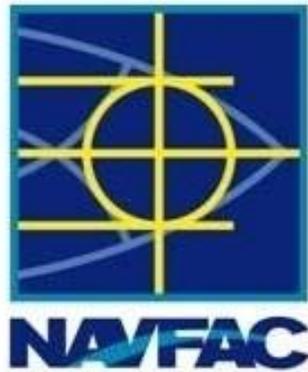

Final Well Decommissioning Report
Naval Weapons Station Seal Beach
Seal Beach, California



May 2015

Prepared for:

*Naval Facilities Engineering Command Southwest
San Diego, California*

Contract No. N62473-09-D-2627

CTO NO. 0010

DCN: CEKA-2627-0010-0007

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Prepared by:

CE2-KLEINFELDER JV

Pleasanton, CA



Final Well Decommissioning Report

Naval Weapons Station Seal Beach

Seal Beach, California



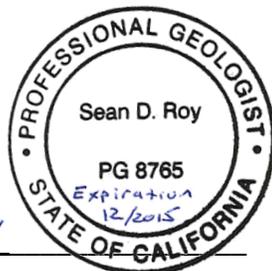
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DCN: CEKA-2627-0010-0007



Sean Roy

Sean Roy, PG #8765, Project Manager

Date: May 22, 2015

Neil Fajardo

Neil Fajardo, Field Team Leader/SSHO

Date: May 22, 2015

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Executive Summary

CE2 Kleinfelder Joint Venture (CE2-K) has prepared this Well Decommissioning Report to support the work to be performed by for the Naval Facilities Engineering Command (NAVFAC) Southwest under Performance Based Small Business Environmental Multiple Award Contract No. N62473-09-D-2627, Task Order NO. 0010. The task order involved groundwater monitoring well decommissioning activities at several former and current Installation Restoration Program (IRP) sites within Naval Weapons Station (NAVWPNSTA) Seal Beach (Figures 1 and 2). This Well Decommissioning Report provides the technical approach used to complete the well decommissioning activities.

A site inspection/well survey was conducted on November 17, 2014, to assess the physical locations of the 47 wells reported to be present and an additional 24 suspected wells. CE2-K utilized a handheld Trimble™ 2005 GeoXT GPS unit and a metal detector to assess the well locations and their current condition (present, damaged, decommissioned, etc.). A total of 42 wells were confirmed to be present during the site inspection/well survey field activities. The findings of the site inspection/well survey are tabulated in Appendix A. The status and final disposition of the remaining wells that were not located is unknown. The list of 42 wells confirmed to be present and decommissioned at NAVWPNSTA Seal Beach are included in Table ES-1 below.

In January-February 2015, well decommissioning activities were completed in accordance with the *Final Work Plan, Basewide Well Decommissioning, Naval Weapons Station Seal Beach, California*, dated December 2014 (Work Plan) and applicable regulatory guidance. Copies of the Work Plan concurrence letters prepared by the California Department of Toxic Substances Control (DTSC) and Santa Ana Regional Water Quality Control Board (RWQCB) are included in Appendix B. A summary of the decommissioned wells is included as Appendix C. Site-specific monitoring well locations are shown in Figures 3a – 3i.

Please note that the project area included wells that are located inside the Seal Beach National Wildlife Refuge. These wells have an asterisk next to them in Table ES-1 below. Some of these wells were in sensitive habitat that support federal and state listed, threatened, and endangered species and required specialized equipment to access and are indicated with a (^) symbol in Table ES-1 below.

Table ES-1: Wells Confirmed to be Present during Well Survey

Site	Well Identification
04	MW-04-01*, MW-04-02*, MW-04-03, MW-04-04, and MW-04-05
05	MW-05-01, MW-05-02, MW-05-03*^, MW-05-04*^, and MW-05-05*^
06	W-40*, MW-06-01*, MW-06-02*, MW-06-03*^, MW-06-04*, and MW-06-05^
07	07M01^, W-41*, W-42*, W-43*, and W-45^
12	12_M01* and 12_M02*

Site	Well Identification
14	BSW-14-01, BSW-14-02, BSW-14-03, BSW-14-04, BSW-14-05, BSW-14-06, BSW-14-07, BSW-14-08, BSW-14-09, BSW-14-10, and BSW-14-11
16	16_M01 and 16_M02
35	35_M01* and 35_M02*
UST 229	SB229-MW01, SB229-MW02, SB229-MW03, and SB229-MW04

*- Indicates well was located inside the Seal Beach National Wildlife Refuge

^ - Indicates well was located in sensitive habitat and required specialized equipment to access.

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Abbreviations and Acronyms

bgs	below ground surface
APP	accident prevention plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CE2-K	CE2-Kleinfelder Joint Venture
CSWRCB	California State Water Resources Control Board
DOD	United States Department of Defense
DON	Department of the Navy
DTSC	California Department of Toxic Substances Control
GIS	geographic information system
HERO	hazards of electromagnetic radiation to ordnance
IDW	investigative derived waste
IRP	Installation Restoration Program
JV	joint venture
NAVFAC	Naval Facilities Engineering Command
NAVWPNSTA	Naval Weapons Station
NWR	National Wildlife Refuge
OCEHD	Orange County Environmental Health Division
OSHA	Occupational Safety and Health Administration
PG	Professional Geologist
PSI	pounds per square inch
PVC	polyvinyl chloride
RFP	request for proposal
RWQCB	Santa Ana Regional Water Quality Control Board
SOW	scope of work
SSHP	site safety and health plan
UST	underground storage tank
WDR	well decommissioning report

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1.0 Introduction

CE2-Kleinfelder JV (CE2-K) has prepared this Well Decommissioning Report (WDR) for the Naval Facilities Engineering Command (NAVFAC) Southwest under Performance Based Small Business Environmental Multiple Award Contract No. N62473-09-D-2627, Task Order NO. 0010. The task order involves groundwater monitoring well decommissioning activities at several former and current Installation Restoration Program (IRP) sites within Naval Weapons Station (NAVWPNSTA) Seal Beach (Figures 1 and 2). The groundwater monitoring well decommissioning activities at Sites 01, 04, 05, 06, 07, 08_42, 12, 13, 14, 16, 19, 35, and Underground Storage Tank (UST) Site 229 (the Sites) were conducted in accordance with the NAVFAC's SOW included in the contract, dated July 11, 2014, the *Final Work Plan, Basewide Well Decommissioning, Naval Weapons Station Seal Beach, California*, dated December 2014 (Work Plan) (CE2-K, 2014a), and the approved Final Accident Prevention Plan (APP)/Site Safety and Health Plan (SSHP) dated December 2014 (CE2-K, 2014b).

The Sites and their corresponding California State Water Resources Control Board's (CSWRCB) Geotracker identification numbers are included in Table 1-1 below.

Table 1-1: Remedial Project Sites and Geotracker ID #

Site	Geotracker ID #
01	SLT8R2604067
04	DOD100379000
05	DOD100379100
06	DOD100350500
07	DOD100350600
08_42	(8) - DOD100350700, (42) - T0605953305
12	DOD100352200
13	DOD100352300
14	T0605901139
16	DOD100352400
19	DOD100352500
35	DOD100355600
UST 229	T0605901373

1.1 Scope of Work

Well decommissioning activities for the Sites that are described in this WDR consist of the following:

- A site inspection/well survey was conducted to investigate the presence and location of the 47 wells reported to be present and the additional 24 suspected wells;
- Mobilization of drill rig, associated equipment, and personnel;
- Proper decommissioning of groundwater monitoring wells in general accordance with Orange County Environmental Health Division (OCEHD) guidelines and California Department of Water Resources, California Well Standards;
- Management and disposal of wastes derived during well decommissioning activities;
- Demobilization and site cleanup; and,
- Preparation of this well decommissioning report.

1.2 Report Organization

- **Section 1.0 Introduction** - Provides an introduction to the objectives and the report organization.
- **Section 2.0 Background** - Provides a Site description (including the facility history).
- **Section 3.0 Well Decommissioning Activities** – Describes the preparation and execution of well decommissioning activities
- **Section 4.0 References**– Contains literature and report references.

2.0 Background

This section provides a general description and historical information for NAVWPNSTA Seal Beach and a well inventory list for the Sites.

2.1 Site Description and History

NAVWPNSTA Seal Beach is located in Seal Beach, northwest Orange County, approximately 25 miles south of downtown Los Angeles, California (Figure 1). NAVWPNSTA Seal Beach comprises approximately 5,000 acres of land originally purchased or condemned between 1941 and 1944, commissioned as the Naval Ammunition and Net Depot in 1944 and as NAVWPNSTA Seal Beach in 1964. A portion of the Anaheim Bay and its adjoining salt marsh, recognized as Seal Beach National Wildlife Refuge (NWR), are also located within the extent of NAVWPNSTA Seal Beach (SWDIV 1990).

2.2 Geologic Setting

NAVWPNSTA Seal Beach is situated in the coastal plain of Los Angeles-Orange Counties, regionally underlain with Recent Alluvium to a depth of approximately 80 to 100 feet below ground surface (bgs). The upper-most 50 feet consists of varying soil types, including fine sand, silt, and clay which overlies deeper unconsolidated sands, gravels, silty sands and clays, and clays.

The Recent Alluvium is underlain by the Upper Pleistocene Lakewood Formation, extending from approximately 80 to 100 feet bgs to approximately 350 feet bgs, followed by the Lower Pleistocene San Pedro Formation, and the Pliocene Pico Formation (DWR 1961).

2.3 Hydrogeology

Groundwater beneath NAVWPNSTA Seal Beach is situated in the Orange County groundwater management zone, beneath the Lower Santa Ana River Basin – East Coastal Plain hydrologic subarea (801.11) (Water Board 1995, amended 2004).

The four aquifer zones identified at NAVWPNSTA Seal Beach include (JEG 1995):

- A semi-perched, unconfined zone in the upper portion of the Recent Alluvium
- A confined fresh groundwater zone in the lower portion of the Recent Alluvium
- Pleistocene deposits of the Lakewood and San Pedro Formations, and localized portions of the Late Pliocene Pico Formation
- Confined saline water underlies the freshwater zone

According to the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan), beneficial uses of the groundwater supply in the Orange County groundwater management zone include industrial process supply, industrial service water supply, agricultural supply, and municipal supply (Water Board, 1995, amended 2004).

2.4 Regulatory Framework

NAVWPNSTA Seal Beach is the lead agency for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response actions at the IRP Sites included in the well decommissioning activities of this WDR. The Santa Ana Regional Water Quality Control Board (RWQCB) and California Department of Toxic Substances Control (DTSC) varied as the lead regulatory agency on a site-specific basis. The applicable RWQCB and DTSC case numbers for the Sites are included below in Table 2-1. Additionally, a case number is also setup by OCEHD for the UST 229 Site (Case #91UT32).

Table 2-1: Applicable Regulatory Case Numbers

Site	RWQCB Case Number	DTSC Case Number
01	SLT8R260	CA0170024491
04	166-69 – 2	400136 -- 2
05	166-69 – 1	400136 -- 1
06	166-69 – 21	400136 -- 21
07	16583—20	--
08_42	(8) - 166-69 – 19, (42) - 16583-22	(8) - 400136 – 19, (42) – 400136 - 22
12	16583 – 17	400136 -- 17
13	16583 – 16	400136 -- 16
14	083001494T	--
16	166-69 – 15	400136 -- 15
19	16583 – 14	400136 -- 14
35	16583 – 9	400136 -- 9
UST 229	083001835T	--

All of the Sites, except for IRP Site 7, have been granted for no further action by regulators. Table 2-2 below lists the references documents for each case giving the justification for well decommissioning. The reference listed for Site 7 provides the rationale for why no further action is required for groundwater monitoring. Concurrence was received by the regulators for each of these documents. These reports are publicly available and can be obtained directly from the Navy.

Table 2-2: Case References

Site	Reference
1	Southwest Division Naval Facilities Engineering Command (SWDIV), 2002. <i>Final Record of Decision, Installation Restoration Sites 1 and 19, Naval Weapons Station Seal Beach, Seal Beach, California.</i> 18 April.
4	Southwest Division Naval Facilities Engineering Command (SWDIV), 2005. <i>Final First Annual Groundwater Monitoring Report, IR Sites 4, 5, 6, and 7, Naval Weapons Station Seal Beach, Seal Beach, California.</i> June.
5	Southwest Division Naval Facilities Engineering Command (SWDIV), 2007. <i>Final Third Annual Groundwater Monitoring Report, IR Sites 5 and 7, Naval Weapons Station Seal Beach, Seal Beach, California.</i> June.
6	Southwest Division Naval Facilities Engineering Command (SWDIV), 2005. <i>Final First Annual Groundwater Monitoring Report, IR Sites 4, 5, 6, and 7, Naval Weapons Station Seal Beach, Seal Beach, California.</i> June.
7	Southwest Division Naval Facilities Engineering Command (SWDIV), 2007. <i>Final Third Annual Groundwater Monitoring Report, IR Sites 5 and 7, Naval Weapons Station Seal Beach, Seal Beach, California.</i> June.
12	CH2M Hill, 2002. <i>Draft Final Focused Site Inspection Phase II Report, Naval Weapons Station Seal Beach, Seal Beach, California.</i> 28 January.
14	MARRS Services, Inc., 2007. <i>Final Groundwater Monitoring Report, Installation Restoration Program Site 14, Naval Weapons Station Seal Beach, Seal Beach, California.</i> June 1.
16	CH2M Hill, 2002. <i>Draft Final Focused Site Inspection Phase II Report, Naval Weapons Station Seal Beach, Seal Beach, California.</i> 28 January.
35/44/45	<p>Jacobs Engineering Group, Inc., 1996. <i>Draft Final Operable Units 4 and 5 Focused Site Inspection Report, Naval Weapons Station Seal Beach, Seal Beach, California.</i> 20 December.</p> <p>CH2M Hill, 1998, <i>Final (Revision 1) Operable Unit 4 Site Inspection Report, Naval Weapons Station Seal Beach, Seal Beach, California.</i> 19 March</p> <p>CH2M Hill, 1998, <i>Final Operable Unit 5 Site Inspection Report, Naval Weapons Station Seal Beach, Seal Beach, California.</i> 20 March</p> <p>CH2M Hill, 2002. <i>Draft Final Focused Site Inspection Phase II Report, Naval Weapons Station Seal Beach, Seal Beach, California.</i> 28 January.</p>
UST 229	Brady, 2011. <i>Final Extended Site Assessment Report of Former Underground Storage Tank Site 229, Naval Weapons Station Seal Beach, Seal Beach, California.</i> July 29.

The activities described in this WDR were conducted under the current requirements of the RWQCB, DTSC, and the Department of the Navy (DON). Well decommissioning activities

followed the OCEHD and California Department of Water Resources, California Well Standards Bulletins 74-81 and 74-90 guidelines.

Although not required, groundwater monitoring well destruction permit applications were assembled and submitted to the NAVWPNSTA Seal Beach IRP coordinator as requested. The IRP Coordinator forwarded the well destruction permit applications to the OCEHD for informational purposes only.

2.5 Well Inventory List

Except for Site 7, the wells decommissioned as part of this scope of work were located at sites that have received no further action/closure approval from their respective agency or agencies. Additional landfill cover vegetation is still on-going for Site 07, but no further action is required for groundwater. Since there is no need to continue to monitor groundwater using these wells, to prevent being used as a route of entry for potential future releases and to prevent some of the well heads being used as perching points by predatory birds, the Navy decided to properly decommission these wells.

The 47 wells included in the request for proposal (RFP) for decommissioning at NAVWPNSTA Seal Beach are listed in Table 2-3 below.

Table 2-3: The 47 Wells Included in the RFP

Site	Well Identification
1	01M02*, 01M03*, and 01M04*
4	MW-04-01, MW-04-02, MW-04-03, MW-04-04, and MW-04-05
5	MW-05-01, MW-05-02, MW-05-03, MW-05-04, and MW-05-05
6	MW-06-01, MW-06-02, MW-06-03, MW-06-04, and MW-06-05
7	07M01, 07M02*, 07M03*, 07M04*, W-41, W-42, W-43, W-44*, W-45, and W-46
12	12_M01 and 12_M02
14	BSW-14-01, BSW-14-02, BSW-14-03, BSW-14-04, BSW-14-05, BSW-14-06, BSW-14-07, BSW-14-08, BSW-14-09, BSW-14-10, and BSW-14-11
16	16_M01 and 16_M02
UST 229	SB229-MW01, SB229-MW02, SB229-MW03, and SB229-MW04

* - Indicates well was not found during site inspection/well survey (See Section 3.1)

The 24 suspected (optional item) wells, included in the original RFP, are listed in Table 2-4 below. Site-specific monitoring well locations are presented in Figure 3a-3i.

Table 2-4: The 24 Optional Wells in the RFP

Site	Well Identification
5	05-MW01* and 05-MW02*
6	06-MW01*, W-38*, W-39*, and W-40
8-42	USGS-1*, USGS-1A*, USGS-2*, USGS-23*, and USGS-24*
13	13-MW01*, 13-MW02*, and 13-MW03*
14	N35*, N36*, N37*, N38*, and N39*
19	W54*, W55*, and W56*
35	35_M01 and 35_M02

* - Indicates well was not found during site inspection/well survey (See Section 3.1)

Only 42 of the 47 wells in Table 2-3 and Table 2-4 were located and subsequently decommissioned. The other wells listed could not be located and are marked with an asterick (*) in Table 2-3 and Table 2-4.

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3.0 Well Decommissioning Activities

Well decommissioning activities were completed in January-February 2015 in accordance with the Work Plan and applicable guidance. This section provides information on the various practices that were utilized by CE2-K to complete the well decommissioning activities. Appendix A presents findings of the site inspection/well survey. Appendix B includes copies of the Work Plan concurrence letters prepared by the DTSC and RWQCB. Appendix C presents the summary of decommissioned wells. Appendix D includes a photographic log of well decommissioning activities.

3.1 Confirming Location of Monitoring Wells

A site inspection/well survey was conducted on November 17, 2014, to assess the physical location of the 47 wells reported to be present and the 24 suspected wells. CE2-K utilized a handheld Trimble™ 2005 GeoXT GPS unit and a metal detector to assess the well locations and their current condition (present, damaged, decommissioned, etc.). Prior to site inspection/well survey activities, the specifications for the GPS Unit and metal detector were submitted to the IRP Coordinator to clear equipment for hazards of electromagnetic radiation to ordnance (HERO) by the NAVWPNSTA explosives safety office.

A total of 42 wells were confirmed to still exist during the site inspection/well survey field activities. The findings of the site inspection/well survey are tabulated in Appendix A. The status and final disposition of the remaining wells that were not located is unknown. The list of 42 wells confirmed to be present at the Sites are shown in Table 3-1 below. The latitude and longitude of the 42 wells were recorded with the handheld GPS unit. A geographic information system (GIS) layer for the wells decommissioned as part of this project is presented to the Navy as Figure 3a-3i. The GIS data is provided in the format ArcGIS Map Package, which is included on the electronic copy of this WDR. The wells that are located inside the Seal Beach National Wildlife Refuge (SBNWR) have an asterisk next to them in Table 2-5 below. Some of these wells were located in sensitive habitat that support federal and state listed, threatened, and endangered species and required specialized equipment to access and are indicated with a (^) symbol. Many of the wells located inside the SBNWR were decommissioned using traditional drilling equipment.

Table 3-1: Wells Confirmed to be Present during Well Survey

Site	Well Identification
4	MW-04-01*, MW-04-02*, MW-04-03, MW-04-04, and MW-04-05
5	MW-05-01, MW-05-02, MW-05-03*^, MW-05-04*^, and MW-05-05*^
6	W-40*, MW-06-01*, MW-06-02*, MW-06-03*^, MW-06-04*, and MW-06-05^
7	07M01^, W-41*, W-42*, W-43*, and W-45^

Site	Well Identification
12	12_M01* and 12_M02*
14	BSW-14-01, BSW-14-02, BSW-14-03, BSW-14-04, BSW-14-05, BSW-14-06, BSW-14-07, BSW-14-08, BSW-14-09, BSW-14-10, and BSW-14-11
16	16_M01 and 16_M02
UST 229	SB229-MW01, SB229-MW02, SB229-MW03, and SB229-MW04
35	35_M01* and 35_M02*

* - Indicates well is located inside the SBNWR

^ - Indicates well is located in sensitive habitat and requires specialized equipment to access.

3.2 Well Decommissioning Methodology

The well decommissioning activities were completed by ABC Liovin Drilling, Inc. a California licensed C-57 drilling subcontractor, in accordance with the Work Plan, OCEHD well decommissioning requirements, and California Department of Water Resources, California Well Standards, Bulletins 74-81 and 74-90 guidelines. Well decommissioning equipment anticipated to be used on the project included a group pump with hose, a four-wheel drive backhoe, a jack hammer, an air compressor, and a fork lift. The well decommissioning process included the following procedures:

- Destruction of the existing well completion components, including the concrete pad, crash posts, and well box structure.
- Pressure grout in place, using a hose as a Tremie pipe to properly inject the bentonite grout from total depth to approximately 5 feet below ground surface. After placement of the appropriate amount of grout, a minimum of 25 pounds per square inch (psi) pressure was applied with a secured pressure head for five minutes or until refusal. The grout slurry consisted of bentonite grout with 25% solids. Additional grout was added and the process was repeated as necessary.
- The approximate volume of grout used was compared to theoretical volume of the voids in the sand pack and the casing volume for each well (Appendix E).
- After pressure grouting, the PVC riser pipe was removed from each well from ground surface to a minimum of depth of 5 feet bgs.
- Approximately 3-4 feet medium bentonite chips was placed on top of the grout and hydrated (Appendix E).
- The decommissioning at each borehole location was completed by restoring the area to surrounding grade including matching the surrounding material (soil, asphalt, or cement) as necessary.

Seven of the wells (MW-05-03, MW-05-04, MW-05-05, MW-06-03, MW-06-05, 07M01, and W-45) were located in sensitive habitat and require specialized equipment.

Wells in these seven locations were decommissioned by lowering a breaker bar down the well to break up the bottom of the PVC well screen. The appropriate amount of grout was carried over and poured into the well by hand. A pressure head was attached to the top of the PVC casing and secured. A small, portable air compressor was used to apply 25 psi of pressure for 5

minutes or until refusal. If additional grout was required, this process was repeated as necessary.

A four-wheel forklift with drove over landing mats placed along the pathway to wells MW-05-05, MW-05-04, MW-06-03, MW-06-05, and W-45 and lifted the entire well pad, well box, and well casing off the ground surface. The forklift removed the well materials from the salt marsh to a location where it was broken up in an environmentally safe location. The concrete well pads at MW-05-03 and 07M01 were decommissioned by using a jackhammer with a long air hose and wheelbarrows over mats to remove the concrete.

3.3 Restoration

Following removal activities, the ground surface at each of the 42 monitoring well locations was restored to the condition of the surrounding area. Material varying from concrete, sand, and soil was used for backfill. Additional fill soil that was suitable for reuse was pre-characterized and provided by the IRP Coordinator.

Restoration activities at MW-05-03 could not be completed due to the breeding season of several bird species listed by federal and/or state agencies as threatened or endangered. The pending restoration work will be completed after the breeding season for these birds.

3.4 Waste Management

No hazardous waste was generated during the well decommissioning activities. Non-hazardous waste generated during well decommissioning activities consisted of concrete, protective steel monument casings, PVC, and steel bollards and was managed in accordance with the Work Plan. The non-hazardous waste was placed in the staging area at the end of each field day pending removal from the installation. Concrete pads were broken up and contained in covered roll-off bins. Roll-off bins were removed from the installation and transported to Philadelphia Recycling Mine in Mira Loma, CA, for disposal as nonhazardous waste. Protective steel monument casings and bollards were transported offsite by ABC Liovin Drilling for recycling. The upper 5 feet of PVC casing was disposed of as municipal solid waste. Copies of non-hazardous waste manifests for concrete are included in Appendix F.

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4.0 References

DWR (California Department of Water Resources). 1961. *Planned Utilization of Ground Water Basins of the Coastal Plain of Los Angeles County*. Bulletin 104. Appendix B. June.

Water Board (California Regional Water Quality Control Board, Santa Ana Region). 1995. *Water Quality Control Plan, Santa Ana River Basin*; with amendment R8-2004-0001, January 2004.

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CE2-K, 2014b. *Final Accident Prevention Plan, Basewide Well Decommissioning, Naval Weapons Stations Seal Beach, California*. December.

JEG (Jacobs Engineering Group Inc.). 1995. *Final Preliminary Assessment Report for the Research, Testing and Evaluation Area, Naval Weapons Station, Seal Beach, Seal Beach, California*. February 1995.

California, State of, Department of Water Resources *Bulletin Number 74-81, Water Well Standards: State of California*, December 1981.

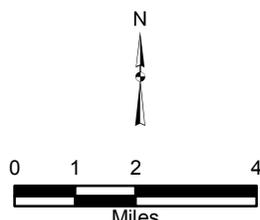
California, State of, Department of Water Resources *Bulletin Number 74-90 (Supplement to 74-81)*, California Well Standards, June 1991.

Southwest Division Naval Facilities Engineering Command (SWDIV). 1990. *Final Site Inspection Report, Volume I - Technical Report, Naval Weapons Station Seal Beach, California*.

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Figures

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**NAVAL FACILITIES ENGINEERING COMMAND
SOUTHWEST**

FIGURE 1

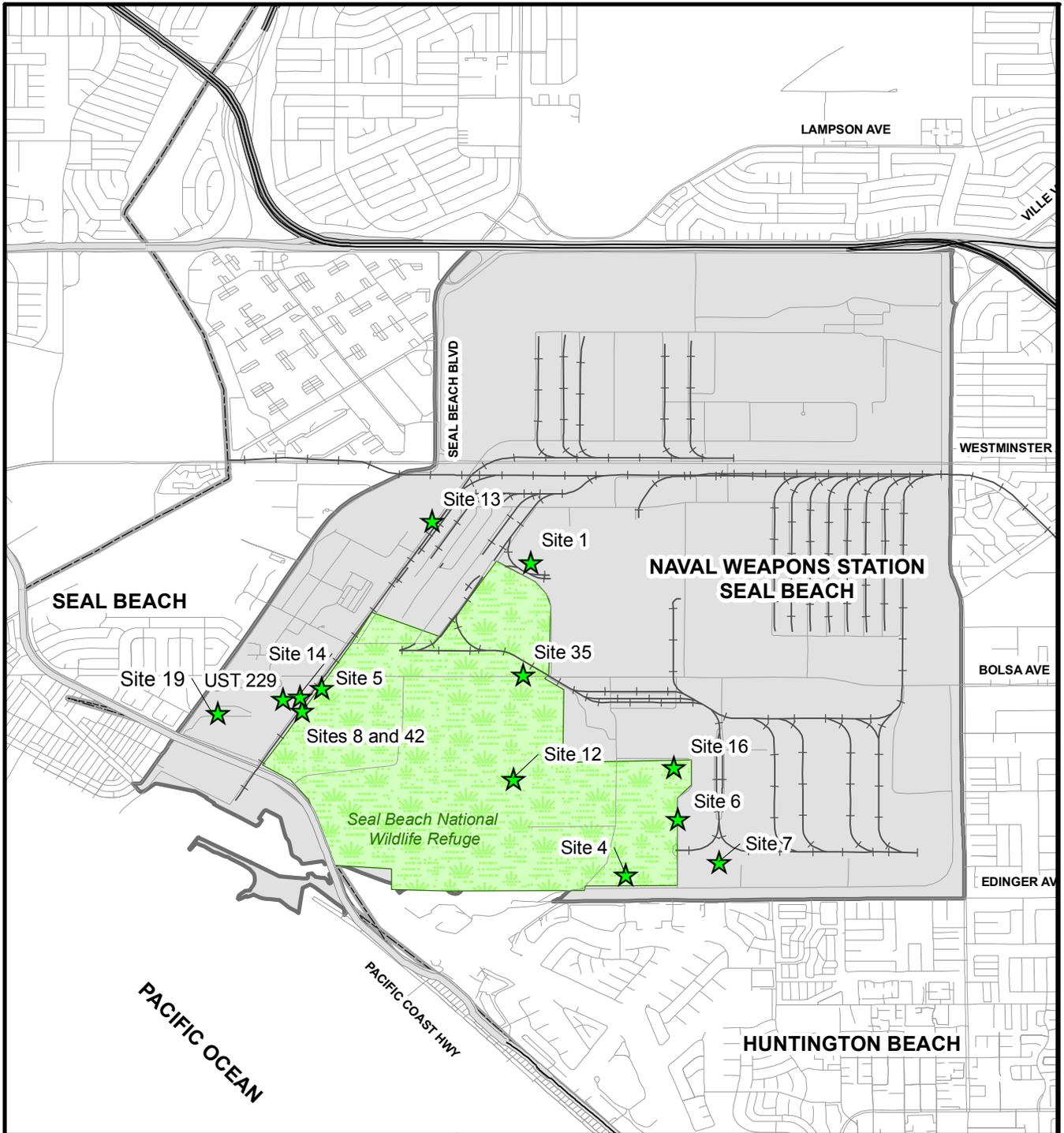
FACILITY LOCATION MAP

**BASEWISE WELL DECOMMISSIONING
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA**

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AUTHOR: RD
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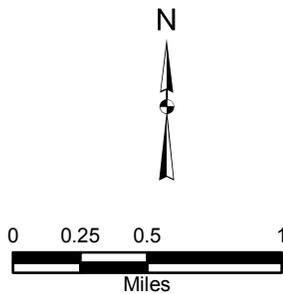


**NAVAL FACILITIES ENGINEERING COMMAND
SOUTHWEST**

FIGURE 2

SITE LOCATION MAP

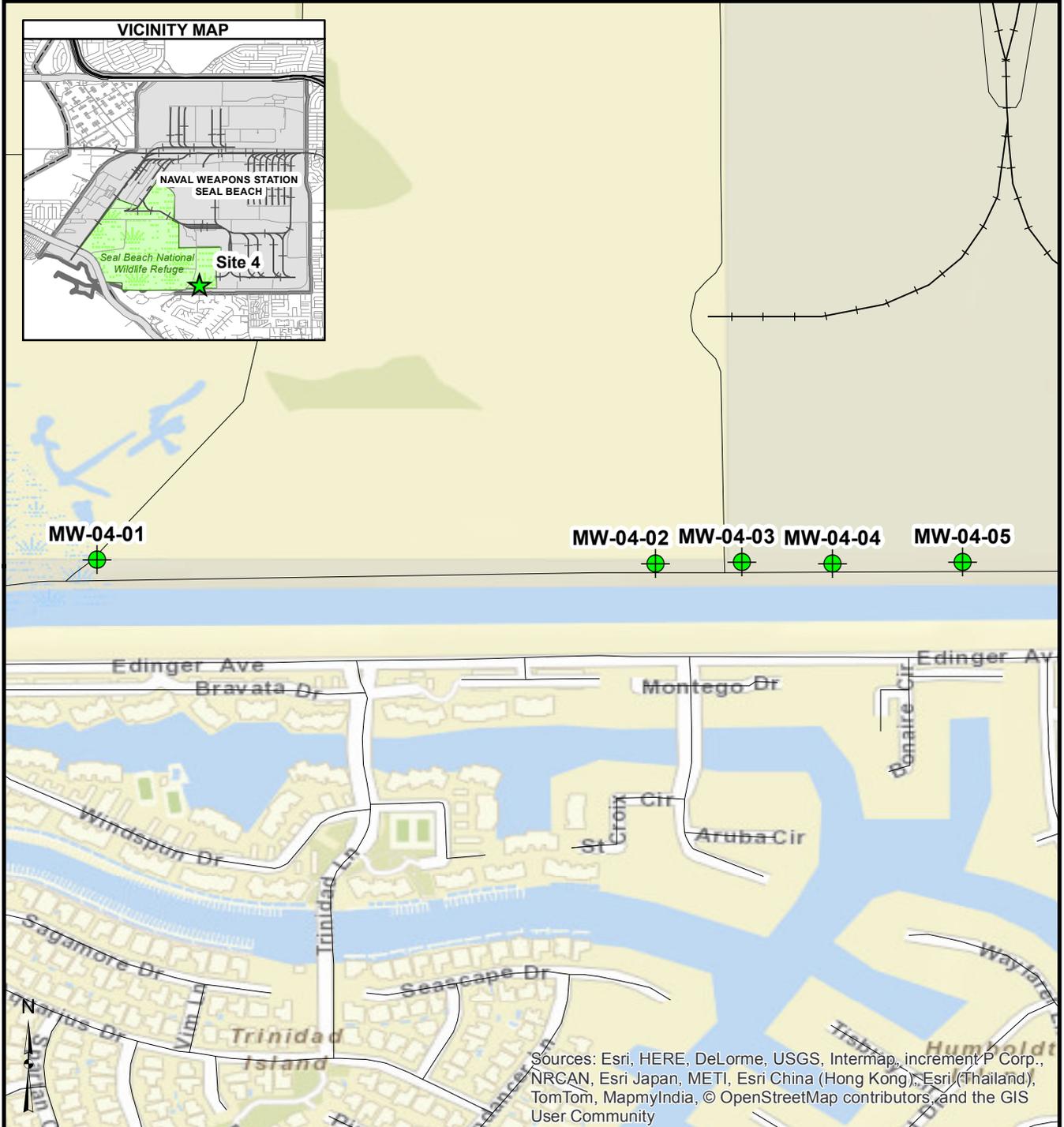
BASEWIDE WELL DECOMMISSIONING
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA



REVIEW: DM
AUTHOR: RD
FILE NUMBER: Figure 2.mxd



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LEGEND

- DECOMMISSIONED WELL
- RAILROAD TRACKS
- ROAD

**NAVAL FACILITIES ENGINEERING COMMAND
SOUTHWEST**

FIGURE 3a

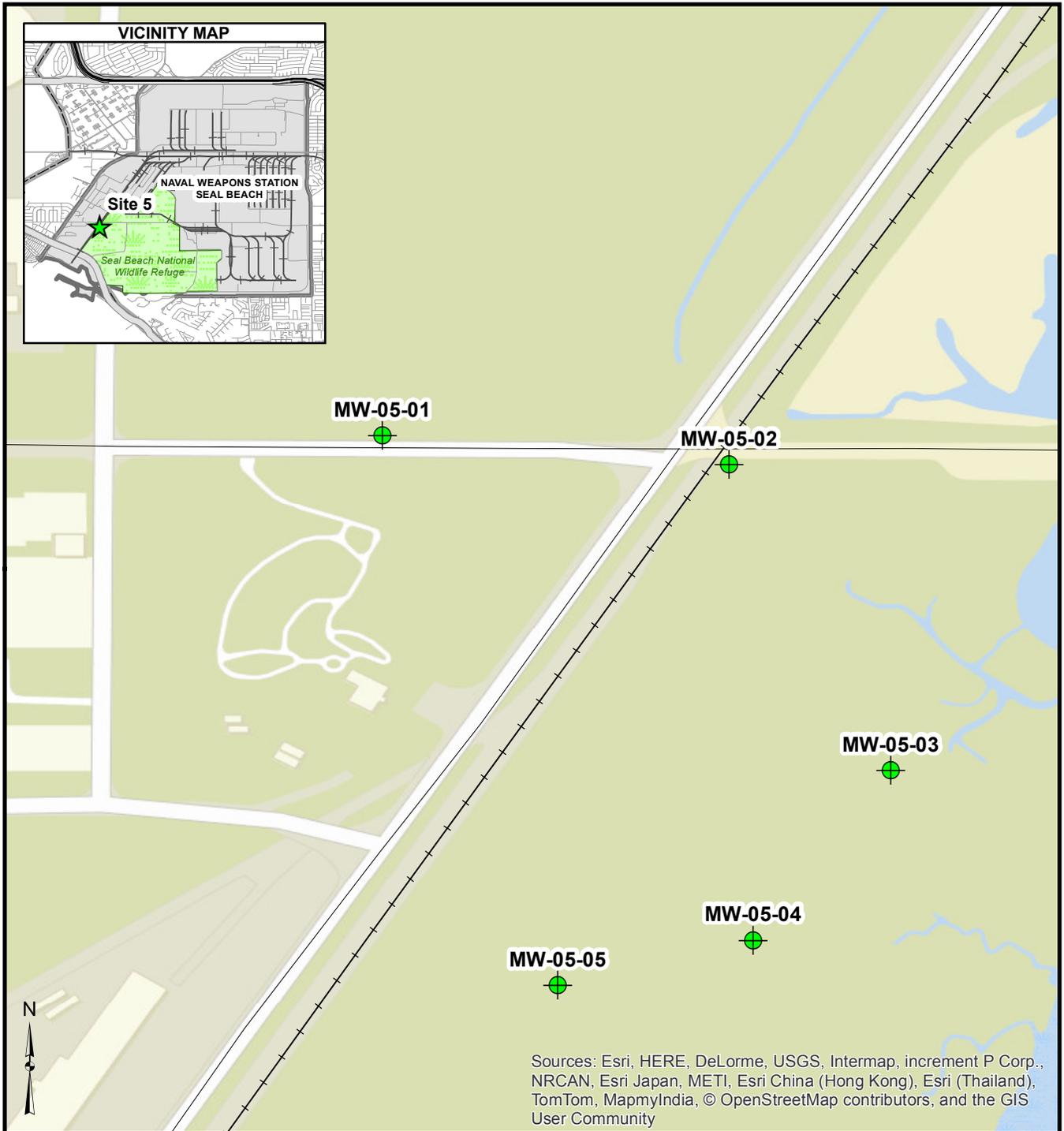
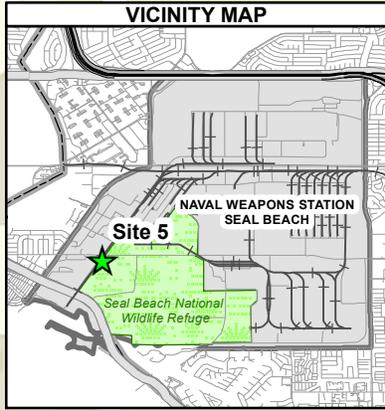
MONITORING WELL LOCATIONS - SITE 4

BASEWISE WELL DECOMMISSIONING
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

REVIEW: DM
AUTHOR: RD
FILE NUMBER: Figure 3.mxd



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LEGEND

- DECOMMISSIONED WELL
- RAILROAD TRACKS
- ROAD

**NAVAL FACILITIES ENGINEERING COMMAND
SOUTHWEST**

FIGURE 3b

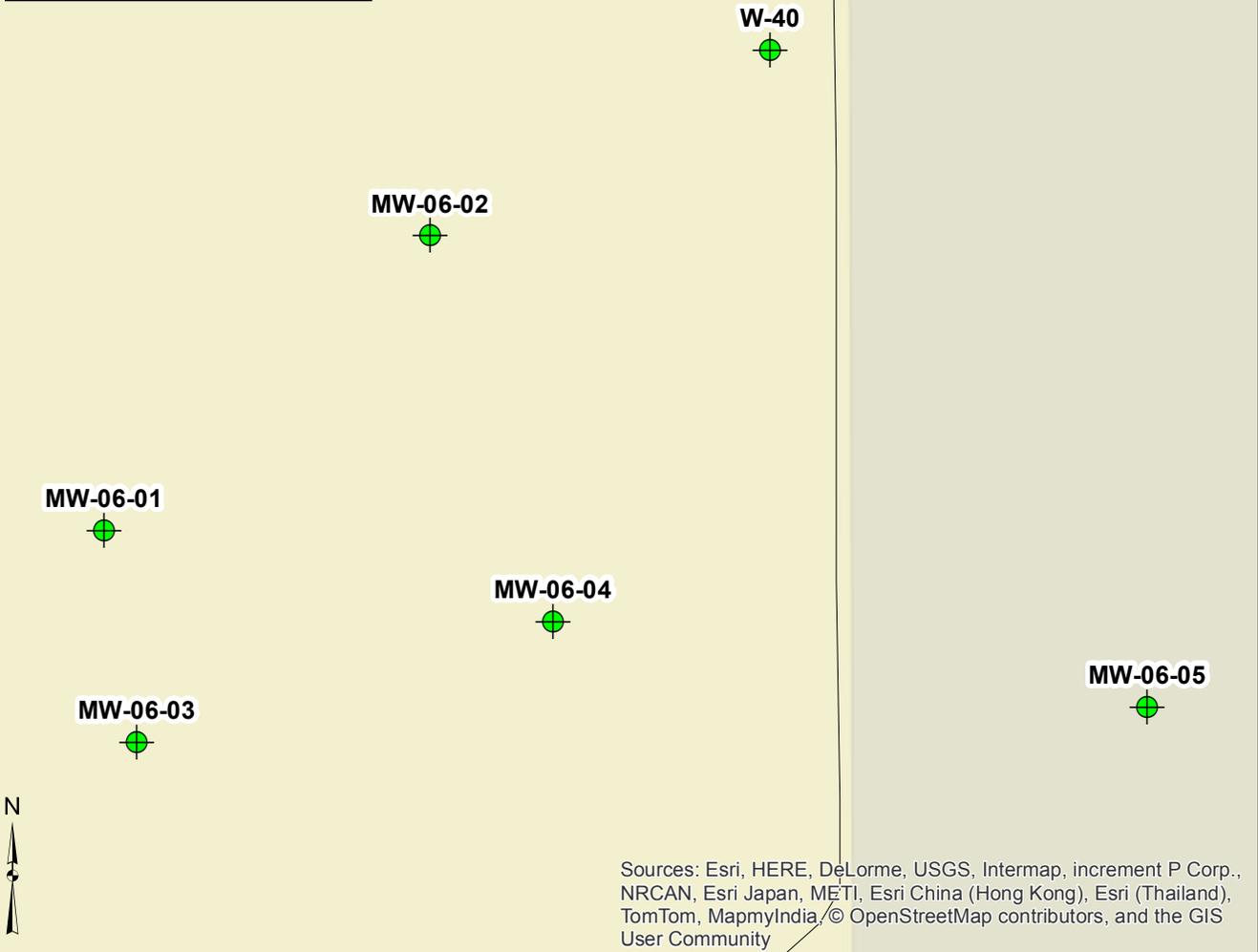
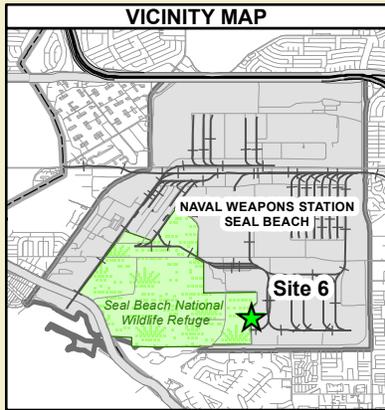
MONITORING WELL LOCATIONS - SITE 5

BASEWISE WELL DECOMMISSIONING
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

REVIEW: DM
AUTHOR: RD
FILE NUMBER: Figure 3.mxd



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LEGEND

- DECOMMISSIONED WELL
- RAILROAD TRACKS
- ROAD

**NAVAL FACILITIES ENGINEERING COMMAND
SOUTHWEST**

FIGURE 3c

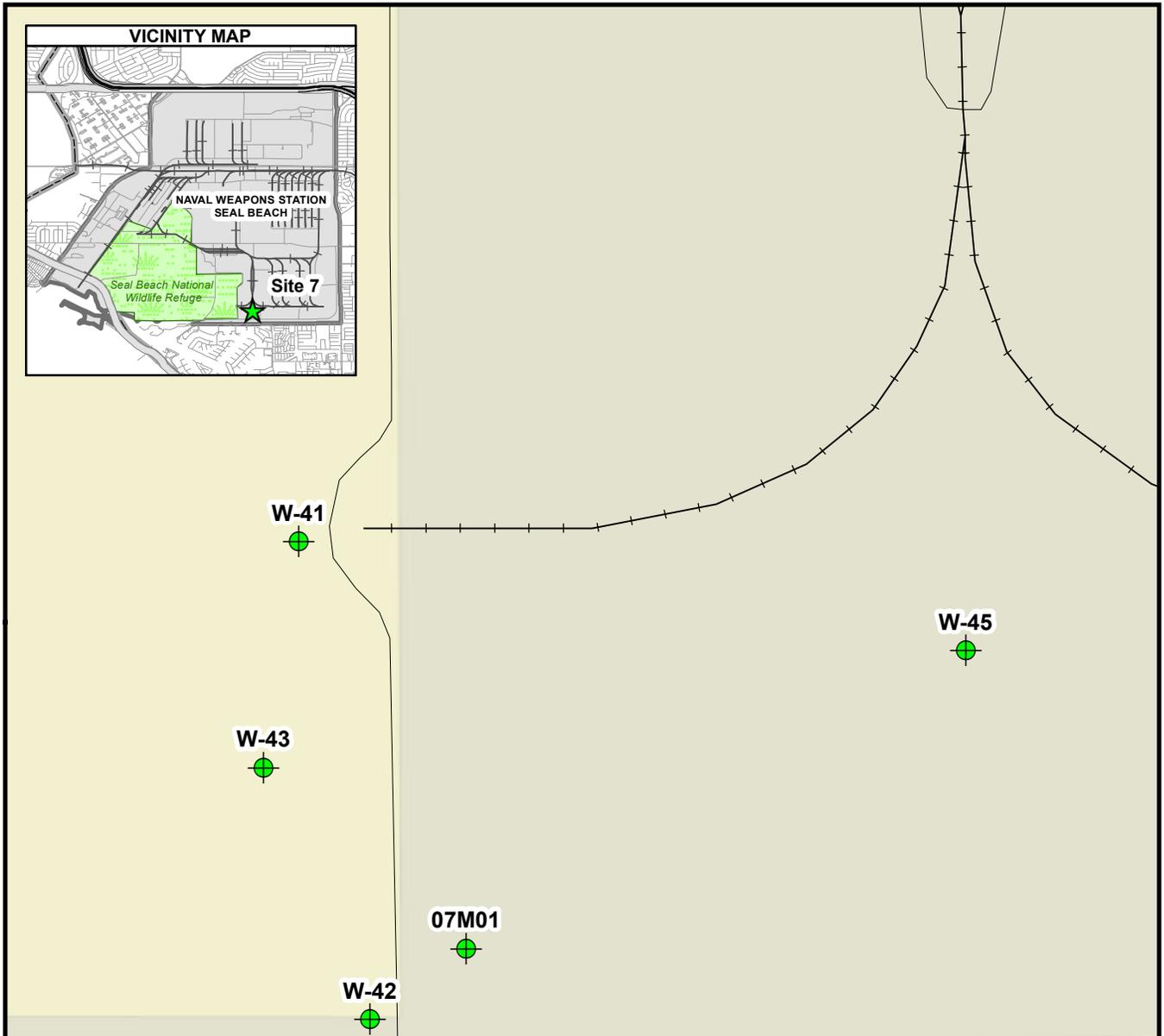
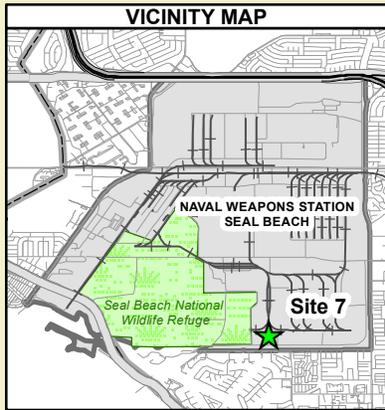
MONITORING WELL LOCATIONS - SITE 6

BASEWIDE WELL DECOMMISSIONING
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

REVIEW: DM
AUTHOR: RD
FILE NUMBER: Figure 3.mxd



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LEGEND

- DECOMMISSIONED WELL
- RAILROAD TRACKS
- ROAD

**NAVAL FACILITIES ENGINEERING COMMAND
SOUTHWEST**

FIGURE 3d

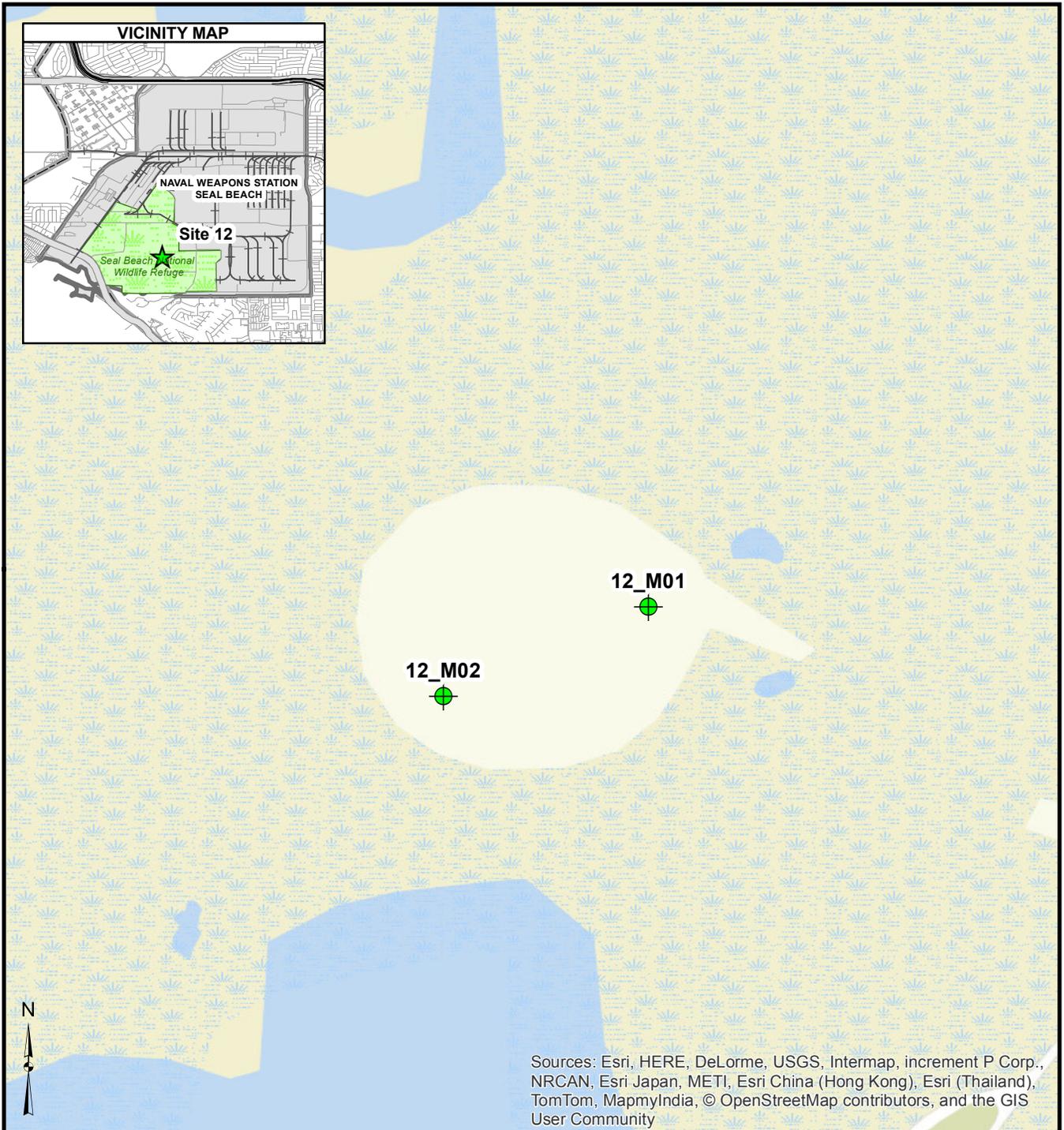
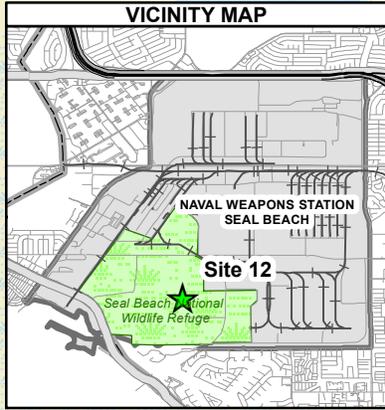
MONITORING WELL LOCATIONS - SITE 7

BASEWISE WELL DECOMMISSIONING
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

REVIEW: DM
AUTHOR: RD
FILE NUMBER: Figure 3.mxd



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LEGEND

-  DECOMMISSIONED WELL
-  RAILROAD TRACKS
-  ROAD

**NAVAL FACILITIES ENGINEERING COMMAND
SOUTHWEST**

FIGURE 3e

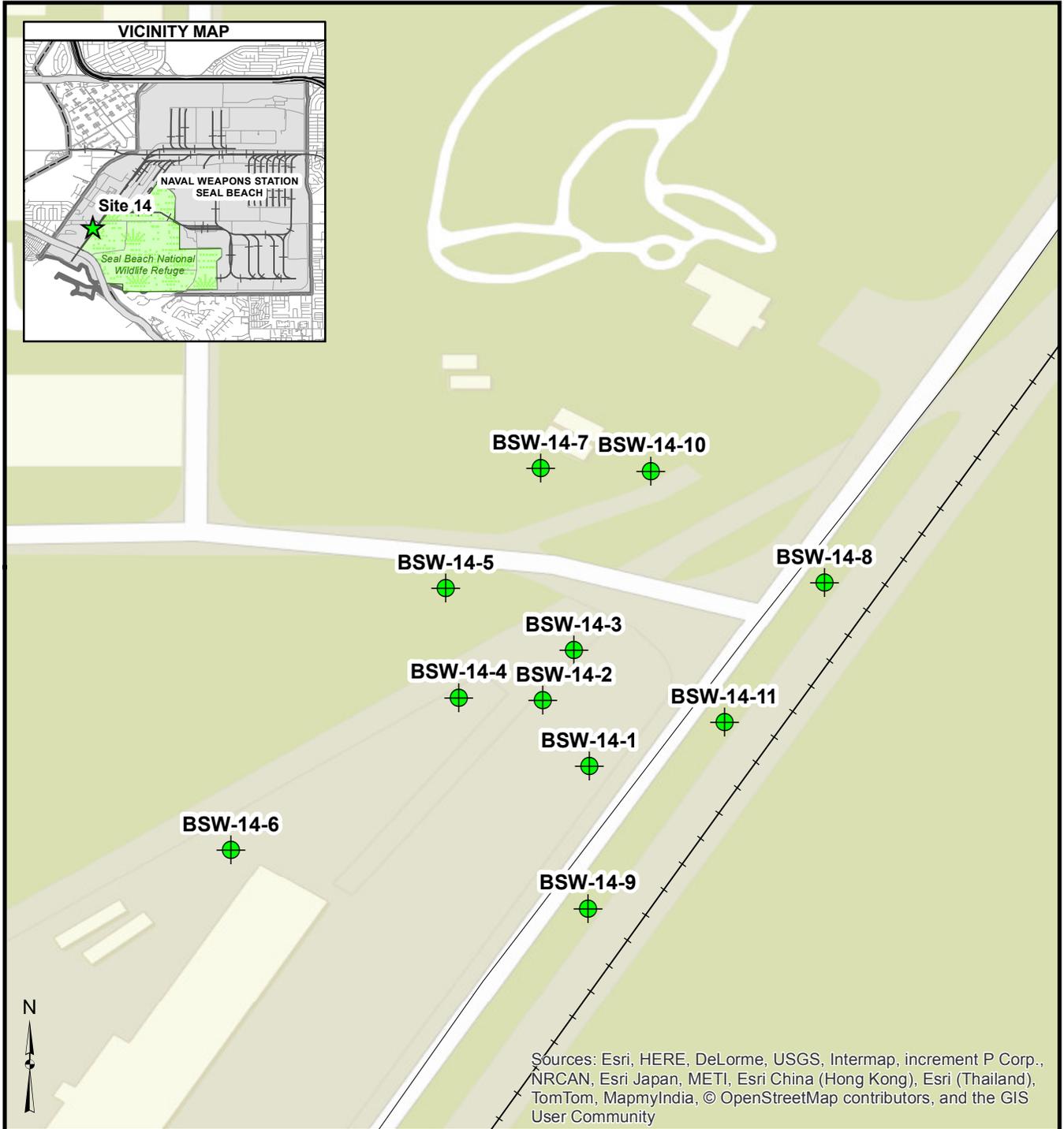
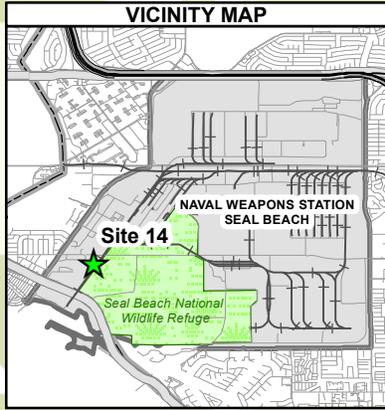
MONITORING WELL LOCATIONS - SITE 12

BASEWISE WELL DECOMMISSIONING
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

REVIEW: DM
AUTHOR: RD
FILE NUMBER: Figure 3.mxd



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LEGEND

-  DECOMMISSIONED WELL
-  RAILROAD TRACKS
-  ROAD

**NAVAL FACILITIES ENGINEERING COMMAND
SOUTHWEST**

FIGURE 3f

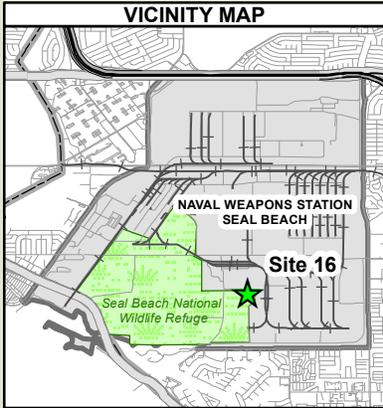
MONITORING WELL LOCATIONS - SITE 14

BASEWIDE WELL DECOMMISSIONING
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

REVIEW: DM
AUTHOR: RD
FILE NUMBER: Figure 3.mxd



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16_M01



16_M02



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LEGEND

-  DECOMMISSIONED WELL
-  RAILROAD TRACKS
-  ROAD

**NAVAL FACILITIES ENGINEERING COMMAND
SOUTHWEST**

FIGURE 3g

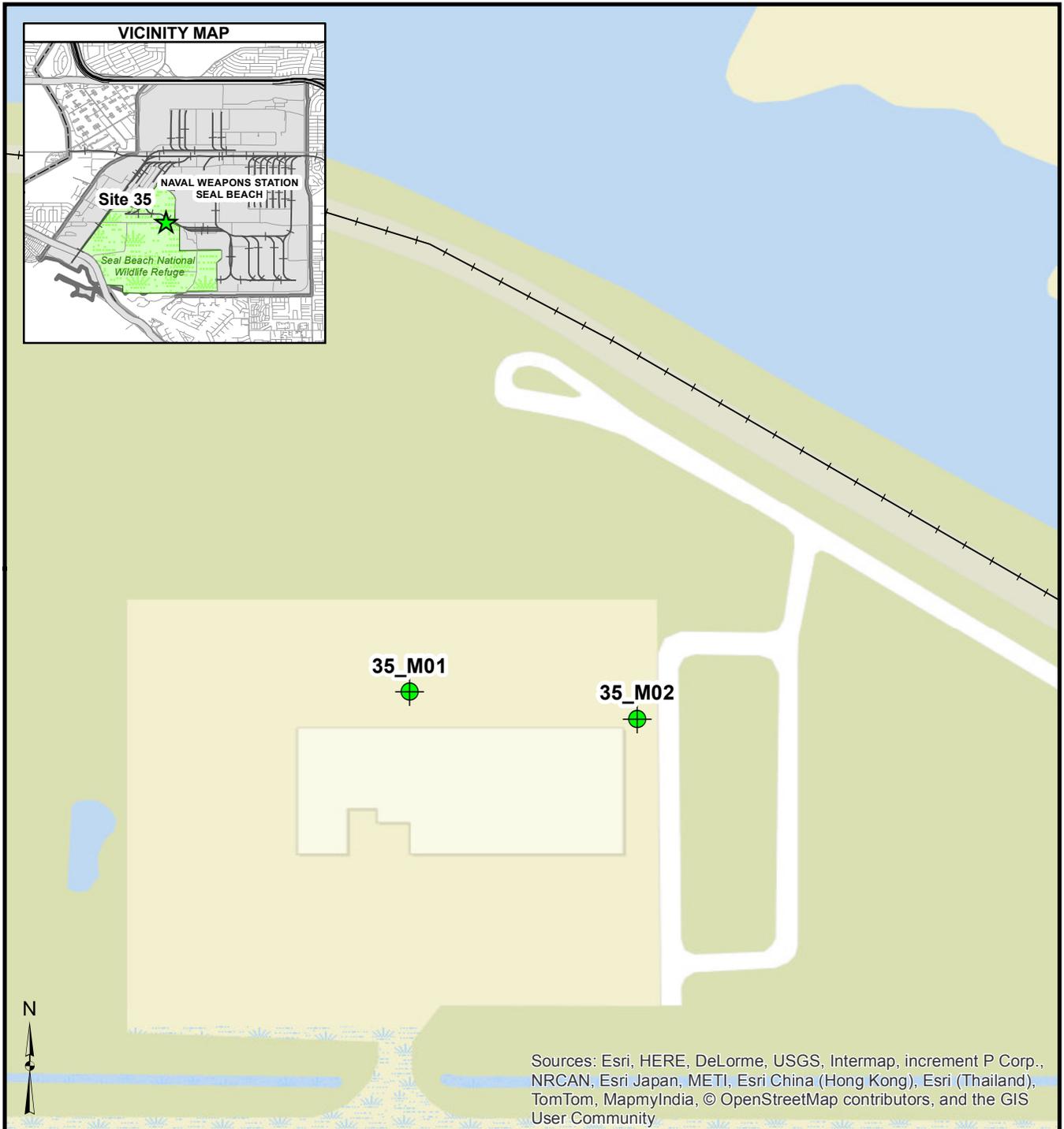
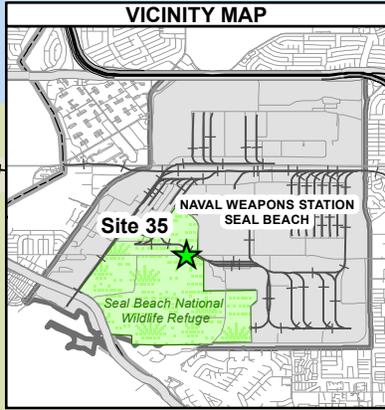
MONITORING WELL LOCATIONS - SITE 16

BASEWISE WELL DECOMMISSIONING
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

REVIEW: DM
AUTHOR: RD
FILE NUMBER: Figure 3.mxd



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LEGEND

-  DECOMMISSIONED WELL
-  RAILROAD TRACKS
-  ROAD

**NAVAL FACILITIES ENGINEERING COMMAND
SOUTHWEST**

FIGURE 3h

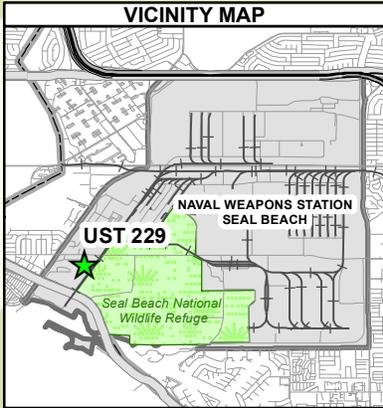
MONITORING WELL LOCATIONS - SITE 35

BASEWIDE WELL DECOMMISSIONING
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

REVIEW: DM
AUTHOR: RD
FILE NUMBER: Figure 3.mxd



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SB229-MW04



SB229-MW01



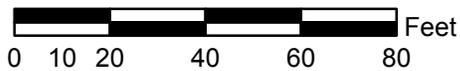
SB229-MW02



SB229-MW03



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



LEGEND

-  DECOMMISSIONED WELL
-  RAILROAD TRACKS
-  ROAD

**NAVAL FACILITIES ENGINEERING COMMAND
SOUTHWEST**

FIGURE 3i

MONITORING WELL LOCATIONS - UST 229

BASEWISE WELL DECOMMISSIONING
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

REVIEW: DM
AUTHOR: RD
FILE NUMBER: Figure 3.mxd

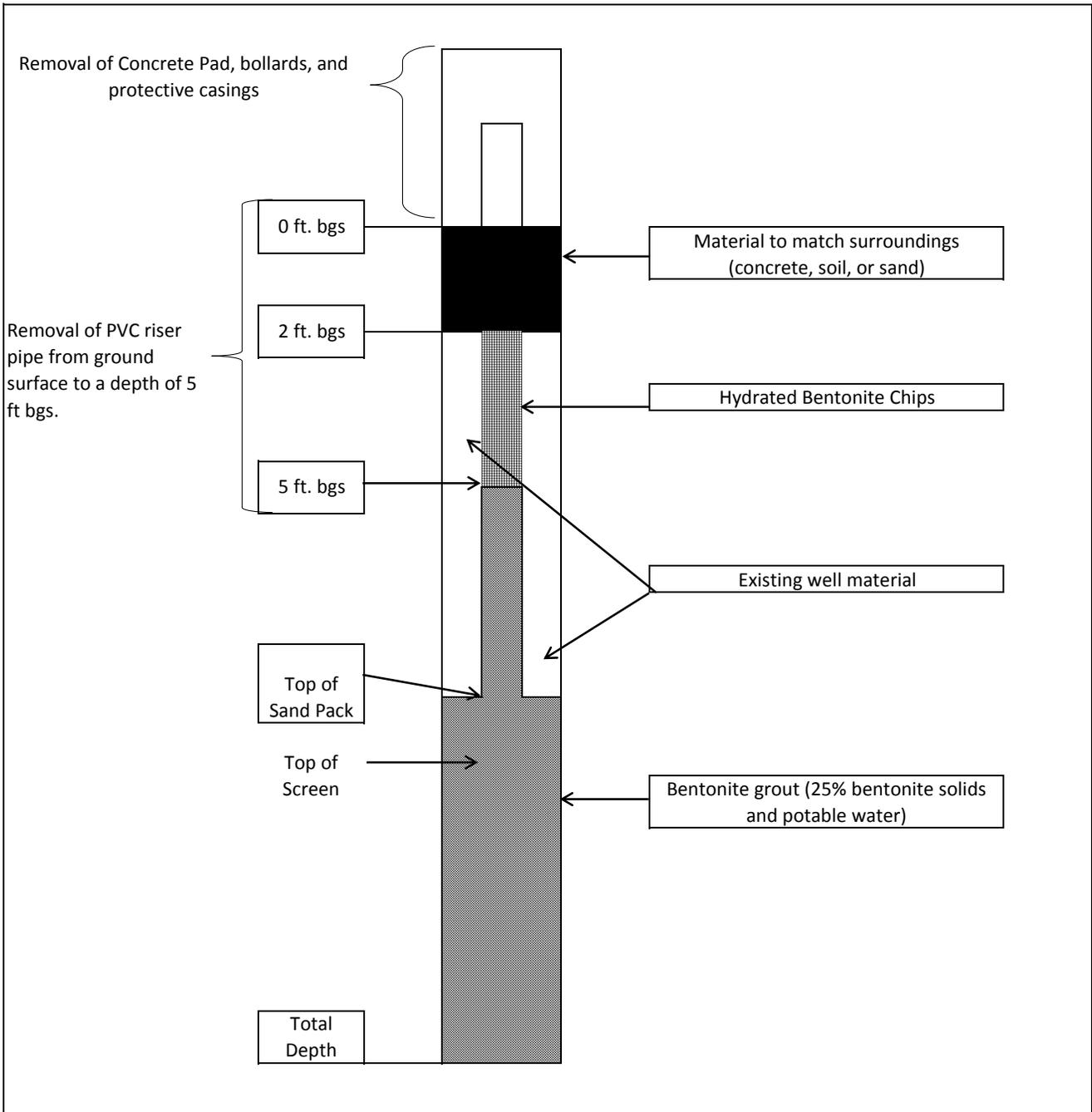


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Figure 4 - Typical Decommissioned Well Diagram
 Final Well Decommissioning Report
 Naval Weapons Station Seal Beach, California

Project Name:	Basewide Well Decommissioning
Site Location:	NAVWPNSTA Seal Beach
Drilling Contractor:	ABC Liovin Drilling

Driller:	Charlie Goodwin
Date:	January - February 2015



Notes: General depiction of decommissioned well . Material volumes used for each specific well can be found in Appendix D.

PVC-Polyvinyl chloride
 ft. bgs- feet below ground surface

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Appendix A:
Findings of the Site Inspection/Well Survey

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Appendix A
Findings of Site Inspection/Well Survey
Final Well Decommissioning Report
Naval Weapons Station Seal Beach, California

Site No.	Well ID	Location confirmed?	GPS Location		Well Inside SBNWR	Wetland, Upland, Neither	Footprint	Comments
			Latitude	Longitude				
1	01M02	No						
1	01M03	No						
1	01M04	No						
4	MW-04-01	Yes	33° 43' 50.416" N	118° 04' 3.05"W	Yes	Wetland	0 ft ²	Off the road=> No footprint
4	MW-04-02	Yes	33° 43' 50.261" N	118° 03' 42.961"W	Yes	Wetland	0 ft ²	Off the road=> No footprint
4	MW-04-03	Yes	33° 43' 50.333" N	118° 03' 39.842" W	No	Upland	0 ft ²	Off the road=> No footprint
4	MW-04-04	Yes	33° 43' 50.260" N	118° 03' 36.590" W	No	Upland	0 ft ²	Off the road=> No footprint
4	MW-04-05	Yes	33° 43' 50.319" N	118° 03' 31.895" W	No	Upland	0 ft ²	Off the road=> No footprint
5	05-MW01	No						
5	05-MW02	No						
5	MW-05-01	Yes	33° 44' 42.140" N	118° 05' 11.644" W	No	Neither		
5	MW-05-02	Yes	33° 44' 41.764" N	118° 05' 07.106" W	No	Neither		
5	MW-05-03	Yes	33° 44' 37.757" N	118° 05' 4.988" W	Yes	Wetland	2,000 ft ²	Driving forklift over mats to MW-05-04 and remotely using equipment to access MW-05-03 or backhoe with mats
5	MW-05-04	Yes	33° 44' 35.531" N	118° 05' 6.791" W	Yes	Wetland	300 ft ²	Driving forklift/equipment over mats to well location
5	MW-05-05	Yes	33° 44' 34.938" N	118° 05' 9.349" W	Yes	Wetland	0 ft ²	Drive over mudflats with forklift, no vegetation, mats if needed
6	06-MW01	No						
6	W-38	No						
6	W-39	No						
6	W-40	Yes	33° 44' 10.196" N	118° 03' 41.326" W	Yes	Wetland	0 ft ²	Off the road=> No footprint
6	MW-06-01	Yes	33° 44' 5.001" N	118° 03' 48.531" W	Yes	Wetland	0 ft ²	Off the road=> No footprint
6	MW-06-02	Yes	33° 44' 8.190" N	118° 03' 45.006" W	Yes	Wetland	0 ft ²	Off the road=> No footprint
6	MW-06-03	Yes	33° 44' 2.703" N	118° 03' 48.174" W	Yes	Wetland	450 ft ²	Driving forklift/equipment over mats to well location
6	MW-06-04	Yes	33° 44' 4.012" N	118° 03' 43.672" W	Yes	Wetland	0 ft ²	Off the road
6	MW-06-05	Yes	33° 44' 3.086" N	118° 03' 37.250" W	No	Upland	2,500 ft ²	Driving forklift/equipment over mats to well location
7	07M01	Yes	33° 43' 51.610" N	118° 03' 39.232" W	No	Upland	600 ft ²	Driving forklift/equipment over mats to well location
7	07M02	No						
7	07M03	No						
7	07M04	No						
7	W-41	Yes	33° 43' 58.926" N	118° 03' 42.241" W	Yes	Wetland	0 ft ²	Off the road =>No footprint
7	W-42	Yes	33° 43' 50.333" N	118° 03' 40.961" W	Yes	Wetland	0 ft ²	Off the road =>No footprint
7	W-43	Yes	33° 43' 54.864" N	118° 03' 42.872" W	Yes	Wetland	0 ft ²	Off the road =>No footprint
7	W-44	No						
7	W-45	Yes	33° 43' 56.965" N	118° 03' 30.260" W	No	Upland	1,000 ft ²	Driving forklift/equipment over mats to well location
7	W-46	No						
8_42	USGS-1	No						
8_42	USGS-1A	No						
8_42	USGS-2	No						
8_42	USGS-23	No						
8_42	USGS-24	No						
12	12_M01	Yes	33° 44' 19.170" N	118° 04' 24.030" W	Yes	Neither	0 ft ²	Must coordinate with range

Appendix A
Findings of Site Inspection/Well Survey
Final Well Decommissioning Report
Naval Weapons Station Seal Beach, California

Site No.	Well ID	Location confirmed?	GPS Location		Well Inside SBNWR	Wetland, Upland, Neither	Footprint	Comments
			Latitude	Longitude				
12	12_M02	Yes	33° 44' 17.995" N	118° 04' 26.71" W	Yes	Neither	0 ft ²	Must coordinate with range
13	13-MW01	No						
13	13-MW02	No						
13	13-MW03	No						
14	BSW-14-1	Yes	33° 44' 35.783"N	118° 05' 12.750"W	No	Neither		
14	BSW-14-2	Yes	33° 44' 36.214"N	118° 05' 13.055"W	No	Neither		
14	BSW-14-3	Yes	33° 44' 36.543"N	118° 05' 12.853"W	No	Neither		
14	BSW-14-4	Yes	33° 44' 36.233"N	118° 05' 13.605"W	No	Neither		
14	BSW-14-5	Yes	33° 44' 36.948"N	118° 05' 13.691"W	No	Neither		
14	BSW-14-6	Yes	33° 44' 35.234"N	118° 05' 15.100"W	No	Neither		
14	BSW-14-7	Yes	33° 44' 37.737"N	118° 05' 13.07"W	No	Neither		
14	BSW-14-8	Yes	33° 44' 36.987"N	118° 05' 11.21"W	No	Neither		
14	BSW-14-9	Yes	33° 44' 34.851"N	118° 05' 12.760"W	No	Neither		
14	BSW-14-10	Yes	33° 44' 37.720"N	118° 05' 12.35"W	No	Neither		
14	BSW-14-11	Yes	33° 44' 36.073"N	118° 05' 11.866"W	No	Neither		
14	N35	No						
14	N36	No						
14	N37	No						
14	N38	No						
14	N39	No						
16	16_M01	Yes	33° 44' 21.986" N	118° 03' 47.808" W	Yes	Wetland	0 ft ²	Off the road =>No footprint
16	16_M02	Yes	33° 44' 21.926" N	118°03' 41.661" W	Yes	Wetland	0 ft ²	Off the road=> No footprint
19	W54	No						
19	W55	No						
19	W56	No						
35	35_M01	Yes	33° 44' 44.720"N	118° 04' 21.960"W	Yes	Neither	0 ft ²	In asphalt, must coordinate with torpedo facility
35	35_M02	Yes	33° 44' 44.540"N	118° 04' 20.470"W	Yes	Neither	0 ft ²	In asphalt, must coordinate with torpedo facility
UST229	SB229-MW01	Yes	33° 44' 36.996"N	118° 05' 15.848"W	No	Neither		
UST229	SB229-MW02	Yes	33° 44' 36.368"N	118° 05' 16.279"W	No	Neither		
UST229	SB229-MW03	Yes	33° 44' 35.934"N	118° 05' 15.139"W	No	Neither		
UST229	SB229-MW04	Yes	33° 44' 36.998"N	118° 05' 16.298"W	No	Neither		

Notes : SBNWR - Seal Beach National Wildlife Refuge

Latitude and longitude coordinates recorded by CE2-Kleinfelder JV personnel with a Trimble GeoXT 2005 handheld Global Positioning Satellite (GPS) unit using World Geodetic System 1984 (WGS84) datum on November 17, 2014

Red and Bold Indicates these wells are "Optional Wells for Decommissioning"

Number of Confirmed Wells for Decommissioning = 42

Footprint indicates the estimated area in square feet (ft²) of potential impact to sensitive habitat wetland or upland.

Appendix B:
DTSC and RWQCB Work Plan
Concurrence Letters

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Department of Toxic Substances Control



Matthew Rodriguez
Secretary for
Environmental Protection

Barbara A. Lee, Director
5796 Corporate Avenue
Cypress, California 90630

Edmund G. Brown Jr.
Governor

December 23, 2014

Ms. Pei-Fen Tamashiro
Installation Restoration Coordinator
Naval Weapons Station Seal Beach
800 Seal Beach Blvd
Seal Beach, CA 90740-5000

FINAL BASEWIDE WELL DECOMMISSIONING WORK PLAN, NAVAL WEAPONS STATION SEAL BEACH (NWSSB), CALIFORNIA

Dear Ms. Tamashiro:

The Department of Toxic Substances Control (DTSC) received the above referenced document dated December 11, 2014. The Navy proposes to decommission 42 groundwater monitoring wells at NWSSB. These wells are located at Sites 1, 4, 5, 6, 7, 12, 14, 16, 19, 35, and UST 229, respectively.

DTSC's past comment on the draft work plan has been adequately addressed. We do not have further comments to be forwarded to the Navy and concur with the proposed well decommissioning. If you have any questions regarding this letter, please contact me at (714) 484-5458.

Sincerely,

Stephen Niou, P.E.
Brownfields and Environmental Restoration Program

Santa Ana Regional Water Quality Control Board

January 9, 2015

Ms. Pei-Fen Tamashiro
Installation Restoration Coordinator
Naval Weapons Station Seal Beach
800 Seal Beach Blvd.
Seal Beach, CA 90740-5000
pei-fen.tamashiro@navy.mil

**RESPONSE TO FINAL BASEWIDE WELL DECOMMISSIONING WORK PLAN FOR
NAVAL WEAPONS STATION SEAL BEACH, ORANGE COUNTY
GEOTRACKER ID: SLT8R2604067, DOD100379000, DOD100379100, DOD100350500,
DOD100350600, DOD100350700, DOD100352200, DOD100352300, T0605901139, DOD100352400,
DOD100352500, DOD100355600, T0605953305, T0605901373**

Dear Ms. Tamashiro:

We have completed our review of the above-referenced work plan dated December 2014, which we received on December 19, 2014. The work plan proposes the decommissioning of 47 groundwater monitoring wells at Sites 1, 4, 5, 6, 7, 12, 14, 16, and UST 229. Twenty-four additional wells at Sites 5, 6, 8, 42, 13, 14, 19, 35 (44/45) are also proposed for decommissioning provided they can be located. Attached is a map showing the locations of Sites where groundwater monitoring wells are proposed to be decommissioned.

Site	Well identification
01	01M02, 01M03, and 01M04
04	MW-4-01, MW-4-02, MW-4-03, MW-4-04, and MW-4-05
05	MW-5-01, MW-5-02, MW-5-03, MW-5-04, and MW-5-05
06	MW-6-01, MW-6-02, MW-6-03, MW-6-04, and MW-6-05
07	07M01, 07M02, 07M03, 07M04, W-41, W-42, W-43, W-44, W-45, and W-46
12	12_M01 and 12_M02
14	BSW-14-01, BSW-14-02, BSW-14-03, BSW-14-04, BSW-14-05, BSW-14-06, BSW-14-07, BSW-14-08, BSW-14-09, BSW-14-10, and BSW-14-11
16	16_M01 and 16_M02
UST 229	SB229-MW01, SB229-MW02, SB229-MW03, and SB229-MW04

Optional Wells for Decommissioning, provided they can be located			
Site	Well identification	Site	Wells identification
05	05-MW01 and 05-MW02	14	N35, N36, N37, N38, and N39
06	06-MW01, W-38, W-39, and W-40	19	W54, W55, and W56
08/42	USGS-1, USGS-1A, USGS-2, USGS-23, and USGS-24	35	35_M01 and 35_M02
13	13-MW01, 13-MW02, and 13-MW03		

We concur with the proposed work plan.

Should you have any questions regarding this letter, please contact me at (951) 782-4498, or by email at patricia.hannon@waterboards.ca.gov.

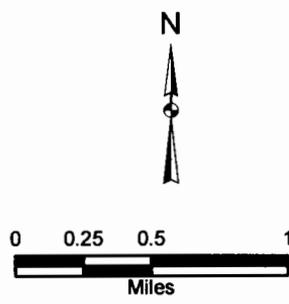
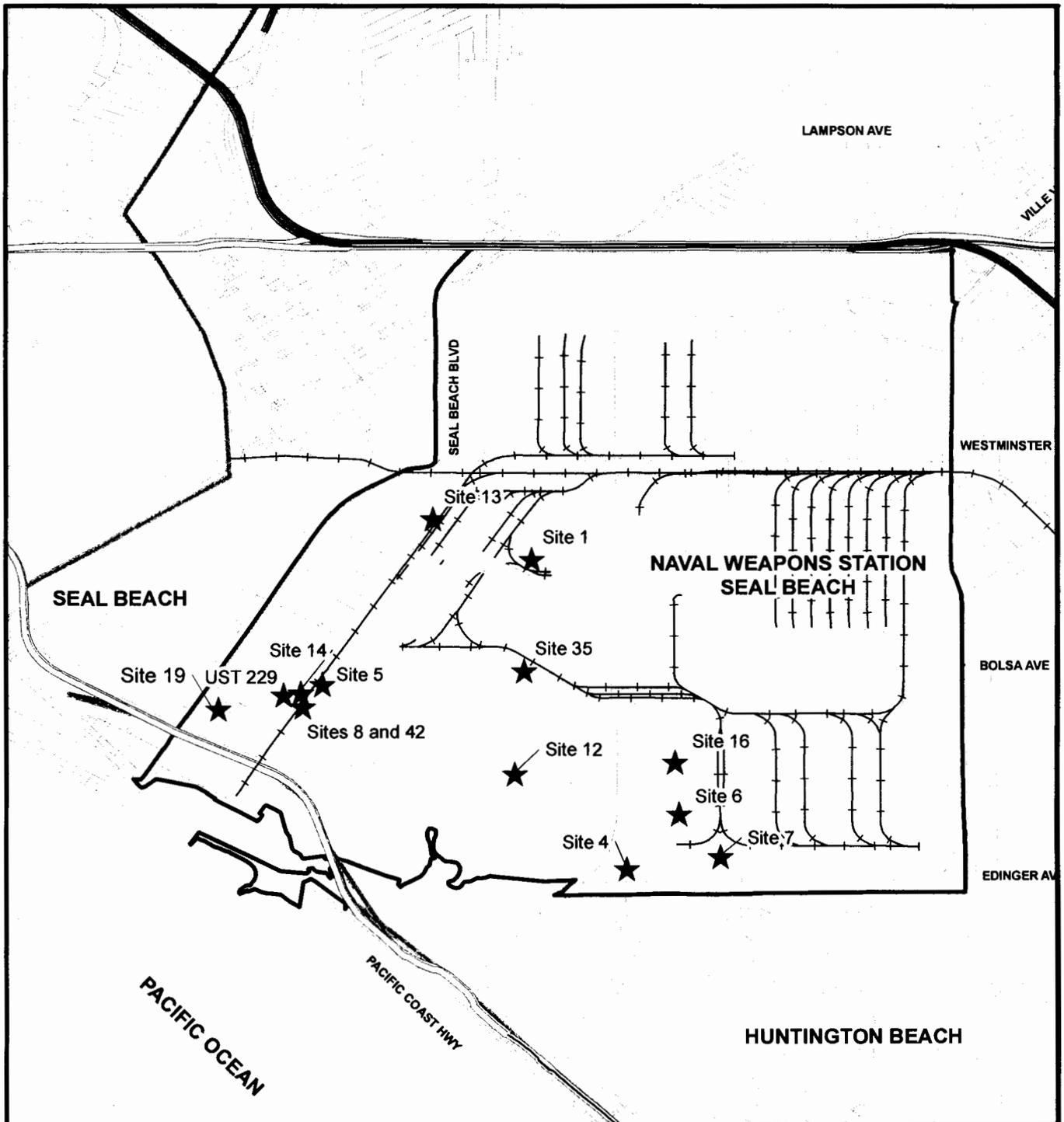
Sincerely,



Patricia A. Hannon, PG
Engineering Geologist
Land Disposal and DoD Section

Attachment: Site Location Map from Work Plan

cc: Ms. Brenda Reese, Nav Fac Eng Command Southwest, brenda.reese@navy.mil
Mr. Stephen Niou, DTSC, Stephen.Niou@dtsc.ca.gov



**NAVAL FACILITIES ENGINEERING COMMAND
SOUTHWEST**

PREDRAFT WORK PLAN
AUGUST 2014

FIGURE 2

SITE LOCATION MAP

BASEWIDE WELL DECOMMISSIONING
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

REVIEW: DM
AUTHOR: RD
FILE NUMBER: Figure 2.mxd



Appendix C:
Summary of Decommissioned Wells

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Appendix C
Summary of Decommissioned Wells
Final Well Decommissioning Report
Naval Weapons Station Seal Beach, California

Site No.	Well ID	Installation Date	Decommission Date	Location ¹		Well Details					Figure Reference Number ³
				Latitude	Longitude	Total Depth (ft bgs)	Borehole Diameter (in)	Casing Diameter (in)	Casing Type ²	Surface Completion	
4	MW-04-01	9/29/2003	1/12/2015	33° 43' 50.416" N	118° 04' 3.05" W	19	10	4	PVC	Above Ground	3a
4	MW-04-02	9/29/2003	1/9/2015	33° 43' 50.261" N	118° 03' 42.961" W	31	10	4	PVC	Above Ground	3a
4	MW-04-03	9/25/2003	1/12/2015	33° 43' 50.333" N	118° 03' 39.842" W	30.5	10	4	PVC	Above Ground	3a
4	MW-04-04	9/25/2003	1/13/2015	33° 43' 50.260" N	118° 03' 36.590" W	30.5	10	4	PVC	Above Ground	3a
4	MW-04-05	9/25/2003	1/15/2015	33° 43' 50.319" N	118° 03' 31.895" W	19	10	4	PVC	Above Ground	3a
5	MW-05-01	12/3/1998	1/15/2015	33° 44' 42.140" N	118° 05' 11.644" W	31	8	4	PVC	Above Ground	3b
5	MW-05-02	9/22/2003	1/15/2015	33° 44' 41.764" N	118° 05' 07.106" W	30.5	8	4	PVC	Above Ground	3b
5	MW-05-03	10/20/2003	2/11/2015	33° 44' 37.757" N	118° 05' 4.988" W	30.5	8	4	PVC	Above Ground	3b
5	MW-05-04	9/23/2003	2/10/2015	33° 44' 35.531" N	118° 05' 6.791" W	30	8	4	PVC	Above Ground	3b
5	MW-05-05	9/22/2003	1/13/2015	33° 44' 34.938" N	118° 05' 9.349" W	30.5	8	4	PVC	Above Ground	3b
6	W-40	11/1/1988	1/8/2015	33° 44' 10.196" N	118° 03' 41.326" W	30	8	2	PVC	Above Ground	3c
6	MW-06-01	12/3/1998	1/9/2015	33° 44' 5.001" N	118° 03' 48.531" W	31.5	8	4	PVC	Above Ground	3c
6	MW-06-02	9/19/2003	1/9/2015	33° 44' 8.190" N	118° 03' 45.006" W	30.5	10	4	PVC	Above Ground	3c
6	MW-06-03	9/19/2003	2/9/2015	33° 44' 2.703" N	118° 03' 48.174" W	30.5	10	4	PVC	Above Ground	3c
6	MW-06-04	9/24/2003	1/9/2015	33° 44' 4.012" N	118° 03' 43.672" W	30.5	10	4	PVC	Above Ground	3c
6	MW-06-05	9/24/2003	1/21/2015	33° 44' 3.086" N	118° 03' 37.250" W	30.5	10	4	PVC	Above Ground	3c
7	07M01	12/22/1993	1/21/2015	33° 43' 51.610" N	118° 03' 39.232" W	22	10	4	PVC	Above Ground	3d
7	W-41	11/4/1988	1/20/2015	33° 43' 58.926" N	118° 03' 42.241" W	30	8	2	PVC	Above Ground	3d
7	W-42	11/4/1988	1/16/2015	33° 43' 50.333" N	118° 03' 40.961" W	30	8	2	PVC	Above Ground	3d
7	W-43	11/7/1988	2/9/2015	33° 43' 54.864" N	118° 03' 42.872" W	30	8	2	PVC	Above Ground	3d
7	W-45	11/10/1988	1/20/2015	33° 43' 56.965" N	118° 03' 30.260" W	28	7	2	PVC	Above Ground	3d
12	12_M01	2/24/1995	1/6/2015	33° 44' 19.170" N	118° 04' 24.030" W	26	10.375	4	PVC	Flush, no cover	3e
12	12_M02	2/24/1995	1/6/2015	33° 44' 17.995" N	118° 04' 26.71" W	26	10.375	4	PVC	Flush, no cover	3e
14	BSW-14-1	10/20/1999	1/9/2015	33° 44' 35.783" N	118° 05' 12.750" W	25	10	4.5	PVC	Flush Mounted	3f
14	BSW-14-2	10/20/1999	1/7/2015	33° 44' 36.214" N	118° 05' 13.055" W	25	10	4.5	PVC	Flush Mounted	3f
14	BSW-14-3	10/20/1999	1/7/2015	33° 44' 36.543" N	118° 05' 12.853" W	25	10	4.5	PVC	Flush Mounted	3f
14	BSW-14-4	10/20/1999	1/5/2015	33° 44' 36.233" N	118° 05' 13.605" W	25	10	4.5	PVC	Flush Mounted	3f
14	BSW-14-5	10/20/1999	1/6/2015	33° 44' 36.948" N	118° 05' 13.691" W	25	10	4.5	PVC	Flush Mounted	3f
14	BSW-14-6	10/2/2001	1/5/2015	33° 44' 35.234" N	118° 05' 15.100" W	25	10	4	PVC**	Flush Mounted	3f
14	BSW-14-7	10/1/2001	1/5/2015	33° 44' 37.737" N	118° 05' 13.07" W	25	10	4	PVC	Flush Mounted	3f
14	BSW-14-8	10/1/2001	1/7/2015	33° 44' 36.987" N	118° 05' 11.21" W	24	10	4	PVC**	Flush Mounted	3f
14	BSW-14-9	10/1/2001	1/7/2015	33° 44' 34.851" N	118° 05' 12.760" W	25	10	4	PVC**	Flush Mounted	3f
14	BSW-14-10	8/1/2006	1/5/2015	33° 44' 37.720" N	118° 05' 12.35" W	25	10	4	PVC	Flush Mounted	3f
14	BSW-14-11	8/2/2006	1/7/2015	33° 44' 36.073" N	118° 05' 11.866" W	27.5	10	4	PVC	Flush Mounted	3f

Appendix C
 Summary of Decommissioned Wells
 Final Well Decommissioning Report
 Naval Weapons Station Seal Beach, California

Site No.	Well ID	Installation Date	Decommission Date	Location ¹		Well Details					Figure Reference Number ³
				Latitude	Longitude	Total Depth (ft bgs)	Borehole Diameter (in)	Casing Diameter (in)	Casing Type ²	Surface Completion	
16	16_M01	5/3/1995	1/8/2015	33° 44' 21.986" N	118° 03' 47.808" W	21.5	10.375	4	PVC	Above Ground	3g
16	16_M02	5/3/1995	1/8/2015	33° 44' 21.926" N	118° 03' 41.661" W	21.5	10.375	4	PVC	Above Ground	3g
35	35_M01	4/19/1995	1/9/2015	33° 44' 44.720"N	118° 04' 21.960"W	20.8	10.375	4	PVC	Flush Mounted	3h
35	35_M02	4/17/1995	1/8/2015	33° 44' 44.540"N	118° 04' 20.470"W	21.5	10.375	4	PVC	Flush Mounted	3h
UST229	SB229-MW01	7/21/2009	1/7/2015	33° 44' 36.996"N	118° 05' 15.848"W	16.5	10	2	PVC	Flush Mounted	3i
UST229	SB229-MW02	7/21/2009	1/7/2015	33° 44' 36.368"N	118° 05' 16.279"W	15	10	2	PVC	Flush Mounted	3i
UST229	SB229-MW03	7/21/2009	1/7/2015	33° 44' 35.934"N	118° 05' 15.139"W	14.5	10	2	PVC	Flush Mounted	3i
UST229	SB229-MW04	7/30/2009	1/7/2015	33° 44' 36.998"N	118° 05' 16.298"W	16.5	10	2	PVC	Flush Mounted	3i

Notes: ft bgs- feet below ground surface
 ID - identification
 in - inches
 PVC - Polyvinyl Chloride
 ** Schedule 80 PVC

¹ Latitude and longitude coordinates recorded with a Trimble GeoXT 2005 handheld Global Positioning Satellite (GPS) unit using World Geodetic System 1984 (WGS84) datum.

² Schedule 40 PVC unless specified with **

³ Figures references are in Appendix B

Appendix D: Photography Log

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**PHOTO 01: If necessary, route to well from road was matted.
(Looking west)**

**PHOTO 02: Bentonite grout (25% solids) was added.
(Looking north)**



**PHOTO 03: A minimum of 25 pounds per square inch of
pressure was applied with a secured pressure head.**

**PHOTO 04: The PVC riser pump was removed from each well
from ground surface to a depth of 5 feet bgs (Looking east)**



**6140 Stoneridge Mall Rd Ste 500
Pleasanton Ca 94588**

**Photography Log
Basewide Well Decommissioning Activities
Naval Weapons Station Seal Beach
Seal Beach, CA**



PHOTO 05: Concrete pad was jack-hammered for removal if the four-wheel drive backhoe or forklift could not get close enough (Looking west).



PHOTO 06: Concrete pad and well box structure was removed with four-wheel drive backhoe or forklift if it could get close enough to well (Looking south).



PHOTO 07: Concrete was broken up to less than 24 inches for disposal (Looking east)



PHOTO 08: Concrete was stored in 10 cubic yard roll-off bins pending removal offsite (Looking north)



6140 Stoneridge Mall Rd Ste 500
Pleasanton Ca 94588

Photography Log
Basewide Well Decommissioning Activities
Naval Weapons Station Seal Beach
Seal Beach, CA

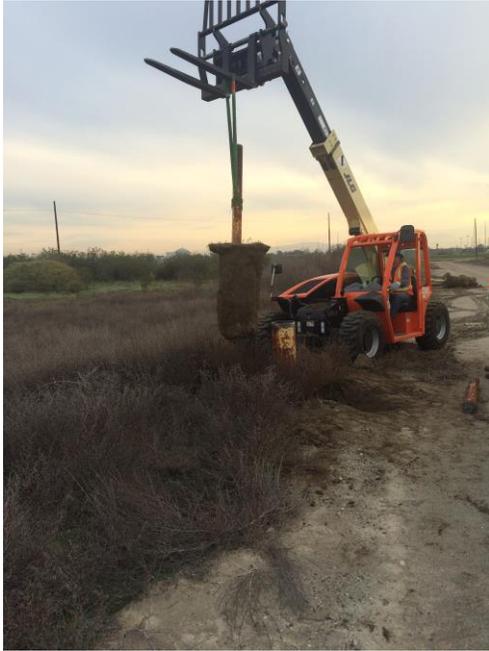


PHOTO 09: Bollards were removed with other well completion components. (Looking west).

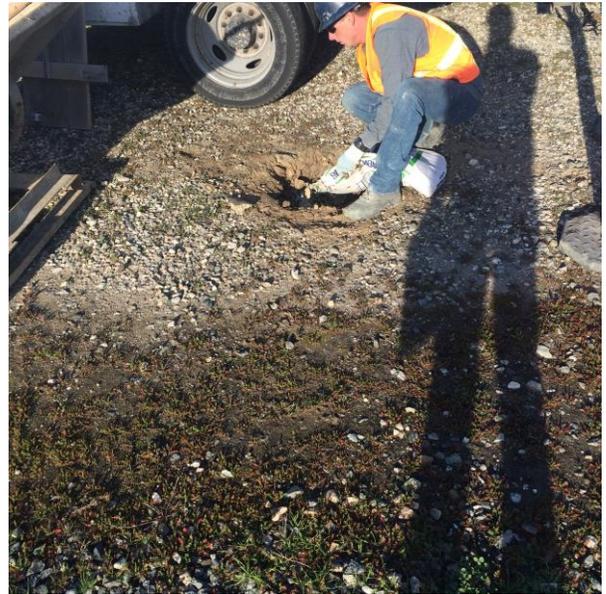


PHOTO 10: Bentonite chips was placed on top of the grout.



PHOTO 11: Concrete was added if it matched surrounding area. (Looking west)



PHOTO 12: Sand was added if it matched surrounding area.



6140 Stoneridge Mall Rd Ste 500
Pleasanton Ca 94588

Photography Log
Basewide Well Decommissioning Activities
Naval Weapons Station Seal Beach
Seal Beach, CA



PHOTO 13: If soil backfill was needed, designated soil by the Navy was collected for use. (Looking north)



PHOTO 14: Soil was added if it matched surrounding area.



PHOTO 15: Route to well from road were swept were graded to remove tire marks (Looking north)

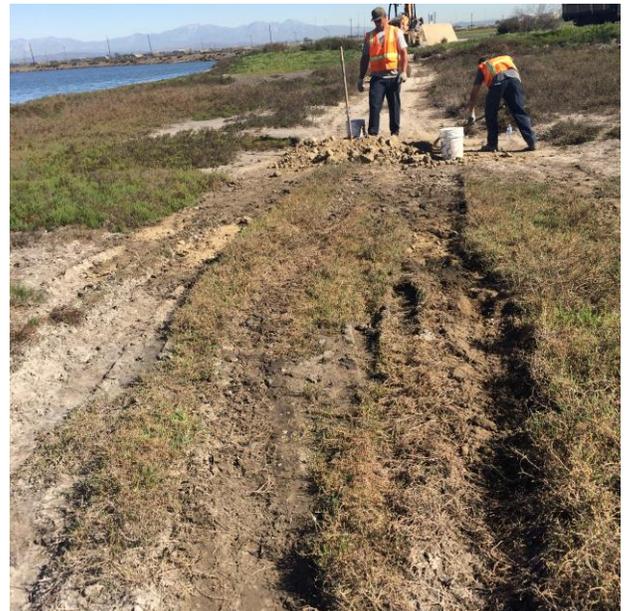


PHOTO 16: Backfill soil was used to remove any ruts (Looking west)



6140 Stoneridge Mall Rd Ste 500
Pleasanton Ca 94588

Photography Log
Basewide Well Decommissioning Activities
Naval Weapons Station Seal Beach
Seal Beach, CA

Appendix E:
Material Volumes used for Basewide Well
Decommissioning

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Appendix E
Material Volumes used for Basewide Well Decommissioning
Final Well Decommissioning Report
Naval Weapons Station Seal Beach, California

Site No.	Well ID	Theoretical Volume of Grout Required** (gal)	Volume of Bentonite Grout used (gal)	Volume of Bentonite Chips used (ft ³)	Material to match surroundings
4	MW-04-01	22.54	28	1.64	Soil
4	MW-04-02	37.48	40	1.64	Soil
4	MW-04-03	39.62	45	1.64	Soil
4	MW-04-04	39.62	47	1.64	Soil
4	MW-04-05	20.48	25	1.64	Soil
5	MW-05-01	34.37	45	1.05	Soil
5	MW-05-02	22.18	25	1.05	Soil
5	MW-05-03	23.47	25	1.05	Soil
5	MW-05-04	21.31	25	1.05	Soil
5	MW-05-05	25.34	28	1.05	Soil
6	W-40	19.45	28	1.05	Soil
6	MW-06-01	27.49	30	1.05	Soil
6	MW-06-02	28.48	38	1.64	Soil
6	MW-06-03	30	32	1.64	Soil
6	MW-06-04	27.3	44	1.64	Soil
6	MW-06-05	43.95	40	1.64	Soil
7	07M01	26.66	32	1.64	Soil
7	W-41	16.87	26	1.05	Soil
7	W-42	19.02	14***	1.05	Soil
7	W-43	17.54	21	1.05	Soil
7	W-45	14.13	18	0.80	Soil
12	12_M01	29.72	40	1.76	Sand
12	12_M02	29.42	40	1.76	Sand
14	BSW-14-1	28.99	38	1.64	Concrete
14	BSW-14-2	28.073	40	1.64	Concrete
14	BSW-14-3	30.8	38	1.64	Concrete
14	BSW-14-4	31.89	40	1.64	Soil
14	BSW-14-5	31.71	43	1.64	Soil
14	BSW-14-6	29.59	40	1.64	Soil
14	BSW-14-7	26.33	45	1.64	Soil
14	BSW-14-8	28.36	38	1.64	Soil
14	BSW-14-9	32.42	44	1.64	Soil
14	BSW-14-10	28.21	35	1.64	Soil
14	BSW-14-11	29.82	37	1.64	Soil

Appendix E
Material Volumes used for Basewide Well Decommissioning
Final Well Decommissioning Report
Naval Weapons Station Seal Beach, California

Site No.	Well ID	Theoretical Volume of Grout Required** (gal)	Volume of Bentonite Grout used (gal)	Volume of Bentonite Chips used (ft ³)	Material to match surroundings
16	16_M01	17.83	33	1.76	Soil
16	16_M02	24.07	27	1.76	Soil
35	35_M01	24.07	35	1.76	Concrete
35	35_M02	21.4	33	1.76	Concrete
UST229	SB229-MW01	10.76	18	1.64	Soil
UST229	SB229-MW02	9.55	15	1.64	Soil
UST229	SB229-MW03	9.41	15	1.64	Soil
UST229	SB229-MW04	11.43	18	1.64	Soil
<p>Notes: <i>ft - feet</i> <i>ID - identification</i> <i>in - inches</i> <i>PVC - Polyvinyl Chloride</i> <i>gal-gallons</i> <i>ft³-cubic feet</i> ** - <i>Theoretical volume of grout required includes the volume of the voids in the sand pack (assuming 30% porosity) and the casing volume based on provided well construction details</i> ***-<i>A minimum of 25 pounds per square inch (psi) pressure was applied with a secured pressure head for five minutes or until refusal as described in the Final Well Decommissioning Report. Additional grout cannot be added without overflowing the well.</i></p>					

Appendix F:
Non-hazardous Waste Manifests

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NO. 715214

NON-HAZARDOUS WASTE DATA FORM

BESI # 249447

GENERATOR	Generator's Name and Mailing Address NAVAL WEAPONS STATION SEAL BEACH ATTN: PEI-FEN TAMASHIRO 800 SEAL BEACH BLVD. SEAL BEACH, CA 90740	Generator's Site Address (if different than mailing address) NAVAL WEAPONS STATION SEAL BEACH 800 SEAL BEACH BLVD. SEAL BEACH, CA
	Generator's Phone: 562-426-7897	

GENERATOR	Container type removed from site: <input type="checkbox"/> Drums <input type="checkbox"/> Vacuum Truck <input checked="" type="checkbox"/> Roll-off Truck <input type="checkbox"/> Dump Truck <input type="checkbox"/> Other _____	Container type transported to receiving facility: <input type="checkbox"/> Drums <input type="checkbox"/> Vacuum Truck <input checked="" type="checkbox"/> Roll-off Truck <input type="checkbox"/> Dump Truck <input type="checkbox"/> Other _____
	Quantity 1	Quantity 1 Volume 18 y

WASTE DESCRIPTION	CONCRETE & CONSTRUCTION DEBRIS	GENERATING PROCESS	WELL DESTRUCTION		
COMPONENTS OF WASTE	PPM	%	COMPONENTS OF WASTE	PPM	%
1.	CONCRETE		90-100%	3.	
2.	MISC. DEBRIS		0-10%	4.	

Waste Profile _____ PROPERTIES: pH _____ SOLID LIQUID SLUDGE SLURRY OTHER _____

HANDLING INSTRUCTIONS: WEAR ALL APPROPRIATE PERSONAL PROTECTIVE CLOTHING.

BW 28 CT

Generator Printed/Typed Name	Signature	Month	Day	Year
Pei-Fen Tamashiro		11	22	15

The Generator certifies that the waste as described is 100% non-hazardous

TRANSPORTER	Transporter 1 Company Name	Phone#			
	BELSHIRE	949-460-5200			
	Transporter 1 Printed/Typed Name	Signature	Month	Day	Year
	PAUL DELGADO		11	22	15
Transporter Acknowledgment of Receipt of Materials					
Transporter 2 Company Name	Phone#				
Transporter 2 Printed/Typed Name	Signature	Month	Day	Year	
Transporter Acknowledgment of Receipt of Materials					

RECEIVING FACILITY	Designated Facility Name and Site Address	Phone#		
	PHILADELPHIA RECYCLING MINE 12000 PHILADELPHIA STREET MIRA LOMA, CA 91752	951-885-8343		
	Printed/Typed Name	Signature	Month	Day
Vicki Garispe		11	22	15

Designated Facility Owner or Operator: Certification of receipt of materials covered by this data form.

BOOSEALB
1107565

NO. 715211

NON-HAZARDOUS WASTE DATA FORM

BESI # 249447

GENERATOR

Generator's Name and Mailing Address: NAVAL WEAPONS STATION SEAL BEACH... Generator's Site Address (if different than mailing address): NAVAL WEAPONS STATION SEAL BEACH...

Generator's Phone: -- 562-626-7897

Container type removed from site: [X] Roll-off Truck... Container type transported to receiving facility: [X] Roll-off Truck...

Quantity: 1... Volume: 18 y

WASTE DESCRIPTION: CONCRETE & CONSTRUCTION DEBRIS... GENERATING PROCESS: WELL DESTRUCTION

Table with 2 columns: Components of Waste, PPM, % for CONCRETE and MISC. DEBRIS.

Waste Profile... PROPERTIES: pH... [] SOLID [] LIQUID [] SLUDGE [] SLURRY [] OTHER

HANDLING INSTRUCTIONS: WEAR ALL APPROPRIATE PERSONAL PROTECTIVE CLOTHING.

Generator Printed/Typed Name: Pei-Fen Tamashiro... Signature: [Signature]... Month Day Year: 11/22/15

The Generator certifies that the waste as described is 100% non-hazardous

TRANSPORTER

Transporter 1 Company Name: BELSHIRE... Phone#: 949-460-5200

Transporter 1 Printed/Typed Name: PAUL DELGADO... Signature: [Signature]... Month Day Year: 11/22/15

Transporter Acknowledgment of Receipt of Materials

Transporter 2 Company Name... Signature... Month Day Year

Transporter Acknowledgment of Receipt of Materials

RECEIVING FACILITY

Designated Facility Name and Site Address: PHILADELPHIA RECYCLING MINE... Phone#: 951-685-8343

Printed/Typed Name: [Signature]... Signature: [Signature]... Month Day Year: 11/22/15

Designated Facility Owner or Operator: Certification of receipt of materials covered by this data form.

800SEALB 1114107

NO. 715460

NON-HAZARDOUS WASTE DATA FORM

BESI # 249447

GENERATOR

Generator's Name and Mailing Address: NAVAL WEAPONS STATION SEAL BEACH, ATTN: PEI-FEN TAMASHIRO, 800 SEAL BEACH BLVD., SEAL BEACH, CA 90740. Generator's Site Address (if different than mailing address): U.S. NAVAL WEAPONS STATION, 800 SEAL BEACH BLVD., SEAL BEACH, CA 90740.

Generator's Phone: 562-626-7887

Container type removed from site: [X] Roll-off Truck. Container type transported to receiving facility: [X] Roll-off Truck.

Quantity: 1. Volume: 14,000 LBS

WASTE DESCRIPTION: CONCRETE & CONSTRUCTION DEBRIS. GENERATING PROCESS: WELL DESTRUCTION

Table with 2 columns: COMPONENTS OF WASTE, PPM, %. Row 1: CONCRETE, 90-100%. Row 2: MISC. DEBRIS, 0-10%.

Waste Profile: PROPERTIES: pH, [] SOLID, [] LIQUID, [] SLUDGE, [] SLURRY, [] OTHER

HANDLING INSTRUCTIONS: WEAR ALL APPROPRIATE PERSONAL PROTECTIVE CLOTHING.

BIN # 102

Generator Printed/Typed Name: JUSTIN WILHELM. Signature: [Signature]. Month Day Year: 2 | 13 | 15

The Generator certifies that the waste as described is 100% non-hazardous

TRANSPORTER

Transporter 1 Company Name: BELSHIRE. Phone#: 949-460-5200

Transporter 1 Printed/Typed Name: PAUL DELGADO. Signature: [Signature]. Month Day Year: 2 | 13 | 15

Transporter Acknowledgment of Receipt of Materials

Transporter 2 Company Name: Phone#: [Blank]

Transporter 2 Printed/Typed Name: Signature: [Blank]. Month Day Year: [Blank]

Transporter Acknowledgment of Receipt of Materials

RECEIVING FACILITY

Designated Facility Name and Site Address: PHILADELPHIA RECYCLING MINE, 12000 PHILADELPHIA STREET, MIRA LOMA, CA 91752. Phone#: 951-885-8343

Printed/Typed Name: [Signature]. Signature: [Signature]. Month Day Year: 2 | 13 | 15

Designated Facility Owner or Operator: Certification of receipt of materials covered by this data form.

800 Seal B 1114818

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