

## TECHNICAL MEMORANDUM

**DATE:** 11 March 2024

**TO:** Amanda Rohrbaugh, Remedial Project Manager

**FROM:** Dana Ramquist, EA Project Manager

**SUBJECT:** Final Technical Memorandum: 2023 Naval Base Kitsap Keyport Institutional Controls Inspection and Vapor Intrusion Monitoring Results, Naval Base Kitsap, Keyport, Washington  
Contract No. N4425520D60006  
DCIN: EA-LTM/OM-6006-24-0040

---

This technical memorandum has been prepared by EA Engineering, Science, and Technology, Inc., PBC (EA) to document the findings of the 2023 institutional control (IC) inspections and vapor intrusion (VI) monitoring conducted at Naval Base Kitsap (NBK) Keyport. The inspections were completed at Operable Unit (OU) 1 Area 1, OU 2 Area 2, OU 2 Area 8, Area 22, Area 7, and Site 23 (Figure 1) following the requirements presented in the 2020 Land Use Controls Plan, Operable Unit 1, Operable Unit 2, Areas 22 and 7, and Site 23 (2020 LUC Plan; Department of the Navy [DON] 2020). The VI monitoring was completed at OU 2 Area 8 following the requirements presented in the 2021 VI Long-Term Monitoring and Building Inspection Plan (2021 VI Inspection Plan; DON 2021).

### 1. Institutional Control Inspection Process

The inspection process included:

- Visually inspecting the sites with ICs to ensure controls remain protective.
- Identifying current land users and documenting any changes.
- Interviewing appropriate Keyport personnel to ensure that the various administrative controls are appropriately implemented.

Additional information on the IC inspection process can be found in the 2020 LUC Plan (DON 2020).

Distribution Statement A

Approved for public release; distribution unlimited

## 2. Institutional Control Inspection Results

The following subsections discuss the results of the IC inspections conducted at NBK Keyport. The visual inspection of each of the IC sites was conducted on 24 August 2023. Interviews with NBK Keyport personnel and Naval Undersea Warfare Center (NUWC) Division Keyport personnel (the primary tenant of NBK Keyport) were conducted via email and telephone and included the following individuals:

- Mr. Jared Peterson – NUWC Division Keyport, Facilities Branch Head: construction, excavation, permitting, administrative controls
- Mr. Kenney Eiford – NUWC Division Keyport, Environmental Engineer
- Mr. Philip Frith – NBK Security, Physical Security Specialist: access and site security

Completed IC Checklists are provided as Attachment A and photographs are included in Attachment B. Summaries of the IC inspection findings are presented below.

### 2.1 OU 1 Area 1

OU 1 Area 1, the former landfill (Figure 2), is covered by asphalt and gravel surfaced parking areas, two phytoremediation plantations, equipment and material laydown areas, and several storage structures. A portion of the paved area is used occasionally for motorcycle training. A marsh system, marsh pond, tide flats, vegetated areas, and nature trails are located adjacent to the former landfill. Land use is primarily light industrial and open space, consistent with past inspections.

Based on observations and interviews, administrative procedures in place to control intrusive activities (digging) at OU 1 have been followed. Signs of current or recent excavation were not observed at the time of inspection. No excavation or construction were completed in or around the marsh area. Construction and/or maintenance activities have not appeared to disturb the marsh and marsh pond system. Required remedy components, such as plantations, fencing, asphalt covers, and monitoring wells have not been damaged or compromised.

No full-time occupancy of the buildings located on the landfill has occurred. However, on 1 November 2022, the Naval Facilities Engineering System Command Northwest (NAVFAC NW) Remedial Project Manager (RPM) found a trailer parked on a paved portion of the landfill. The RPM contacted Washington State Department of Ecology (Ecology) on 2 November 2022, and Ecology concurred the trailer could remain parked at OU1 landfill as long as it was not occupied more than 4 hours per day

(Attachment E). The trailer was removed from OU 1 sometime between December 2022 and January 2023.

No new drinking water wells have been installed within 1,000 feet of the landfill. Since the 2022 inspection, the only new wells installed at and around Area 1 were in support of remedial investigation activities.

The asphalt surface covering the former landfill at OU 1 Area 1 is generally intact and is functioning as intended by the OU 1 Record of Decision (DON, Environmental Protection Agency [EPA], and Ecology 1998). Cracks up to 1-inch wide from general wear, root damage, and alligating were noted in various parts of the asphalt cover in Area 1. However, the cracks appeared to be surficial only with no underlying soil or waste body observed through the cracks.

Access controls are maintained by limiting installation access to authorized personnel with appropriate badging at the main installation access gate. No unauthorized personnel are reported to have gained access to the installation.

## **2.2 OU 2 Area 2**

OU 2 Area 2, the Van Meter Road Spill/Drum Storage Area, includes a recycling facility/material storage center, asphalt-covered laydown/storage areas, undeveloped areas, and adjacent creek and wetland areas. The land use at OU 2 Area 2 remains light industrial, consistent with past inspections.

No signs of current or past excavation were observed during the inspection in the vicinity of OU 2 Area 2 covered by ICs. Based on interview responses, administrative controls have been followed.

No installation of drinking water wells or other water wells has occurred at Area 2. Since the 2022 inspection, the only new wells installed at and around Area 2 were in support of remedial investigation activities.

Installation access controls have been maintained and no unauthorized personnel are reported to have gained access to the installation. Site access to the recycling and storage facility is also controlled by a locked gate maintained by Fleet Logistics Center, the NBK Keyport tenant who operates the recycling and storage facility.

## **2.3 OU 2 Area 8**

OU 2 Area 8, the former Plating Shop Waste/Oil Spill Area, consists of an asphalt-covered parking area surrounded by light industrial activities to the north and west, with

an adjacent beach to the east and south. Land use at OU 2 Area 8 remains consistent with past inspections.

No indications of current or recent excavation were observed at the site during the inspection other than round asphalt patches from soil boring conducted during the 2023 supplemental investigations conducted under another contract. These activities were conducted under approved outage requests/dig permits. Based on interviews, the excavation permit process is in place and effective in control of site excavations.

No drinking water wells or other water wells have been installed at Area 8 in the past year.

Installation access controls have been maintained. No unauthorized personnel are reported to have gained access to the installation.

## **2.4 Area 22**

Land use in Area 22, the former landfill extension area, remains light industrial and is consistent with past inspections. Current land uses include a hazardous waste handling and storage facility, Otto fuel storage and dispensing area, other light industrial operations, and asphalt-covered parking areas, gravel driveways and asphalt-paved streets.

No indications of current or recent excavations were observed at the site during the inspection. Based on interviews, the excavation permit process is in place and effective in control of site excavations. Several potholes, alligatoring, and cracks were noted throughout the asphalt cover in Area 22. However, the cracks appeared to be surficial only with no underlying soil observed through the cracks.

No drinking water wells or other water wells have been installed at the site in the past year. Since the 2022 inspection, the only new wells installed at and around Area 22 were in support of the site investigation (SI) activities.

Installation access controls have been maintained and no unauthorized personnel are reported to have gained access to the installation.

## **2.5 Area 7**

Area 7, the peninsula fill area, is composed of light industrial facilities, asphalt-covered parking areas, and a boat ramp/dock. Light industrial land uses remain consistent with past inspections.

No indications of current or recent excavations were observed at the site. Based on interviews, there has been construction involving excavation and installation of groundwater monitoring wells at Area 7. However, excavation permits were obtained in both cases. Base Environmental is heavily involved in the planning and execution of all excavation activities and the excavation permit process is in place and effective in control of site excavations. Minor root damage to the asphalt cover was noted throughout portions of Area 7. However, the cracks appeared to be surficial only with no underlying soil observed through the cracks.

No drinking water wells or other water wells have been installed within Area 7 during the past year. Since the 2022 inspection, the only new wells installed at and around Area 7 were in support of SI activities.

Installation access controls have been maintained and no unauthorized personnel are reported to have gained access to the installation.

## **2.6 Site 23**

Site 23, former Building 21 Area is comprised of a light industrial unpaved flat area, currently used for parking.

No indications of current or recent excavations were observed at the site during the inspection. Based on interviews, the excavation permit process is in place and effective in control of site excavations. Some minor pavement cracking was observed at the time of the LUC inspections. The cracks appeared to be surficial only with no underlying soil observed through the cracks.

No drinking water wells or other water wells have been installed within Site 23 during the past year.

Installation access controls have been maintained and no unauthorized personnel are reported to have gained access to the installation.

## **3. Completed Corrective Action**

The OU 1 Record of Decision (DON, EPA, and Ecology 1998) does not require a landfill cap, and only requires an asphalt cover to prevent contact with the waste body. The Land Use Control Plan (DON 2020) requires monitoring of the asphalt cover at Area 1, Area 22, and Area 7. Monitoring of cracks in the asphalt covers should continue and cracks should be repaired if/when the cracks expand or worsen, but before the damage observed could either result in potential exposure to waste or subsurface soils or allow significant infiltration of stormwater.

Additional investigations are ongoing at Area 1 which may result in changes to the remedy at OU 1. The need for replacement/repair of the asphalt cover will be evaluated once changes to the remedy are decided. However, if the asphalt is damaged to the point of potential exposure to waste or subsurface soils, or begins to allow significant infiltration of stormwater, it will be addressed as soon as possible. Additionally, the open soil understory of the plantations at Area 1 allows for potential infiltration of precipitation to the waste body, which should be considered in the future Focused Feasibility Study (FFS). No other corrective actions were identified or completed in 2023.

#### **4. Vapor Intrusion Building Inspections**

Annual VI inspection of buildings and building foundations was performed at Buildings 82, 85, and 98, immediately adjacent to OU 2 Area 8. The following tasks were performed and observations documented:

- Visual inspection of the integrity of the entire building floor slab, floor coverings, and condition, noting any changes that could potentially increase soil vapor entry rates.
- Identification of changes in building ventilation that could potentially increase the soil vapor entry rate or decrease the building air flow rate (i.e., ceiling height and/or air exchange rate).
- Identification of changes in building use or occupancy that could change receptors.
- Identification of changes to building footprint or square footage that could require reevaluation of VI assumptions.
- Identification of changes to a building's inventory of identified chemicals that could be potential sources of indoor air contaminants.
- Inspection of areas where previous sub-slab VI samples were collected (sampling of indoor air and sub-slab vapor to occur every 5 years; the most recent sampling event occurred in Summer 2023/Winter 2024 under separate contract).
- Production of an annotated map of the building with description of current floor plans and identification of possible soil vapor entry point locations.

Additional information on the VI monitoring and inspection process can be found in Attachment D in the 2021 VI Inspection Plan (DON 2021).

#### **5. Vapor Intrusion Building Inspection Results**

The following subsections discuss the results of the VI inspections conducted at select buildings in the immediate vicinity of OU 2 Area 8 on NBK Keyport. Visual inspections of

Buildings 82, 85, and 98 were conducted on 6 September 2023. Ms. Amanda Rohrbaugh, NAVFAC NW RPM, joined EA personnel during these building inspections. Interviews with NBK Keyport personnel and NUWC Division Keyport personnel (the primary tenant of NBK Keyport) were conducted in person between EA personnel. VI inspection forms are included in Attachment C.

### **5.1 Building 82**

Building 82 consists of a concrete slab on grade construction with partial second and third stories, epoxy-coated concrete, carpet, and tile covered floors, with natural gas and electric heating, and central air conditioning. The second story is primarily office workstations, and the third floor consists of a meeting room. The first floor of the building was the only floor inspected, since the VI issues would arise from subslab contaminant concentrations. The building is currently occupied and primarily used for electronics and materials testing, with testing rooms, office cubicles, and open space. No changes in building occupancy or use were observed at the time of inspection with the exception of approximately 20 personnel working remotely due to an out of service elevator and second floor access issues. A trench in the floor of the work space in the motor shop had been completely filled in with concrete and resurfaced since the 2022 inspection. New cracks were observed in the flooring at the entrance to the battery shop. Cracking was relatively minor with nothing exceeding 1/16<sup>th</sup> inch and not extending more than 3-4 feet. Cracking seemed to mostly be in the floor coating. Sinking of asphalt at the north and northwest corner of the building were described by the building manager. This appeared to be due to subsidence of backfill and asphalt patches along the north and northwest corner of the building. There were no other changes in the condition of the building floor slab, floor coverings or ventilation from the prior VI inspection conducted in 2022. The current condition of Building 82 is shown on Figure 3.

### **5.2 Building 85**

Building 85 consists of a concrete slab on grade construction with infrared and electric heating, and mechanical ceiling fans, windows, and roll-up doors for ventilation. It is currently not occupied and primarily used for storage. A new tenant has taken over building occupancy and continues to use the building for storage. Although minor cracks were observed in several areas, there were no changes in the condition of the building floor slab or building ventilation from the prior VI inspection conducted in 2022. The current condition of Building 85 is shown on Figure 4.

### **5.3 Building 98**

Building 98 consists of a two-story concrete slab on grade construction with epoxy-coated concrete floors, carpet, and tile covered floors. Hot air circulation and electric space heaters are used for heating and central air conditioning and windows for ventilation. Annual VI inspection at Building 98 did not reveal changes to building occupancy or use, other than a shift to flexible work hours. It is currently occupied and primarily utilized as mixed use for electronics and materials manufacturing and testing, with testing rooms, office cubicles, storage, and open space. The second story is primarily office workstations; however, a vapor degreaser, identified in 2018 as a potential indoor air contaminant source remains on the second floor of the building, as it is a mission-critical piece of equipment for operations in the building. There were no changes in the condition of the building floor slab, floor covering, or ventilation from the prior VI inspection conducted in 2022 with the exception of two potential soil vapor entry points: cracks were observed located at the floor/wall confluence in the exploder room and associated storage room. The crack in the storage room was reported to seep water during heavy rain events. The current condition of Building 98 is shown on Figure 5.

### **6. Summary and Conclusions**

Based on the results of the inspections and interviews performed in 2023, ICs have been adequately implemented, have prevented exposure to residual contamination, and have controlled, limited, or prohibited activities that may interfere with the integrity of the completed remedial actions. At OU 1 Area 1 required remedy components, such as plantations, fencing, and monitoring wells, have not been damaged or compromised. Minor damage to asphalt from general wear and root damage at Area 1, Area 22, and Area 7 should continue to be monitored and will be repaired if/when the cracks expand or worsen; however, the cracks do not currently require repair. Furthermore, additional investigations are ongoing at Area 1 which may result in changes to the remedy at OU1. The need for replacement/repair of the asphalt cover will be evaluated once changes to the remedy are decided. If the asphalt is damaged to the point of potential exposure to waste or subsurface soils, or begins to allow significant infiltration of stormwater, it will be addressed as soon as possible. Additionally, the open soil understory of the plantations at Area 1 allows for potential infiltration of precipitation to the waste body, which should be considered in the future FFS.

IC inspections of OU 1 Area 1, OU 2 Area 2 and Area 8, Area 7, Area 22, and Site 23 should continue as described in the 2020 LUC Plan until ICs are removed from these areas. Annual VI inspection at OU 2 Area 8, Buildings 82, 85, and 98 did not reveal



changes to building occupancy or use, other than a shift to flexible work hours at Building 98, since the previous 2022 VI inspection. Building 98 had cracks in the exploder room and associated storage room, which seep water during heavy rain events. It is recommended that these potential vapor entry points be repaired. There were no other changes in conditions of flooring, other than filling a floor trench in the motor shop in Building 82. There were no changes to ventilation, or other potential pathways for vapor intrusion into these buildings. Annual VI inspections should continue at OU 2 Area 8, Buildings 82, 85, and 98, as described in the 2021 VI Inspection Plan (DON 2021), provided as Attachment D.

## 7. References

- Department of the Navy (DON), Environmental Protection Agency (EPA), and Washington State Department of Ecology (Ecology). 1998. *Record of Decision for Operable Unit 1, Naval Undersea Warfare Center Division, Keyport, Washington*. 30 September.
- DON. 2020. *Final Land Use Controls Plan, Operable Unit 1, Operable Unit 2, Areas 22 and 7, and Site 23, Naval Base Kitsap, Keyport, Washington*. 6 August.
- DON. 2021. *Final Vapor Intrusion Long-Term Monitoring and Building Inspection Plan, Operable Unit 2, Area 8, Naval Base Kitsap, Keyport, Washington*. 17 July.

## Figures

- 1 Locations of OU 1, OU 2, Areas 22 and 7, and Former Site 23
- 2 OU 1 LUC Areas
- 3 Building 82 Floor Plan
- 4 Building 85 Floor Plan
- 5 Building 98 Floor Plan

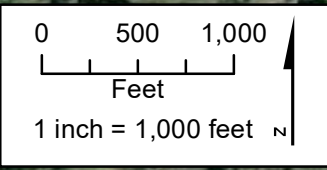
## Attachments

- A IC Inspection Forms
- B Photograph Log
- C VI Inspection Forms
- D 2021 VI Long-Term Monitoring and Building Inspection Plan, Operable Unit 2, Area 8, Naval Base Kitsap, Keyport, Washington
- E Communications with Ecology 2022

## Figures

This page intentionally left blank

Path: \\leafp\departments\Federal\NAVFAC NW LTM LTO\GIS\Keyport\21F4076\Annual I&M Report\MXD\Figure1\_OULocations.mxd



**LEGEND**

- Pollution Site
- NUWC Keyport Boundary

**FIGURE 1**  
**LOCATIONS OF OU1 AND OU2**  
**AREAS 22 AND 7**  
**AND FORMER SITE 23**  
 TECHNICAL MEMORANDUM  
 2023 NAVAL BASE KITSAP KEYPORT  
 INSTITUTIONAL CONTROL INSPECTION RESULTS  
 NAVAL BASE KITSAP KEYPORT  
 KEYPORT, WA

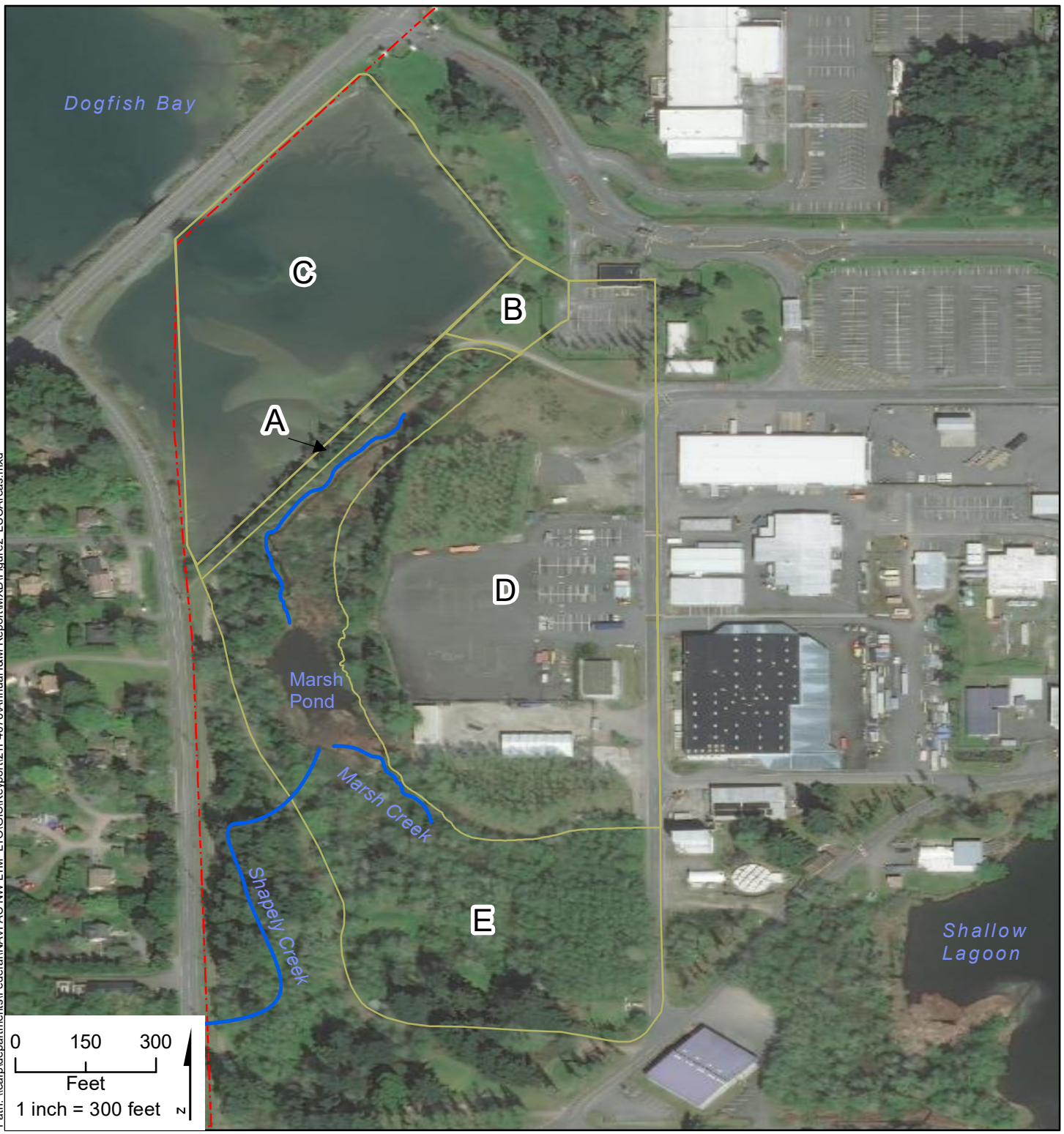
**U.S. NAVY**  
 Map Date: 11/2/2022

Source: Sealaska 2019

This page intentionally left blank



Path: \\leafp\departments\Federal\NAVFAC NW LTM LTO\GIS\Keyport\21F4076\Annual I&M Report\MXD\Figure2\_LUCAreas.mxd



**LEGEND**

- NUWC Keyport Boundary
- A** Land Between Tide Flats
- B** Land Between Tide Flats and Pass & ID Building
- C** Tide Flats and Adjacent Shoreline
- D** Landfill Area
- E** Marsh Pond and Marsh System

**FIGURE 2**  
**OU 1 LUC AREAS**  
 TECHNICAL MEMORANDUM  
 2023 NAVAL BASE KITSAP KEYPORT  
 INSTITUTIONAL CONTROL INSPECTION RESULTS  
 NAVAL BASE KITSAP KEYPORT  
 KEYPORT, WA

This page intentionally left blank





***Technical Memorandum: 2023 Naval Base Kitsap Keyport  
Institutional Controls Inspection and Vapor Intrusion Monitoring  
Results, Naval Base Kitsap, Keyport, Washington***

**NOTIFICATION: FIGURES 3-5 CONTAIN SENSITIVE BUT  
UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE  
FREEDOM OF INFORMATION ACT**

***FOIA Exemption 3 (5 USC 552(b)(3))  
10 USC Section 130(e) Treatment of Certain Critical  
Infrastructure Security Information***

**TO REQUEST A COPY OF THE DOCUMENT**

**PLEASE CONTACT**

**Department of the Navy  
Freedom of Information Act Office**

**<http://www.secnav.navy.mil/foia/Pages/default.aspx>**

**Distribute to U. S. Government Agencies Only**

This page intentionally left blank

# **Attachment A**

## **IC Inspection Forms**

This page intentionally left blank

**Naval Base Kitsap Keyport  
Institutional Controls Inspection Checklist**

**Operable Unit 1, Area 1 Former Landfill**

Inspected by: S. Stamper, M. Clayton

Date of inspection: 8/24/2023

Land Uses: Paved parking, storage structures, phytoremediation plantations, monitoring wells.

Land Users: Keyport employees, government contractors, recreational users, parking, motorcycle training

Page 1 of 2

Inspector's Checklist	Y/N NA/NC	Findings/Comments	Finding No.
Has access to OU 1 been maintained (have security procedures for base entry served to maintain a restricted access)?	Y	Person Contacted: Philip Frith – Security (8/21/23): No instances where security protocols were not maintained. Findings: None	
Have drinking water wells been installed on Navy property within 1,000 feet of the landfill?	N	Person Contacted: Amanda Rohrbaugh-RPM (10/2/23): There have been no drinking water wells installed at NBK Keyport. Findings: None	
For <b>Area A</b> , the land between the tide flats and the marsh, have water wells been installed, except those for monitoring or remedial action purposes?	N	Findings: None	
For <b>Area B</b> , the land between the tideflats and the Pass and ID Building parking lot, have water wells been installed, except those for monitoring or remedial action purposes?	N	Findings: None	
For <b>Area C</b> , the tide flats and adjacent shoreline owned by the Navy, have any activities occurred that could interfere with or compromise monitoring or remedial actions?	N	Findings: None	
For <b>Area D</b> , the former landfill, have water wells been installed, except those for monitoring or remedial action purposes?	N	Findings: None	
For <b>Area D</b> , the former landfill, are any employees permanently assigned to work in buildings within this area?	N	Findings: None	
For Area D, the former landfill, have there been any land use activities other than remedial activities, storage, parking, and facilities that involve only occasional occupancy by workers?	Y	Office trailer parked on LF 11/1/22 found by RPM; follow up emails discovered permission had not been granted. As of inspection 8/24/2023, the trailer has been removed. Occasional motorcycle training area; smoking area.	1
For <b>Area D</b> , the former landfill, have activities that involve digging and construction within this area been controlled by the base excavation/dig permit procedure and other pertinent base instructions?	N/A	Person Contacted: Jared Peterson – Facilities Branch Head (8/1/2023): No activities were performed requiring a Base Excavation Permit/ Kenneth Eiford – Environmental Engineer (8/29/2023): In all cases controls of the dig permit were met. Findings: None	

1 August 2023

**Operable Unit 1, Area 1 Former Landfill**Inspected by: S. Stamper, M. ClaytonDate of inspection: 8/24/2023Land Uses: See Page 1Land Users: See Page 1

Page 2 of 2

Inspector's Checklist	YIN NA/NC	Findings/Comments	Finding No.
For <b>Area D</b> , the former landfill, is there significant damage (e.g., cracking, seam separation, root damage, etc.) to asphalt surfaces that permits direct-contact exposure of people to underlying soils or that may significantly increase infiltration of surface water/stormwater?	Y	Cracks in asphalt throughout parking lot up to 1-in wide, root causing hole in asphalt	2
For <b>Area D</b> , the former landfill, if activities requiring an excavation/dig permit were conducted, were there any instances in which the permit requirements were not effective in maintaining the requirements of the Institutional Controls Plan?	N	Person Contacted: Jared Peterson – Facilities Branch Head (8/1/2023): No, there were no instances where the existing ICs were not effective in maintaining controls. Findings: None	
For <b>Area E</b> , the marsh pond and marsh system, have there been any new construction or maintenance activities that disturbed the wetlands adjacent to the landfill and resulted in an exposure hazard?	N	Person Contacted: Jared Peterson – Facilities Branch Head (8/1/2023): No. Findings: None	
For <b>Area E</b> , the marsh pond and marsh system, have there been any new construction or maintenance activities that interfere with or compromise the monitoring or remedial actions for the landfill?	N	Person Contacted: Jared Peterson – Facilities Branch Head (8/1/2023): No. Findings: None	

I certify that the conditions of Operable Unit 1 Area 1 on the inspection date were as reported above.



Inspector

8/25/2023

Date

**Naval Base Kitsap Keyport  
Institutional Controls Inspection Checklist**

**Operable Unit 2 Area 2, Van Meter Road Spill/Drum Storage Area**

Inspected by: S. Stamper, M. Clayton

Date of inspection: 8/24/2023

Land Uses: Materials storage, wetlands and natural area, dirt and asphalt roads and parking.

Land Users: Keyport employees, Base walkers

Page 1 of 1 Inspector's Checklist	Y/N NA/NC	Comments	Finding No.
Has access to OU 2 Area 2 been maintained (have security procedures for base entry served to maintain a restricted access)?	Y	Person Contacted: Philip Frith – Security (8/21/23): No instances where security protocols were not maintained. Findings: None	
Have activities that involve digging and construction within OU 2 Area 2 been controlled by the base excavation/dig permit procedure and other pertinent base instructions?	NA	Person Contacted: Jared Peterson – Facilities Branch Head (8/1/2023) Findings: None	
If activities requiring an excavation/dig permit were conducted within OU 2 Area 2, were there any instances in which the permit requirements were not effective in maintaining the requirements of the Institutional Controls Plan?	NA	Person Contacted: Jared Peterson – Facilities Branch Head (8/1/2023): No / Kenneth Eiford – Environmental Engineer (8/29/2023): In all cases controls of the dig permit were met. Findings: None	
Have water wells been installed at OU 2 Area 2, except those for monitoring or remedial actions?	N	Findings: None	
Has residential development occurred in OU 2 Area 2?	N	Findings: None	

I certify that the conditions of Operable Unit 2 Area 2 on the inspection date were as reported above.



Inspector

8/25/2023

Date

This page intentionally left blank



## Naval Base Kitsap Keyport Institutional Controls Inspection Checklist

### Operable Unit 2 Area 8, Plating Shop Waste/Oil Spill Area

Inspected by: S. Stamper, M. Clayton

Date of inspection: 8/24/2023

Land Uses: Industrial, occupied building, asphalt parking and roadways

Land Users: Keyport employees, Base walkers

Page 1 of 1

Inspector's Checklist	Y/N NA/NC	Comments	Finding No.
Has access to OU 2 Area 8 been maintained (have security procedures for base entry served to maintain a restricted access)?	Y	Person Contacted: Philip Frith – Security (8/21/23): No instances where security protocols were not maintained. Findings: None	
Have activities that involve digging and construction within OU 2 Area 8 been controlled by the base excavation/dig permit procedure and other pertinent base instructions?	Y	Person Contacted: Jared Peterson – Facilities Branch Head (8/1/2023): Yes. There have been no digging or construction activities uncontrolled by the Base excavation permit procedures by NUWC Keyport in this area. / Kenneth Eiford – Environmental Engineer (8/29/2023): Yes. Monitoring wells were dug to further investigate soil conditions, and potholing was conducted to locate utilities. All of these activities were adequately controlled by the Base excavation permit procedure. Findings: None	
If activities requiring an excavation/dig permit were conducted below the water table within OU 2 Area 8, were there any instances in which the permit requirements were not effective in maintaining the requirements of the Institutional Controls Plan?	N	Person Contacted: Jared Peterson – Facilities Branch Head (8/1/2023): No. / Kenneth Eiford – Environmental Engineer (8/29/2023): No, permit requirements were effective. Findings: None	
Have water wells been installed at OU 2 Area 8, except these for monitoring or remedial actions?	N	Findings: None	
Has residential development occurred in OU 2 Area 8?	N	Findings: None	

I certify that the conditions of Operable Unit 2 Area 8 on the inspection date were as reported above.



Inspector

8/25/2023

Date

This page intentionally left blank

1 August 2023

## Naval Base Kitsap Keyport Institutional Controls Inspection Checklist

### Area 22

Inspected by: S. Stamper, M. ClaytonDate of inspection: 8/24/2023Land Uses: Light industrial, offices, parking, roadwaysLand Users: Keyport employees

Page 1 of 1

Inspector's Checklist	Y/N NA/NC	Comments	Finding No.
Has access to Area 22 been maintained (have security procedures for base entry served to maintain a restricted access)?	Y	Person Contacted: Philip Frith – Security (8/21/23): No instances where security protocols were not maintained. Findings: None	
Have activities that involve digging and construction within Area 22 been controlled by the base excavation/dig permit procedure and other pertinent base instructions?	Y	Person Contacted: Jared Peterson – Facilities Branch Head (8/1/2023): Yes. There have been no digging or construction activities uncontrolled by the Base excavation permit procedures by NUWC Keyport in this area. / Kenneth Eiford – Environmental Engineer (8/29/2023): Yes, all activities were controlled by the Base excavation permit procedure. Findings: None	
If activities requiring an excavation/dig permit were conducted within Area 22, were there any instances in which the permit requirements were not effective in maintaining the requirements of the Institutional Controls Plan?	N	Person Contacted: Jared Peterson – Facilities Branch Head (8/1/2023): No. Findings: None.	
Have water wells been installed in Area 22, except those for monitoring or remedial actions?	N	No	
Is pavement still in place at Area 22?	Y	Alligatoring, cracks and potholes throughout paved areas.	3
Has land use at Area 22 changed?	N	Findings: None	

I certify that the conditions of Area 22 on the inspection date were as reported above.



Inspector

8/25/2023

Date

This page intentionally left blank

## Naval Base Kitsap Keyport Institutional Controls Inspection Checklist

### Area 7

Inspected by: S. Stamper, M. Clayton

Date of inspection: 8/24/2023

Land Uses: Light industrial, offices, paved parking and roadways, boat dock, shoreline

Land Users: Keyport employees, Base walkers

Page 1 of 1

Inspector's Checklist	Y/N NA/NC	Comments	Finding No.
Has access to Area 7 been maintained (have security procedures for base entry served to maintain a restricted access)?	Y	Person Contacted: Philip Frith – Security (8/21/23): No instances where security protocols were not maintained. Findings: None	
Have activities that involve digging and construction within Area 7 been controlled by the base excavation/dig permit procedure and other pertinent base instructions?	Y	Person Contacted: Jared Peterson – Facilities Branch Head (8/1/2023): Yes. There have been no digging or construction activities uncontrolled by the Base excavation permit procedures by NUWC Keyport in this area. / Kenneth Eiford – Environmental Engineer (8/29/23): Yes. There has been construction that involves excavation in this area. Base environmental is heavily involved in the planning and execution of all excavation activities. Monitoring wells for soil, and potholing for utility locating were also dug in this area. All of these activities were adequately controlled by the Base excavation permit procedure. Findings: None	
If activities requiring an excavation/dig permit were conducted within Area 7, were there any instances in which the permit requirements were not effective in maintaining the requirements of the Institutional Controls Plan?	N	Person Contacted: Jared Peterson – Facilities Branch Head (8/1/2023): No. Findings: None	
Have water wells been installed in Area 7, except those for monitoring or remedial actions?	N	No	
Is pavement still in place at Area 7?	Y	Minor root damage, alligating and cracking in paved areas.	4
Has land use at Area 7 changed?	N	No	

I certify that the conditions of Area 7 on the inspection date were as reported above.



Inspector

8/25/2023

Date

This page intentionally left blank

1 August 2023

## Naval Base Kitsap Keyport Institutional Controls Inspection Checklist

### Site 23

Inspected by: S. Stamper, M. ClaytonDate of inspection: 8/24/2023Land Uses: Light industrial, offices, storageLand Users: parking

Page 1 of 1

Inspector's Checklist	Y/N NA/NC	Comments	Finding No.
Has access to Site 23 been maintained (have security procedures for base entry served to maintain a restricted access)?	Y	Person Contacted: Philip Frith – Security (8/21/23): No instances where security protocols were not maintained. Findings: None	
Have activities that involve digging and construction within Site 23 been controlled by the base excavation/dig permit procedure and other pertinent base instructions?	Y	Person Contacted: Kenneth Eiford – Environmental Engineer (8/29/2023): Yes. There have been construction that involves excavation in this area. Base environmental is heavily involved in the planning and execution of all excavation activities. Monitoring wells for soil, and potholing for utility locating were also dug in this area. All of these activities were adequately controlled by the Base excavation permit procedure. Findings: None	
If activities requiring an excavation/dig permit were conducted within Site 23, were there any instances in which the permit requirements were not effective in maintaining the requirements of the Institutional Controls Plan?	N	Person Contacted: Kenneth Eiford – Environmental Engineer (8/29/2023): No. The permit approval process was effective in maintaining all Institutional Control Plan requirements. Findings: None	
Have water wells been installed in Site 23 except those for monitoring or remedial actions?	N	No	
Is pavement still in place at Site 23?	Y	Some pavement cracking.	5
Has land use at Site 23 changed?	N	No	

I certify that the conditions of Site 23 on the inspection date were as reported above.



Inspector

8/25/2023

Date

This page intentionally left blank



## **Attachment B**

### **Photograph Log**

This page intentionally left blank



<b>Photograph 1.</b> August 2023	View of the site facing north pavement crack OU1 Area D.
-------------------------------------	--



<b>Photograph 2.</b> August 2023	View facing north, alligating on east edge of OU1.
-------------------------------------	--





<b>Photograph 3.</b> August 2023	View facing south, alligating on east side of OU1
-------------------------------------	---



<b>Photograph 4.</b> August 2023	View facing south, pavement cracking near storage shed.
-------------------------------------	---





<b>Photograph 5.</b>	View facing south, pavement cracking near southern plantation.
August 2023	



<b>Photograph 6.</b>	View facing south, alligating at OU1 Area 22 near 4th Street parking area.
August 2023	





<b>Photograph 7.</b> August 2023	View facing south, root damage to asphalt at OU2 Area 2.
-------------------------------------	--



<b>Photograph 8.</b> August 2023	View facing south, cracked pavement in front of Building 15, OU2 Area 7.
-------------------------------------	--





**Photograph 9.** View facing east, damaged pavement at loading zone OU2 Area 7.  
August 2023



**Photograph 10.** View facing north, cracked pavement at OU2 Area 2.  
August 2023

This page intentionally left blank



## **Attachment C**

### **VI Inspection Forms**

This page intentionally left blank

## NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Survey Completed by: S. Stamper

Date: 9/6/2023

Building #: 82 Building Name: Torpedo Assembly/Shipping Year Built: 1940

Navy Contact/Escort: Amanda Rohrbaugh, Jeni Larson, Fred Smith

Navy Contact/Escort Contact Information: Rohrbaugh, Amanda L CIV USN NAVFAC NW SVD WA (USA)  
amanda.l.rohrbaugh.civ@us.navy.mil; Larson, Jenifer F CIV USN NAVFAC NW SVD WA (USA)  
jenifer.f.larson.civ@us.navy.mil;

Personnel Interviewed: Fred Smith

### General Building Description:

*Refer to map for conditions documented during last inspection. Note any changes on this form and on map.*

*Note: Bolded text in parentheses on the forms is the original status of the buildings when inspected or examples for field usage and clarify in the form where items are an example versus an original building condition.*

Has the 1<sup>st</sup> Floor description changed? (Torpedo workstations and open offices)

No Changes

Changes (Describe): Click or tap here to enter text.

Has the 2<sup>nd</sup> Floor description changed? (Office space, cubicles, and small offices)

No Changes

Changes (Describe): Click or tap here to enter text.

Has the 3<sup>rd</sup> Floor description changed? (Conference room)

No Changes

Changes (Describe): No changes in use. Roof leaks observed.

### Building Use:

*Refer to map for usage conditions documented during last inspection. Note any changes on this form and on map.*

Document changes to activities conducted on each level of the building (e.g., office work, storage, machine repair, metal shop, painting, degreasing/cleaning)?

Have there been changes to 1<sup>st</sup> Floor uses? (Torpedo workstation/assembly/testing/motor shop)

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 82

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): [Click or tap here to enter text.](#)

**Have there been changes to 2<sup>nd</sup> Floor uses? (Office space; enclosed offices along walls, cubicles, electronics workstations)**

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): [Click or tap here to enter text.](#)

**Have there been changes to 3<sup>rd</sup> Floor uses? (Conference room with deck; staircase on outside of building with roof access)**

No Changes:

Changes (Describe, include interviewee name and contact information, if applicable): [Click or tap here to enter text.](#)

**Building Occupants:**

**1<sup>st</sup> Floor: 20-25**

**2<sup>nd</sup> Floor: 100-120**

**3<sup>rd</sup> Floor: 0 full time, temporary only**

No Changes      Note: second floor workers teleworking due to elevator down.

Changes (Describe, include interviewee name and contact information): Fredrick Smith stated that about 20 people are working remotely due to broken elevator.

**Working Hours:**

**What are the normal working hours? (Occupied from 0700 to 1700, but can run three 8-hour shifts when necessary to meet mission)**

No Changes: Work hours may be as early as 6:00.

Changes (Describe, include interviewee name and contact information): [Click or tap here to enter text.](#)

**Have alternative work schedules been used in the past year?**

No

Yes (Describe, include dates and duration, and interviewee name and contact information): Some flex and some remote employees.

**Building Characteristics:**

***Refer to map for building characteristics documented during last inspection. Note any changes on this form and on map***

**Irrigation (Sprinkler system inside building with water main water line in back of building):**

- No changes
- Changes (Describe): Click or tap here to enter text.

**Evidence of additions or expansion in the last year?**

- No
- Yes (Describe): Click or tap here to enter text.

**Are there currently any plans for additions, expansions, or remodeling?**

- No
- Yes (Describe, including projected dates and duration, and interviewee name and contact information): Motor shop floor redone 6-8 months ago; trench filled. Currently fixing building roof overhang at the front door. Elevator is on schedule to be replaced

**Above grade construction (Concrete with Steel Beams):**

- No Changes
- Changes (Describe): trench 2-3 feet below grade; filled.

**Lowest level depth level below grade? \_\_\_ feet or inches (bold/circle one)**

**Foundation walls:**  Poured  Block  Stone  Other Click or tap here to enter text.

**Is the building insulated?**  No  Yes (Describe): Click or tap here to enter text.

**Are there gaps between footings and floor slab? (As shown on map - First floor has gaps through the concrete slab along the perimeter of the north, east, and south sides of the building)**

- No Changes
- Changes (Describe): Click or tap here to enter text.

**Heating, Ventilation, and Air Conditioning (HVAC):**

***Note any changes on this form and on map***

**What type of HVAC system(s) are used in this building? (As shown on map - Separate HVAC system on first floor. Motor shop and zinc battery charging rooms are on separate HVACs. Main workstations contain space heaters. Laboratories on first floor have fume hoods. Drop ceiling has AC/heat. Second floor appears to be on one centralized HVAC system):**

- Hot air circulation  Heat pump  Hot water baseboard
- Space heaters  Steam radiation  Hot air radiation  Radiant floor  Electric baseboard
- Wood stove  Outdoor wood boiler  None  Other: Click or tap here to enter text.

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 82

No Changes: Roll-up doors open when warm outside except north side supply bay door due to damage (has been broken over 1 year)

Changes (Describe, include interviewee name and contact information, if applicable): Click or tap here to enter text.

**Primary type of fuel used is:**  Natural gas  Fuel oil  Kerosene  Electric  Propane  Solar  
 Wood  Coal

**Hot water tank fueled by:** N/A

**Air conditioning ventilation (Window units, mechanical fans in warehouse; battery changing room on separate HVAC with negative pressure; rollup door with screen and windows are open during summer mornings, but then closed in the afternoon; no AC in summer in the main warehouse, but one AC window unit present on 2<sup>nd</sup> floor.):**  Central Air  Window Units  Open Windows  Open Doors  
 Mechanical Fans  None  Other Click or tap here to enter text.

**Are there distribution ducts?**  Yes  No  N/A

No Changes

Changes (Describe): Click or tap here to enter text.

### HVAC Operations

Current HVAC Operation: The HVAC in the building is operated on weekdays only. During summer months, windows and doors are temporarily opened, and window air conditioning units are used.

**Describe changes to HVAC conditions/operation:**

**Are HVAC systems operated only during normal working hours?**  Yes  No  Other  
(Describe): operating 24/7 during normal working hours

**Are HVAC systems shut down on weekends?**  Yes  No  Other (Describe): HVAC is operated during normal weekday working hours

**Does system operation change from summer to winter?**  Yes  No  Other (Describe): Click or tap here to enter text.

**Have unusual circumstances caused HVAC system shutdown (e.g., maintenance shutdown, weather)?**  Yes  No  Other (Describe): Does not get all the way down to temp in the summer.

**Are windows, doors, or loading dock doors left open?**  Yes  No  Other (Describe): Click or tap here to enter text.

*Indicate locations on map, along with type, size, frequency, and duration of time*

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 82

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): Click or tap here to enter text.

**Outside Contaminant Sources:**

***Note any changes on this form and on map***

**List nearby land use (industrial/commercial/residential):**

**North:** Navy Buildings 1074 and 234

**South:** Road and Port Orchard Bay

**East:** Parking lot, Area 8, and Port Orchard Bay

**West:** Navy Buildings 763 and 1058

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): Click or tap here to enter text.

**Other stationary sources nearby (gas stations, emission stacks, other manufacturing facilities, etc.): (Parking lot to east)**

No Changes

Changes (Describe): Click or tap here to enter text.

**Heavy vehicular traffic or area where vehicles idle nearby (or other mobile sources): (Parking lot to east and road to south)**

No Changes

Changes (Describe): Click or tap here to enter text.

**Indoor Contaminant Sources:**

***Identify all potential indoor sources and products that have the potential to affect indoor air sample quality. Indicate whether the item can be removed from the building prior to indoor air sampling event.***

Potential Background Sources	Present? (Yes / No)		If Present, Description (location, size, condition*, ingredients)	Removable prior to Sampling? (Yes / No)
	Previous	Current		
Gasoline storage cans	No	No		
Gas-powered equipment (e.g., forklift)	No	No		
Paints/thinners/stripers	No	No		
Solvents	Yes	Yes	Failure analysis test area. Lectra Clean – CRC (TCE) 79-01-6,	

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 82

Potential Background Sources	Present? (Yes / No)		If Present, Description (location, size, condition*, ingredients)	Removable prior to Sampling? (Yes / No)
	Previous	Current		
			Power Buster (1-1-difluoroethane), Small engine oil	
Dry cleaned clothing	No	No		
Pesticides/herbicides (e.g., applied around bldg. foundation)	No	No		
Moth balls	No	No		
Cleaning products	Yes	Yes	Various general household cleaners	
Air fresheners	No	No		
Kitchen cleaners	Yes	Yes	1 <sup>st</sup> floor- kitchen disinfectant and soaps, 2 <sup>nd</sup> floor- disinfectant, cleaners, and soaps	
Waste storage	No	No		
New furniture or upholstery	No	No		
New carpeting or flooring	No	No		
Glues	No	No		
Heavy duty degreaser	Yes	Yes	In motor shop, CRC Industries Inc. green bottle. Aerosol N.O. 03095, PCE, TCE, 1-2-Butylene Oxide	
Primer coating	Yes	Yes	In motor shop	
Zinc dust petrolatum	Yes	Yes	In motor shop	
Greaseless lubricant	Yes	Yes	In motor shop	
HumiSeal	Yes	Yes	In motor shop	
Chemical closets	Yes	Yes	4 – 6 chemical closets in main warehouse	
Lens cleaning solution	No	No		
CreteCleaner	No	No		

\* Describe the condition of the product containers as Unopened (UO), Used (U), or Deteriorated (D)

**Any known spills of a chemical immediately outside or inside the building over the last year?**

No

Yes (Specify location and describe, including interviewee name and contact information): [Click or tap here to enter text.](#)

**Has the building had a fire in the last year?**

No

Yes (Specify location and describe, including interviewee name and contact information): [Click or tap here to enter text.](#)



**Building Map Changes:**

**Has the ground cover around outside of building changed? (Asphalt)**

No

Yes (Describe): The building manager described sinking on the north side and northwest corner of the building. The sinking of asphalt at the north and northwest corner appeared to be due to subsidence of backfill. This sinking was confirmed during the site inspection

**Has the storm drain system near the building changed? (Compare current conditions to storm drains as shown on map)**

No

Yes (Describe): Click or tap here to enter text.

**Flooring type inside building:**

**Has flooring changed on 1<sup>st</sup> floor? (Sealed concrete)**

No

Yes (Describe): Click or tap here to enter text.

**Has flooring changed on 2<sup>nd</sup> floor? (Carpet)**

No

Yes (Describe): Click or tap here to enter text.

**Has flooring changed on 3<sup>rd</sup> floor? (Carpet)**

No

Yes (Describe): Click or tap here to enter text.

**Tunnels? (None)**

No

Yes (Describe): Click or tap here to enter text.

**Sumps? If present, indicate whether there is water in the sump. (Sump in zinc battery charging area; water observed in sump)**

No Note: Motor shop sump filled and floor recoated since last inspection. Washdown station outside with no water present; battery charging

Yes (Describe): Click or tap here to enter text.

**Change in potential soil vapor entry points and approximate sizes? Include cracks, utility ports, drains, gaps in floor slab. (As shown on map)**

No

Yes (Describe and document on map): There are new cracks at the entrance to the battery shop probably due to the increased use of the roll up door located between the battery shop and the motor shop. Cracking was relatively minor with nothing exceeding 1/16<sup>th</sup> inch and not extending more than 3-4 feet. Cracking seemed to mostly be in the floor coating but could extend deeper.

**Have there been changes to HVAC components in the building including blowers, intake, and/or exhaust vents? (As shown on map)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Boiler/Furnace? (Not present)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Change in bathroom exhaust fans? (As shown on map)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Change in manufacturing process vents? (As shown on map)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Additional building vents? (As shown on map)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Are there any building windows or doors that are left open? Include location, type, size, frequency, and duration of time. (As shown on map - building is secure, so windows/doors are opened temporarily, but are secured at end of each workday)**

No

Yes (Describe and document on map): Bay doors opened occasionally, closed 95% of the time

**Are there areas that have little or no air exchange? (None identified)**

No

Yes (Describe and document on map): Click or tap here to enter text.

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 82

**Have location(s) of designated or common smoking areas changed? (As shown on map - directly north of the building across the street)**

No

Yes (Describe and document on map): [Click or tap here to enter text.](#)

## NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Survey Completed by: S. Stamper

Date: 9/6/2023

Building #: 85 Building Name: NAVSUP (Storage) Year Built: 1944

Navy Contact/Escort: Amanda Rohrbaugh, Jeni Larson

Navy Contact/Escort Contact Information: Rohrbaugh, Amanda L CIV USN NAVFAC NW SVD WA (USA)  
amanda.l.rohrbaugh.civ@us.navy.mil; Larson, Jenifer F CIV USN NAVFAC NW SVD WA (USA)  
jenifer.f.larson.civ@us.navy.mil;

Personnel Interviewed: Jeremiah Leblanc

### General Building Description:

*Refer to map for conditions documented during last inspection. Note any changes on this form and on map.*

*Note: Bolded text in parentheses on the forms is the original status of the buildings when inspected or examples for field usage and clarify in the form where items are an example versus an original building condition.*

**Has the 1<sup>st</sup> Floor description changed? (General storage and former battery shop)**

No Changes

Changes (Describe): Click or tap here to enter text.

**Has the 2<sup>nd</sup> Floor description changed? (Office space, cubicles, and small offices)**

No Changes (single floor only)

Changes (Describe): Click or tap here to enter text.

**Has the 3<sup>rd</sup> Floor description changed? (Conference room)**

No Changes

Changes (Describe): Click or tap here to enter text.

### Building Use:

*Refer to map for conditions documented during last inspection. Note any changes on this form and on map.*

**Document changes to activities conducted on each level of the building (e.g., office work, storage, machine repair, metal shop, painting, degreasing/cleaning)?**

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 85

**Have there been changes to 1<sup>st</sup> Floor uses? (NAVSUP Storage; South side: Parts and equipment, accessed one time per week; North side: Warehouse for excess office desks and cubicles, not accessed frequently)**

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): Click or tap here to enter text.

**Have there been changes to 2<sup>nd</sup> Floor uses? (N/A)**

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): **Click or tap here to enter text.**

**Have there been changes to 3<sup>rd</sup> Floor uses? (N/A)**

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): Click or tap here to enter text.

**Building Occupants:**

**1<sup>st</sup> Floor: 0**

**2<sup>nd</sup> Floor: N/A**

**3<sup>rd</sup> Floor: N/A**

No Changes

Changes (Describe, include interviewee name and contact information,): Click or tap here to enter text.

**Working Hours:**

**What are the normal working hours? (Access limited to 0700 to 1700)**

No Changes

Changes (Describe, include interviewee name and contact information): Click or tap here to enter text.

**Have alternative work schedules been used in the past year?**

No

Yes (Describe, include dates and duration, and interviewee name and contact information): Click or tap here to enter text.

**Building Characteristics:**

***Refer to map for building characteristics documented during last inspection. Note any changes on this form and on map***

**Irrigation (Not noted in previous inspection):**

- No changes
- Changes (Describe): Click or tap here to enter text.

**Evidence of additions or expansion in the last year?**

- No
- Yes (Describe): Click or tap here to enter text.

**Are there currently any plans for additions, expansions, or remodeling?**

- No Note: replacement of doors
- Yes (Describe, including projected dates and duration, and interviewee name and contact information): Click or tap here to enter text.

**Above grade construction (Wood frame):**

- No Changes
- Changes (Describe): Click or tap here to enter text.

**Lowest level depth below grade:** \_\_\_ feet or inches (bold/circle one)

**Foundation walls:**  Poured  Block  Stone  Other Outside of building lined with asbestos containing shield

**Is the building insulated?**  No  Yes (Describe): Click or tap here to enter text.

**Are there gaps between footings and floor slab? (Not indicated during previous inspection)**

- No Changes
- Changes (Describe): Click or tap here to enter text.

**Heating, Ventilation, and Air Conditioning (HVAC):**

***Note any changes on this form and on map***

**What type of HVAC system(s) are used in this building? (As shown on map – Heating system in use on north side of the building although building is not occupied):**  Hot air circulation  Heat pump  Hot water baseboard  Space heaters  Steam radiation  Hot air radiation  Radiant floor  Electric baseboard  Wood stove  Outdoor wood boiler  None  Other: gas overhead heaters

- No Changes
- Changes (Describe, include interviewee name and contact information, if applicable): Click or tap here to enter text.

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 85

**Primary source of fuel used is:**  Natural gas  Fuel oil  Kerosene  Electric  Propane  
 Solar  Wood  Coal

**Hot water tank fueled by:** N/A

**Air conditioning ventilation (One ceiling fan on south side, one electrical fan in back room on north side):**  Central air  Window units  Open windows  Open doors  
 Mechanical fans  None  Other [Click or tap here to enter text.](#)

**Are there distribution ducts?**  Yes  No  N/A

No Changes

Changes (Describe): [Click or tap here to enter text.](#)

### HVAC Operations

Current HVAC Operation: No HVAC in use in building

**Describe changes to HVAC conditions/operation:**

**Are HVAC systems operated only during normal working hours?**  Yes  No  Other  
(Describe): HVAC unused; building not occupied.

**Are HVAC systems shut down on weekends?**  Yes  No  Other (Describe): [Click or tap here to enter text.](#)

**Does system operation change from summer to winter?**  Yes  No  Other (Describe): [Click or tap here to enter text.](#)

**Have unusual circumstances caused HVAC system shutdown (e.g., maintenance shutdown, weather)?**  Yes  No  Other (Describe): [Click or tap here to enter text.](#)

**Are windows, doors, or loading dock doors left open?**  Yes  No  Other (Describe): [Click or tap here to enter text.](#)

*Indicate locations on map, along with type, size, frequency, and duration of time*

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): [Click or tap here to enter text.](#)

### Outside Contaminant Sources:

**Note any changes on this form and on map**

**List nearby land use (industrial/commercial/residential):**

**North:** Navy Building 40

**South:** Navy Building 82 and parking lot

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 85

**East:** Navy Building 98

**West:** Navy Building 1074

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): Click or tap here to enter text.

**Other stationary sources nearby (gas stations, emission stacks, other manufacturing facilities, etc.):**  
N/A

No Changes

Changes (Describe): Click or tap here to enter text.

**Heavy vehicular traffic or area where vehicles idle nearby (or other mobile sources): (Parking lot to south)**

No Changes

Changes (Describe): Click or tap here to enter text.

**Indoor Contaminant Sources:**

Identify all potential indoor sources and products that have the potential to affect indoor air sample quality. Indicate whether the item can be removed from the building prior to indoor air sampling event.

Potential Background Sources	Present? (Yes / No)		If Present, Description (location, size, condition*, ingredients)	Removable prior to Sampling? (Yes / No)
	Previous	Current		
Gasoline storage cans	No	No		
Gas-powered equipment (e.g., forklift)	No	No		
Paints/thinners/strippers	No	No		
Solvents	No	No		
Dry cleaned clothing	No	No		
Pesticides/herbicides (e.g., applied around bldg. foundation)	No	No		
Moth balls	No	No		
Cleaning products	No	No		
Air fresheners	No	No		
Waste storage	No	No		
New furniture or upholstery	No	No		
New carpeting or flooring	No	No		
Glues	No	No		
Heavy duty degreaser	No	No		
Primer coating	No	No		
Zinc dust petrolatum	No	No		
Greaseless lubricant	No	No		



NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 85

Potential Background Sources	Present? (Yes / No)		If Present, Description (location, size, condition*, ingredients)	Removable prior to Sampling? (Yes / No)
	Previous	Current		
HumiSeal	No	No		
4-6 Chemical closets in main warehouse	No	No		
Lens cleaning solution	Yes	No		
CreteCleaner	Yes	No		

\* Describe the condition of the product containers as Unopened (UO), Used (U), or Deteriorated (D)

**Any known spills of a chemical immediately outside or inside the building over the last year?**

No Unknown; not likely

Yes (Specify location and describe, including interviewee name and contact information): Click or tap here to enter text.

**Has the building had a fire in the last year?**

No

Yes (Specify location and describe, including interviewee name and contact information): Click or tap here to enter text.

**Building Map Changes:**

**Has the ground cover around outside of building changed? (Concrete, asphalt)**

No

Yes (Describe): Click or tap here to enter text.

**Has the storm drain system near the building changed? (Compare current conditions to storm drains as shown on map)**

No

Yes (Describe): Click or tap here to enter text.

**Flooring type inside building:**

**Has flooring changed on 1<sup>st</sup> floor? (Coated concrete)**

No

Yes (Describe): Click or tap here to enter text.

**Has flooring changed on 2<sup>nd</sup> floor? (N/A)**

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 85

No

Yes (Describe): Click or tap here to enter text.

**Has flooring changed on 3<sup>rd</sup> floor? (N/A)**

No

Yes (Describe): Click or tap here to enter text.

**Tunnels? (None)**

No

Yes (Describe): Click or tap here to enter text.

**Sumps? If present, indicate whether there is water in the sump. (Yes; Water not noted during previous inspection)**

No

Yes (Describe): sink/eyewash safety drain into sump

**Change in potential soil vapor entry points and approximate sizes? Include cracks, utility ports, drains, gaps in floor slab. (As shown on map)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Have there been changes to HVAC components in the building including blowers, intake, and/or exhaust vents? (As shown on map)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Boiler/Furnace? (Not present)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Change in bathroom exhaust fans? (As shown on map)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Change in manufacturing process vents? (As shown on map)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Additional building vents? (As shown on map)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Are there any building windows or doors that are left open? Include location, type, size, frequency, and duration of time. (As shown on map – windows not left open)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Are there areas that have little or no air exchange? (None identified)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Have location(s) of designated or common smoking areas changed? (None identified)**

No

Yes (Describe and document on map): Click or tap here to enter text.

## NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Survey Completed by: S. Stamper

Date: 9/6/2023

Building #: 98 Building Name: Click or tap here to enter text. Year Built: 1940

Navy Contact/Escort: Amanda Rohrbaugh, Jeni Larson

Navy Contact/Escort Contact Information: Rohrbaugh, Amanda L CIV USN NAVFAC NW SVD WA (USA) amanda.l.rohrbaugh.civ@us.navy.mil; Larson, Jenifer F CIV USN NAVFAC NW SVD WA (USA) jenifer.f.larson.civ@us.navy.mil;

Personnel Interviewed: Chris Lawson

### General Building Description:

*Refer to map for conditions documented during last inspection. Note any changes on this form and on map.*

*Note: Bolded text in parentheses on the forms is the original status of the buildings when inspected or examples for field usage and clarify in the form where items are an example versus an original building condition.*

**Has the 1<sup>st</sup> Floor description changed? (General work areas, storage, and shipping)**

No Changes

Changes (Describe): Click or tap here to enter text.

**Has the 2<sup>nd</sup> Floor description changed? (Workstations)**

No Changes

Changes (Describe): Click or tap here to enter text.

**Has the 3<sup>rd</sup> Floor description changed? (N/A)**

No Changes

Changes (Describe): Click or tap here to enter text.

### Building Use:

*Refer to map for conditions documented during last inspection. Note any changes on this form and on map.*

**Document changes to activities conducted on each level of the building (e.g., office work, storage, machine repair, metal shop, painting, degreasing/cleaning)?**

**Have there been changes to 1<sup>st</sup> Floor uses? (General work areas, cubicles, storage, work benches, torpedo storage, and shipping near back of building)**

No Changes

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 98

Changes (Describe, include interviewee name and contact information, if applicable): Click or tap here to enter text.

**Have there been changes to 2<sup>nd</sup> Floor uses? (Work areas and workstations consisting of soldering and electrical work in addition to miscellaneous work from staff on a daily basis)**

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): **Click or tap here to enter text.**

**Have there been changes to 3<sup>rd</sup> Floor uses? (N/A)**

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): Click or tap here to enter text.

**Building Occupants:**

**1<sup>st</sup> Floor:** 45-60

**2<sup>nd</sup> Floor:** 20-30

**3<sup>rd</sup> Floor:** N/A

No Changes

Changes (Describe, include interviewee name and contact information): Click or tap here to enter text.

**Working Hours:**

**What are the normal working hours? (Access limited to 0600 to 1600)**

No Changes

Changes (Describe, include interviewee name and contact information): Click or tap here to enter text.

**Have alternative work schedules been used in the past year?**

No

Yes (Describe, include dates and duration, and interviewee name and contact information, if applicable): **Flexible work hour schedule 05:00-15:30**

**Building Characteristics:**

***Refer to map for building characteristics documented during last inspection. Note any changes on this form and on map***

**Irrigation (Not noted in previous inspection):**

No changes

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 98

Changes (Describe): Click or tap here to enter text.

**Evidence of additions or expansion in the last year?**

No

Yes (Describe): Click or tap here to enter text.

**Are there currently any plans for additions, expansions, or remodeling?**

No

Yes (Describe, including projected dates and duration, and interviewee name and contact information, if applicable): Click or tap here to enter text.

**Above grade construction (Wood frame, concrete, brick, slab on grade):**

No Changes

Changes (Describe): Click or tap here to enter text.

**Lowest level depth below grade:** 2-3 feet floor trenches

**Foundation walls:**  Poured  Block  Stone  Other Brick exterior with large beams inside and some wood support

**Is the building insulated?**  No  Yes (Describe): Click or tap here to enter text.

**Are there gaps between footings and floor slab? (Not indicated during previous inspection)**

No Changes

Changes (Describe): Click or tap here to enter text.

**Heating, Ventilation, and Air Conditioning (HVAC):**

***Note any changes on this form and on map***

**What type of HVAC system(s) are used in this building? (Exploder shop has separate HVAC, heat lamps in work areas):**  Hot air circulation  Heat pump  Hot water baseboard  Space heaters  Steam radiation  Hot air radiation  Radiant floor  Electric baseboard  Wood stove  Outdoor wood boiler  None  Other: Heat Lamps

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): Click or tap here to enter text.

**Primary source of fuel used is:**  Natural gas  Fuel oil  Kerosene  Electric  Propane  
 Solar  Wood  Coal

**Hot water tank fueled by:** N/A

**Air conditioning ventilation (Window units in work areas and kitchen):**  Central air  Window units

Open windows  Open doors

Mechanical fans  None  Other [Click or tap here to enter text.](#)

**Are there distribution ducts?**  Yes  No  N/A

No Changes

Changes (Describe): [Click or tap here to enter text.](#)

### **HVAC Operations**

Current HVAC Operation: HVAC is present. 1st floor – Central HVAC with window units in kitchens and workspaces. 2nd floor – Central HVAC and heating, windows can open but usually are not. Rollup door in back (north) is occasionally opened for shipments and receiving

**Describe changes to HVAC conditions/operation:** [Click or tap here to enter text.](#)

**Are HVAC systems operated only during normal working hours?**  Yes  No  Other

(Describe): some areas stay on

**Are HVAC systems shut down on weekends?**  Yes  No  Other (Describe): on 24/7

**Does system operation change from summer to winter?**  Yes  No  Other (Describe): [Click or tap here to enter text.](#)

**Have unusual circumstances caused HVAC system shutdown (e.g., maintenance shutdown, weather)?**  Yes  No  Other (Describe): [Click or tap here to enter text.](#)

**Are windows, doors, or loading dock doors left open?**  Yes  No  Other (Describe): during summer months

*Indicate locations on map, along with type, size, frequency, and duration of time*

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): [Click or tap here to enter text.](#)

### **Outside Contaminant Sources:**

***Note any changes on this form and on map***

**List nearby land use: (industrial/commercial/residential):**

**North:** Buildings

**South:** Parking lot and Area 8

**East:** Port Orchard Bay

**West:** Navy Building 85

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 98

No Changes

Changes (Describe, include interviewee name and contact information, if applicable): Click or tap here to enter text.

**Other stationary sources nearby (gas stations, emission stacks, other manufacturing facilities, etc.): (Parking lot to south and road to east)**

No Changes

Changes (Describe): Click or tap here to enter text.

**Heavy vehicular traffic or area where vehicles idle nearby (or other mobile sources): (Parking lot to south and road to east)**

No Changes

Changes (Describe): Click or tap here to enter text.

**Indoor Contaminant Sources:**

*Identify all potential indoor sources and products that have the potential to affect indoor air sample quality. Indicate whether the item can be removed from the building prior to indoor air sampling event.*

Potential Background Sources	Present? (Yes / No)		If Present, Description (location, size, condition*, ingredients)	Removable prior to Sampling? (Yes / No)
	Previous	Current		
Gasoline storage cans	No	No		
Gas-powered equipment (e.g., forklift)	No	No		
Paints/thinners/strippers	No	No		
Solvents	No	No		
Dry cleaned clothing	No	No		
Pesticides/herbicides (e.g., applied around bldg. foundation)	No	No		
Moth balls	No	No		
Cleaning products	Yes	Yes	Men's restroom: PureBright Bleach, Disinfectant cleaner, Lemon Eze Cleaner, Consume Nature's Way (alcohol), Spar Cling (hydrogen chloride). Lunchroom: Dawn dish soap, wipes, bleach cleaner, disinfecting cleaner. Skilcraft concentrated power green cleaner. Office (Jeff Stoch) – Powerduster (Skilcraft), 1,1-difluoroethane. Vapor degreaser room (2 <sup>nd</sup> floor), trans 1,2-DCE, in drum with secondary containment	
Moth balls	No	No		
Air fresheners	No	No		



NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 98

Potential Background Sources	Present? (Yes / No)		If Present, Description (location, size, condition*, ingredients)	Removable prior to Sampling? (Yes / No)
	Previous	Current		
Waste storage	No	No		
New furniture or upholstery	No	No		
New carpeting or flooring	No	No		
Glues	No	No		
Heavy duty degreaser	No	No		
Primer coating	No	No		
Zinc dust petrolatum	No	No		
Greaseless lubricant	No	No		
HumiSeal	No	No		
4-6 Chemical closets in main warehouse	No	No		
Lens cleaning solution	No	No		
CreteCleaner	No	No		
Paint	Yes	Yes	Small paint room with fume hood. MSDS codes: HDQQBR, HDLKNM, DDMHGK, HDJBAY, HDMJVB	

\* Describe the condition of the product containers as Unopened (UO), Used (U), or Deteriorated (D)

**Any known spills of a chemical immediately outside or inside the building over the last year?**

No

Yes (Specify location and describe, including interviewee name and contact information): Click or tap here to enter text.

**Has the building had a fire in the last year?**

No

Yes (Specify location and describe, including interviewee name and contact information): Click or tap here to enter text.

**Building Map Changes:**

**Has the ground cover around outside of building changed? (Asphalt)**

No

Yes (Describe): Click or tap here to enter text.

**Has the storm drain system near the outside of the building changed? (Compare current conditions to the storm drains as shown on map)**

No

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY  
Building 98

Yes (Describe): Click or tap here to enter text.

**Flooring type inside building:**

**Has flooring changed on 1<sup>st</sup> floor? (Sealed concrete)**

No

Yes (Describe): Click or tap here to enter text.

**Has flooring changed on 2<sup>nd</sup> floor? (tile/carpet)**

No

Yes (Describe): Click or tap here to enter text.

**Has flooring changed on 3<sup>rd</sup> floor? (N/A)**

No

Yes (Describe): Click or tap here to enter text.

**Tunnels? (None)**

No

Yes (Describe): Click or tap here to enter text.

**Sumps? If present, indicate whether there is water in the sump. (None)**

No

Yes (Describe): Click or tap here to enter text.

**Change in potential soil vapor entry points and approximate sizes? Include cracks, utility ports, drains, gaps in floor slab. (As shown on map)**

No

Yes (Describe and document on map): Two points in exploder shop/shop storage room

**Have there been changes to HVAC components in the building including blowers, intake, and/or exhaust vents? (As shown on map)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Boiler/Furnace? (Not present)**

No

Yes (Describe and document on map): Click or tap here to enter text.

**Change in bathroom exhaust fans? (As shown on map)**

NBK KEYPORT OU 2, AREA 8 BUILDING SURVEY

Building 98

No

Yes (Describe and document on map): [Click or tap here to enter text.](#)

**Change in manufacturing process vents? (As shown on map)**

No

Yes (Describe and document on map): [Click or tap here to enter text.](#)

**Additional building vents? (As shown on map)**

No

Yes (Describe and document on map): [Click or tap here to enter text.](#)

**Are there any building windows or doors that are left open? Include location, type, size, frequency, and duration of time. (As shown on map – windows not left open)**

No

Yes (Describe and document on map): roll-up doors during summer

**Are there areas that have little or no air exchange? (None identified)**

No

Yes (Describe and document on map): [Click or tap here to enter text.](#)

**Have location(s) of designated or common smoking areas changed? (None identified)**

No

Yes (Describe and document on map): [Click or tap here to enter text.](#)

This page intentionally left blank

## **Attachment D**

**2021 VI Long-Term Monitoring Plan, Operable  
Unit 2, Area 8, NBK Keyport, Keyport,  
Washington**

This page intentionally left blank



**FINAL**

17 July 2021

# **Vapor Intrusion Long-Term Monitoring and Building Inspection Plan**

Operable Unit 2, Area 8

**Naval Base Kitsap**

Keyport, Washington

**Department of the Navy  
Naval Facilities Engineering Systems Command  
Engineering Field Activity, Northwest  
1101 Tautog Circle  
Silverdale, WA 98315-1101**



This page intentionally left blank





**Department of the Navy  
Naval Facilities Engineering Systems Command Northwest**

**Final**

# **Vapor Intrusion Long-Term Monitoring and Building Inspection Plan**

## **Operable Unit 2, Area 8**

**NAVAL BASE KITSAP KEYPORT WASHINGTON**

**July 2021**

Prepared for NAVFAC Northwest by  
**AECOM Technical Services, Inc.**  
**1111 3rd Avenue Suite 1600**  
**Seattle WA 98101**

**N3943016D1802**  
**CTO N3943018F4355**

This page intentionally left blank

---

## CONTENTS

Abbreviations and Acronyms	vii
1. Introduction	1
1.1 Site Location and History of OU 2, Area 8	1
2. Current Conceptual Site Model	9
2.1 Building 82	9
2.2 Building 85	10
2.3 Building 98	11
3. Management and Monitoring Approach	19
3.1 Selected Monitoring Approach	19
3.1.1 Contaminants of Concern and Project Action Limits	20
3.2 Monitoring Implementation and Evaluation	20
3.2.1 Foundation and Building Inspections	21
3.2.2 Indoor Air and Sub-slab Vapor Sampling	21
4. Reporting	33
5. References	33

## APPENDICES

A Field Forms and Procedures	
B Responses to Comments on Draft Inspection Plan	

## FIGURES

1 NBK Keyport Vicinity Map	5
2 Area 8 Plan View	7
3 Building 82 Vapor Intrusion Conceptual Site Model	12
4 Building 85 Vapor Intrusion Conceptual Site Model	15
5 Building 98 Vapor Intrusion Conceptual Site Model	17
6 Building 82 Floor Plan	23
7 Building 85 Floor Plan	25
8 Building 98 Floor Plan	27
9 Building 82 First Floor Sample Locations	29
10 Building 98 Sample Locations	31

## TABLES

1 Inspection and Sampling Schedule	19
------------------------------------	----



This page intentionally left blank

---

## ABBREVIATIONS AND ACRONYMS

1,1-DCE	1,1-dichloroethene
AF	attenuation factor
BSAF	building-specific attenuation factor
bgs	below ground surface
cDCE	cis-1,2-dichloroethene
COC	contaminant of concern
CSM	conceptual site model
cVOC	chlorinated volatile organic compound
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency, United States
ESD	explanation of significant difference
HVAC	heating, ventilation, and air conditioning
IC	institutional control
ID	identification
LTM	long-term monitoring
mg/kg	milligram per kilogram
MMA	Management and Monitoring Approach
msl	mean sea level
MTCA	Model Toxics Control Act
NAVFAC	Naval Facilities Engineering Systems Command
NAVSEA	Naval Sea Systems Command
Navy	United States Department of the Navy
NBK	Naval Base Kitsap
NW	Northwest
OU	Operable Unit
PAL	project action limit
PCE	tetrachloroethene
QAPP	quality assurance project plan
RAO	remedial action objective
RG	remediation goal
ROD	record of decision
RPM	remedial project manager
SVOC	semi-volatile organic compound
TCE	trichloroethene
tDCE	trans-1,2-dichloroethene
U.S.	United States
UST	underground storage tank
VC	vinyl chloride
VI	vapor intrusion
VISL	Vapor Intrusion Screening Level
VOC	volatile organic compound



This page intentionally left blank

## 1. Introduction

This Management and Monitoring Approach (MMA) Plan was developed to support vapor intrusion (VI) monitoring activities at buildings north and west of the former plating shop comprising Operable Unit (OU) 2, Area 8 of Naval Base Kitsap (NBK) in Keyport, Washington (Figure 1 and Figure 2). This MMA Plan provides details for inspections and indoor air and sub-slab vapor sampling at Buildings 82, 85, and 98 to monitor the VI pathway and collect information to support the consideration of monitoring program adjustments or mitigation, if required.

This Plan was prepared by AECOM Technical Services under subcontract to Battelle Memorial Institute through United States (U.S.) Department of the Navy (Navy) contract N3943016D1802, Task Order N3943018F4355.

NBK Keyport is the west coast Naval Undersea Warfare Center for the Navy. NBK Keyport occupies 340 acres (including tidelands) adjacent to Keyport in Kitsap County, Washington, on a small manmade peninsula in the central portion of the Puget Sound. The peninsula is surrounded by Dogfish and Liberty Bays to the northwest and Port Orchard bay to the north and east. Marine and brackish water bodies on and near the site consist of Liberty Bay, Dogfish Bay, the tide flats, a marsh, and a shallow lagoon. Freshwater bodies include two creeks discharging into the marsh pond and two creeks discharging into the lagoon. The topography of the site rises gently from the shoreline to an average of 25 to 30 feet above mean sea level (msl), and then rises steeply at the southeast corner of the facility to approximately 130 feet above msl.

The OU 2 Record of Decision (ROD) was executed in September 1994. At Area 8, the OU 2 ROD requires long-term monitoring (LTM) of groundwater and a groundwater seep, and institutional controls (ICs) (Navy, U.S. Environmental Protection Agency [EPA], and Washington State Department of Ecology [Ecology] 1994). The vapor pathway is currently not considered in the OU 2 ROD. In 2015, a VI study was recommended in the Fourth Five-Year Review following new EPA risk-based VI Guidance (EPA 2015). A soil vapor investigation was completed in 2017 (Navy 2018a), and a VI study was completed in 2019 (Navy 2020a).

Recommendations made in the 2019 VI study (Navy 2020a) have been incorporated in this MMA Plan.

### 1.1 SITE LOCATION AND HISTORY OF OU 2, AREA 8

Area 8 occupies approximately 1 acre on the eastern portion of NBK Keyport (Figure 2), encompassing the location of the former plating shop (Building 72). Area 8 is located on a manmade peninsula in a heavily industrialized part of the base. The area is predominantly flat and almost entirely paved or covered by buildings. A parking lot is currently present on the site of the former plating shop (former Building 72), which was demolished in 1999. From Hunnicutt Street and H Street, the shoreline drops steeply approximately 12 feet to the intertidal area of the adjacent beach (Figure 2). The embankment is reinforced by an armor rock wall to the south, beyond Hunnicutt Street, and transitions to a concrete seawall to the east beyond H Street.

Past releases at Area 8 include chrome plating solutions spilling onto the ground; plating wastes discharging to a utility trench; and plating solutions leaking through cracks in the Building 72 plating shop floor, waste disposal pipes, and sumps during plating shop operations. These chrome plating solutions and plating wastes contained chlorinated volatile organic compounds (cVOCs) and metals. Petroleum hydrocarbons (diesel and heavy oil) were also released to the environment from leaky underground storage tanks (USTs) and underground concrete vaults located within Area 8.

The OU 2 ROD was signed in 1994 (Navy, EPA, and Ecology 1994), and identified volatile organic compounds (VOCs) and metals (arsenic, cadmium, and chromium) as the contaminants of concern (COCs) associated with Area 8.

VOCs and metals were identified as COCs for groundwater, based on residential use of groundwater as drinking water and inhalation of water vapor during household use. Selected remedies for the site include removal of vadose zone soil hot spots for offsite disposal, continued groundwater, seep water, sediment, and tissue monitoring, and ICs to restrict residential use of the site.

Arsenic and cadmium concentrations in subsurface soil were identified as major contributors to future resident's risk during household use and ingestion of produce grown in the soil.

Semi-volatile organic compounds (SVOCs) associated with the petroleum release were detected in soil at concentrations below Washington State Model Toxics Control Act (MTCA) Method B cleanup levels based on soil ingestion, protection of drinking water, and protection of surface water standards, and were not included as COCs.

Following the signing of the OU 2 ROD, the Navy performed the following remedial actions:

1. Demolition of Building 72, the former plating shop, and removal/disposal of soil hot spots above the water table in July 1998 and March 1999. Soil removal was based on cadmium and chromium concentrations exceeding 1999 MTCA Method B cleanup levels for soil ingestion (80 milligrams per kilogram [mg/kg] for cadmium and 400 mg/kg for chromium) (Navy 1999).
2. Removal of USTs northeast and south of former Building 72 and excavation of petroleum-contaminated soil associated with these USTs. Slurry walls were constructed at the location of the former USTs (immediately northeast and south of the former plating shop) to provide shoring during excavations. These slurry walls impact contaminant migration in their vicinity.
3. Implementation of ICs, beginning in 2000, to prevent exposure to soil and groundwater containing site COCs at concentrations exceeding the thresholds for residential use.
4. Installation and LTM of four groundwater wells starting in 1995.
5. Sediment and tissue LTM in the intertidal zone of the beach adjacent to Area 8 starting in 1996 and continuing every 4 years or less thereafter, including 2000, 2004, 2008, 2012 (sediment only), 2015, and 2016.
6. Evaluation of human health and ecological risks associated with site groundwater contamination discharging to the adjacent beach using tissue and sediment data.
7. Execution of independent remedial actions under MTCA related to past petroleum releases (Navy 2000).

The OU 2 ROD also calls for implementation of contingent groundwater control actions if Area 8 groundwater is found to present an unacceptable risk to human health or the environment based on sediment and tissue monitoring on the adjacent beach. A human health and ecological risk assessment encompassing sediments and clam tissue was completed in 2015 and 2016 (Navy 2018a). No risk to human health was identified, but a potential ecological risk was identified. The 2019 ecological risk assessment addendum (Navy 2020b) found that acute and chronic exposure to accumulated site COCs in intertidal zone sediment on the beach adjacent to OU 2 Area 8 poses a current hazard to benthic



organisms based on the bioassay results/endpoints. As a result, the Navy is conducting a supplemental remedial investigation to support selection of a contingent groundwater control action.

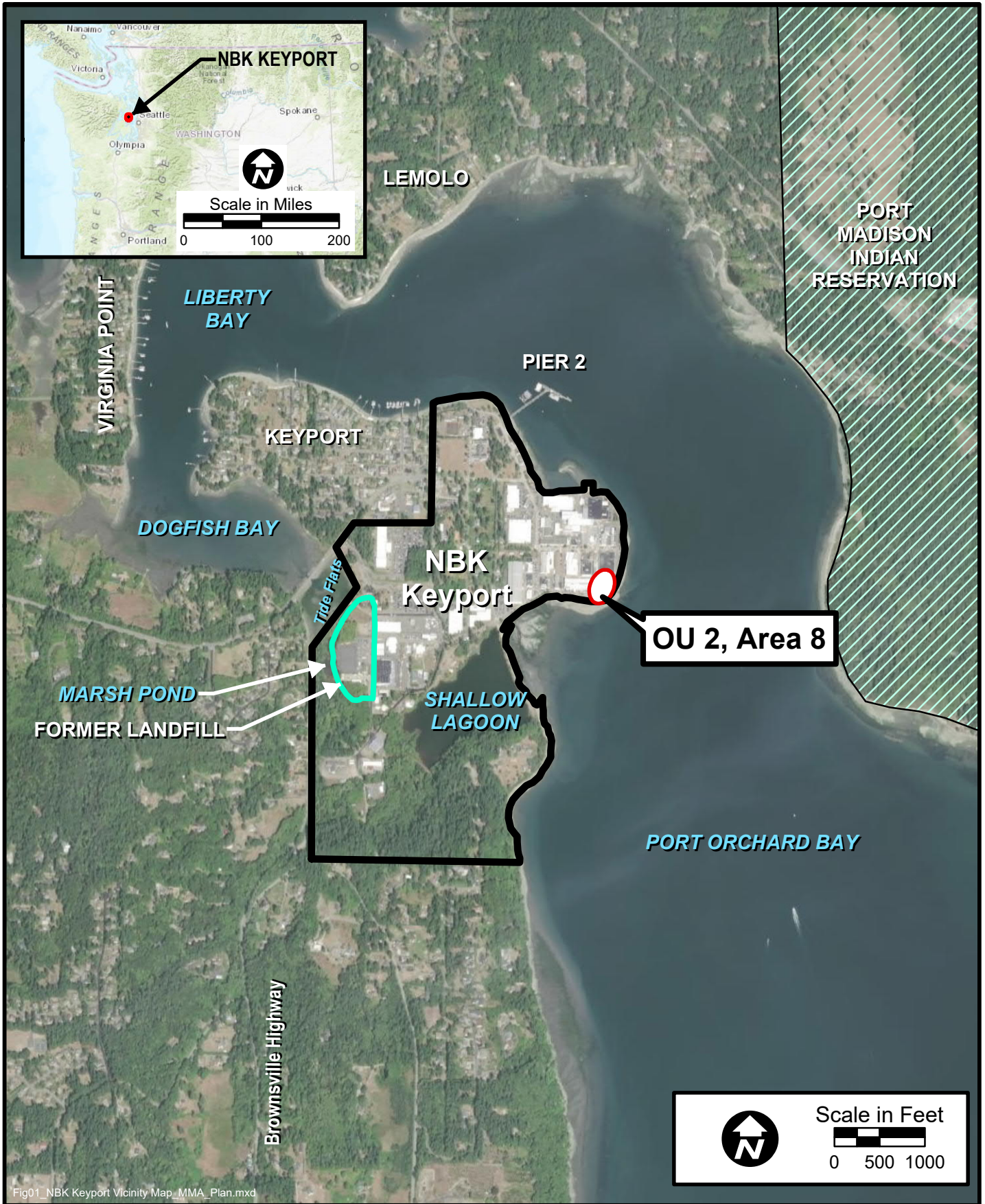
Starting in 1995, groundwater samples were analyzed for inorganics, including arsenic, cadmium, chromium (total), hexavalent chromium, copper, lead, mercury, nickel, silver, thallium, zinc, and cyanide. Although an explanation of significant differences (ESD) was signed in 1996 that directed: "In determining the quantity of soils to be excavated during Phase 1, total chromium will be tested for and assumed to be all hexavalent chromium (Cr VI)" (Navy, EPA and Ecology 1996), chromium speciation was not discontinued until after the sampling event in 2000, when recommended. Subsequently, all measured total chromium values have been assumed to be 100 percent hexavalent chromium (Navy 2001). Following the 2002 sampling event, analysis of groundwater for cyanide was discontinued because it had not been detected since 1998.

The Fourth Five-Year Review (Navy 2015) concluded that a VI study was warranted based on new EPA risk-based VI Guidance (EPA 2015) requiring a VI study when VOC compounds in groundwater exceedance current Ecology MTCA Method C (Industrial) groundwater VI screening levels and are within 100 feet of occupied buildings. The primary potential human health VI pathway receptors for Area 8 are workers in buildings within 100 feet of contaminated groundwater, including Buildings 82 and 98. Although over 100 feet away, Buildings 1074 and 85 were included in the VI study, in an abundance of caution. Building 1074 houses a large number of employees and, although Building 85 is currently used for storage, the Navy believed that VI data was necessary for future planning purposes.

In November 2017, a soil vapor investigation was conducted at Area 8 (Navy 2018b). Six soil vapor wells were installed and sampled at locations adjacent to Buildings 82 and 98, nearest the cVOC exceedances in groundwater. The soil vapor wells were designed as dual-completion wells, screened immediately above the first occurrence of groundwater (typically 10 feet below ground surface [bgs]), and at 5 feet bgs. Due to shallower-than-expected groundwater conditions observed during well installation, only five of the six deeper wells were installed. Ultimately, a deep sample was collected at just one of the five locations due to higher than expected groundwater levels. Shallower samples were collected successfully from all six locations at approximately 5 feet bgs. Soil vapor samples were analyzed for a list of VOCs based on the COCs associated with Area 8, as documented in the OU 2 ROD, and also for 1,4-dioxane based on more recent detections in groundwater. Detected concentrations of VOCs exceeded their respective project action limits (PALs) in five of seven samples. The 2017 soil vapor investigation report recommended additional investigation of the VI pathway at Area 8, including VOC migration along preferential pathways.

In 2019, an indoor VI study was conducted at Buildings 82, 95, 98, and 1074 (Navy 2020a). Indoor air, outdoor air, and sub-slab vapor samples were collected, and differential pressure was monitored in both early spring (April 2019) and summer (July 2019) to account for the seasonal variability of VI potential. Indoor air samples were collected from areas regularly occupied by workers and each was collocated with a sub-slab vapor sample to the extent possible, while outdoor air samples were collected to be representative of upwind outdoor air. The April 2019 sampling event included six outdoor air samples, 30 indoor air samples, and 28 sub-slab vapor samples. The July 2019 sampling event included four outdoor air samples, 29 indoor air samples, and 28 sub-slab vapor samples. Detected concentrations of VOCs exceeded their respective PALs in sub-slab vapor samples in Buildings 82, 85, and 98; however, VOCs were not detected in the paired indoor air samples, with the exception of trans-1,2-dichloroethene (tDCE) which exceeded its PAL in Building 98 indoor air. The investigation concluded that the trans-1,2-dichloroethene concentration detected exceeding the PAL in indoor air was the result of an indoor background sources. While the VI pathway is not currently a

complete exposure pathway, additional inspections and sampling were recommended to ensure no future risks go undetected. Annual use monitoring was recommended for Building 85, which is used for general storage and is not regularly occupied. Annual building and foundation inspections and paired sub-slab vapor and indoor air monitoring every 5 years were recommended for Buildings 82 and 98. No further actions were recommended for Building 1074, where no indoor air or sub-slab vapor exceedances were observed.



**U.S. NAVY**

**Figure 1  
NBK Keyport Vicinity Map**

CTO N3943018F4355  
NBK Keyport, Area 8  
Indoor Vapor MMA Plan

This page intentionally left blank





**U.S. NAVY**

**Figure 2  
Area 8 Plan View**

CTO N3943018F4355  
 NBK Keyport, Area 8  
 Indoor Vapor MMA Plan

This page intentionally left blank



## 2. Current Conceptual Site Model

Area 8 occupies approximately 1 acre on the eastern portion of NBK Keyport, on a manmade peninsula within a heavily industrialized area and currently encompasses a parking lot. The parking lot is on the site of a former plating shop (former Building 72), which was demolished in 1999. The area is predominantly flat, almost entirely paved, and surrounded by industrial buildings.

The five geologic units identified at Area 8 are described in a site-wide geologic cross-section in the OU 2 ROD (Navy, EPA, and Ecology 1994). The upper unit consists primarily of silty gravelly sand fill and is approximately 3 to 13 feet thick. The unit below that, the Vashon Advance Outwash, consists of dense sand, gravel, and some silt. The depth to groundwater at Area 8 is generally less than 10 feet bgs. The upper aquifer is thought to be 50 to 154-feet thick. Water elevations from wells screened at the bottom and the top of the aquifer show a vertical groundwater gradient that indicates a potential for upward flow. Horizontal groundwater flow is generally eastward toward the shore, though intermittent reversals near the shore are inferred due to tidal influences.

Two classes of contaminants have been identified as COCs for Area 8: VOCs and metals. The SVOC 1,4-dioxane was added to the LTM program as an emergent COC for the site following the Third Five-Year Review (Navy 2010), after having been identified in site groundwater.

The current conceptual site model (CSM) identifies VOCs and metals as COCs due to risks associated with exposure to soil, groundwater, and produce by future hypothetical residents and the potential for human health and ecological exposure from contaminants discharging to Port Orchard Bay impacting marine sediment and tissue (Navy 2015). VOCs and metal concentrations above OU 2 ROD Remediation Goals (RGs) remain in the upper aquifer. Concentration trends are generally stable or decreasing, except at two locations where trichloroethene (TCE) is exhibiting increasing trends (Navy 2015). Continued monitoring of groundwater and an intertidal seep is intended to confirm the effectiveness of the remedies (source removal, monitored natural attenuation, and ICs) and document progression toward achieving RGs.

Data generated to date indicate that solvents used in former Building 72 or other former adjacent buildings and metals from plating activities conducted in former Building 72 have impacted shallow groundwater, subsurface soils, and downgradient groundwater seeps, surface water, and sediments in Port Orchard Bay. The 2017 soil vapor investigation and 2019 indoor VI study identified cVOCs in soil gas and sub-slab vapor adjacent to and beneath Buildings 82 and 98, indicating that previously unknown sources may be present.

The vapor pathway is currently not considered in the OU 2 ROD. Consideration of the vapor pathway began in 2017, following publication of new EPA risk-based VI Guidance (EPA 2015). A VI CSM was developed for Buildings 82, 85, and 98 after interpretation of the 2019 VI study results. No further action was required for Building 1074 because both indoor and sub-slab vapor concentrations were below PALs, therefore, a VI CSM was not developed.

### 2.1 BUILDING 82

Figure 3 presents a VI CSM for Building 82. The evidence collected to date suggests a source of VOCs is present in groundwater near the building, with TCE detected above its groundwater Vapor Intrusion Screening Level (VISL) at several nearby groundwater wells and tetrachloroethene (PCE) and 1,1-dichloroethene (1,1-DCE) also detected above their groundwater VISLs, but at lower frequencies. The nearest monitoring well is located approximately 100 feet to the east of Building 82 and within the former plating shop area. No groundwater wells are located to the west, north, or south of the

building. Thus, there is some uncertainty as to the distribution of cVOC concentrations in groundwater adjacent to and directly below Building 82.

TCE, PCE, and tDCE were detected above their respective PALs at one nearby exterior soil vapor sample location (SV-1), and TCE was detected above its PAL at a second nearby exterior soil vapor sample location. TCE also was detected above its PAL at five sub-slab vapor locations and above its building-specific screening level (based on the building-specific attenuation factor [BSAF]) at three locations. tDCE detections above its indoor air PAL at six locations during the July sampling event were attributed to an indoor background source rather than VI (Figure 3-18, [Navy 2019 and 2020a]). TCE and PCE were not detected above their indoor air PALs.

Based on this evidence, the VI pathway at Building 82 is currently not of concern. However, given the presence of sub-slab vapor concentrations of TCE above its building-specific screening level in certain locations, ICs are recommended, such as periodic (e.g., annual) inspection of the integrity of the entire building floor slab and identification of any changes in building ventilation that could potentially increase the soil vapor entry rate or decrease the building air flow rate (i.e., ceiling height and/or air exchange rate). Inspections should focus on those areas where sub-slab vapor TCE concentrations were detected above the building-specific screening level, which includes the east side of the building. In addition, sampling of indoor air and sub-slab vapor every 5 years is recommended in support of five-year review reporting. Sampling will be conducted during conditions favorable to VI (i.e., naturally depressurized conditions, as may occur during the heating season) and approximately two years prior to the next five-year review due date. These ICs should remain in place until completion of the groundwater remedy or demolition of the building. A description of the Building Inspection and Monitoring Plan is provided in Section 3.

Due to the lack of groundwater or exterior soil vapor data on the north, west, and south sides of the building, some additional characterization may be warranted to determine if there is a source of sub-slab vapors in addition to the former plating shop area.

## **2.2 BUILDING 85**

Figure 4 presents a VI CSM for Building 85. The evidence collected to date suggests a source of VOCs is present in groundwater near/beneath the building, with TCE detected above its groundwater VISL at groundwater wells to the southeast, and PCE and 1,1-DCE also detected above their groundwater VISLs, but to a lesser degree. The nearest monitoring well is located approximately 200 feet to the southeast of Building 85 and within the former plating shop area. No groundwater wells are located to the west and north of the building. Thus, there is some uncertainty as to the distribution of cVOC concentrations in groundwater adjacent to and directly below Building 85.

TCE was detected above its PAL in one nearby exterior soil vapor sample location (SV-3) in 2017, and TCE and PCE were detected above their respective PALs at one sub-slab vapor sample location at the north end of the building; however, all sub-slab vapor concentrations were below the building-specific screening levels. Indoor air sampling showed that all target VOCs were below PALs, including TCE and PCE.

Based on this evidence, the VI pathway at Building 85 is currently not of concern. Because of the presence of sub-slab vapor concentrations of PCE and TCE above PALs, ICs are recommended, such as annual monitoring of building use. If the building use is revised to include human occupation of the north end of the building, then annual building inspection and indoor air and sub-slab vapor sampling every 5 years are recommended. If implemented based on a change in building occupancy at Building 85, building inspections should include inspection of the integrity of the building floor slab and identification of any changes in building ventilation that could potentially increase the soil vapor entry



rate or decrease the building air flow rate (i.e., ceiling height and/or air exchange rate). These inspections will focus on those areas where sub-slab vapor TCE and PCE concentrations were detected above the PALs (the northern portion of Building 85). Periodic indoor air and sub-slab vapor sampling at locations where sub-slab vapor concentrations exceeded the PALs for TCE and PCE will also be performed to assess the potential for future exceedances. The sampling events will be limited to every 5 years in support of five-year review reporting. Sampling will be conducted during conditions favorable to VI (i.e., naturally depressurized conditions, as may occur during the heating season) and approximately two years prior to the next five-year review due date. ICs should remain in place until completion of the groundwater remedy or demolition of the building. A description of the Building Inspection and Monitoring Plan is provided in Section 3.

Due to the lack of groundwater or exterior soil vapor data on the north and west sides of the building, some additional characterization may be warranted to determine if there is a source of sub-slab vapors unrelated to the former plating shop area.

### **2.3 BUILDING 98**

Figure 5 presents a VI CSM for Building 98. The evidence collected to date suggests a source of VOCs is present in groundwater near the building, with TCE detected above its groundwater VISL at several nearby groundwater wells and PCE and 1,1-DCE also detected above their groundwater VISLs, but at lower frequencies. The nearest monitoring well is located less than 100 feet to the south of Building 98 and within the former plating shop area. No groundwater wells are located to the west, north, or east of the building. Thus, there is some uncertainty as to the distribution of cVOC concentrations in groundwater adjacent to and directly below Building 98.

TCE was detected above its PAL in two nearby exterior soil vapor sample locations (SV-3 and SV-4). TCE also was detected above its PAL at seven sub-slab vapor sample locations and above its building-specific screening level (based on the BSAF) at four locations. PCE was detected above its PAL at one sub-slab vapor sample location, but this detection was below its building specific screening level. tDCE detections above its indoor air PAL at four locations over the two sampling events were attributed to an indoor background source (the vapor degreaser) rather than VI (as indicated by the empirical attenuation factors [AFs] for tDCE being greater than Ecology's default generic AF). TCE and PCE were not detected above their indoor air PALs.

Based on this evidence, the VI pathway at Building 98 is currently not of concern. Due to the presence of sub-slab vapor concentrations of TCE above its building-specific screening level in certain locations, ICs are recommended, such as annual inspection of the integrity of the entire building floor slab and identification of any changes in building ventilation that could potentially increase the soil vapor entry rate or decrease the building air flow rate (i.e., ceiling height and/or air exchange rate). Inspections should focus on those areas where sub-slab vapor TCE concentrations were detected above the building-specific screening level, which includes the main workshop area and the large enclosed workshop in the southeast quadrant of the building. In addition, sampling of indoor air and sub-slab vapor every 5 years is recommended in support of the five-year reviews. Sampling will be conducted during conditions favorable to VI (i.e., naturally depressurized conditions, as may occur during the heating season) and approximately two years prior to the next five-year review due date. ICs should remain in place until completion of the groundwater remedy or demolition of the building. A description of the Building Inspection and Monitoring Plan is provided in Section 3.

Due to the lack of groundwater or exterior soil vapor data on the east, north, and west sides of the building and the higher sub-slab vapor concentrations in areas of the building that are farther from the former plating shop area, additional characterization is being conducted under a different Task Order to determine if there is an additional source of sub-slab vapor.

This page intentionally left blank

VI Pathway Questions	PCE	TCE	11DCE	cDCE	tDCE	VC	Building Factors			
							Building Ventilation	Slab Condition	Preferential Pathways	
Indoor sources? Detected in Indoor Air?	Yes < PAL <sub>IA</sub>	Potential < PAL <sub>IA</sub>	No < PAL <sub>IA</sub>	Suspected Yes (NE)	Yes > PAL <sub>IA</sub> (6 locations, July only)	No No	various	good, mostly coated concrete	utility corridors, trench drain, vault	
Empirical Sub-Slab AF?	BSAF = 0.006						NA			
Detected in Sub-Slab Vapor?	< SL <sub>SS,BSAF</sub>	> SL <sub>SS,BSAF</sub> (3 locations)	< SL <sub>SS,BSAF</sub>	Yes (NE)	< SL <sub>SS,BSAF</sub>	No				
Detected in Nearby Soil Gas? (2017)	< PAL <sub>SS</sub>	> PAL <sub>SS</sub> (5 locations)	< PAL <sub>SS</sub>	Yes (NE)	< PAL <sub>SS</sub>	No				
Detected in Site Groundwater? (1991-2016)	> VISL <sub>GW</sub> (10 of 287 samples)	> VISL <sub>GW</sub> (218 of 278 samples)	> VISL <sub>GW</sub> (1 of 277 samples)	Yes (NE)	< VISL <sub>GW</sub>	< VISL <sub>GW</sub>	silty, gravelly sand fill	< 10 ft bgs	utility lines	

Likely Source of Indoor Exceedance(s)      None      None      None      None      Indoor      None

Likely Source of Soil Gas Exceedance(s)      Groundwater Source      Groundwater Source      None      None      Vadose Zone Source      None

- Legend**
- < PAL<sub>IA</sub>      Indoor air concentrations less than MTCA Method C (Industrial) indoor air screening level
  - > PAL<sub>IA</sub>      Indoor air concentrations greater than MTCA Method C (Industrial) indoor air screening level
  - Vadose zone
  - > PAL<sub>SS</sub> or > SL<sub>SS,BSAF</sub>      Sub-slab or soil vapor concentrations greater than MTCA Method C (Industrial) sub-slab screening level or the building-specific screening level
  - Groundwater
  - > VISL<sub>GW</sub>      Groundwater concentrations greater than MTCA Method C (Industrial) groundwater VI screening levels

Empirical sub-slab AF = (indoor air concentration)/(sub-slab vapor concentration) for collocated samples, if maximum is greater than the default generic AF of 0.03, suggests an indoor source

AF - attenuation factor

BSAF - building-specific attenuation factor

ft bgs - feet below ground surface

NA - not applicable

NE - PAL or screening level not established

PAL<sub>SS</sub> - project action limit for sub-slab vapor or shallow soil vapor

SL<sub>SS,BSAF</sub> - building-specific screening level for sub-slab vapor

VISL<sub>GW</sub> - vapor intrusion screening level for groundwater

This page intentionally left blank

VI Pathway Questions	PCE	TCE	11DCE	cDCE	tDCE	VC	Building Factors		
							Building Ventilation	Slab Condition	Preferential Pathways
Indoor sources? Detected in Indoor Air?	No < PAL <sub>IA</sub>	No < PAL <sub>IA</sub>	No No	No No	No < PAL <sub>IA</sub>	No No	none	fair, some large cracks	former and currently present trench drain, sump
Empirical Sub-Slab AF?	BSAF = 0.0001						Subsurface Factors		
Detected in Sub-Slab Vapor?	< SL <sub>SS,BSAF</sub>	< SL <sub>SS,BSAF</sub>	< SL <sub>SS,BSAF</sub>	No	No	No	Soil Type	Depth to groundwater	Preferential Pathways
Detected in Nearby Soil Gas? (2017)	> PAL <sub>SS</sub> (1 location)	> PAL <sub>SS</sub> (1 location)	< PAL <sub>SS</sub>	No	No	No	silty, gravelly sand fill	< 10 ft bgs	utility lines
Detected in Site Groundwater? (1991-2016)	< PAL <sub>SS</sub>	> PAL <sub>SS</sub>	No	Yes (NE)	< PAL <sub>SS</sub>	No			
Likely Source of Indoor Exceedance(s)	None	None	None	None	None	None			
Likely Source of Soil Gas Exceedance(s)	Groundwater Source	Groundwater Source	None	None	None	None			

**Legend**

- < PAL<sub>IA</sub> Indoor air concentrations less than MTCA Method C (Industrial) indoor air screening level
- > PAL<sub>IA</sub> Indoor air concentrations greater than MTCA Method C (Industrial) indoor air screening level
- Vadose zone
- > PAL<sub>SS</sub> or > SL<sub>SS,BSAF</sub> Sub-slab or soil vapor concentrations greater than MTCA Method C (Industrial) sub-slab screening level or the building-specific screening level
- Groundwater
- > VISL<sub>GW</sub> Groundwater concentrations greater than MTCA Method C (Industrial) groundwater VI screening levels

Empirical sub-slab AF = (indoor air concentration)/(sub-slab vapor concentration) for collocated samples, if maximum is greater than the default generic AF of 0.03, suggests an indoor source

AF - attenuation factor

BSAF - building-specific attenuation factor

ft bgs - feet below ground surface

NA - not applicable

NE - PAL or screening level not established

PAL<sub>SS</sub> - project action limit for sub-slab vapor or shallow soil vapor

SL<sub>SS,BSAF</sub> - building-specific screening level for sub-slab vapor

VISL<sub>GW</sub> - vapor intrusion screening level for groundwater

This page intentionally left blank

VI Pathway Questions	PCE	TCE	1,1-DCE	cDCE	tDCE	VC	Building Factors		
							Building Ventilation	Slab Condition	Preferential Pathways
Indoor sources? Detected in Indoor Air?	No < PAL <sub>IA</sub>	Potential < PAL <sub>IA</sub>	No < PAL <sub>IA</sub>	Suspected < PAL <sub>IA</sub>	Yes > PAL <sub>IA</sub> (4 locations)	No < PAL <sub>IA</sub>	various	good, mostly coated concrete	utility corridors
Empirical Sub-Slab AF?	> 0.03	> 0.03	NA BSAF = 0.005	> 0.03	> 0.03	NA	Subsurface Factors		
Detected in Sub-Slab Vapor?	< SL <sub>SS,BSAF</sub>	> SL <sub>SS,BSAF</sub> (4 locations)	No			No	Soil Type	Depth to groundwater	Preferential Pathways
Detected in Nearby Soil Gas? (2017)	> PAL <sub>SS</sub> (1 location)	> PAL <sub>SS</sub> (7 locations)	No	< PAL <sub>SS</sub>	< PAL <sub>SS</sub>	No	silty, gravelly sand fill	< 10 ft bgs	utility lines
Detected in Site Groundwater? (1991-2016)	< PAL <sub>SS</sub>	> PAL <sub>SS</sub>	< PAL <sub>SS</sub>	Yes (NE)	< PAL <sub>SS</sub>	No			
	> VISL <sub>GW</sub> (10 of 287 samples)	> VISL <sub>GW</sub> (218 of 278 samples)	> VISL <sub>GW</sub> (1 of 277 samples)	Yes (NE)	< VISL <sub>GW</sub>	< VISL <sub>GW</sub>			

Likely Source of Indoor Exceedance(s)

None      None      None      None      Indoor      None

Likely Source of Soil Gas Exceedance(s)

Groundwater Source      Groundwater Source      None      None      None      None

**Legend**

- < PAL<sub>IA</sub>      Indoor air concentrations less than PAL
- > PAL<sub>IA</sub>      Indoor air concentrations greater than PAL
- Yellow background      Vadose zone
- > PAL<sub>SS</sub> OR > SL<sub>SS,BSAF</sub>      Sub-slab or soil vapor concentrations greater than MTCA Method C (Industrial) sub-slab screening level or the building-specific screening level
- Blue background      Groundwater
- > VISL<sub>GW</sub>      Groundwater concentrations greater than MTCA Method C (Industrial) groundwater VISL

Empirical sub-slab AF = (indoor air concentration)/(sub-slab vapor concentration) for collocated samples, if maximum is greater than the default generic AF of 0.03, suggests an indoor source

AF - attenuation factor

BSAF - building-specific attenuation factor

ft bgs - feet below ground surface

NA - not applicable

NE - PAL or screening level not established

PAL<sub>SS</sub> - project action limit for sub-slab vapor or shallow soil vapor

SL<sub>SS,BSAF</sub> - building-specific screening level for sub-slab vapor

VISL<sub>GW</sub> - vapor intrusion screening level for groundwater

This page intentionally left blank



### 3. Management and Monitoring Approach

#### 3.1 SELECTED MONITORING APPROACH

As stated above, the vapor pathway was not considered in the OU 2 ROD. Therefore, there are no ROD-specified remedial action objectives (RAOs) or RGs applicable to vapor. Consideration of the vapor pathway began in 2017, following a new EPA risk-based VI Guidance.

The 2019 VI study (Navy 2020a) recommended periodic monitoring of Buildings 82, 85, and 98, and the regulator/stakeholder team concurred with this recommendation, which establishes the requirement for monitoring. The required periodic monitoring includes an annual assessment of building use, annual inspection of buildings and foundations, and sampling of indoor air and sub-slab vapor every 5 years in Buildings 82 and 98. The VI pathway associated with Building 85 is currently not of concern, as there is a low potential for VI under current building conditions. Building 85 is primarily used for storage, and no employees work full time in the building. Therefore, only annual building use/occupation monitoring is required to assess whether building use has been or is planned to be revised. If a change in building use that includes occupation of the north end of the Building 85 is identified, then sampling of indoor air and sub-slab vapor every 5 years will be added to the monitoring program. The VI pathways associated with Buildings 82 and 98 are also currently not of concern. However, sub-slab vapor TCE concentrations exceed building-specific screening levels, indicating there is a potential for VI under current conditions. Therefore, annual building inspections, along with sub-slab vapor and indoor air monitoring every 5 years, are being implemented for both Building 82 and Building 98.

A Building Inspection and Monitoring Plan has been developed as part of this Plan and includes a checklist for inspecting the floor slab condition and building ventilation as part of the annual building inspections. Sub-slab vapor and indoor air sampling will be conducted every 5 years, approximately two years prior to five-year review due dates, in January (representing winter conditions) and July (representing summer conditions). With this schedule, the next sampling event would take place in 2023. The Building Inspection and Monitoring Plan includes the possibility of conducting monitoring sooner than every 5 years, if an event that could change building conditions, such as an earthquake, takes place. If the results from the two seasons of sampling are equivalent for decision-making purposes for the 2023 sampling event, then the monitoring program may be reduced to winter only for subsequent monitoring events. Results and findings of the monitoring events will be documented in a report as described in Section 4. Inspection and indoor vapor monitoring frequency are summarized in Table 1.

**Table 1: Inspection and Sampling Schedule**

2021	2022	2023
<ul style="list-style-type: none"> <li>Assess use/occupation at Buildings 82, 85, and 98</li> <li>Inspect Buildings 82 and 98</li> </ul>	<ul style="list-style-type: none"> <li>Assess use/occupation at Buildings 82, 85, and 98</li> <li>Inspect Buildings 82 and 98</li> </ul>	<ul style="list-style-type: none"> <li>Assess use/occupation at Buildings 82, 85, and 98</li> <li>Inspect Buildings 82 and 98</li> <li>Conduct indoor vapor and sub-slab sampling at Buildings 82 and 98, one event during winter and one event during summer</li> </ul>

### 3.1.1 Contaminants of Concern and Project Action Limits

Contaminants identified as VI COCs and their associated PALs are described in this section.

#### CONTAMINANTS

Indoor air and sub-slab vapor samples will be analyzed for target compounds:

- PCE
- TCE
- 1,1-DCE
- cis-1,2-Dichloroethene (cDCE)
- tDCE
- Vinyl Chloride (VC)

#### PROJECT ACTION LIMITS

The objective of this Plan is to guide annual visual inspections and interviews, as agreed to by the Keyport Project Team; therefore, PALs do not apply to the work being completed under this Plan. PALs will be developed for future indoor air and sub-slab sampling events based on the guidance and action levels at the time.

### 3.2 MONITORING IMPLEMENTATION AND EVALUATION

The three buildings at NBK Keyport Area 8 subject to VI inspections and sampling are controlled by the Naval Sea Systems Command (NAVSEA) and are some of the most secure buildings on the installation. Staff in these buildings also have a strong union structure that must be respected during inspection and sampling. Navy contractors performing VI inspections and sampling must be aware of, and comply with, the latest versions of the following guidelines:

- Separate badging for both the region (NBK) and NAVSEA is required to pass the main gate and enter buildings, respectively.
- Escorts are required when working inside these buildings, including both a Naval Facilities Engineering Systems Command (NAVFAC) Northwest (NW) representative and a NAVSEA escort, coordinated in advance through the NAVFAC NW remedial project manager (RPM). NAVSEA personnel are typically limited to their normal work hours for escort duty, and this can particularly impact deployment and retrieval of sampling devices that must collect samples for a full eight hours.
- Walking through workspaces or placing sampling devices (such as Summa canisters, which look suspicious) within work areas requires advance notification and planning through both installation security and the unions. Union representatives must be provided with notification language that can be disseminated to all employees in the workspace in advance of the work. An example of this notification is provided in Appendix A.
- The parking at Area 8 near these buildings is assigned to union employees and an outage request must be approved in advance for Navy contractors to occupy parking spaces during VI inspections and/or sampling. The parking area can fill completely, so it is often necessary to block off the needed and approved spaces the night before field work, with the blocked spaces displaying a copy of the approved outage request.

### 3.2.1 Foundation and Building Inspections

On-site building inspections will be conducted annually at Buildings 82 and 98. During each building inspection, the following information will be collected for comparison to the equivalent information collected during the building inspections conducted on November 14 and 15, 2018:

- Current building use/occupation.
- Changes to building footprint or square footage.
- Current approximate number of employees and typical working hours.
- Changes to building structure description (i.e., number of floors, location of utilities, etc.).
- Visual inspection of the slab conditions and floor covering types, including new or changed cracks or perforations.
- Heating, ventilation, and air conditioning (HVAC) types, operation, and any other pertinent ventilation notes (i.e., mechanical fans or open roll up door, etc.).
- Inventory of identified chemicals that could be sources of indoor air contaminants (i.e., cleaning supplies, paints, solvents, fuels, and other chemicals).
- Annotated map of the building with a depiction of the current floor plan, locations of possible soil vapor entry points, such as drains, vents, sinks, and utility penetrations, etc., as compared to Figures 6 through 8, which are based on the 2018 building inspections.
- To support this annual inspection, interviews will be conducted with building managers, the NAVFAC NW RPM, and the Keyport environmental manager. Interviewees will be asked to provide information relevant to the building inspections, as described in the previous bullets, including building foundation condition, changes to building use, occupation or layout, and changes to HVAC systems.
- Current building use/occupation will also be evaluated annually for Building 85. The findings of these annual building inspections will be recorded on the field form provided in Appendix A.

### 3.2.2 Indoor Air and Sub-slab Vapor Sampling

Indoor air and sub-slab vapor sampling and analysis will be conducted once every 5 years at Buildings 82 and 98. Indoor air and sub-slab vapor were sampled in 2019 as part of the initial VI study, with the next event planned for 2023. Indoor air and sub-slab vapor samples are collected from seven locations in Building 82 and 13 locations in Building 98. Sampling locations are summarized for Buildings 82 and 98 on Figures 9 and 10, respectively. An individual Quality Assurance Project Plan (QAPP) will be prepared for each round of indoor air and sub-slab vapor sampling.

This page intentionally left blank



***Technical Memorandum: 2023 Naval Base Kitsap Keyport  
Institutional Controls Inspection and Vapor Intrusion Monitoring  
Results, Naval Base Kitsap, Keyport, Washington***

**NOTIFICATION: ATTACHMENT D FIGURES 6-10 CONTAIN  
SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS  
PROTECTED BY THE FREEDOM OF INFORMATION ACT**

***FOIA Exemption 3 (5 USC 552(b)(3))  
10 USC Section 130(e) Treatment of Certain Critical  
Infrastructure Security Information***

**TO REQUEST A COPY OF THE DOCUMENT**

**PLEASE CONTACT**

**Department of the Navy  
Freedom of Information Act Office**

**<http://www.secnav.navy.mil/foia/Pages/default.aspx>**

**Distribute to U. S. Government Agencies Only**

This page intentionally left blank

## 4. Reporting

One report will be prepared following each annual building inspection-only event. For years where both annual building inspections and sub-slab and indoor air sampling occur, separate reports will be prepared for each event. The building inspection reporting format will follow the Management and Monitoring Report format, which in general follows this MMA Plan, or as prescribed by the Navy RPM. The report will contain the site history and CSM sections, as presented in this MMA Plan, along with a summary of field activities and figures showing findings, as applicable.

Indoor air and sub-slab soil vapor sampling results from both the winter and summer will be reported together following sampling, in the year immediately prior to the 5-year review report. The report will contain figures showing indoor air and sub-slab soil vapor sampling locations and results, as applicable, and analytical results will be compared to MTCA Method C and/or other appropriate screening levels, as agreed upon in collaboration with the Keyport Project Team.

## 5. References

- Department of the Navy (Navy). 1999. Closure Report, Remedial Action, Area 8, Building 72 Plating Shop Demolition and Soil Hot Spot Removal, Naval Undersea Warfare Center Division, Keyport, Washington. Prepared by Foster Wheeler Environmental Corporation for EFA Northwest. Keyport, WA.
- . 2000. Final Independent Remedial Action Report, TPH Soil Removal and Demolition of Building 804, Area 8, Operable Unit 2, Naval Undersea Warfare Division, Keyport, Washington. Prepared by Foster Wheeler Environmental Corporation. Keyport, WA.
- . 2001. Long-Term Monitoring Data Report, Former Plating Shop/Waste Oil Spill Area, Area 8, Operable Unit 2, Naval Undersea Warfare Center Division Keyport, Washington. Prepared by CH2M HILL Constructors, Inc., and TEC LTM Team.
- . 2010. Final Third Five-Year Review, Naval Base Kitsap Keyport, Operational Units 1 and 2, Keyport, Washington. Keyport, WA.
- . 2015. Fourth Five-Year Review, Naval Base Kitsap Keyport, Washington. Prepared by URS Group, Inc. Naval Facilities Engineering Command, Northwest.
- . 2018a. OU 2 Area 8 Human Health and Ecological Risk Assessment, Naval Base Kitsap Keyport, Keyport Washington. Prepared by Resolution Consultants, a Joint venture of AECOM and EnSafe. Keyport, WA: Naval Facilities Engineering Command, Northwest.
- . 2018b. Final 2017 Investigation Report, Vapor Intrusion Study, Operable Unit 2, Area 8, Naval Base Kitsap, Keyport, Washington. Prepared by Battelle Memorial Institute and Trihydro Corporation.
- . 2019. Final Sampling and Analysis Plan for Fiscal Year 2018 Keyport Area 8 Indoor Vapor Intrusion Study at Naval Base Kitsap Keyport, Keyport, Washington. Prepared by Battelle Memorial Institute and Geosyntec Consultants. Keyport, WA.
- . 2020a. Final Indoor Vapor Intrusion Study, Operable Unit 2, Area 8, Naval Base Kitsap, Keyport, Washington. Prepared by Battelle Memorial Institute and Geosyntec Consultants. Keyport, WA.

———. 2020b. Final Ecological Risk Assessment Addendum, Operable Unit 2, Area 8, Naval Base Kitsap, Keyport, Washington. Prepared by AECOM. Keyport, WA.

Navy, Environmental Protection Agency (EPA), and Washington State Department of Ecology (Ecology). 1994. Final Record of Decision for Operable Unit 2, Naval Undersea Warfare Center Division, Keyport, Washington. Keyport, WA.

———. 1996. Explanation of Significant Differences for the Record of Decision for Operable Unit 2, Naval Undersea Warfare Center Division, Keyport, Washington. Keyport, WA. March 15 (revised June 1).

Environmental Protection Agency, United States (EPA). 2015. OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. OSWER 9200.2-154. Office of Solid Waste and Emergency Response. June.



**Appendix A:  
Field Forms and Procedures**

This page intentionally left blank

**SITE INFORMATION**

Site name: Keyport OU 2 Area 8	Person & company performing inspection:
Building Number:	
Navy Contact/Escort:	Date:
Contact's Phone:	Time:
Contact's Email:	Weather & temperature:

**INTERVIEWS**

Personnel	Title	Date
Interviewed: at site / at office / by phone		
Problems, suggestion, recommendations:		
Personnel	Title	Date
Interviewed: at site / at office / by phone		
Problems, suggestion, recommendations:		
Personnel	Title	Date
Interviewed: at site / at office / by phone		
Problems, suggestion, recommendations:		
Personnel	Title	Date
Interviewed: at site / at office / by phone		
Problems, suggestion, recommendations:		

BUILDING USE

General Building Description

\_\_\_\_\_
\_\_\_\_\_
\_\_\_\_\_

What types of activities take place on each level of the building (e.g., office work, storage, machine repair, metal shop, painting, degreasing/cleaning?)

1st Floor \_\_\_\_\_

2nd Floor \_\_\_\_\_

3rd Floor \_\_\_\_\_

Rooftop \_\_\_\_\_

Building occupants (approximate number)"

Adults: \_\_\_\_\_ Office Staff: \_\_\_\_\_ Non-Office Staff: \_\_\_\_\_

Working Hours:

What are the normal working hours (e.g., 0700-1500, three 8-hour shifts)?

Are different work schedules ever used? \_\_\_\_\_
\_\_\_\_\_

Building Characteristics (circle all that apply)

Irrigation present: Yes / Yes (but not used) / No

Age of Building: \_\_\_\_\_

Age and description of separate additions or expansion: \_\_\_\_\_

Above grad construction: wood frame/ concrete/ stone/ brick / steel

Slab on grade / basement / crawlspace / other \_\_\_\_\_

Lowest level depth below grade: \_\_\_\_\_ ft

Foundation walls: poured / block / stone / other \_\_\_\_\_

Foundation walls: unsealed / sealed, sealed with \_\_\_\_\_

Is the building insulated? Yes / No

Are there gaps between footing and floor slab: Yes / No / NA

**Heating, Ventilation and Air Conditioning (HVAC)**

What type of HVAC system(s) are used in this building (circle all that apply - note primary, indicate location on map):

Hot air circulation / Heat pump / Hot water baseboard / Space Heaters / Steam Radiation / Hot air radiation / Radiant floor / Electric baseboard / Wood stove / outdoor wood boiler / None / Other

The primary type of fuel used is: Natural Gas / Fuel Oil / Kerosene / Electric / Propane / Solar / Wood / Coal

Hot water tank fueled by: \_\_\_\_\_

Air conditioning/ ventilation: Central Air / Window units / Open Windows / Open Doors / Mechanical / Fans / None / Other \_\_\_\_\_

Are there air distribution ducts? Yes/ No

Are windows, doors, or loading dock doors left open? Yes/ No

Indicate location(s) on map, along with type, size, frequency, and duration of time

---

---

Describe changes to HVAC conditions/operation: a) at end of normal working hours:

---

---

b) from weekday to weekends (does system shut down?):

---

---

c) from summer to winter (does system shut down?):

---

---

d) based on unusual circumstances (e.g., maintenance shutdown, weather):

---

---

**OUTSIDE CONTAMINANT SOURCES**

List nearby land use: (industrial / commercial / residential)

North: \_\_\_\_\_ South: \_\_\_\_\_

West: \_\_\_\_\_ East: \_\_\_\_\_

Other stationary sources nearby (gas stations, emission stacks, other manufacturing facilities, etc):

---

---

Heavy vehicular traffic or area where vehicles idle nearby (or other mobile sources):

---

---

**SITE HISTORY**

Any known spills of a chemical immediately outside or inside the building? Yes/ No

Describe (with location): \_\_\_\_\_

---

---

Has the building ever had a fire? Yes/ NO

Describe: \_\_\_\_\_

---

*Building inspection checklist is on the following page. Please use this space for additional notes.*

**BUILDING INSPECTION CHECKLIST**

Compare building map to current conditions. Annotate discrepancies / changes as necessary

- Ground Cover around outside of building (grass / concrete / asphalt)
- Storm drains near outside of building
- Floor type inside building (unsealed concrete/sealed concrete/wood/tile/carpet/other)
- Tunnels
- Load bearing walls, roof support, columns, and isolated piers
- Sumps (if present, indicate whether there is water in the sump)
- Potential soil vapor entry points and approximate the size (e.g., cracks, utility ports, drains, gaps in floor slab)
- HVAC components in the building including blowers, intake and exhaust vents
- Boiler/Furnace
- Bathroom exhaust fans
- Manufacturing process vents
- Additional building vents
- Location of any building windows or doors that are left open (include type, size, frequency, and duration of time)
- Areas that have little or no air exchange
- Location of designated or common smoking areas
- Cracks - note length, width and depth
- Settlement (low spots) - note areal extent and depth
- Floor Penetrations ( holes, cuts, utility installations/ repairs, etc) - note areal extent and depth
- Wet areas / water damage (wet areas / ponding / seeps/ soft subgrade) - note areal extent

Notes:

**INDOOR CONTAMINANT SOURCES**

Identify all potential sources and products that have the potential to affect indoor air sample quality. Indicate whether the item can be removed from the building prior to the indoor air sampling event

<b>Potential Background sources</b>	<b>Present? (Yes/No)</b>	<b>If present, description (location, size, condition*, ingredients)</b>	<b>Removable prior to sampling? (Yes / No)</b>
Gasoline storage cans			
Gas-powered equipment (e.g., forklift)			
Paints/thinners/strippers			
Solvents			
Dry cleaned clothing			
Pesticides/herbicides (e.g., applied around bldg. foundation)			
Moth balls			
Cleaning products			
Air fresheners			
Kitchen cleaners			
Waste storage			
New furniture or upholstery			
New carpeting or flooring			
Glues			

\* Describe the condition of the product containers as Unopened (UO), Used (U), or Deteriorated (D)





**FACILITY OUTAGE REQUEST**

**Date:**

NAVBASEKITSAPINST 11300.1

**PERMIT NUMBER**

**Instructions**

- Provide the Requester contact information. Please provide both an email address and a fax number. We must have a way to provide you with an approved signed copy of the request before work begins.
- Provide the Government Representative Contact information. This person is the first POC for all questions/concerns and/or explanations of task requirements. This is typically the Engineering Technician assigned to the project. For BOSC Firm Fixed Price (FFP) work, a BOSC Representative serves as the Government Representative.
- Items 1 through 5 under the **REQUESTER** section are to be completed by the Requester and submitted to the Government Representative. Two requested outage dates and times must be requested. Times should be selected to cause the least amount of disruption to the customers.
- Item 1 under the **GOVERNMENT ACTION** section is to be completed by the Government Representative.
- Item 2 under the **GOVERNMENT ACTION** is to be completed and signed by the Building Manager or Facility Management Specialist.
- Area Outage Coordinators (AOC) shall ensure Commands and CDO's are notified of all approved outage requests as required.
- **NOTE:** No outage shall begin without an approved outage form in-hand. In the event a Building Manager is not available, the cognizant Facility Management Specialist can approve the outage.

**Distribution:** Approved request Distribution List (Available upon Request) Minimum: Requestor, Government Technical Representative, Building Manager, Fire, Security, N6, Unions

**Enclosure (4)**



This page intentionally left blank

**Appendix B:  
Responses to Comments on Draft Plan**

This page intentionally left blank

**From:** [Meyer, Michael \(US\)](#)  
**To:** [Burgess, Greg](#); [Palmieri, Anthony](#)  
**Subject:** [EXTERNAL] RE: NBK Keyport Area 8 - Submittal of Draft Building Inspection Plan for Review  
**Date:** Tuesday, July 6, 2021 15:42:34

---

Greg and Anthony,

During a meeting today I confirmed with Harry and Denice that they also do not have any comments on the building inspection plan. Nice work!

Could you please generate a final version of the document, with the typical final electronic deliverable native files for the Navy's use?

We'll probably need Navy direction regarding the number of hard copies to send to each recipient and where they want them send. The pandemic upended standard practice for hardcopy submittals.

### **Michael Meyer, PMP, RG, LEG, LHG**

Lead, Environmental Science and Site Investigation Team  
Environment Division  
Office/Mobile: 206.601.1309 | Fax: 614.458.2934  
[meyerm@battelle.org](mailto:meyerm@battelle.org)

### **Battelle**

25814 78<sup>th</sup> Ave. SW  
Vashon, WA 98070-8508  
<http://www.battelle.org>

### **Connect with Battelle**

[Facebook](#) | [LinkedIn](#)  
[Twitter](#) | [YouTube](#)

*This message is intended only for the use of the individual or entity to which it is addressed, and may contain information that is privileged, confidential and/or otherwise exempt from disclosure under applicable law. If the reader of this message is not the intended recipient or the employee or agent responsible for delivering the message to the intended recipient, any disclosure, dissemination, distribution, copying or other use of this communication or its substance is prohibited. If you have received this communication in error, please return to the sender and delete from your computer system.*

---

**From:** Cellucci, Carlotta CIV USN NAVFAC NW SVD WA (USA) <carlotta.cellucci.civ@us.navy.mil>  
**Sent:** Thursday, July 01, 2021 10:06 AM  
**To:** Meyer, Michael (US) <meyerm@battelle.org>; Burgess, Greg <greg.burgess@aecom.com>; Anthony Palmieri (anthony.palmieri@aecom.com) <anthony.palmieri@aecom.com>  
**Cc:** amanda.rohrbaugh@navy.mil  
**Subject:** RE: NBK Keyport Area 8 - Submittal of Draft Building Inspection Plan for Review

Great Job everyone!!!

C.

Carlotta Cellucci, LG  
Remedial Project Manager  
Naval Facilities Engineering Systems Command (NAVFAC) Northwest  
206-595-6711  
[Carlotta.cellucci.civ@us.navy.mil](mailto:Carlotta.cellucci.civ@us.navy.mil)

---

**From:** Alam, Mahbub (ECY) <[MALA461@ECY.WA.GOV](mailto:MALA461@ECY.WA.GOV)>  
**Sent:** Tuesday, June 29, 2021 4:59 PM  
**To:** [carlotta.cellucci@navy.mil](mailto:carlotta.cellucci@navy.mil); [amanda.rohrbaugh@navy.mil](mailto:amanda.rohrbaugh@navy.mil)  
**Cc:** Harry Craig ([Craig.harry@epamail.epa.gov](mailto:Craig.harry@epamail.epa.gov)) <[Craig.harry@epamail.epa.gov](mailto:Craig.harry@epamail.epa.gov)>; Denice Taylor ([dtaylor@suquamish.nsn.us](mailto:dtaylor@suquamish.nsn.us)) <[dtaylor@suquamish.nsn.us](mailto:dtaylor@suquamish.nsn.us)>; Meyer, Michael (US) <[meyerm@battelle.org](mailto:meyerm@battelle.org)>; [travis.b.lewis@navy.mil](mailto:travis.b.lewis@navy.mil); Burgess, Greg <[greg.burgess@aecom.com](mailto:greg.burgess@aecom.com)>; Anthony Palmieri ([anthony.palmieri@aecom.com](mailto:anthony.palmieri@aecom.com)) <[anthony.palmieri@aecom.com](mailto:anthony.palmieri@aecom.com)>  
**Subject:** [Non-DoD Source] RE: NBK Keyport Area 8 - Submittal of Draft Building Inspection Plan for Review

Hello, Amanda:  
Ecology reviewed the draft VI LTM plan for Keyport OU 2 Area 8.  
Ecology does not have any comments on the plan.  
Take care,

Mahbub Alam, PhD, PE  
Senior Environmental Engineer  
~~360 407 6913 (O)~~; 360 280 6274(C)

---

**From:** Meyer, Michael (US) <[meyerm@battelle.org](mailto:meyerm@battelle.org)>  
**Sent:** Wednesday, May 12, 2021 2:38 PM  
**To:** Alam, Mahbub (ECY) <[MALA461@ECY.WA.GOV](mailto:MALA461@ECY.WA.GOV)>; Denice Taylor ([dtaylor@suquamish.nsn.us](mailto:dtaylor@suquamish.nsn.us)) <[dtaylor@suquamish.nsn.us](mailto:dtaylor@suquamish.nsn.us)>; Harry Craig ([Craig.harry@epamail.epa.gov](mailto:Craig.harry@epamail.epa.gov)) <[Craig.harry@epamail.epa.gov](mailto:Craig.harry@epamail.epa.gov)>  
**Cc:** Rohrbaugh, Amanda L CIV USN NAVFAC NW SVD WA (USA) <[amanda.rohrbaugh@navy.mil](mailto:amanda.rohrbaugh@navy.mil)>; Lewis, Travis B CIV NAVFAC, EV31 <[travis.b.lewis@navy.mil](mailto:travis.b.lewis@navy.mil)>; Cellucci, Carlotta CIV NAVFAC NW, EV31 <[carlotta.cellucci@navy.mil](mailto:carlotta.cellucci@navy.mil)>; Anthony Palmieri ([anthony.palmieri@aecom.com](mailto:anthony.palmieri@aecom.com)) <[anthony.palmieri@aecom.com](mailto:anthony.palmieri@aecom.com)>; Burgess, Greg <[greg.burgess@aecom.com](mailto:greg.burgess@aecom.com)>  
**Subject:** NBK Keyport Area 8 - Submittal of Draft Building Inspection Plan for Review

**THIS EMAIL ORIGINATED FROM OUTSIDE THE WASHINGTON STATE EMAIL SYSTEM - Take caution not to open attachments or links unless you know the sender AND were expecting the attachment or the link**

Denice, Mahbub, and Harry,

Attached please find the *Draft Vapor Intrusion Long-Term Monitoring and Building Inspection Plan for Operable Unit 2, Area 8, Naval Base Kitsap, Keyport, Washington*, for your review. This plan was



prepared by Battelle's subcontractor, AECOM.

We would appreciate receiving your comments in 30 calendar days, by June 11, 2021. A comment/response table is provided for your convenience.

Please direct any comments or questions regarding this document to Carlotta Cellucci of NAVFAC NW.

Best regards,

**Michael Meyer, PMP, RG, LEG, LHG**

*Lead, Environmental Science and Site Investigation Team*

Environment Division

Office/Mobile: 206.601.1309 | Fax: 614.458.2934

[meyerm@battelle.org](mailto:meyerm@battelle.org)

**Battelle**

25814 78<sup>th</sup> Ave. SW

Vashon, WA 98070-8508

<http://www.battelle.org>

**Connect with Battelle**

[Facebook](#) | [LinkedIn](#)

[Twitter](#) | [YouTube](#)

*This message is intended only for the use of the individual or entity to which it is addressed, and may contain information that is privileged, confidential and/or otherwise exempt from disclosure under applicable law. If the reader of this message is not the intended recipient or the employee or agent responsible for delivering the message to the intended recipient, any disclosure, dissemination, distribution, copying or other use of this communication or its substance is prohibited. If you have received this communication in error, please return to the sender and delete from your computer system.*

This page intentionally left blank

## **Attachment E**

### **Communications with Ecology 2022**

This page intentionally left blank

**From:** [Rohrbaugh, Amanda L CIV USN NAVFAC NW SVD WA \(USA\)](#)  
**To:** [Shaljian, Michael \(ECY\)](#)  
**Cc:** [Andrew Schmeising](#); [Leake, Benjamin](#)  
**Subject:** Temporary Office Trailer at OU1  
**Date:** Wednesday, November 2, 2022 11:25:33 AM

---

Hi Mike,

I'm sending this e-mail to follow-up to our phone conversation from earlier today and so that we may document your concurrence in writing. I've cc'd Andrew and Ben for their awareness.

Per the LUCs for OU1, approval for temporary occupation of structures on the landfill must be approved by the lead regulator, Ecology. Back in April 2022 a request was made within the Navy for placement of a mobile office trailer on the LF. Carlotta indicated in an e-mail that this was acceptable assuming the trailer was not occupied for more than a few hours each day and that notification was provided to her prior to placement of the trailer so that approval from Ecology could be obtained. This caveat information was not passed on to the contractor or other relevant Navy personnel, nor was it included in the area outage approval from NAVFAC Public Works (note that "area outage" just refers to any requested use of a given space, such as parking areas, paved areas, dirt areas, etc. to support staging of equipment, materials, and/or personnel for Navy projects). I received no notification of the trailer placement, but observed it during a routine site visit yesterday afternoon, 11/1/2022. The main issue with occupation of structures on the LF is potential vapor intrusion of volatile organic compounds (VOCs) and LF gases, such as methane; however, the trailer is elevated several feet off the ground and the few feet of space below the trailer is open to the ambient air. These factors should allow any potential vapors to disperse/mix with ambient air and minimize possible vapor intrusion concerns. In addition, the highest areas of VOCs are in the southern portion of the LF, while the trailer is located in the central/northern portion of the LF (there are still VOC concentrations, just not as high). To further ensure protections, no personnel will occupy the office trailer for a period of more than four (4) hours each day.

I have already initiated the following corrective actions:

- Since taking over outage reviews upon Carlotta's retirement, I closely check the final outage approvals to ensure they include any caveat language that I've provided to the outage approval body. This does seem to be helping since a few weeks ago I caught an approval missing language. Revision of the approval was sent out same day to include the missing caveat language.
- Communicated to relevant Navy project personal the concerns, provided them with the LUC Plan, and specified no occupation of the structure for more than four (4) hours each day.
- Asked the outage approval personnel about modifying the request form to include an entry regarding LUCs. My hope is that even if folks are initially unaware of LUCs, having to complete an entry on the form will require them to ask questions about what LUCs are and where they are present.
- Contacted Ecology via phone 11/2/2022 regarding the issue and requesting approval for staging of the trailer; provided the requested follow-up e-mail to document the situation in writing.

If you have any questions, please feel free to contact me. Thanks!

Amanda Rohrbaugh  
NAVFAC NW Remedial Project Manager  
Environmental Restoration, EV31  
360-396-0248 (office)  
916-698-8069 (cell)  
[amanda.l.rohrbaugh.civ@us.navy.mil](mailto:amanda.l.rohrbaugh.civ@us.navy.mil)

Naval Facilities Engineering Systems Command Northwest  
1101 Tautog Circle, Suite 203  
Silverdale, WA 98315

Upcoming Planned Time Off / Out of Office:

In Field – partial day November 14th  
Holidays – November 10th, November 24th  
RDOs – October 28th, November 11<sup>th</sup>, November 25th