



DEPARTMENT OF THE AIR FORCE
AIR FORCE CIVIL ENGINEER CENTER
JOINT BASE SAN ANTONIO LACKLAND TEXAS

April 8, 2020

Mr. Robert Delaney
Michigan Environment, Great Lakes, and Energy
P.O. Box 30473
Lansing, Michigan 78909-7973

Subject: Response to Michigan Environment, Great Lakes, and Energy Comments on
Review of Five-Year Review Report
Former Defense Fuel Supply Point, Escanaba, Michigan

Dear Mr. Delaney:

Thank you for your comments provided in correspondence dated October 10, 2019. The Air Force Civil Engineer Center (AFCEC) has addressed your comments and hereby provides the following responses to clarify the Five-Year Review Report. The Five-Year Review Report provides evaluation of the effectiveness of the remedy for wood tar and petroleum (historic) contaminants on the DFSP site. Since characterization of PFOS/PFOA is not complete and a remedy has not been determined for impacted media, the Five-Year Review does not include a PFOS/PFOA-related remedy evaluation. The impacted media identified in Section E includes only those impacted by the historic wood tar and petroleum contamination that were addressed in the remedy in the 2007 Interim Response Activity Plan (IRAP).

Responses to comments in the August 16, 2019 memo are provided below in blue text and are similarly numbered:

1. Section I. Declaration Statement

The statement just above the signature block is inconsistent with the protectiveness statement later in the document. EGLE recommends that both the declaration and the protectiveness statements be revised. Per- and Polyfluoroalkyl (PFAS) has been identified in groundwater and surface water at the site above risk-based criteria. PFAS levels in Little Bay de Noc exceed ambient water quality standards for drinking water and fish consumption. Additional work is required to evaluate exposures - both through private drinking water wells, future municipal supplies, and fish consumption. Also, the evaluation of residential wells during 2015-2016 is considered insufficient by EGLE due to the relatively high laboratory detection levels by Accutest Laboratory, and the fact that only 6 PFAS compounds were tested for instead of the list of 24 compounds recommended by EGLE

(https://www.michigan.gov/documents/deq/deq-tou-wrd-Analytes-IPP_PFAAS_621093_7.pdf.)

Another issue that affects protectiveness in the long-term, is the fact that Restrictive Covenants have not been placed on neighboring residential properties to ensure that contaminated groundwater is not used for drinking water.

Response to 1, First Comment. Noted. As stated above, the Five-Year Review does not include protectiveness determinations for per-and polyfluoroalkyl substances (PFAS) since these contaminants are not fully characterized and a remedy has not yet been determined. A brief summary of the status of the PFAS-related site investigation is included in Section I, Site Background.

Response to 1, Second Comment. Revised Text. The Five-Year Review Report acknowledges that LUCs could not be placed on the neighboring properties with residual contamination as intended because the AF cannot place restrictions on property it does not own. AFCEC proposes to work with EGLE to alert current and future land owners of impacts to the shallow groundwater and recommended restrictions on land use. The declaration statement in Section I has been revised to state that "...it is concluded that the remedies ~~are currently~~ are currently protective of human health and the environment in the neighboring properties..."

2. Section II, Response Action Summary, Response Actions, End of Third Paragraph. For clarification, we recommend adding one sentence to the end of the third paragraph: "The Chemical-specific cleanup criteria concentrations are considered appropriate and relevant unless there are site-specific conditions that significantly differ from conditions on which the generic criteria are based. **The Remedial Action Objectives (RAOs) for groundwater at this site were based on site-specific groundwater-surface water interface (GSI) criteria.**"

Response to 2. Text was revised. The sentence was added to Section II, Response Action, end of third paragraph, as suggested.

The site-specific GSI criteria are based on the generic GSI criteria for surface water protected as a drinking water source, which remain unchanged for all COCs at DFSP. Also revised table in Section II, Response Actions, Table of RAO Chemical-Specific Criteria are from Table 2-10 Contaminants of Concern and Remedial Action Objectives for Groundwater from 2007 IRAP.

3. Section II, Response Action Summary, Response Actions, Table of RAO Chemical-Specific Criteria

The table should list all chemical specific RAO criteria, or should be clearly labeled and explained that the table only represents the exceptions to the Part 201 generic criteria, which are the compounds with site specific GSI criteria. Because some site specific GSI criteria were developed for the site, the generic 2018 GSI criteria should not be discussed here. Delete the third column with the heading 2018 GSI. Delete the last sentence of this section: ~~Generic groundwater surface water criteria were revised by DEQ in 2018, and revised generic criteria for ethylbenzene, toluene, xylenes, 1,2,4 and 1,3,5 trimethylbenzenes are lower than the site specific criteria provided in the 2007 IRAP.~~ New toxicity values and exposure assumptions and criteria are to be discussed under Question B: "Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid." The discussion under Question B must focus on the significance of any new toxicity values and exposure assumptions that resulted in revised generic GSI criteria in 2018. The discussion in Question B must recommend whether or not the mixing zone determination (from which the site specific GSI criteria were calculated) must be reviewed and updated based on the new toxicity values.

It should be stated in this section that:

A new group of contaminants Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) have been identified in groundwater and surface water at the site since the remedy was implemented. These compounds were not included in the RAOs.

Response to 3, First Comment. Accepted. Removed generic GSI sentence. The site-specific GSI criteria are based on the generic GSI criteria for surface water protected as a drinking water source, which remain unchanged for all COCs at DFSP.

Response to 3, Second Comment. Noted. PFAS are addressed in response to Comment #1.

4. Section II, Response Action Summary, Status of Implementation

Add a paragraph to this section describing the current conditions at the site. State whether all buildings are removed, all above ground storage tanks and their foundations removed, monitoring wells abandoned, slurry wall breached to allow groundwater flow, whether areas of clean soil fill are stable and vegetated, and whether there is any current use of the site - commercial, industrial or residential.

Response to 4. Text Revised. A paragraph was added to Section II, Response Action Summary, LUC Summary Table to provide a description of property conditions and current status of use (unused).

5. Section II, Response Action Summary, LUC Summary Table

The Land Use Control (LUC) Summary Table lists only the LUCs that have been implemented. Another row and column should be added so that the outstanding LUCs which have not yet been implemented can also be listed. These outstanding LUCs affect the site protectiveness.

Response to 5. Text Revised. This table is for LUCs included in the Decision Document and therefore does not discuss the LUCs that were proposed for the neighboring properties. Discussion of LUCs intended for the neighboring properties are discussed in the bullets preceding the LUC Summary Table. AFCEC Legal then made minor revisions to the bullets preceding the LUC Summary Table after EGLE's review, which clarify the reasons the neighboring property LUCs have not been implemented.

6. Section IV, Five-Year Review Process, Data Review, First Paragraph, First Sentence

For clarification, revise first sentence as follows: ~~Although~~ No samples were collected during this FY Review period **other than for PFAS.**

Response to 6. Accepted. The sentence was revised as suggested.

7. Section IV, Five-Year Review Process, Data Review, Last Paragraph Before Methane Table.

Methane concentrations at the site can be discussed here, but the discussion of the change in criteria for methane in groundwater should be moved to Question 8. Clarify that the third column represents the **Revised** Flammability and Explosivity Screening Level (2013)

Response to 7. Accepted. The third column of the methane table was revised to add "Revised" to the column heading.

8. Section V, Technical Assessment. Question A Question A Summary. 4th Paragraph Clarify as follows: As of the most recent sampling in 2010, benzene and 1,2,4-trimethylbenzene impacted groundwater exceeded residential generic criteria on one of the adjacent private properties. (Be specific here, did it exceed **generic drinking water criteria or the site specific GSI which was used as the RAO?**) Methane- impacted groundwater exceeded the flammability and explosive screening level of **520 mg/I, which was used as the RAO for the Interim Remedial Action Plan (IRAP)** on both adjacent properties. **However, a soil gas investigation for methane gas in 2012 and 2013 did not identify methane in soil vapor.**

Response to 8. Text Revised. Question A answer was revised to indicate site-specific chronic GSI criteria was exceeded by benzene and 1,2,4-trimethylbenzene. Question A answer was revised as suggested related to the methane discussion.

9. Section V, Technical Assessment. Question 8 1 Question B Summary. First Paragraph and Table

This section should not focus on new generic criteria, but rather must cover new toxicity values, and review of the previous mixing zone determination. If there are new toxicity values for the contaminants in the table, it may be appropriate to recalculate and update the mixing zone/site specific GSI criteria determination for the site. This should be stated.

Response to 9. Text Revised. The answer to Question B was revised to add discussion of a change to the source for the chronic inhalation reference concentration for 1,2,4-trimethylbenzene, however the reference concentration did not change. The change in methane criteria discussion was moved from Section IV, Data Review to Question B.

10. Section V, Technical Assessment. Question 8 . Question B Summary. Methane Following the paragraph on Michigan's Flammability and Explosivity Screening Level (FESL) for methane, move the following methane paragraph and concentration table to this section:

A change in the methane in groundwater criteria was promulgated by the state of Michigan late in 2013. The change resulted in an increase in the flammability/explosivity screening level (FESL) for methane from 520 ug/l to 28,000 ug/l. The methane concentrations detected in groundwater samples collected during the phase 3 sampling events (2010) do not exceed the revised criteria. A comparison of the phase 3 sample methane results and the new FESL is provided below.

Include the table of methane concentrations and criteria.

Response to 10. Text Revised. The change in methane criteria discussion was moved from Section IV, Data Review to Question B.

11. Section V, Technical Assessment. Question 8 1 Question B Summary

Since some of the generic criteria for GSI and the methane FESL have changed, the following sentence should be deleted: ~~No changes to exposure pathways or risk assessment methods have occurred, have been identified, or are relevant to the historical contaminants in the last five years.~~ Add instead a discussion on PFAS: **A new group of contaminants PFAS, have been identified in groundwater and surface water at the site. Michigan has promulgated groundwater and surface water criteria for two PFAS compounds, Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA). Sampling conducted in late 2015 identified PFOS and**

PFOA at concentrations exceeding the EPA Lifetime Health Advisory for drinking water and Michigan Drinking Water Cleanup Criteria (.07 ug/L for PFOS and PFOA, when found individually or in combined concentrations) in groundwater at all three release areas listed above and also exceeding the GSI Criteria.

Subsequent Sampling of seven nearby residential drinking water wells from December 2015 to March 2016 confirmed there is currently no unacceptable exposure through the drinking water pathway is inconclusive for locations GW-008 through GW-012, GW-14, GW-15, GW-16 and GW-18 due to the relatively high laboratory detection levels by Accutest Laboratory, and the fact that only 6 PFAS compounds were tested for instead of the list of 24 compounds recommended by EGLE (https://www.michigan.gov/documents/deq/deg-tou-wrd-Analytes-IPP_P_FAS_621093_7.pdf). Since the PFAS source areas have not been remediated, EGLE Staff advise that the Air Force resample these water supply wells on an annual schedule. This should be included under the Issues and Recommendations Section of the FYR.

Surface water and sediment were sampled in Little Bay de Noc in the Spring of 2017. PFOS was detected in Little Bay de Noc at concentrations exceeding the Michigan Human Noncancer Value (HNV) for surface water used as a drinking water source. PFOA was detected in Little Bay de Noc at concentrations below the Michigan HNV. PFOS and PFOA were detected in sediment below the calculated screening levels. There are no Michigan cleanup criteria for PFAS in sediment. (Michigan soil cleanup criteria do not apply to sediment.) PFOA and PFOS will be further addressed following the same CERCLA process as established for other contaminants.

Residential Water Supply PFAS Results					
Sample#	Analytical Method	Lab	Sample Date	Results	LOD/MDL
GW-13S split	537M	Maxxam	1/14/2019	ND	.0019-.0053 ug/L (2-5 ppt)
GW-008	537M	Accutest	12/10/2015	ND	.01-.033 ug/L (10-32 ppt)*
GW-009	537M	Accutest	12/10/2015	ND	.01-.032 ug/L (10-32 ppt)*
GW-10	537M	Accutest	1/12/2016	ND	.01-.031 ug/L (10-31 ppt)*
GW-11	537M	Accutest	1/12/2016	ND	.01-.032 ug/L (10-32 ppt)*
GW-12	537M	Accutest	1/12/2016	ND	.01-.031 ug/L (10-31 ppt)*
GW-13	537M	Accutest	1/14/2016	ND	.01-.031 ug/L (10-31 ppt)*
GW-14	537M	Accutest	1/14/2016	ND	.01-.031 ug/L (10-31 ppt)*
GW-15	537M	Accutest	1/27/2016	ND	.01-.031 ug/L

Residential Water Supply PFAS Results					
Sample#	Analytical Method	Lab	Sample Date	Results	LOD/MDL
					(10-31 ppt)*
GW-16	537M	Accutest	1/27/2016	ND	.01-.031 ug/L (10-31 ppt)*
GW-17	537M	Accutest	3/2/2016	ND	.01-.015 ug/L (10-15 ppt)*
GW-18	537M	Accutest	3/2/2016	ND	.01-.016 ug/L (10-16 ppt)
GW-17S Split	537M	Vista	3/2/2016	PFOA .000811 ug/L	.004 ug/L (4 ppt)

ND – Non-Detect at the reported detection level

LOD - Level of Detection

MDL - Method Detection Level

ug/L - micrograms per liter

ppt - parts per trillion

*** - Elevated Detection Level**

Response to 11. Noted. Since characterization of PFAS is not complete and a remedy has not been determined for impacted media, the Five-Year Review does not include a PFAS-related remedy evaluation. The impacted media identified in Section E includes only those impacted by the historic wood tar and petroleum contamination that were addressed in the remedy in the 2007 Interim Response Activity Plan (IRAP). Information related to recent sample results for perfluoroalkyl substances (PFAS) can be found in the Final Site Inspection Report for Aqueous Film Forming Foam (AFFF) Areas at Former Defense Fuel Supply Point, Escanaba, Michigan (June 2018). An overview of the PFAS investigation and path forward are included as part of the answer to Question C, as this update is more appropriate under Question C than Question B.

12. Section VI. Issues/Recommendations

Add another issue/recommendation regarding the need to evaluate the exposure pathways for PFAS. **PFAS has been identified in groundwater and surface water. Groundwater at the site is restricted and will not be used for drinking water.**

However, several private water supply wells exist adjacent to the site. And the use of groundwater on those properties has not been restricted. Those land use controls (LUCs) must be implemented. A milestone date should be set for completion of the LUCs by 2021. Because source areas have not been addressed, the residential water supply wells should be resampled without delay, and on an annual schedule. This first sample should have a milestone completion date of early 2021.

PFAS in surface water may also bioaccumulate in fish, resulting in a fish consumption advisory or restriction. The Air Force must sample fish immediately

to determine if there is an imminent and substantial endangerment to human health by consumption of fish.

Additional investigation is required to determine if PFAS in surface water will affect current or future municipal water supplies. Additional work is required at the site to stop the discharge of PFAS contaminants to surface water. Because of the PFAS concentrations in surface water and groundwater, the current site remedy is not protective.

Response to 12, First Comment. Noted. LUCs on neighboring properties are addressed in the response to Comment #5.

Response to 12, Second Comment. The private drinking water wells were located upgradient, with one well downgradient, and the results from the drinking water well sampling were non-detect, except for one upgradient well that was well below criteria. The Air Force has fully investigated the drinking water pathway and found the pathway is not complete. As reported in the Final SI Report, “AFFF Areas 1, 2, 3 and Little Bay de Noc exceeded project screening levels but have incomplete drinking water pathways as confirmed by the UCMR3 sampling at the City of Escanaba’s treatment plant.”

Response to 12, Third Comment. All relevant exposure pathways will be evaluated following the CERCLA process.

Response to 12, Fourth Comment. Please refer to Response to Comment #1, First Comment.

Protectiveness Statement(s)

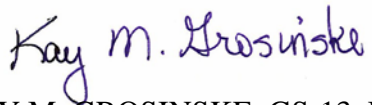
The protectiveness determination should be changed from ~~Will be Protective~~ to **Not Protective**. The Protectiveness Statement should be rewritten and clarified as follows: ~~The remedy at DFSP is protective of the current designated use for limited nonresidential purposes, and LUCs will be in place indefinitely to prevent uses that are not consistent with the RAOs specified in the IRAP.~~ Defense Fuel Supply Point is characterized by BTEX and VOCs, which exceed the cleanup criteria in groundwater **as well as PFAS, which exceed cleanup criteria for drinking water and surface water.** The remedy included **VOC** contaminant mass removal, groundwater monitoring and LUCs. All remedial actions **pertaining to VOC and SVOC contamination** at the site have been completed and groundwater monitoring has been discontinued with EGLE's consent. COCs in groundwater have met the restricted use criteria in accordance with the IRAP, but remain above Part 201 residential drinking water criteria. **The PFAS contamination in groundwater and surface water identified in 2015 requires further investigation.** Land and groundwater use restrictions control applicable exposure pathways. When LUCs are placed on the deeds of the adjacent private properties, **and when the PFAS contamination and exposure pathway have been fully evaluated and all unacceptable exposures have been addressed,** the site ~~will~~ **may** be eligible for limited nonresidential restricted site closure.

Response to Protectiveness Statement comment. The protectiveness statement (Section VII) was revised based on EGLE’s suggestions related to VOC and SVOC contamination. No

further revisions related to PFAS contamination were added to the protectiveness statement for the reasons provided in the response above to EGLE's comment #11.

The final version of the attached Second Five-Year Review report has addressed EGLE's comments provided in the October 10, 2019 correspondence and August 16, 2019 memo and AFCEC considers the current report as final. Should you have any further questions or comments, please contact me at kay.grosinske@us.af.mil.

Respectfully,

Handwritten signature of Kay M. Grosinske in blue ink.

KAY M. GROSINSKE, GS-13, DAF
Program Manager, Execution Branch
BRAC Program Management Division
Air Force Civil Engineer Center (AFCEC)
kay.grosinske@us.af.mil

Commercial (210) 395-8272
DSN 969-8272
Cell (210) 627-4659