6.5.2 ASSET MANAGEMENT PROGRAM ADDENDUM – Responses to EPA Follow-on Questions/Comments/Requests

1. *Staffing is critical to implementation of the asset management program.*
   a. *Please list all key positions required to fully implement the Asset Management Program at the JBPHH / Base level.*
   b. *Are all key positions fully staffed? If not, where are the gaps?*
   c. *If there are staffing gaps (unfilled or under filled positions and functions), what are the plans to fully staff all positions necessary for full implementation?*

Response:

Key positions to fully implement the Asset Management Program at JBPHH include:

a. Utilities Infrastructure Condition Assessment Program (UICAP) Manager – monitors program metrics and provides assistance to staff on business systems, program goals, briefing leadership, etc.
b. Engineering Technician for Potable Water Branch – Responsible for populating and maintaining asset data and preventive maintenance work orders in Maximo.
c. Potable Water Engineers (Work Center PRP32A) – In addition to engineering support, the engineers participate in the asset management program by communicating with sustainment personnel on issues with equipment (for possible recapitalization). Engineers work in the Utilities Risk Tool (URT) to identify high-risk failure scenarios and address those scenarios with appropriate mitigations (likely a recapitalization project). Projects are presented for consideration of several funding streams.
d. Sustainment staff – Potable Water Branch has 3 work centers with different areas of responsibility (AOR). PRP32A2 is the Water Production Section that manages non-linear production assets (pumps stations, booster stations, treatment, etc.) for all of JBPHH's public water systems (PWS). PRP32A3 is the Water Distribution Section handling linear assets (pipes and associated equipment) for Pearl Harbor and all outlying areas. PRP32A4 is handles linear assets on the Hickam Field area of JBPHH. Each of these work centers responds to Emergency, Urgent, and Routine work orders and conducts preventive maintenance on assets within their AOR.

Enclosure 1 contains the Organizational Chart for PRP32A Potable Water Branch. Names are redacted for employee privacy. As shown in the chart, there are 2 vacant engineering billets and 14 vacancies (30%) in the sustainment personnel work centers. Recruitment actions are ongoing for these positions. Industrial Equipment Mechanic positions have been challenging to hire for. NAVFAC HI is looking into additional recruitment incentives to fill these gaps and attract qualified candidates.

2. *The Navy's submittal states on p. 3 of the pdf: "Specific asset inventory information exported from iNFADS or Maximo can be provided upon request in the form of an Excel spreadsheet." Yes, please provide specific asset inventory information in the form of an Excel spreadsheet. The spreadsheet should include all attributes (#1-7) listed on pp. 3-4 of the submittal, as well as each asset's risk score.*

Response:

Enclosure 2 contains screenshots of all tabs in the Maximo Assets Module for Asset # SA-FWY S4083. This provides a view of the Navy's Maximo interface and the fields available for population for a single asset as an example. Note that not all fields are populated and this is because some are not necessary for execution of work. This interface is used for all types of dynamic equipment that the Navy maintains (including non-utilities) so some fields are not applicable to Potable Water Branch. Navy is also submitting a spreadsheet (Enclosure 3) that contains a Maximo query of all assets that Potable Water Branch maintains. Note that this spreadsheet does not contain Risk Score for each asset because a score is not assigned by asset but rather by functional group (e.g. pump station vs. pump motor). Essentially the condition on each asset is pulled into the URT and risk is evaluated there rather than on an asset-by-asset basis. Enclosure 4 contains JBPHH's Risk Assessment for reference.

3. *When was the last time the inventory of assets at JBPHH Water System was reviewed and updated?*
   a. *The last metric listed on p. 5 of the pdf is "perform an intensive asset inventory every 5 years." P-603 discusses specific inventory requirements for sustaining UICAP, iNFADS, Maximo, and PM Business system/program records. Are these inventory updates occurring, and on the required timelines?*
   b. *What is the status of the existing Inventory for JBPHH PWS, and is it fully populated?*
   c. *When will the inventory be reviewed and updated next?*

Response: The "intensive asset inventory every 5 years" referenced in the original submittal was alluding to the Utility System Assessments (USAs) that NAVFAC HI conducts (via Architect-Engineer contract) of the potable water systems. The USAs study condition, capacity, and reliability of the potable water system and this information is used to update degradation index (DI) in Maximo and identify projects. The last USA conducted on the JBPHH PWS-360 was done in 2015. Another USA of PWS-360 will be commissioned once all pump stations are operational again (currently Aiea-Halawa and Red Hill are secured).

Inventory requirements for the purposes of UICAP include maintaining data currency in iNFADS, Maximo, and the Navy's GeoReadiness Explorer (GRX). Maximo data is continuously updated as sustainment staff obtain updated DI (determined during the preventive maintenance or other work orders). Certain fields in Maximo (Condition, Asset Info, Basic Spec, and Spec Robustness) are tracked for data currency and metrics are issued to the shops monthly. iNFADS and GRX data is updated during the Navy's Periodic Inventory (PINV). In general, the installation is to evaluate 1/5 of its iNFADS inventory on a yearly basis, but JBPHH is undergoing a re-baseline effort in FY25 that will evaluate 100% of water real property assets. Any corrections to iNFADS and GRX will be applied that year. Otherwise, corrections can be done any time an error is identified.

Maximo, iNFADS, and GRX data for the JBPHH PWS is considered fully populated.

4. *The Navy's submittal states on p. 4 of the pdf: "In principle, a Risk Assessment is performed annually, which updates risk assessments caused by asset failure to establish maintenance and Sustainment, Restoration & Modernization (SRM) priorities."*
   a. *What is the frequency of a risk assessment of JBPHH Water System's assets in practice?*
   b. *When was the last risk assessment of JBPHH Water System's assets performed?*

c. *The Navy's submittal states on p. 3 that the degradation index is updated at least every 2 years. The DI is a factor in Likelihood of Failure. What parts of a Risk Assessment are reviewed annually?*
d. *How is a risk assessment different from a condition assessment?*

Response: JBPHH staff conduct a risk assessment annually in the Spring. Results from this risk assessment are used to determine projects that will be submitted for centralized funding (MILCON, special project, ERCIP, etc.) and the priority of projects on the installation's Maintenance Execution Plan (MEP). The last completed risk assessment occurred in March 2023. Another risk assessment for the upcoming project cycles is currently underway.

During the annual risk assessment, staff work to complete all failure scenarios, meaning all fields in the likelihood and consequence of failure tabs are populated. Mitigations are developed for those failure scenarios with a risk score greater than 4.2 (at least, but often are created for those scenarios with lower risk). Often fields were populated in previous years. In this case, engineers review to ensure those fields are up to date. Similarly, there are mitigations (projects) in the database from prior years that will be updated as needed or removed if no longer viable.

Risk assessment is different than a condition assessment in that the risk assessment considers other factors that contribute to the overall impact of an asset/system failing. The risk assessment *includes* condition assessment (DI rating) but goes further to consider mission impact, health and safety, redundancy and several other factors. The risk assessment is conducted every year by engineering staff and management. Condition assessment is conducted routinely by sustainment technicians as they complete works orders (preventive maintenance), when they are advised of an asset's condition (e.g. through USA or other study/report), or if the asset experiences increased breaks (thereby raising the DI).

Per EPA request during the 11/29/2023 meeting, NAVFAC is providing the current URT Risk Formula, Categories & Weights below:

Consequence of Failure (COF)
Mission Disrupted: [redacted]%
Disruption Severity: [redacted]%
MDI Facilities: INFO ONLY
Operational Cost: INFO ONLY
Asset Restoration Time: INFO ONLY
Health & Safety: [redacted]%
([redacted] * [redacted] + [redacted] * [redacted] + [redacted] * [redacted])* [redacted])

Likelihood of Failure (LOF)
Maximum Degradation Index: [redacted]%
Average Degradation Index: INFO ONLY
Performance Capabilities: [redacted]%
O&M/PM Procedures: [redacted]%
Reliability: [redacted].%
([redacted] * [redacted], [redacted]) + [redacted] * [redacted], [redacted]) + [redacted] * [redacted])

RISK SCORE = [redacted]*[redacted] +[redacted]*[redacted]

5. *Levels of Service:*
   a. *The first 2 metrics listed on p. 5 of the pdf include goals of 100%. What are the targets/goals for the next 3 metrics listed?*
   b. *What metrics indicate reliability of assets?*
   c. *Many of the metrics address water quality. Which metrics address water quantity?*
   d. *Guidance for defining Levels of Service often refer to SMART goals, meaning Specific, Measurable, Attainable, Realistic, and Time Bound. Some of these metrics are not specific, measurable, or time bound.*
   e. *When was the last time the JBPHH Water System's Asset Management Program was reviewed and updated? The frequency of reviewing and updating this water system's Asset Management Program could be a metric.*

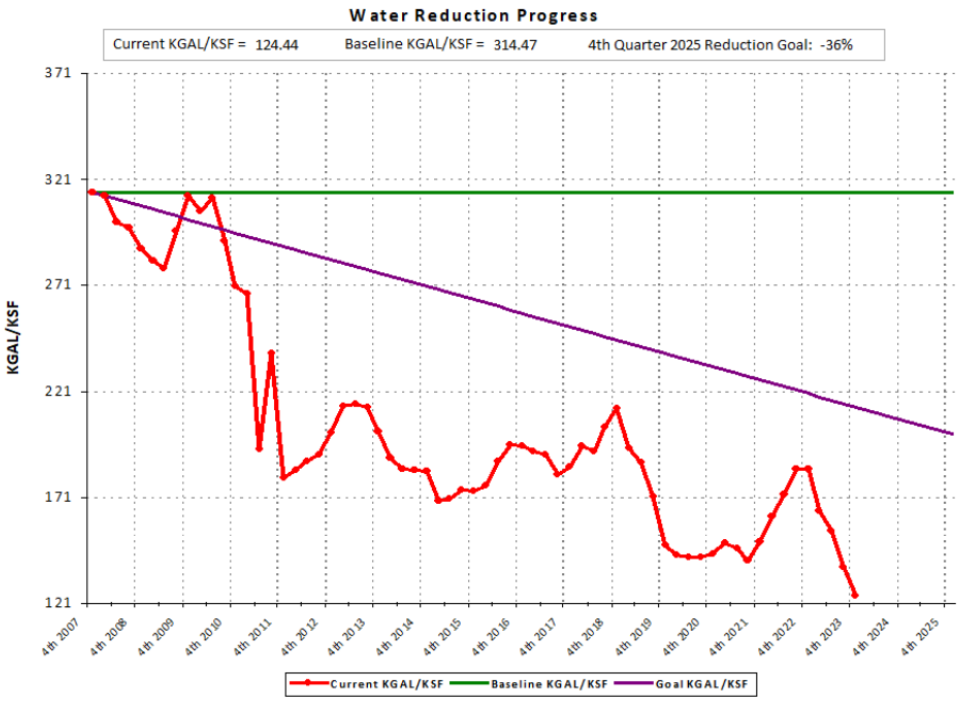
Response: Water tank levels, system pressures, pump run times, residual chlorine and fluoride levels are tracked continuously as stated in section *6.5.2.2 Provide Required Sustainable Levels of Service*, but the JBPHH PWS does not have a metric on these data points other than to stay within operational parameters required by AWWA and Hawaii State DOH standards. The response was meant to identify what the Navy tracks but there is no metric associated with this data currently. The goal is to stay within operational parameters at all times.

Likewise, "actively monitor connectivity of various remote stations throughout the distribution system to ensure visibility to real time data" is included because the Navy tracks this in real time, but there is no metric for it. Staff monitor via SCADA interface and also rovers are sent daily to each remote site to visually inspect those stations.

Customer complaints are tracked by the Red Hill OIC Team. All customer complaints are investigated and the group coordinates with the Rapid Response Team to perform sampling and flushing, and works on increasing public education. The goal for customer complaints is to investigate and address 100% of all complaints. In the future, as more data is gathered and the Navy returns to normal operations, there may be specific benchmarks developed to define trigger levels regarding complaints and the responses associated with each level. The Navy welcomes input from regulators on this matter.

Reliability is factored into the URT Risk Score and is 23.2% of the Likelihood of Failure calculation. Potable Water Branch also tracks water line breaks.

Metrics for water quantity include water reduction goals for overall intensity (KGal/KSF) and irrigation water. The current goal is a 2% reduction in intensity each year from 2007 to 2025. The following graph is a sample showing progress on this metric.



NAVFAC's UICAP program was recently reviewed and updated to include revised URT scoring weights in preparation for next year's project submission cycles. This review/update was completed at the HQs level. A Preventive Maintenance (PM) Quality Assurance program is in development at the NAVFAC HI level. The program aims to evaluate and improve data and PM work execution quality.

6. *The Navy's submittal on p. 5 of the pdf refers to a critical asset list. Please provide the JBPHH Water System's critical asset list, in prioritized order.*

Response: Enclosure 5 is the "Potable Water Key Operational Infrastructure List" for JBPHH. The assets are not in priority order and fields are redacted for security. The only aspect that is ranked is the risk score, with projects having a greater risk score ranking higher. As mentioned in question 2, the Navy does not attach Risk Scores to assets but rather to failure scenarios that may contain numerous assets.

7. *Life cycle cost analysis: please provide an example using an actual asset from JBPHH System demonstrating how a life cycle cost analysis determined that the mitigation will be a capital improvement project. Similarly, please provide an example demonstrating how a life cycle cost analysis determined that the mitigation will be preventive maintenance.*

Response: Enclosure 6 includes a planning document (form DD1391) for a past water project with economic analysis verbiage and an economic analysis generated from ECONPACK. Life cycle cost analysis is done in the project planning stage and is used to support the decision to recapitalize versus sustainment via preventive maintenance. Sustainment via PM is considered the status quo, and NAVFAC will continue to PM as long as it is cost effective to do so (within current controls). If PM is

effective, the DI for an asset generally should remain at level 3 or lower. If PM activities are unable to effectively maintain the asset, the DI will be elevated (as the condition and reliability decline), which will support recapitalization as mitigation. In summary, the life cycle cost analysis is done *after* a decision is made to recapitalize. Below are the project cost thresholds the Navy uses to determine whether a planning document is required and the level of economic analysis associated with each threshold.

Threshold for DD1391 = $1.5M
Threshold for Partial Economic Analysis = $1.5M - $7M
Threshold for Full Economic Analysis >$7M (Also threshold for DASN approval)

8. *Long term funding plan:*
   a. *How often is an asset which has been placed on a capital improvement list (annual MEP) rolled over to a Maintenance Action Plan or Long Range Maintenance Plan due to its status below the funding cut line? How is this occurrence tracked for a particular asset?*
   b. *What strategy does the Navy have for funding asset replacement/repairs? e.g., a reserve fund dedicated to drinking water asset management (which does NOT allow for other drinking water expenses such as personnel salaries, etc.)*
   c. *Please provide a schedule for the long-term implementation of the JBPHH Water System's Asset Management Program.*

Response: Current year projects rolling over into the next year is a fairly common occurrence as the installation manages funding and execution of its projects. Some projects are scheduled as "swing" projects, meaning they are scheduled for the current fiscal year if funding is available but will occur the following fiscal year if funding is not available. Adjustments are constantly occurring as bids come in, emerging requirements are presented, etc. If a project slips to the following year, it may not mean this adds an entire extra year to the execution. Sometimes it is a matter of a few months when a project is awarded in the next fiscal year. The occurrence of projects moving from MEP to MAP is not tracked as a metric.

NAVFAC has sustainment (ST) and utilities (UT) non-labor accounts to fund asset replacement and repairs. The MEP projects and PMs are funded through ST. Costs associated with production of utilities are funded with UT. The Utilities Department is allocated ST funds each year for projects and equipment/parts purchases, though JBPHH has the ability to realign priorities if needed and provide additional funds to Potable Water Branch. As seen in the contamination events at Red Hill, JBPHH can leverage Enterprise support in emergency situations.

The schedule for JBPHH Water System's Asset Management Program occurs on an annual cycle. For the POM-27 project cycle and FY24 MEP development, below are a rough list of milestones:

- Risk Assessment occurred in Spring of 2023.
- Water projects are provided to Facilities Management Division in summer of 2023 for FY24 execution on the MEP.
- Asset Management begins planning documents (DD1391) in Spring/Fall of 2023.
- Regions brief Shore Mission Integration Group (SMIG) in Summer 2024 for POM-27
- CNIC distributes Final FSRM/MILCON Project List in December 2024

Enclosure 7 shows JBPHH's Potable Water Transmission Line Replacement Goals. The Navy has submitted JBPHH's recapitalization plan previously.

9. *Table 8-2 on p. 148 of the pdf shows storage tank inspections to be every 5 years triggered by water test results. This inspection should entail comprehensive inspection of the tank integrity, including the tank interior, and ideally should also entail tank cleaning.*
   a. *What are the water tests that would trigger the inspection?*
   b. *While comprehensive tank inspections should occur every five years, there should be different levels of tank inspections that occur more frequently. What other tank inspections are required, and are these requirements contained in an SOP separate from the Asset Management Program?*
   c. *While the paragraph above Table 8-2 mentions specialized inspections of such other components as pumping systems and valves, why does Table 8-2 not include these, as well as hydrants or treatment facilities? Are requirements regarding inspections of these components/facilities contained in an SOP separate from the Asset Management Program?*

Response: Storage tank inspections would be conducted with level 1 and level 2 assessments whenever there are RTCR MCL exceedances. Specialized inspections occur every 5 years, sanitary surveys conducted by Hawaii State DOH occur every 3 years, and JBPHH inspects tanks at varying intervals according to an SOP for *Routine Water Storage Tank Inspections and Checks* (Enclosure 8). JBPHH last had a cathodic tank inspection done in 2021. Future specialized tank inspections may be delayed pending sufficient redundancy in the system to comply with UFC 3-230-01 requirements for finished water storage.

Table 8-2 in P-603 is not meant to be all-inclusive of all assets. P-603 is a general document applicable to most, if not all of NAVFAC's utility infrastructure *globally*. There may be specific requirements at other installations that are governed by different regulatory bodies (e.g. different states, countries, etc.). JBPHH has SOPs covering other components of the system that will be reviewed in section 6.5.1 of the ACO. These SOPs are specific to JBPHH.