the data.

3.1. *Nature and Extent of Contamination*

Respondent's report should describe the existing information on the nature and extent of contamination with regard to the units and areas of concern which are the subject of the RFI Work Plan.

3.1.1. Respondent's report should summarize all possible source areas of contamination. For each area, Respondent should identify the following, to the extent that information is available:

- Location of unit/area (which must be depicted on a facility map);
- Quantities of solid and hazardous wastes;
- Hazardous waste or constituents, to the extent known; and
- Identification of areas where additional information is necessary.

3.1.2. The Current Conditions Report should provide an assessment and description of the existing degree and extent of contamination. The assessment should include:

- Available monitoring data and qualitative information on locations and levels of contamination at the facility;

- All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and

- The potential impact(s) on human health and the environment, including demography, groundwater and surface water use, and land use.

4.0. RFI Work Plan

The RFI work plan must meet the requirements of this permit and should include elements outlined in this Attachment. The work plan should also include preliminary interim and final objectives for the facility and for the RFI. Other pertinent EPA guidance may be used in work plan development.

4.1. *Project Management Plan*

The Project Management Plan should include a discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan should also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan should also document the overall management approach to the RCRA Facility Investigation. Objectives for the RFI should be developed

4.2. *Sampling and Analysis and Quality Assurance Plans (SAP/QAP)*

All sampling and analysis should be conducted in accordance with the SAP/QAP. All sampling locations should be documented in a log and identified on a detailed site map.

The SAP/QAP should document all monitoring procedures including, but not limited to, the sampling and analytical procedures to be performed during the investigation to characterize the environmental setting, source, and releases of hazardous constituents, so as to ensure that all information and data are valid and properly documented. The sampling strategy and procedures should be in accordance with the *Characterization of Hazardous Waste Sites, a Methods Manual: Volume II, Available Sampling Methods*, EPA-600/4-84-076; *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846), (third edition, 1986 and most recent updates); or other EPA approved methods. In accordance with Module III, Respondent should include in the RFI work plan justifications for deviations from these references.

The SAP/QAP should include the following:

4.2.1. Data Collection Strategy

4.2.1.1. A description of the intended uses for the data and the necessary level of precision and accuracy for these uses;

4.2.1.2. A description of the methods and procedures to be used to assess the precision, accuracy and completeness of the data;

4.2.1.3. A description of the rationale used to assure that the data accurately and precisely represent characteristics of a population, parameter variations at a sampling point, a process condition or an environmental condition. Examples of factors which should be considered and addressed include:

- Environmental conditions at the time of sampling;
- Number of sampling points;
- Representativeness of selected media; and
- Representativeness of selected analytical parameters.

4.2.1.4. A description of the measures to be taken to assure that the following data sets are comparable:

- RFI data generated by Respondent;

- RFI data generated by an outside laboratory or consultant versus data generated by Respondent; and

- Data generated by separate consultants or laboratories.

4.2.1.5. Details relating to the schedule and information to be provided in quality assurance reports, including:

- Periodic assessment of measurement data accuracy, precision, and completeness;
- Results of performance audits;
- Results of system audits;
- Significant quality assurance problems and recommended solutions; and
- Resolutions of previously stated problems.

4.2.2. Sampling Strategy

The sampling strategy should incorporate the following:

- Selecting appropriate sampling locations, depths etc.;

- Providing a statistically significant number of sampling sites;

- Obtaining all necessary ancillary data;

- Determining conditions under which sampling should be conducted;

- Determining which media are to be sampled (e.g., groundwater, air, soil, sediment, subsurface gas);

- Determining which parameters are to be measured and where and documenting the rationale for parameter selection;

- Selecting the frequency of sampling and length of sampling period;

- Selecting the types of samples (e.g., composites vs. grabs) and number of samples to be collected; and

- Preventing contamination of the sampling equipment and cross contamination between sampling points.

4.2.3. Sampling Procedures

4.2.3.1. Documenting sampling operations and procedures, including:

- Procedures for preparation of reagents or supplies which become an integral part

of the sample (e.g., filters, preservatives, and absorbing reagents);
- Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
- Specific sample preservation methods;
- Calibration of field instruments;
- Collection of replicate samples;
- Submission of field-based blanks, where appropriate;
- Potential interferences present at the facility;
- Construction materials and techniques associated with monitoring wells and piezometers;
- Field equipment listing and sampling containers;
- Sampling order; and
- Decontamination procedures.

4.2.3.2. Selecting appropriate sample containers;

4.2.3.3. Sample preservation; and

4.2.3.4. Chain-of-custody, including:
- Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and
- Pre-prepared sample labels containing all information necessary for sample tracking.

4.2.4. <u>Field Measurements</u>
4.2.4.1. Determining which parameters are to be measured and where;

4.2.4.2. Selecting the frequency of field measurements and duration of field measurement period;

4.2.4.3. Providing a statistically significant number of field measurements;

4.2.4.4. Determining conditions under which field measurements should be conducted;

4.2.4.5. Determining which media are to be addressed by appropriate field measurements (e.g., groundwater, air, soil, sediment, etc.);

4.2.4.6. Documenting field measurement operations and procedures, including:
- Procedures and forms for recording raw data and the exact location, time, and facility-specific considerations associated with the data acquisition;
- Calibration of field instruments;
- Collection of replicate measurements;
- Submission of field-based blanks, where appropriate;
- Potential interferences present at the facility;
- Construction materials and techniques associated with monitoring wells and

piezometers used to collect field data;

- Field equipment listing;
- Order in which field measurements will be made; and
- Decontamination procedures.

4.2.5. Sample Analysis

Sample analyses should be conducted in accordance with the most recent edition of *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846) (third edition, 1986 and most recent updates); *Standard Methods for the Examination of Water and Wastewater*, (twenty-first edition, 2005); or an equivalent method approved by the Department. The sample analysis section of the Sampling and Analysis Plan should specify the following:

4.2.5.1. Chain-of-custody procedures, including:

- Identification of the responsible party at the laboratory who is authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;

- Use of a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and

- Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.

4.2.5.2. Sample storage, procedures, and storage times;

4.2.5.3. Sample preparation methods;

4.2.5.4. Analytical procedures, including:

- Scope and application of the procedure;
- Sample matrix;
- Potential interferences;
- Precision and accuracy of the methodology; and
- Method detection limits.

4.2.5.5. Calibration procedures and frequency;

4.2.5.6. Data reduction, validation and reporting;

4.2.5.7. Internal quality control checks, laboratory performance and systems audits and frequency, including:

- Method blank(s);
- Laboratory control sample(s);
- Calibration check sample(s);
- Replicate sample(s);
- Matrix-spiked sample(s);

- "Blind" quality control sample(s);
- Control charts;
- Surrogate samples;
- Zero and span gases; and
- Reagent quality control checks.

4.2.5.8. Preventive maintenance procedures and schedules;

4.2.5.9. Corrective action (for laboratory problems); and

4.2.5.10. Turnaround time.

4.2.6. Groundwater Investigations

4.2.6.1. Monitoring system design

- Downgradient wells should be located to satisfy regulatory requirements for release detection and no migration of hazardous constituents beyond the site boundary. The horizontal placement of these wells should be such that they intercept potential pathways for contaminant migration. Wells should be monitored at each depth necessary to ensure immediate detection of a release.

- Upgradient or background wells should be installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of uncontaminated water that has not been affected by leakage from a SWMU or AOC. A sufficient number of wells should be installed to allow for stratified comparisons of water quality and to account for spatial variability in groundwater quality.

4.2.6.2. Monitoring well drilling methods

- Drilling should be performed in a manner that minimizes the disturbance and maintains the natural properties of the subsurface materials;

- Contamination and/or cross-contamination of groundwater and aquifer materials should be avoided;

- The drilling method should allow for the collection of representative samples of rock, unconsolidated materials, and soil;

- The drilling method should allow the owner/operator to determine when the appropriate location for the screened interval has been encountered;

- The drilling method should allow sufficient annular space around the well casing and screen to place the filter pack and annular sealants; and

- The drilling method should allow for the collection of representative groundwater samples. Drilling muds should be used only when minimal impact to the surrounding formation and groundwater can be ensured.

4.2.6.3. Monitoring well design and construction

- The most suitable material for a particular well at a particular site will depend on the characteristics of the site hydrogeology. The following factors should be taken into consideration: depth to the water-bearing zone, geochemistry of the soil and rock over the entire interval in which the well is to be cased, and the chemistry of the groundwater at the site. In addition, the screens and casing of all groundwater wells should be: 1) inert in the water being tested and 2) chemically resistant to any contaminants that are present in the aquifer(s) being monitored.

- The appropriate length of well screens varies from site to site; however, Respondent should provide justification for any screen which cuts across hydraulically separated geologic units. Well screens must be factory slotted or the equivalent. Field slotting is not permitted under any conditions.

- All wells should have a bottom sump to allow sediments that may enter the well to settle without silting in the well and preventing proper flow of fluids.

- The annular space between the borehole wall and the screen or slotted casing should be filled to minimize passage of formation materials into the well.

- A filter pack should be used when the natural formation is: 1) poorly sorted; 2) a uniform fine sand, silt, or clay; 3) very thin-bedded; 4) poorly cemented sandstone; or 5) highly fractured or characterized by relatively large solution channels. Filter pack material should be chemically inert and may not be constructed from fabric.

4.2.6.4. Annular sealant

- The well annulus must be properly sealed. Sealant materials should be chemically compatible with the highest anticipated concentration of chemical constituents that may be expected in the groundwater.

- When the screened interval is within the saturated zone, a minimum of two feet of sealing material should be placed immediately over the protective sand layer overlying the filter pack.

- The precise volume of filter pack material and sealant required should be calculated before placement; the actual volumes used should be determined during well construction. Any discrepancies between the calculated volumes and the actual volumes should be detailed and documented.

4.2.6.5. Surface completion

- A monitoring well surface seal should be installed on top of the annular sealant and extend vertically up the well annulus between the well casing and the borehole to the land surface.

- A protective casing should be installed around the well casing to prevent damage or unauthorized entry.

- A suitable cap should be placed on the well to prevent tampering or the entry of any foreign materials. A lock should be installed on the cap to provide security. Lubricants may not be applied to the lock.

4.2.6.6. Documentation of well design

Respondent should keep a record of the following information for each well:

- A well construction log;
- Date of construction;
- Drilling method and drilling fluid used;
- Well location ($\pm$ 0.5 ft);
- Bore hole and well casing diameter;
- Well depth ($\pm$ 0.1 ft);
- Drilling and lithologic logs;
- Casing materials;
- Screen materials and design;
- Casing and screen joint types;
- Screen slot size/length;
- Filter pack material/size, grain analysis;
- Filter pack volume calculations;
- Filter pack placement method;
- Sealant materials (% bentonite);
- Sealant placement method;
- Sealant volume (lbs/gallon of cement);
- Surface seal design/construction;
- Well development procedure;
- Type of protective well cap;
- Ground surface elevation ($\pm$ 0.01 ft);
- Surveyor's pin elevation ($\pm$ 0.01 ft) on concrete apron;
- Top of monitoring well casing elevation ($\pm$ 0.01 ft);
- Top of protective steel casing elevation ($\pm$ 0.01 ft); and
- Detailed drawing of well (include dimensions).

4.2.7. Water Level Elevation Determination

The following procedures should be followed when determining water level elevations:

- Field measurements should include depth to standing water and total depth of the well to the bottom of the intake screen.

- Prior to measurement, water levels in piezometers and wells should be allowed to stabilize for a minimum of 24 hours after well construction and development or well purging.

- Water level measurements from boreholes, piezometers, or monitoring wells used to define the water table or a single potentiometric surface should be collected within less than 24 hours.

4.2.8. Well Purging

The following procedures should be followed when purging wells:

- The purging method should ensure that all stagnant water is replaced by fresh formation water upon completion of the procedure.

- If the purged water is contaminated or if its chemistry is unknown, the water should be stored in appropriate containers until analytical results are available, at which time proper arrangements for disposal or treatment should be made.

- When purging a medium- to high-yielding well, the well should not be pumped dry if recharge causes the formation water to cascade vigorously down the sides of the screen.

- When purging a low yielding well, the sample must be collected within 24 hours of purging the well.

4.2.9. Sample Collection

- Monitoring well sampling should always progress from the well expected to be least contaminated to the well expected to be most contaminated. Samples to be analyzed for the most volatile constituents should be collected and containerized first.

- Equipment that minimizes agitation and reduces or eliminates contact with the atmosphere during sample transfer should be used.

- The following equipment or materials are not acceptable: neoprene fittings, PVC bailers, tygon tubing, silicon rubber bladders, neoprene impellers, polyethylene, and viton.

4.2.10. Bailers

The following precautions should be taken when using bailers:

- Bailers used in sampling groundwater from monitoring wells should be constructed of either fluorocarbon resin or stainless steel. Disposable single-use inert polyethylene bailers may also be used. The cable used to raise and lower the bailer should also be an inert material or coated with an inert material.

- Bailers should never be dropped into a well and should be removed in a manner that causes as little agitation as possible.

4.2.11. Sample Preservation

- A temperature history of the samples should be maintained. Upon receipt of a shipment, the laboratory should record the temperatures on the chain of custody record;

- The laboratory should record the date/time sampled, the date/time received, the date/time extracted, and the date/time analyzed for all samples received.

- Samples should not be transferred from one sample container to another unless approved by the Department.

- No headspace should exist in the containers of samples containing volatile organics.

4.2.12. Borehole Location and Sampling Strategy

- Borings should be located so that reasonably accurate cross-sections can be constructed.

- Borehole samples should be collected with a shelby tube, split barrel sampler, rock corer, or other appropriate device and should be described in the field by a professional experienced in geology. Concise drilling logs and field records should be kept.

- Samples should be collected from all borings at intervals approved by DEQ and should be collected wherever contamination is suspected.

- Borings in which permanent wells are not installed and wells being abandoned should be sealed with material at least an order of magnitude less permeable than the surrounding soil.

4.3. *Data Management Plan*

A Data Management Plan should be developed to document and track the RFI data and results. This plan should identify and set up data documentation materials and procedures, project file requirements, and progress reporting procedures and documents. The plan should also describe the format for presenting the raw data and conclusions of the investigation.

4.3.1. Data Record

The data record should include the following:

- Unique sample or field measurement code;
- Sampling or field measurement location and sample or measurement type;
- Sampling or field measurement raw data;
- Laboratory analysis ID number;
- Property or component measures; and
- Result of analysis (e.g. concentration).

4.3.2. Tabular Displays

The following data should be presented in tabular displays:

- Unsorted (raw) data;

- Results for each medium, or for each constituent monitored;

- Data reduction for statistical analysis, as appropriate;

- Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and

- Summary data.

4.3.3. Graphical Displays

The following data should be included in the Data Management Plan and may be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transits, three dimensional graphs, etc.):

- Sampling location and sampling grid;
- Boundaries of sampling locations and areas where more data are required;
- Geographical extent of contamination;
- Contamination levels, averages and maxima;
- Sampling locations and levels of contamination at each;
- Changes in concentration in relation to distances from the source, time, depth or other parameters; and
- Features affecting inter-media or intramedia transport and potential receptors.

4.4. *Health and Safety Plan*

4.4.1. Respondent should prepare a Health and Safety Plan which includes the following:

- A facility description including the locations of roads, water supply, electricity, and telephone service;
- The known hazards and an evaluation of the risks associated with those hazards;
- Key personnel and alternates responsible for site safety, response operations, and the protection of public health;
- A description of the work area;
- Levels of protection to be worn by personnel;
- Procedures to control site access;
- Decontamination procedures for personnel and equipment;
- Site emergency procedures;
- Emergency medical care for injuries and toxicological problems;
- Requirements for an environmental surveillance program;
- Routine and special training required for responders; and
- Procedures for protecting workers from weather-related problems.

4.4.2. The Health and Safety Plan should be consistent with:

- NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste

Site Activities (1985);

- EPA Order 1440.1 - Respiratory Protection;
- EPA Order 1440.3 - Health and Safety Requirements for Employees Engaged in Field Activities;
- Facility Contingency Plan;
- EPA Standard Operating Safety Guide (1984);
- OSHA regulations, particularly in 29 CFR 1910 and 1926;
- State and local regulations; and
- Other EPA guidance as provided.

** Note – DEQ will not approve or disapprove Respondent's Health and Safety Plan.

4.5. *Community Relations Plan*

Documents submitted to DEQ are part of the pubic record and are available to the public. Upon request, a plan for the dissemination of information to the public, regarding investigation activities and results, will be prepared.

Attachment VII.4

Baseline Risk Assessment

Scope of Work

Attachment VII.4
Scope of Work
Baseline Risk Assessment

1.0. Introduction

- Statement of the problem
- Site-specific objectives of the risk assessment
- Risk Assessment Report Organization

1.1. *Site Background*

- Site description
- Map of site
- Site History
- Current land use
- Regulatory Background
- Significant site reference points
- Description of SWMUs, AOCs, and other units considered in the risk assessment
- General sampling locations and media sampled
- Description of any interim corrective or stabilization measures

1.2. *Scope of Risk Assessment*

- Complexity of assessment
- Synopsis of study design

2.0. Site Characterization

2.1. *Summary of the Remedial Investigation Results*

- Soil/sediment/waste Investigation
- Surface Water Investigation
- Ground Water Investigation

3.0. Data Usability

3.1. *Site-Specific Data Collection Considerations*

- Identification of potential human exposure
- Identification of potential environmental exposure
- Groundwater, soils, and air modeling parameters
- Sampling locations and media sampled
- Sampling methods for each medium
- QA/QC methods for sample collection and analysis

3.2. *Study Areas for Which Media-Specific Samples Were Collected*

- Collection strategies for sampling in each area studied
- Evaluation of data collected
- Comparison of chemical concentrations with background samples
- Uncertainties in data

4.0. **Human Health Baseline Risk Assessment**

4.1. *Selection/Description of Chemicals of Potential Concern*

- Summary of applicable Data Usability in Section 2.0
- Comparison of maximum soil, groundwater, surface water, and sediment concentrations to screening and background levels
- Comparison of detection limits to screening or background levels
- Potential daughter products
- Final selection of human health COPCs

4.2. *Identify Receptors of Concern/Potentially Exposed Populations*

- Typical on- and off-site receptor types
- Relative locations and descriptions of populations with respect to site
- Current land uses adjacent to site
- Populations of concern which might be or are being affected by site contaminants

4.3. *Characterization of Exposure Setting*

- Climate
- Vegetation
- Soil types
- Surface water hydrology
- Ground water hydrology

4.3.1. Identification of Exposure Pathways

- Contaminant sources- primary and secondary
- Media receiving contamination on- and off-site
- Fate and transport of contaminants in media
- Exposure points and exposure routes
- Integration of sources, releases, fate and transport mechanisms, exposure points, and exposure routes into complete exposure pathways
- Summary of exposure pathways to be quantified
- Current and potential future receptors
- Conceptual site model

4.4. *Risk Analysis*

4.4.1. Exposure Assessment

4.4.1.1. Quantification of Exposure

- Exposure Point Concentrations
- Chemical intake estimates for individual exposure pathways

4.4.1.2. Summary of Exposure Assessment

4.4.2. Toxicity Assessment

4.4.2.1. Toxicity Information for Non-carcinogenic Effects

- Appropriate exposure periods for toxicity values
- Latest Reference Dose (RfD) for all chemicals

- Reference Concentration (RfC) for all chemicals
- One- and ten-day health advisories for shorter term oral exposures
- Overall database and the critical study on which the toxicity value is based
- Effects that may appear at doses higher than those required to elicit critical effect
- Consideration of absorption efficiency

4.4.2.2. Toxicity Information for Carcinogenic Effects

- Exposure averaged over lifetime
- Latest slope factors for all carcinogens
- Weight-of-evidence classification for all carcinogens
- Concentrations above which the dose-response curve is no longer linear

4.4.2.3. Chemicals for Which No EPA Toxicity Values Are Available

- Qualitative evaluation
- Documentation/justification of any new toxicity values

4.4.2.4. Uncertainties Related To Toxicity Information

- Quality of individual studies
- Completeness of overall database
- Uncertainty Factors
- Modifying Factors

4.4.2.5. Summary of Toxicity Information

4.5. *Risk Characterization*

4.5.1. <u>Current Land-Use Conditions</u>

- Carcinogenic risk of individual substances
- Chronic hazard quotient calculation for individual substances
- Subchronic hazard quotient calculation for individual substances
- Shorter-term hazard quotient calculation for individual substances
- Carcinogenic risk for multiple substances
- Chronic hazard index for multiple substances
- Subchronic hazard index for multiple substances
- Shorter-term hazard index calculation for multiple substances
- Segregation of hazard indices
- Justification for combining risks across pathways
- Non-carcinogenic hazard index (multiple pathways)
- Carcinogenic risk (multiple pathways)

4.5.2. <u>Future Land-Use Conditions</u>

- Carcinogenic risk of individual substances
- Chronic hazard quotient calculation for individual substances
- Subchronic hazard quotient calculation for individual substances
- Shorter-term hazard quotient calculation for individual substances

- Carcinogenic risk for multiple substances
- Chronic hazard index for multiple substances
- Subchronic hazard index for multiple substances
- Shorter-term hazard index calculation for multiple substances
- Segregation of hazard indices
- Justification for combining risks across pathways
- Non-carcinogenic hazard index (multiple pathways)
- Carcinogenic risk (multiple pathways)

4.5.3. Uncertainties

- Site-specific uncertainty factors
- Definition of physical setting
- Model applicability and assumptions
- Parameter values for fate/transport and exposure calculations
- Summary of toxicity assessment uncertainty
- Identification of potential health effects
- Derivation of toxicity value
- Potential for synergistic or antagonistic interactions
- Uncertainty in evaluating less-than-lifetime exposures

4.5.4. Summary Discussion and Tabulation of Risk Characterization

- Key site-related contaminants and exposure pathways
- Types of health risks of concern
- Level of confidence in the quantitative information used to estimate risk
- Presentation of qualitative information on toxicity
- Confidence in the key exposure estimates for key exposure pathways
- Magnitude of the carcinogenic and non-carcinogenic risk estimates
- Major factors driving risk
- Major factors contributing to uncertainty
- Exposure human population characteristics
- Comparison with site-specific health studies

4.6. *Human Health Risk Assessment References*

5.0. **Ecological Risk Assessment**

5.1. *Problem Formulation*

5.1.1. Selection of Ecological COPCs (Screening Level ERA)

- Summary of Applicable Data Usability in Section 2.0
- Comparison of maximum soil, groundwater, surface water and sediment concentrations to screening or background levels
- Comparison of detection limits to screening levels
- Inclusion of bioaccumulative chemicals
- Final selection of ecological COPCs

5.2. *Ecological Setting*

- Climate
- Vegetation
- Soil types
- Surface water hydrology
- Ground water hydrology
- Detailed habitat descriptions
- List of species observed or expected to occur
- Discussion of special status species

5.2.1. Conceptual Site Model

- Environmental setting
- Ecological COPCs
- Contaminant sources
- Media receiving contamination on-and off-site
- Fate and transport of contaminants in media
- Potential exposure pathways
- Current and potential future receptors
- Conceptual model diagrams

5.2.2. Assessment Endpoints

- Description of management goals
- Identification of assessment endpoints linked to management goals

5.2.3. Analysis Plan

- Risk hypotheses or questions
- Identification of measures (including measures of effect, measures of exposure, and measures of ecosystem and receptor characteristics)
- Brief description of site-specific biota surveys or toxicity tests that were conducted (complete study reports should be included as attachments)
- Selection of representative receptors (for wildlife, typically one avian and one mammalian species from each of the feeding guilds that are expected to be most highly exposed)
- Specify data quality objectives
- Outline weight-of-evidence framework

5.2.4. Risk Analysis

5.2.4.1. Exposure Assessment

- Exposure concentrations
- Exposure parameters
- Methods for estimating tissue concentrations (measured or modeled)
- Uptake factors (if applicable)

- Ingested dose, hazard quotient, and other relevant equations

5.2.4.2. Effects Assessment

- Toxicity reference values (TRVs) for abiotic media to protect community-level receptors such as plants, terrestrial invertebrates, benthic invertebrates and aquatic life
- Dose-based TRVs for wildlife
- Critical body residue TRVs (if applicable)
- Dietary TRVs for fish and/or wildlife (if applicable)

5.2.5. <u>Risk Characterization</u>

- Description of hazard quotient calculation methods
- Discussion of risks for each line of evidence
- Spatial analysis of risks for receptor with limited mobility (e.g. plants, invertebrates)
- Background comparison for inorganic compounds
- Weight-of-evidence analysis

5.2.6. <u>Uncertainty Analysis</u>

- Discussion of qualitative magnitude and direction of each uncertainty (uncertainty tendency to underestimate or overestimate risks)
- Conceptual model
- Exposure model applicability and assumptions
- Exposure concentrations
- Exposure parameters
- Toxicity values
- Potential for synergistic or antagonistic interactions

5.2.7. <u>Ecological Risk Assessment Conclusions</u>

5.3. *Ecological Risk Assessment References*

6.0. **Summary**

7.0. **Conclusions**

Attachment VII.5

Corrective Measures Study

Scope of Work

Corrective Measures Study (CMS)
Scope of Work

1.0. The Corrective Measures Study (CMS)

The CMS is used to help determine which corrective measure is most appropriate for the facility. Sections 2.0 and 3.0 discuss the evaluation process for developing and recommending corrective measures alternatives. Section 4.0 and Section 5.0 outline contents of the CMS Work Plan and Report.

2.0. Evaluation of the Corrective Measure Alternatives

2.1. *Corrective Action Objectives*

Corrective action objectives for the facility should be established. These objectives should be based on public health and environmental criteria, information gathered during the RFI, EPA guidance, and the requirements of any applicable federal and state statutes. The objectives should include the facility-specific purpose for the corrective action, identifying actual and/or potential exposure pathways to be addressed. Objectives established during the RFI should be used in developing objectives for the CMS.

2.2. *Screening of Corrective Measures Technologies*

The CMS should include a preliminary assessment of technologies which may be applicable at the facility. Corrective measures technologies should be screened to eliminate those that may prove infeasible to implement, rely on technologies unlikely to perform satisfactorily or reliably, or do not achieve the corrective measure objectives within a reasonable time period. The screening process should focus on elimination of technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations. Reasons for excluding any technology should be documented. Site, waste, and technology characteristics used to screen inapplicable technologies are described in more detail below:

2.2.1. <u>Site Characteristics</u>

Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies that are clearly precluded by site characteristics may be eliminated from further consideration.

2.2.2. <u>Waste Characteristics</u>

A review of waste characteristics, including remediation waste, should be conducted. Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site). Technologies clearly limited by site waste characteristics may be eliminated from consideration.

2.2.3. Technology Limitations

During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or not fully demonstrated may be eliminated.

2.3. *Evaluation and Development of the Corrective Measure Alternatives*

Corrective measure alternatives should be developed based on the corrective action objectives and an analysis of the corrective measure technologies that pass the initial screening process. The corrective action alternatives developed in the CMS should represent a workable number of options that adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. Technology descriptions and information used to support Respondent's evaluation of the alternative corrective measures should be included in the CMS Report. Reasons for excluding any technology should also be documented. The evaluation of alternatives should be based on technical, environmental, human health and institutional concerns. A cost estimate should be developed for each corrective measure alternative.

2.3.1. Technical/Environmental/Human Health/Institutional

Respondent should evaluate each alternative from a technical, environmental, human health and institutional standpoint, following the guidelines presented below.

2.3.1.1. Technical

Each corrective measure alternative should be evaluated based on performance, reliability, implementability and safety.

2.3.1.1.1. Performance should be evaluated based on the effectiveness and useful life of the corrective measure:

- Effectiveness should be evaluated in terms of the ability to perform intended functions, such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure should be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness should be considered. The evaluation should also consider the effectiveness of combinations of technologies.

- Useful life is defined as the length of time the level of desired effectiveness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure should be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of each technology, as well as appropriateness of each technology, should be considered in estimating the useful life of the project.

2.3.1.1.2. The reliability of each corrective measure should be evaluated based on its operation and maintenance requirements and its demonstrated reliability:

- Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements should also be considered.

- Demonstrated and expected reliability is a way of measuring the risk and effect of failure. Respondent should evaluate whether the technologies have been used effectively under analogous conditions, whether the combination of technologies have been used together effectively, whether failure of any one technology has an immediate impact on receptors, and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

2.3.1.1.3. The implementability of each corrective measure should be evaluated, including the relative ease of installation (constructability) and the time required to achieve a given level of response:

- Constructability is determined by conditions both internal and external to the facility and includes such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the facility (i.e., remote location vs. a congested urban area). Respondent should evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities.

- Components of time should be addressed: 1) the time it takes to implement a corrective measure and 2) the time it takes to see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.

- Respondent should evaluate each corrective measure alternative with regard to safety. This evaluation should include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider are fire, explosion, and exposure to hazardous substances.

2.3.1.2. Environmental

An environmental assessment should be performed for each alternative. The environmental assessment should focus on the facility conditions and pathways of contamination actually addressed by each alternative. The environmental assessment for each alternative should include, at a minimum, an evaluation of the short- and long-term beneficial and adverse effects of the response alternative, any adverse effects on environmentally sensitive areas, and an analysis of measures to mitigate adverse effects.

2.3.1.3. Human Health

Each alternative should be assessed in terms of the extent to which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementation of the corrective measure. The assessment should describe the concentrations and characteristics of the contaminants on-site, potential exposure routes, and the potentially affected population. Each alternative should be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact should be determined by comparing residual levels of each alternative with existing criteria, standards, or guidelines acceptable to the Department.

2.3.1.4. Institutional Needs and Controls

The relevant institutional needs for each alternative should be assessed. Specifically, those needs include the effects of federal, state and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative.

2.3.2. <u>Cost Estimate</u>

An estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative) should be developed. The cost estimate should include both capital, and operation and maintenance costs.

2.3.2.1. Capital Costs

Capital costs consist of direct (construction) and indirect (non-construction and overhead) costs.

2.3.2.1.1. Direct capital costs include:

- Construction costs: Costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure;

- Equipment costs: Costs of treatment, containment, disposal and/or service equipment necessary to implement the action. These materials remain until the corrective action is complete;

- Land and site-development costs: Expenses associated with purchase of land and development of existing property; and

- Buildings and services costs: Costs of process and non-process buildings, utility connections, purchased services, and disposal costs.

2.3.2.1.2. Indirect capital costs include:

- Engineering expenses: Costs of administration, design, construction supervision, drafting, and testing of corrective measure alternatives;

- Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;

- Start-up and shakedown costs: Costs incurred during corrective measure start-up; and

- Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strike, and inadequate facility characterization.

2.3.2.2. Operation and Maintenance Costs

Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. Respondent should consider the following operation and maintenance cost components:

- Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;

- Maintenance materials and labor cost: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

- Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

- Purchased service: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;

- Disposal and treatment costs: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operations;

- Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;

- Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accident insurance; real estate taxes on purchased land or right-of-way; licensing fees for certain technologies; and hazardous waste regulatory fees and reporting costs;

- Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and

- Other costs: items that do not fit any of the above categories.

2.3.3. Use of the Corrective Action Management Unit (CAMU)

As a part of any corrective measures alternative, Respondent may propose designation of one or more remediation units under the provisions of 40 CFR 264, Subpart S. These units would include CAMUs, temporary units, and/or staging piles. Final designation of subpart S units are made by the Department.

3.0. Recommending Corrective Measure(s)

Once the evaluation process is complete, Respondent should justify and recommend a corrective measure alternative using technical, human health, and environmental criteria. This recommendation should include summary tables which allow the alternative or alternatives to be understood easily. Tradeoffs among health risks, environmental effects, and other pertinent factors should be highlighted.

3.1. *Technical Criteria*

3.1.1. Performance - corrective measure(s) which are most effective at performing their intended functions and maintaining the performance over extended periods of time are preferred;

3.1.2. Reliability - corrective measure(s) which do not require frequent or complex operation and maintenance activities and that have proven effective with wastes, and under facility conditions similar to those anticipated are preferred;

3.1.3. Implementability - corrective measure(s) which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time are preferred; and

3.1.4. Safety - corrective measure(s) which pose the least threat to the safety of nearby residents, environments and workers during implementation are preferred.

3.2. *Human Health Criteria*

The corrective measure(s) must comply with existing EPA and State of Montana criteria, standards, and/or guidelines for the protection of human health. Corrective measures providing the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

3.3. *Environmental Criteria*

The corrective measure(s) posing the least adverse impact (or greatest improvement) on the environment over the shortest period of time are preferred.

4.0. **CMS Work Plan**

The CMS Work Plan must meet the requirements of Module VII and should include the elements outlined in this Attachment. Other pertinent EPA guidance may be used in work plan development. The work plan should present facility-specific objectives for remediation and the methods Respondent will use to develop and evaluate appropriate corrective measure alternatives. The work plan should also present criteria to be used in determining which alternative best meets the objectives.

4.1. *Contents of the CMS Work Plan*

The CMS Work Plan should include:

- Corrective action objectives for the facility;
- Specific problems or areas to be addressed;
- A description of the general approach to investigating and evaluating potential remedies;
- A description of the specific remedies and/or technologies to be studied;
- A description of how each potential corrective measure(s) and/or technology will be evaluated, including identification of data gaps, implementation of pilot tests or bench studies, etc.; and
- A schedule for completion for all tasks included in the CMS Work Plan.

5.0. **CMS Report**

A Corrective Measures Study Report should be prepared which presents the results of the Corrective Measures Study and includes a recommendation for a corrective measures alternative.

5.1. *Report Content*

The Report should, at a minimum, include:

5.1.1. Site Description

A description of the facility, including a site topographic map. The description should include the current situation at the facility and the known nature and extent of the contamination as documented by the RFI Report, as well as any previous response activities and/or interim measures that have or are being implemented;

5.1.2. RFI Summary

A summary of the RFI and its impact on the selected corrective measure(s), including the following information:

- Field studies (ground water, surface water, soil, air);
- Summary of human health and ecological risk assessments, if performed; and
- Laboratory studies (bench scale, pilot scale).

5.1.3. Corrective Measures Alternatives

The discussion of the corrective measures alternative should include the following:

- Description of the corrective measure(s), the results of the evaluation, and rationale for selection. Each corrective measure evaluated should be described, including those that did not pass the initial screening;
- Performance expectations, including media cleanup levels, points of compliance and remediation timeframes;
- Preliminary design criteria and rationale;
- General operation and maintenance requirements; and
- Long-term monitoring requirements.

5.1.4. Design and Implementation Precautions:

- Special technical problems;
- Additional engineering data required;
- Permits and regulatory requirements;
- Access, easements, right-of-way, and other institutional controls;
- Health and safety requirements; and
- Community relations activities.

5.1.5. Cost Estimates:

- Capital cost estimate;
- Operation and maintenance cost estimate.

5.1.6. Schedules

- Project schedule (design, construction, and operation).

Attachment VII.6

Interim Measures (IM) and Corrective Measures Implementation (CMI)

Scope of Work

Attachment VII.6
Scope of Work
Interim Measures (IM) and Corrective Measures Implementation (CMI) Outline

1.0 Engineer Design

- Treatment Systems
- Containment Systems
- Cover Systems
- Monitoring Networks
- Security

2.0 Operation And Maintenance

- Treatment Systems
- Containment Systems
- Cover Systems
- Monitoring Networks

3.0 Monitoring And Performance Monitoring

- Location
- Frequency
- Sampling and Analysis

4.0 Waste Management

- On-Site Management
- Sampling and Analysis
- Disposition

5.0 Health And Safety Plan

- Same Requirements As Section 4.4 of Attachment V.4

6.0 Schedule

- Construction
- Operation
- Monitoring/Performance Monitoring
- Closure/Completion

7.0 Remediation Goals

- Description of Media Goals
- Time Frames for Achieving Goals

8.0 Reporting

- Types of Reports
- Reporting

9.0 **Public Participation**

- Major Changes to the Selected Corrective Measure(s)
- At Completion of Corrective Measure(s)

10.0 **Demonstration Of Financial Assurance And Cost Estimates**

- Cost Estimate for Corrective Measures Implementation
- Cost Estimate for Maintenance of Corrective Measures after Implementation

Attachment VII.7

Compliance Schedule

Attachment VII.7
Compliance Schedule

Activity & Permit Condition(S)	Due Date
Compliance Reporting	
1. Notification of compliance or noncompliance with compliance schedules - Condition I.J.12.e.	Within 14 calendar days of due date
2. Notification of noncompliance - Condition I.J.12.f.	Oral notification within 24 hours; written notification within 5 calendar days
Newly Identified SWMUs/AOCs, and Newly Discovered Releases at Previously Identified SWMUs and AOCs	
3. Notification of newly identified SWMUs/AOCs or hazardous constituents - Condition VII.D.1.	Within 15 calendar days of discovery
4. Submittal of SWMU/AOC Assessment Report - Condition VII.D.2.	Within 60 calendar days of notification
5. Notification of newly discovered releases at previously identified SWMUs and AOCs - Condition VII.E.1.	Within 15 calendar days of discovery
RCRA Facility Investigation	
6. Submittal of RFI Work Plan(s) for SWMUs and AOCs and Description of Current Conditions Report - Conditions VII.A.5.a., VII.D.3., VII.E.2., VII.H.1.a., and Attachment VII.3	Within the timeframe specified by the Department.
6.a. Submittal of RFI Progress Reports - Condition VII.H.4.	In accordance with the approved RFI Work Plan
6.b. Submittal of Draft RFI Report - Condition VII.H.5.a.i.	In accordance with the approved RFI Work Plan
6.c. Submittal of Final RFI Report - Condition VII.H.5.a.ii.	Within 45 calendar days after receipt of Department comments on RFI Report
Interim Measures	
7. Submittal of IM Work Plan - Condition VII.I.1.a.	Within the timeframe specified by the Department.
7.a. Submittal of IM Progress Reports - Condition VII.I.5.	In accordance with the approved IM Work Plan
7.b. Submittal of IM Final Report - Condition VII.I.6.	Within 45 calendar days of completion of IM or inclusion into Corrective Measures Implementation

Activity & Permit Condition(S)	Due Date
Corrective Measures Study	
8. Submittal of CMS Plan - Condition VII.J.1.a.	Within the timeframe specified by the Department.
9. Submittal of Draft CMS Report - Condition VII.J.4.a.i.	In accordance with the approved CMS Plan
10. Submittal of Final CMS Report - Condition VII.J.4.a.ii.	Within 45 calendar days after receipt of Department comments on draft CMS Report
Corrective Measures Implementation	
11. Submittal of CMI Work Plan - Condition VII.L.1.a.	Within 90 days of following permit modification to incorporate the remedy.
12. Submittal of CMI Progress Reports - Condition VII.L.5.	In accordance with the approved CMI Work Plan
13. Submittal of Five-Year Review Report – Condition VII.L.6.	By April 30, 2022 and five years following that date, until permit reissuance, termination, or another enforceable mechanism is issued.
14. Submittal of Corrective Measures Completion Certification Report - Condition VII.M.3.	Within 45 calendar days of completion of Corrective Measures