Department of Environmental Conservation
Response to Comments

For

Alaska Pollutant Discharge Elimination System

Individual Permit
AK0053694 – ExxonMobil Alaska Production, Inc.
Point Thomson Qiruk Camp

Public Noticed May 10, 2019 – June 11, 2019

June 25, 2019

Alaska Department of Environmental Conservation
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Contents

1 Introduction

1.1 Summary of Facility / Permit

ExxonMobil Alaska Production (EMAP) is the operator of the Point Thomson Unit (PTU), located on the North Slope of Alaska. The Initial Production System (IPS) at Point Thomson includes: producing natural gas and liquid condensate from the Thomson Sand reservoir; recovering liquid condensate; re-injecting the residual gas back into the reservoir, and transporting the condensate via the Point Thomson Export Pipeline (PTEP) for delivery to the Trans Alaska Pipeline System (TAPS).

On March 22, 2013 DEC first issued the Permit (2013 Permit) to EMAP to support both construction activities of the Qiruk Camp and the initial period of operation. At the time the 2013 Permit was issued, effluent characterization was based on performance of similar systems elsewhere on the North Slope, which indicated effluent could meet water quality criteria at the point of discharge. Accordingly, mixing zones were not sought as they were assumed to be unnecessary. Two sets of limits were established based on water quality criteria for either freshwater or marine water because EMAP desired flexibility as the final design for construction had not been completed. Given the need to verify the assumption that effluent met either freshwater or marine water quality criteria, the 2013 Permit required effluent monitoring to effectively characterize the effluent prior to submitting an application for the first reissuance. In addition, the Permit included technology-based effluent limits (TBELs) based on the assumption that the treatment technology employed would perform equivalently compared to systems for which the TBELs imposed had been established in regulation (e.g., 40 CFR 133). Based on characterization data obtained during the initial permit term, DEC determined that not all of the TBELs imposed met the equivalency assumption used in their original derivation. In addition, EMAP and DEC determined that the effluents would not meet either marine or freshwater water quality criteria for certain parameters and a mixing zone would be required in the reissued Permit. Furthermore, because the freshwater lake identified in the 2013 Permit was insufficiently sized to provide for the necessary dilution over the life of the facility, EMAP decided to redirect the discharges to Lion Bay and construct a marine outfall line designed in conjunction with a mixing zone model evaluation submitted with the application received in March 2018 prior to expiration of the 2013 Permit. Based on this timely and complete application submittal, DEC administratively extended the 2013 Permit until the marine outfall was constructed and the Permit is reissued by DEC. Construction of the marine outfall line was completed in April, 2019.

1.2 Opportunities for Public Participation

DEC proposes to issue the Permit after considering all substantive public comments. To ensure public, agency, and tribal notification and opportunities for participation, DEC:

- Identified the permit on the annual Permit Issuance Plan posted online at: http://www.dec.state.ak.us/water/wwdp/index.htm,
- Notified potentially affected tribes and local governments that DEC would be working on this permit via letter, fax and/or email,
- Posted a preliminary draft of the permit on-line for a 10-day applicant review February 28, 2019 and notified tribes, local governments and other agencies,
- Posted the public notice on the DEC public notice web page March 28, 2018 for a 30-day public review on the Draft Permit and Fact Sheet,
- Posted the Proposed Final Permit, Fact Sheet, and Response to Comments (RTC) document on-line for a shortened five-day applicant review to two days beginning on June 20, 2019, and
- Emailed notifications via the APDES Program List Serve when the Preliminary Draft, Draft, and Proposed Final Permits were/are available for review.

DEC requested comments on the Preliminary Draft documents from EMAP, EPA, National Marine Fishery Services (NMFS), United States Fish and Wildlife Service (USFWS), and State agencies including, but not limited to, the Alaska Departments of Fish and Game and Natural Resources. Only EPA provided comments on the Draft Permit and Fact Sheet.

This document summarizes the comments submitted and the justification for any action taken or not taken by DEC in response to the comments received.

1.3 Final Permit

The final permit was adopted by the DEC on June 25, 2019. There were minor changes from the Draft Permit and Fact Sheet after public notice to correct typographical and grammatical errors and to clarify or update information. Changes resulting from the outgrowth of comments received are identified in this RTC document and reflected in the Final Permit and Fact Sheet.

2 Comments Received from EPA

2.1 Typographical Mistake on Water Quality Standards Deadline

EPA identified a typographical error in Fact Sheet Section 3.1 that indicates the deadline for states to develop water quality limitations in permits is July 1, 1997. The correct date is July 1, 1977.

DEC Response:

DEC concurs with the comment and has modified the deadline to July 1, 1977 in Fact Sheet Section 3.1.

2.2 Mixing Zone Analysis with Respect to Manganese

EPA commented that Fact Sheet Section 3.3.1 states that manganese is the driving parameter for the mixing zone for Outfall 004B but the Permit does not require monitoring for manganese to support future characterization. Nor does Fact Sheet Section 2.3 include existing characterization data to illustrate the degree that manganese exceeds water quality criteria at the point of discharge to support this decision. DEC should provide a summary of manganese data and explain why manganese monitoring is not necessary or include manganese monitoring in the Permit.

DEC Response:

Although not shown in Table 2, DEC did consider manganese data obtained for Outfall 004B. However, no manganese data is currently available for Outfall 004A. Therefore, the applicant and DEC applied the manganese data from Outfall 004B to Outfall 004A based on the assumption that manganese in Outfall 004A could be conservatively estimated based on the concentration in the drinking water reject water. There are no known manganese sources entering the domestic wastewater other than that in the treated potable water and minor inputs from domestic sources. Although this assumption could be verified through monitoring during the term of the Permit, DEC determined such monitoring is not necessary based conducting a sensitivity analysis while considring the applicable exposure period for the human health water quality criteria for manganese and the applicable mixing zone regulations in 18 AAC 70.255(c), which requires chronic and human health criteria (HHC) to be met at and beyond the boundary of the chronic mixing zone. The chronic mixing zone is established based on a different set of conditions than that for HHC. Note also that, for manganese, there are no aquatic life criteria but HHC of 50 μg/L is applicable.

Unlike acute and chronic criteria that is based on 1-hour and 4-day exposure periods, respectively, HHC has a much longer exposure period (up to 70 years). The implication of longer exposure periods for HHC means that instead of using maximum expected concentrations and flows along with critical receiving water conditions for mixing zone, as done for acute and chronic criteria, HHC requires evaluation of average effluent concentrations and flows along with average ambient (AMB) receiving water conditions when evaluating whether human health criteria is met at the boundary of the chronic mixing zone. Note that the applicant proposed manganese as the driving parameter for Outfall 004B by applying reasonable potential multipliers to obtain a maximum expected concentration, as is standard for aquatic life criteria, rather than applying average observed concentrations (AOCs) commensurate with the exposure period for human health criteria. For these reasons, DEC did not accept the applicants recommendation and considered the combined discharge of both Outfall 004A and 004B (Outfall 004_{AB}) instead of authorizing mixing zones for each outfall individually.

To evaluate the need to monitor manganese in both effluent discharges into the combined discharge mixing zone, DEC conducted a sensitivity analysis using the equation for the chronic dilution factor, $DF_c = (AOC_{AB} – AMB)/(HHC\text{-}AMB) = 51.5$, and the mass-balance approach described in Fact Sheet Section 2.3.3. In both equations, DEC substituted the AOC for maximum observed concentrations (MOC) appropriately for human health criteria. For the ambient concentration, DEC assumed 15 % of the criteria, or 7.5 µg/L, which resulted in an AOC_{AB} equal to 2,196 µg/L and represents the average concentration in the combined discharge necessary for manganese to exceed the HHC at the boundary of the authorized chronic mixing zone sized according to copper being the driving parameter based on using chronic aquatic life criteria.

The seven data points from the NF Concentrate/Flush system provided a MOC of manganese of 104 µg/L and an average (AOC_B) of 41 µg/L, which is less than the HHC. Using the mass balance equation $AOC_{AB}(Q_A + Q_B) = AOC_A(Q_A) + AOC_B(Q_B)$, rearranging to solve for AOC_A, and inputting the values Q_A = 35 gallons per minute (gpm) and Q_B = 25 gpm yields an AOC_A = 3,735 µg/L. Based on existing data from the NF Concentration/Flush discharge, the manganese in the domestic wastewater effluent would have to be approximately 91 times greater than the water treatment effluent to exceed HHC for manganese at the boundary of the combined effluent chronic mixing zone. Such high concentration is not plausible given the lack of manganese sources in the domestic waste stream. Hence, monitoring manganese is not necessary and no changes to the Fact Sheet and the Permit have been made for manganese monitoring. However, based on this comment DEC believes more transparency is appropriate, so DEC is providing a data summary for manganese in Table 2 and a discussion of why HHC is not addressed in the Fact Sheet. For discussion on human health criteria, the following Section 2.3.4 has been added to the Fact Sheet:

> "Although not discussed in Section 2.3.1 or 2.3.2, human health criteria was considered when characterizing the effluent from the WWTP and WTP. DEC considered the numeric human health criteria for copper, manganese, mercury, and zinc to the average concentrations for those parameters. This comparison indicated that the average concentrations were significantly lower than the human health criteria such that presenting the information is not meaningful because human health criteria is met either at the point of discharge or quickly within the mixing zone authorized for the combined discharge from 004A and 004B. Hence, it is not possible for these parameters to exceed their respective HHC at the boundary of the chronic mixing zone. However, because one data point for manganese exceeded the HHC, manganese is listed as a parameter to be included in the chronic mixing zone."

2.3 Antibacksliding on for Domestic Wastewater Percent Removal

EPA commented that they disagree with the rationale for removing the 85 percent (%) removal requirements for five-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS) from the Permit. The percent removal requirement was initially established using case-by-case best professional judgment (BPJ) citing the technology-based effluent limit (TBEL) from 40 CFR 133. The applicable antibacksliding provisions for TBELs developed using case-by-case BPJ is 40 CFR 122.44(l) [18 AAC 83.480] and 40 CFR 122.62 [18 AAC 83.135]. The basis for backsliding stated in Fact Sheet Section 5.2 is new information that had been obtained during the term of the Permit, which supports eliminating the % removal requirements as a technical mistake such that if the information was available previously the limitation would not have been originally imposed. EPA claims that the new information is consistent with the anticipated performance of the membrane bioreactor (MBR) treatment system stated in the existing Permit. Specifically, EPA references Section 2.0 in the existing Permit that states "MBR's are capable of achieving high quality effluent through the process of micro- or ultrafiltration coupled with biological treatment with a suspended growth bioreactor." In addition, EPA references Fact Sheet Section 7, Antidegradation Finding 4 that states "MBR treatment technologies are capable of achieving higher quality wastewater effluent than traditional secondary biological treatment plants utilizing conventional extended aeration and/or activated sludge processes alone." Based on these references, EPA claims that DEC established the % removal limitation knowing the effluent from the MBR would be of higher quality than those limits required. Accordingly, the elimination of the % removal limitations in the Permit are not justifiable in the context of 40 CFR 122.44(l) [18 AAC 83.480] or 40 CFR 122.62 [18 AAC 83.135] and must be retained in the Permit.

DEC Response:

DEC acknowledges the appearance of improper backsliding on the reissuance of the Permit from the 2013 initial issuance. For the 2013 Permit, DEC presumed applicability of 40 CFR 133 for the domestic waste outfalls 004A and 004B. While MBR technology is known to produce high-quality effluent, the unique demands of remote camps can produce higly variable influent strength. The Publically-owned Treatment Works (POTW) requirements in 40 CFR 133 do not account for a highly variable influent, and the applicability assumption may not be valid. In addition, while the general statements referenced by EPA appear to not support backsliding, these referenced sections do not represent the basis used by DEC for originally developing the % removal TBEL using case-by-case BPJ. The original DEC basis for the TBEL resides in the Appendix B of the 2013 Permit. Specifically, Appendix B, Section B.1 describes the rationale for the % removal citing presumed applicability of 40 CFR 133 for POTWs to privately-owned treatment works. The basis was of equivalency rather than superiority of the MBR. Per the second sentence in the second paragraph of Section B.1, "While secondary requirements only directly apply to POTWs, the Department is applying secondary treatment standards to privately-owned treatment facilities as they are identical to POTWs in mechanics and treatment efficacy, and accordingly, the secondary standards provide the most meaningful baseline pollutant control guidelines for this sector of privately-owned treatment facilities." At the time of issuing the 2013 Permit, DEC had approved the construction of the MBR but did not have performance data that would validate this assumption of equivalency allowing for direct use of 40 CFR 133. Hence, DEC was hesitant to assume that controlling the treatment system performance by imposing % removal was not necessary until demonstrated by data that accounts for influent variability common among remote Alaskan work camps, equipment and material functionality, as well as operation and maintenance of the MBR system during the first term of the permit.

Similar to the original development of the % removal limitation in the 2013 Permit, the appropriate section in the current Fact Sheet supporting subsequent removal is the basis of limits in Appendix C. Specifically, Appendix C Section C.1.2.1 describes that based on current data, DEC made a technical mistake in originally applying the % removal requirement in the 2013 Permit and this justifies changing the basis of the secondary treatment requirements from 40 CFR 133 to 18 AAC 72, which does not include % removal requirements in the definition of secondary treatment. DEC also points out that data obtained during the term of the 2013 Permit demonstrates the MBR performance is greater than equivalent to the systems for which the standards under 40 CFR 133 have been derived. Furthermore, DEC contends that if this data was available at the time of issuing the 2013 Permit, DEC would not have been overly conservative with respect to imposing % removal limitations per 40 CFR 122.44(l) and 18 AAC 83.135(B)(2). DEC believes the elimination of the % removal is a justifiable backsliding based on new data that contradicts previous assumptions for which the original TBEL was developed using case-by-case BPJ.

No changes to the Permit or Fact Sheet have been made as a result of this comment.

2.4 Resolution of Appendix A Figures

EPA Comments that several of the Figures in Appendix A are low resolution and difficult to read and requests higher resolution images.

DEC Response:

DEC concurs and has received images with higher resolution than what was issued in the Draft Permit and Fact Sheet and will update these in the Proposed Final Permit and Fact Sheet.

2.5 Controlling Long-term Average for Copper Limits in Appendix C

EPA identified a typographical error in Appendix C that incorrectly suggested the controlling long-term average (LTA) for development of the water quality-based effluent limit is the chronic LTA when the correct LTA is acute as used in the calculations in Appendix C.

DEC Response:

DEC appreciates pointing out this typographical error and has corrected the controlling LTA in Appendix C as suggested.