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

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AFCEC/CIB
2261 Hughes Avenue, Ste 155
JBSA Lackland, TX 78236-9853

Ms. Kathleen Shirey
Acting Director, Remediation and Redevelopment Division
525 West Allegan Street
P.O. Box 30473
Lansing, MI 48909-7973

RE: Dispute Resolution (DR) Concerning the Former Wurtsmith Air Force Base and Response to Impacts to Drinking Water from PFOS / PFOA Substances, Site ID No. 35000058.

Dear Ms. Shirey:

This letter is in response to your 8 Feb 2018 letter, and subsequent approved extension request letter dated 2 Mar 2018, in which the Michigan Department of Environmental Quality (MDEQ) replied to the Air Force's responses to the issues MDEQ has raised in this dispute under the Defense and State Memorandum of Agreement (DSMOA). In your 2 Mar 2018 extension request approval letter, MDEQ proposed a dispute resolution meeting to be held on 28 Mar 2018 at the MDEQ's offices in Lansing, MI. Due to existing meeting conflicts, the U.S. Air Force (USAF) would like to propose that this next dispute resolution be scheduled for a mutually agreed upon date in April. The Air Force still recommends a meeting with the MDEQ in your Lansing, MI offices.

While the USAF is committed to following the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and protecting human health and the environment, the USAF is troubled that MDEQ chose in its 8 Feb 18 responses to require the submission of work plans for the purposes of implementing tasks MDEQ did not initially identify when it invoked the DSMOA dispute resolution process. In addition, the time frames proposed by the MDEQ for submission of the various work plans requested are not feasible. Specific Air Force responses to each of the MDEQ's 8 Feb 2018 responses are provided below.

We note the MDEQ requests refer to PFAS. Under the current regulatory requirements and the US EPA health advisories are limited to PFOS/PFOA. Consequently, Air Force sampling requirements and planning is based on reporting PFOS/PFOA findings. The Air Force will use EPA method 537 and its modified methods moving forward. All analytical results are shared with regulatory agencies.

1. **MDEQ (14 Dec 17): Regularly monitor existing residential and Type I community wells for PFAS contamination.**

USAF Response (11 Jan 18): *The USAF has performed two rounds of potable well sampling for the Residential and Type I wells in the affected area and results on both rounds are consistent. The first sampling events were conducted in the Winter/Fall of 2015 and the summer of 2016, and the second round in the summer of 2017. There has been only one exceedance of the USEPA lifetime health advisory (HA) for PFOS/PFOA at a private drinking water well. No*

further sampling has been conducted of water from wells that showed no detectable levels of PFOS and PFOA.

The USAF plan is to sample quarterly for the next year the drinking water wells sampled in 2017, which all had PFOS/PFOA below the HAs, then annually for the next two (2) years. We will evaluate these results in coordination with MDEQ to determine further monitoring needs. For example, if sampling results indicate stable concentrations and these are below one half the HA, these wells may not require further sampling.

MDEQ Response (8 Feb 18): The frequency and the duration of the sampling of residential wells on the west side of Van Etten Creek and Van Etten Lake as proposed by the USAF is acceptable to the MDEQ. However, information collected since the MDEQ originally requested monitoring of existing residential wells indicates that assessment of conditions east of Van Etten Creek and Van Etten Lake can be more efficiently accomplished through the actions detailed below:

The USAF must develop in the form of a work plan to be submitted to the MDEQ for review and approval, a plan with a proposed schedule for the investigation of conditions on the east side of Van Etten Lake and Van Etten Creek in the areas indicated on Figure 1. Sampling results in these areas demonstrate that contaminants released from the former USAF base are present at varying concentrations, and must be further evaluated to determine the necessary course of action to protect human health and the environment.

The work plan must be submitted to the MDEQ no later than forty-five (45) days after receipt of this letter. The work plan must include immediate, interim steps to install a groundwater monitoring well network to (1) serve as a sentinel for potable residential and Type I community wells, and (2) support the characterization, both vertically and horizontally, of the plumes in the areas east of Van Etten Lake and Van Etten Creek identified on Figure 1. The monitoring well network necessary to achieve this task must include vertical aquifer sampling for the complete depth of the aquifer. The resulting data must be sufficient to develop a predictive model of the plumes' potential impact on public health and the environment.

USAF Response: *The USAF notes MDEQ's agreement that the frequency and the duration of the sampling of residential wells on the west side of Van Etten Creek and Van Etten Lake is acceptable.*

The requests for a work plan, monitoring well network and characterization are additive to MDEQ's December 14, 2017 letter invoking dispute resolution.

While it is the understanding of the USAF that the MDEQ's sampling of private wells located to the east of Van Etten Creek and Van Etten Lake have identified the presence of PFOS/PFOA, none of these results have exceeded the USEPA HAs. To date, the USAF has only received a portion of the MDEQ's private well results for review, as provided by the Michigan Department of Health and Human Services (MDHHS). The USAF asks that MDEQ provide all of the analytical results associated with the private well sampling conducted on the east side of Van Etten Lake and Van Etten Creek for our review. In addition, MDEQ has not provided the USAF with any evidence such as geological studies, stratigraphic boring logs/cross sections, or hydrogeological information, to include

potentiometric surface measurements from private wells located east of Van Etten Lake or Van Etten Creek, which supports MDEQ's contention that PFOS/PFOA detections east of the lake are the result of releases at the former Wurtsmith AFB which have migrated under the lake. In fact, the MDEQ's contractor, AECOM, stated at the 25 Apr 17 BRAC Cleanup Team (BCT) meeting that groundwater flow on the east side of the lake is back towards the lake. This would appear to contradict the MDEQ's contention that groundwater flows under the lake. If MDEQ has information which it asserts provides sound basis that these PFOS/PFOA detections are associated with former Wurtsmith AFB releases, the USAF requests MDEQ provide this information to the USAF for our review. In the absence of such information, MDEQ's contention that "Sampling results in these areas demonstrate that contaminants released from the former USAF base are present at varying concentrations and must be further evaluated to determine the necessary course of action to protect human health and the environment" is unfounded. As such, the USAF must respectfully decline the MDEQ's request for the immediate investigation of conditions on the east side of Van Etten Lake and Van Etten Creek. However, as MDEQ acknowledged in its 8 Feb 18 letter, the USAF is delineating the PFOA/PFOS contamination in a phased approach. If the USAF's future investigations indicate the plume extends to the east side of Van Etten Creek and Van Etten Lake, the USAF and MDEQ can discuss the needed frequency and duration of sampling on that side of the creek and lake.

Where drinking water samples indicate unacceptable risk to human health, as defined by exceeding one of the USEPA's HAs for PFOS/PFOA, the USAF will take appropriate mitigation action for public and private water sources reasonably believed to be contaminated by USAF actions.

2. **MDEQ (14 Dec 17): Full characterization of the PFAS plumes in areas up gradient of the impacted residential and type I community wells.**

USAF Response (11 Jan 18): *The USAF conducted an initial Site Inspection (SI) for PFAS from April 2016 to November 2016. The SI field work consisted of 60 soil samples and 209 groundwater samples. In addition, the USAF conducted a Supplemental Site Inspection (SSI) from August 2017 to December 2017. Field work conducted for the SSI consisted of 201 more groundwater samples. Further investigation will depend on the results of this field work, and the results are expected to be final by March 2018. The results will be evaluated, and decisions will be made on whether further sampling is needed or enough data has been obtained to characterize the plume. The USAF is following a phased approach and is prioritizing locations that are up gradient of potable residential and Type I community wells impacted by PFOS/PFOA. The SSI results will also refine the delineation of the width of the fire training area (FT002) plume.*

MDEQ Response (8 Feb 18): In 2016, the MDEQ required that the USAF fully characterize the PFAS plumes in the areas up gradient of the impacted residential and Type 1 community wells without distinguishing locations where response actions should be prioritized. Since the MDEQ's February 29, 2016, letter to Mr. David Strainge from Mr. Robert Wagner, information collected and analyzed by the MDEQ indicates that the extent of the plumes emanating from the base and the number of residential wells that are impacted are much greater than was known at the time of the 2016 letter. Although it is important to fully characterize the PFAS contamination from the base, the MDEQ recognizes that these large and complex plumes from the former USAF base must be addressed in a phased, iterative approach that builds upon information and knowledge gathered in each phase. In the immediate, near term future, the first priority for the USAF is to characterize

impacted groundwater areas of high concern from a human health impact perspective. Figure 2 shows these priority areas.

The areas identified in Figure 2 are a priority because contamination is elevated in residential wells that are down gradient of highly contaminated plumes, such that these residential wells are threatened with levels of PFAS contamination that could exceed federal health advisory levels or state criteria. The work plan required under Issue No. 1, above, must also include an investigation of these priority areas, along with a schedule for implementation of the investigation to address this disputed issue.

The investigation of the priority areas must be sufficient enough to identify individual plumes, the maximum concentration levels of contaminates, and migration characteristics. The study must be sufficiently rigorous such that the USAF can identify appropriate sentry well locations and depths, as well as sufficient monitoring frequency, to yield information that will provide warning of plume movement above Part 201 criteria into residential drinking water wells.

To fully characterize the plumes in these areas, the investigation must also include a study of the geology, hydrogeology, appropriate analysis of chemicals of concern, plume extent, characteristics of plume movement and contaminant concentrations. Because the contamination seems to vary greatly with depth in the Wurtsmith plumes both on and off the former USAF base, vertical aquifer sampling through the entire water column will be necessary to fully characterize the plumes.

USAF Response: *As stated in our previous response, the Air Force has no plans to investigate areas east of the lake and creek (identified in your Figure 2) until there is evidence PFOS/PFOA has migrated there from the base. The rest of this response relates to areas in your Figure 2 west of the lake and creek. The USAF is following a phased approach and is prioritizing locations that are up gradient of potable residential and Type I community wells impacted by PFOS/PFOA. As identified under Purpose and Objective and further refined in the Data Quality Objectives (DQOs) portion of the Phase I Supplemental Site Inspection (SSI) Work Plan (November 2017), the SSI is part of a phased approach to further characterize the vertical and horizontal extent of the PFOA and PFOS release in groundwater and understand the groundwater pathways to drinking water wells for plumes containing PFOS/PFOA above the HA, evaluate aquifer hydraulic properties and preferential migration pathways, evaluate treatment system capture, and delineate the horizontal extent of the plume that exceeds the HAs for the Fire Training 02 (FT-02) treatment system.*

The evaluation of data collected during Phase I of the SSI has just recently been completed, and the USAF is in the process of developing Phase II of the investigation to include the collection of additional groundwater data for the purposes of further refining the PFOS/PFOA conceptual site model. This sampling will include further characterizing the extent of the PFOA/PFOS release in groundwater, the understanding of the groundwater migration pathways to potential off-site drinking water receptors and further evaluation of the vertical and horizontal extent of the existing Arrow Street, Mission Street, Benzene Plant and FT-02 treatment system capture zones. As has been our long established process, the USAF anticipates sharing the data collected during the Phase I SSI with MDEQ during upcoming BCT meetings, and to seek input from MDEQ on our proposed path forward under Phase II of the SSI. The USAF will continue to evaluate PFOS/PFOA releases associated with past activities at the former Wurtsmith AFB under the ongoing phased SSI.

3. MDEQ (14 Dec 17): Implement a sentinel monitoring well system to assure that higher level PFAS contamination is not moving toward the portion of the aquifer that is used as a drinking water source.

USAF Response (11 Jan 18): *The results of sampling described in items 1 and 2 will determine whether existing monitoring wells or new wells up gradient of drinking water wells impacted by PFOS/PFOA can serve as sentinel wells.*

MDEQ Response (8 Feb 2018): The MDEQ agrees that the sampling that the USAF refers to, which is part of the SI and SSI cited by the USAF in its response to Issue No. 2, above, is potentially sufficient to identify sentry well locations for some areas of residential wells just off the base. However, the recently completed USAF work does not provide sufficient information for the hatched areas shown on Figure 2: (1) the Defense Reutilization and Marketing Office (DRMO); (2) LF30/31 and Loud Island contaminant plume; (3) the plume in the area of the Alert Apron; (4) the plume near Van Etten Lake Dam; and (5) the residential wells east of Van Etten Lake and Van Etten Creek. The hatched areas need more complete characterization to determine sentry well locations. The groundwater flow regime appears to be highly complex because of the impacts of the operations of the dam that creates the lake. A thorough understanding of the hydrogeological regime is necessary for understanding plume flux into the aquifers near residential wells. The MDEQ agrees that work completed as requested in Issues No. 1 and 2 will inform the location of additional needed sentry wells and appropriate monitoring requirements, including frequency and duration, in the hatched areas.

USAF Response: *As identified in our response to Item No. 2 above, the USAF is following a phased approach under the SSI and is prioritizing the investigation of locations that are up gradient of potable residential and Type I community wells impacted by PFOS/PFOA. The investigation of the DRMO area, LF30/31 and the area of the Alert Apron will be conducted under this same phased SSI approach. As outlined in our previous responses, unless MDEQ is able to provide data for USAF review that conclusively links PFOS/PFOA concentrations in wells east of Van Etten Lake and Van Etten Creek to past releases from the former Wurtsmith AFB, the USAF respectfully declines the MDEQ's request to investigate these areas at this time. However, if the USAF's future investigations indicate the plume extends to the east side of Van Etten Creek and Van Etten Lake, the USAF and MDEQ can discuss the needed frequency and duration of sampling on that side of the creek and lake.*

4. MDEQ (14 Dec 17): Evaluate the existing groundwater extraction systems as an interim remedial action to control the PFAS plume migration toward the impacted residential and Type I community wells.

USAF Response (11 Jan 18): *The current SSI will provide information on the effectiveness of the three-main pump and treat systems (Arrow Street, Mission Street, and Benzene Plant) which are up gradient of the vast majority of the private wells. Based on the SSI evaluation, it will be determined if further plume capture action is needed to protect down gradient drinking water wells from PFOS/PFOA contamination above the HA.*

MDEQ Response (8 Feb 18): MDEQ is seeking actions by the USAF to control PFAS plume migration toward the impacted residential and Type I community wells. The USAF's proposal to rely on the current SSI to evaluate the effectiveness of the groundwater extraction systems is not adequate. The Arrow Street, Mission Street, and Benzene Plant extraction systems are not adequate to capture PFAS plumes on the east side of the base, north of Arrow Street all the way to the plume emanating from the DRMO. Also, the capture zones of these three systems cannot control plumes that are moving off-base south of 5th Street. Each of these areas is up gradient of residential wells that are impacted. Thus, as interim actions, the three systems are only partially effective, over a limited area. The MDEQ is also concerned that PFAS plumes are breaking through the three extraction well capture zones in the area of F41 and Budziak Road. See the plume map shown on Figure 2.

As part of its evaluation of the three existing extraction systems, the USAF must design and implement a monitoring plan that can delineate the capture zone of the existing systems. The monitoring plan shall include sampling locations, frequency, and constituents in order to demonstrate hydraulic capture of the plume over time. This plan, including a schedule for implementation, must be submitted to the MDEQ no later than March 1, 2018.

The USAF must also evaluate the feasibility of expanding the existing extraction systems or adding more groundwater extraction systems to adequately intercept the PFAS plumes. Results of this evaluation must be submitted to the MDEQ no later than forty-five (45) days after receipt of this letter.

USAF Response: *The USAF notes that the monitoring plan requested by MDEQ under Item 4 to be submitted by 1 Mar 2018 (now extended until 22 Mar 2018) and the evaluation of the feasibility of expanding the existing extraction systems or adding more groundwater extraction systems to be submitted no later than forty-five (45) days after receipt of the MDEQ's 8 Feb 2018 letter, was not part of the MDEQ's December 14, 2017 letter invoking dispute resolution, nor were these requested activities part of our January 4, 2018 conference call where the seven primary issues of dispute were discussed.*

As described in our previous response to Item No. 4, the current SSI will provide information on the effectiveness of the three main pump and treat systems (Arrow Street, Mission Street, and Benzene Plant), which are up gradient of the vast majority of the private wells. As identified by the purposes/objectives and DQOs in the Phase I SSI work plan, the phased SSI is designed to further characterize the vertical and horizontal extent of the PFOS/PFOS release in groundwater along the pathways to receptor drinking water wells with levels of PFOS/PFOA, evaluate aquifer hydraulic properties and preferential migration pathways, and evaluate treatment system capture. Based upon the evaluation of data collected under the SSI process, additional monitoring wells will be installed, as required, to further monitor and evaluate the effectiveness of the existing pump and treat systems.

Without first completing the required vertical and horizontal characterization of the extent of the PFOS/PFOA releases, gaining a better understanding of groundwater migration pathways, the evaluation of aquifer hydraulic properties and preferential migration pathways, and the evaluation of treatment system capture, both vertically and horizontally, the monitoring plan requested by MDEQ is premature and would be at best a trial and error exercise. The USAF asserts that the work being

accomplished under the phased SSI approach will provide the information required to determine if the current monitoring plan associated with the existing extraction systems is adequate or requires expansion. The USAF notes that monthly remedial action operations (RA-O) status reports and annual RA-O reports documenting the performance of the Arrow Street, Mission Street, and Benzene Plant extraction systems have been submitted to MDEQ for many years. To date, MDEQ's review of these RA-O monthly status report/annual RA-O reports have not identified the deficiencies now being raised in MDEQ's most recent response.

Until the USAF completes the phased SSI – including the vertical and horizontal characterization of the extent of the PFOS/PFOA releases, the evaluation of aquifer hydraulic properties and preferential migration pathways, and the evaluation of treatment system capture, both vertically and horizontally – it is premature to evaluate the feasibility of expanding the existing extraction systems or adding more groundwater extraction systems to adequately intercept the PFOS/PFOA plumes.

5. MDEQ (14 Dec 17): Present a plan to the MDEQ providing for final remedial actions.

USAF (11 Jan 18): *In accordance with the Comprehensive Environmental, Compensation and Liability Act (CERCLA) and 40 CFR 300.420, at the conclusion of the SSI the USAF will determine whether further action is warranted. Final remedial actions will be determined under the CERCLA process and these will come after a remedial investigation (including risk assessments) and feasibility study are completed.*

MDEQ Response (8 Feb 18): The MDEQ agrees with the USAF that final remedial actions should be informed by investigations of the plumes and their impacts, as well as feasibility studies of possible response actions to address the risks posed to human health and the environment. This issue was raised in the dispute to ensure that the MDEQ and the USAF agree that the development and analysis of investigations and feasibility studies to address the PFAS contamination released by the USAF must keep the goal of final remedial actions in mind and must be aimed at reaching a final remedial action in the future. If the USAF agrees with MDEQ, this issue can be deemed resolved.

USAF Response: *Comment noted. The USAF will follow the CERCLA process in the development of final remedial actions to address PFOS/PFOA contamination related to past USAF actions. As such, the USAF agrees that this item of the dispute has been resolved.*

6. MDEQ (14 Dec 17): Provide an alternative drinking water source to affected well users.

USAF Response (11 Jan 18): *The USAF notes that in its February 29, 2016 letter MDEQ "urged" the USAF to take this action. It was not on MDEQ's list of five demands. Where drinking water samples indicate unacceptable risk to human health, as defined by exceeding one or more of the USEPA's HAs for PFOA, PFOS or PFOA and PFOS combined, the USAF will take appropriate mitigation action for public and private water sources reasonably believed to be contaminated by USAF actions.*

MDEQ Response (8 Feb 18): MDEQ acknowledges that the USAF has provided municipal water to the one residence with a potable water well that was found to have concentrations of PFOA and PFOS above the USEPA HA for PFOA and PFOS combined. It is MDEQ's understanding that the USAF will also provide an alternate drinking water source for any future residential or community drinking water wells

at which sampling results exceed the HA for PFOA, PFOS, or PFOA and PFOS combined.

As you know, the MDEQ issued enforceable criteria for PFOA and PFOS in groundwater as a source of drinking water on January 10, 2018. The Part 201 criteria mirror the EPA HA levels of 70 ppt for PFOA, PFOS, or PFOA and PFOS combined. Section 120(1)(a) of CERCLA explicitly states that federal facilities shall be subject to CERCLA in the same manner and to the same extent as private facilities. 42 USC§ 9620(1)(a). Section 120(a)(4) of CERCLA further specifies that State laws concerning removal and remedial actions shall apply to actions at facilities owned or operated by the United States. 42 USC §9620(a)(4). The enforceable, generally-applicable Michigan standards are more stringent than federal standards, and therefore also qualify as Applicable or Relevant and Appropriate standards under CERCLA, which are mandatory under the National Contingency Plan (NCP). 42 USC§ 9621(d), 40 CFR § 300.430(f)(1)(i)(A).

Under Michigan law, parties responsible for causing a release or threat of release, defined as "any circumstance that may reasonably be anticipated to cause a release," are jointly and severally liable for costs of response activity, natural resource damages, and actions necessary to abate imminent and substantial endangerment to the public health, safety, welfare, and the environment. See MCL 324.20101(1)(ccc); MCL 324.20126a. In addition, Part 201 sets forth specific actions that are required of liable owners or operators of properties that are "facilities" as defined under Part 201. A "facility" under Michigan law is any location where a hazardous substance in excess of the concentrations that satisfy the cleanup criteria for unrestricted residential use has come to be located.

Levels of PFAS exceeding Michigan's cleanup criteria have been identified both on and off the former base, making this area a "facility" of undetermined scope, at this time, where response activities are required. Response activities recognized under Part 201 expressly include enforcement actions, providing alternate water supplies, and state-approved health assessments or health effect studies, among other actions necessary to protect the public health. MCL 324.20101(1(vv). At this time, the MDEQ is seeking the investigations and feasibility studies as described in this dispute communication in an effort to clarify where conditions exist that pose imminent and substantial endangerments to public health, safety, welfare, or the environment, and to appropriately direct response activities necessary to prevent exposures at unacceptable levels, including as needed alternate water supplies.

The discussion above presents a high-level, presentation of the State's authorities to require the USAF to take response actions to address its releases of PFAS at and near Wurtsmith. The State is not, in this statement, waiving its rights to fully enforce all applicable laws and regulations, whether mentioned in this communication or not. Those authorities include, but are not limited to, CERCLA, the Michigan Natural Resources and Environmental Protection Act, MCL 324.101 *et seq,* and the Michigan Safe Drinking Water Act and its water- supply replacement requirements. MCL 325.101 *et seq.*

USAF Response: *The USAF is aware that MDEQ has announced groundwater cleanup criteria pursuant to R299.6 that are identical to the USEPA HA levels of 70 ppt for PFOA, PFOS, or PFOA and PFOS combined. Where drinking water samples indicate unacceptable risk to human health, as defined by exceeding one or more of the USEPA's HAs/R 299.6 grouindwater cleanup criteria for PFOA, PFOS or PFOA and PFOS combined, the USAF will take appropriate mitigation action for public and private water sources reasonably believed to be contaminated by USAF actions. As described in the USAF response to item No. 5, the USAF will follow the CERCLA process in the development of final remedial*

actions to address PFOS/PFOA contamination related to past USAF actions.

The USAF appreciates MDEQ's explanation for the legal bases of its assertions. The USAF reserves its rights to respond or object to the state's assertions at a later date.

7. MDEQ (14 Dec 17): Additional sampling is needed to evaluate compliance with Michigan's statewide criteria for groundwater-surface water interface (GSI) locations as set forth in Part 201. The USAF must move more aggressively and more quickly to define and remove the ongoing threat to public health and the environment, starting with the USAF action to provide a long-term potable water supply to affected well users and followed by response actions to remediate impacted ecosystems, including surface waters, groundwater, fish, birds, and mammals.

USAF Response (11 Jan 18): *As described in item 6, the USAF has provided long-term potable water to the only residence with a well exceeding the USEPA HA levels. We will continue to take the appropriate mitigation actions for public and private drinking water wells reasonably believed to be contaminated above the HA levels by USAF actions. Our first priority remains protection of drinking water.*

The USAF has installed a groundwater treatment system for the plume from the fire training area (FT002). This system is designed to control the levels of PFOS/PFOA in groundwater up gradient from surface water and provide protection of fish in the human food chain. After further base-wide investigations, PFOS/PFOA was discovered in areas that are up gradient of potential drinking water exposures, and this has taken on the highest priority. Ongoing design and construction of a treatment system for the Arrow Street and Benzene Plants will intercept and remove PFOS/PFOA from groundwater and reduce the levels reaching surface water. The SSI will provide additional information about plumes migrating toward surface waters. We will address the other locations that do not have potential drinking water exposures by following the CERCLA process.

MDEQ Response (8 Feb 18): The USAF has appropriately focused on drinking water, however, surface water contamination that affects humans through the consumption of contaminated fish can be of higher risk to human health than drinking water contamination, and is an issue at Wurtsmith. In 2012, the Michigan Department of Health and Human Services (MDHHS) issued a "do not eat" fish advisory for all fish caught from Clark's Marsh and for resident fish in the lower Au Sable River south of the base due to unsafe levels of PFAS released by the USAF. An additional concern is human exposure to PFAS-contaminated foam on surface water.

To address these concerns, the USAF must also investigate and address the impact from its releases of PFAS to surface water and biota in lakes, marshes, creeks and rivers in the area surrounding the base. Although the USAF has conducted some limited investigation of impacts to surface water in the past, there are several areas where there is no data close to the water body. Figure 3 shows areas of potential impact to surface water and outlines the area that the USAF must cover in its investigation. The USAF must submit a work plan for this investigation to the MDEQ within ninety (90) days of receipt of this letter. The work plan must include a schedule for installation of proposed wells that are near the groundwater-surface water interface (GSI) or push point samplers at the GSI.

As requested by the USAF, the MDEQ is enclosing with this communication statutory language regarding GSI compliance (Section 20120e of Part 201) and a copy of Part 31, Water Resources

Protection, and the Part 31 Rules related to water quality standards, which contain the basis for the State's water quality standards and evaluation of GSI criteria compliance.

USAF Response: *Regarding Clarks Marsh, the USAF notes that MDEQ figures identify a release of PFOS/PFOA not related to the USAF.*

Thus, the USAF mitigation alone will not resolve the PFOS/PFOA contamination in the Marsh. The USAF will follow the CERCLA process for the investigation of PFOS/PFOA contamination related to past USAF actions. It appears that the MDEQ is requesting a work plan for the purposes of collecting data for conducting an ecological risk assessment. Under the CERCLA process, an ecological risk assessment is completed at the remedial investigation (RI) stage. Work plans and scheduling are dependent on data collected under the SSI phase. Such assessments are normally conducted during a CERCLA remedial investigation (RI) and would be evaluated after the SSI is completed.

During phase I of the SSI, numerous vertical aquifer sampling (VAS) locations were installed via direct push technology (DPT) to further refine the understanding of the vertical and horizontal distribution of PFOS/PFOA in groundwater that is migrating towards off-base private drinking water wells. Based upon our recently completed analysis of these data, the USAF anticipates that additional VAS locations will be installed during phase II of the SSI. The results of the phase I SSI sampling and proposed path forward, including the proposed locations of addition VAS samples will be presented to the MDEQ during upcoming BCT meetings..

Our first priority remains activities for protection of drinking water, and we will address the other locations that do not have potential drinking water exposures in accordance with the CERCLA process.

In response for USAF's request at the 16 Jan 18 conference call for the legal authority that forbids the use of mixing zones for bioaccumlating contaminants, MDEQ in its 8 Feb 2018 response letter provided portions of the Michigan Natural Resources and Environmental Protection Act (Section 20120e and all of Part 31) and the Michigan Department of Environmental Quality's Water Resources Protection regulations (Part 4). USAF found the answer to its question in R323.1082. However, our review of the provided statutes and regulations still does not explain why MDEQ asserts that the entire extent of the PFOS/PFOA plumes, rather than just the location where the groundwater vents to surface water, must be delineated laterally to 12 ppt. The Air Force requests that MDEQ provide further clarification.

I look forward to our meeting and discussing the Air Force and MDEQ commitment to protecting drinking water supplies affected by the Air Force's historical use of aqueous film-forming foam.

Sincerely,

STEPHEN G. TERMAATH, GS-15, DAF
Chief, BRAC Program Management Division
Installations Division

cc:
Ms. Felicia M. McBride, DSMOA Grants Officer
Mr. Robert Delaney, MDEQ
Mr. Matt Marrs, AFCEC/CIBE