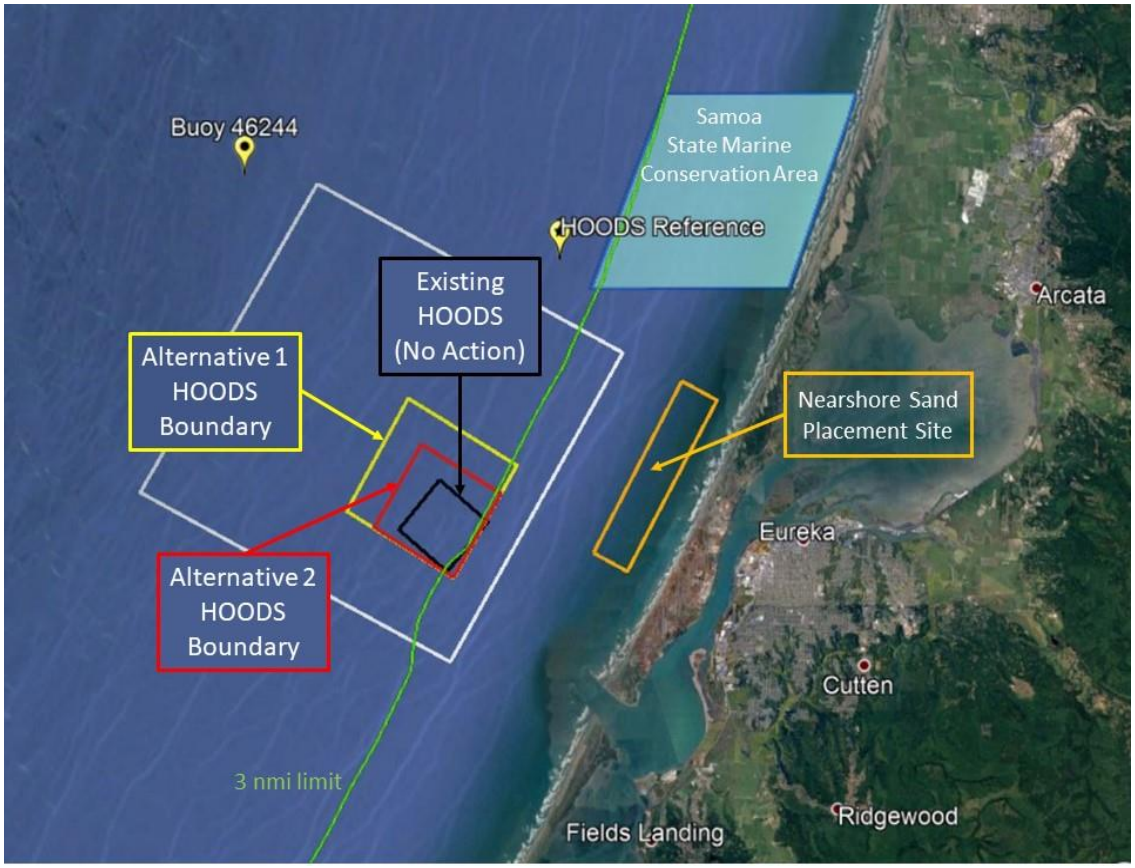
US Army
Corps of Engineers
San Francisco District

Evaluation and Environmental Assessment for Expansion of the Existing Humboldt Open Ocean Disposal Site (HOODS) Offshore of Eureka, California



Prepared by

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15 April, 2020

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SUMMARY AND FINDINGS

Project Name: Hoods Expansion

Purpose: Ocean dredged material disposal sites are designated by the Environmental Protection Agency (EPA) under the authority of the Marine Protection, Research and Sanctuaries Act (U.S.C. 1401 et seq., 1972) and the Ocean Dumping Regulations at 40 CFR 220-228. The Humboldt Open Ocean Disposal Site (HOODS) was originally designated by EPA in 1995 based on a full Environmental Impact Statement (EIS) (EPA, 1995). Since then the HOODS site has experienced significant mounding, creating the possibility of potentially hazardous navigation conditions in the future if the mounding worsens. Today, HOODS has limited capacity to receive future dredged material disposals. If disposal capacity at HOODS is not expanded by the end of 2020, the ability to maintain Humboldt Bay navigation channels, and the commercial and recreational uses they support, could begin to be at risk. While the situation does not constitute an imminent hazard, EPA and USACE have determined that expedited management action is required to prevent adverse conditions from developing.

The continued availability of an ocean dredged material disposal site in the vicinity of Humboldt Bay is necessary to maintain safe deep-draft navigation via authorized federal channels and other permitted shipping facilities. In this Environmental Assessment (EA) the EPA evaluates the potential impacts associated with a proposed rulemaking to expand the boundaries of the existing HOODS for continuing use by approved navigation dredging projects in and around Humboldt Bay, California. This EA also evaluates a possible future nearshore placement area for beneficial use of clean sand dredged from the Humboldt Bay.

Project Description: Alternative 1, the Proposed Action, is to slightly reorient and expand the existing HOODS boundary by 1 nmi to the north (upcoast) and 1 nmi to the west (offshore). Alternative 1 is the Proposed Action because it would provide environmentally acceptable disposal capacity for many years without causing any significant adverse impacts, while also affording the most operational flexibility for managing the dredged material in a manner that would further minimize even physical impacts over time. This configuration would result in the total area of the site increasing from 1 square nmi to 4 square nmi. If today's disposal practices were to continue unchanged (i.e., if 1 million cy of entrance channel sand per year were to continue being placed at HOODS indefinitely), the site would reach capacity again in about 75 years. However, the effective life of the expanded site could be much longer than 75 years if nearshore placement of clean dredged sand for beach or littoral system support were to begin at some point. In that event, disposal of fine sediment would continue in the expanded HOODS footprint, but it could be managed in such a way that little or no additional long-term mounding would occur at all. Alternative 1 would be operated under a Site Management and Monitoring Plan (SMMP), that includes adaptive management provisions to ensure that significant environmental impacts do not occur.

Findings: Disposal site locations are chosen based on several general and specific site selection factors designed to ensure that disposal operations are conducted in a manner that allows them to operate without significant adverse impacts to the marine environment, and without significant conflicts with other uses of the ocean. Based on the evaluation in this EA, including consultation with resource agencies and consideration of the four general criteria and eleven specific factors for selecting ocean disposal sites listed at 40 CFR 228.5 and 228.6, respectively, EPA has determined that the proposed action - Alternative 1 (expansion of the existing HOODS boundaries by one nmi to the north and one nmi to the west) - will have no significant adverse impacts and therefore no Environmental Impact Statement (EIS) is necessary. Simultaneously with this EA, EPA is issuing for public comment a proposed rule to implement Alternative 1. The proposed rule, which is functionally equivalent to a preliminary Finding of No Significant Impact (FONSI), is available both at: www.regulations.gov (Docket ID No. EPA-R09-OW-2020-0188); and at https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents. **EPA is accepting comments on this EA and the proposed rule until 30 days following publication of the proposed rule in the Federal Register.**

Disposal of suitable material (i.e., dredged material evaluated and determined to be suitable under the MPRSA and its implementing regulations) at the existing HOODS has resulted in no significant adverse impacts over 25 years of continuous site use, and EPA's conclusion based on the analysis in this EA is that the expansion proposed under Alternative 1 would similarly have no significant adverse impacts if managed under an updated Site Management and Monitoring Plan (SMMP) that includes site use requirements similar to those in the existing SMMP. A draft updated SMMP is included with this EA as Appendix C, and is also available separately for download and review at https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents. **EPA is also accepting comments on the draft updated SMMP until 30 days following publication of the proposed rule in the Federal Register.**

HOW TO COMMENT

Written comments on the EA and proposed rule and/or the draft SMMP must be received on or before **30 days following publication of the proposed rule in the Federal Register.** Note that due to the ongoing COVID-19 pandemic EPA's office building in San Francisco is closed, and physical mail may not be received for some time. Therefore, written comments should be submitted by one of the following methods, and must reference Docket ID No. **EPA-R09-OW-2020-0188**:

- www.regulations.gov: Follow the on-line instructions for submitting comments and accessing the docket, including materials related to this action (Docket ID No. **EPA-R09-OW-2020-0188)**.
- E-mail: ross.brian@epa.gov

Following the close of the comment period, EPA will respond to any comments received on both the draft updated SMMP and the proposed rule, incorporate any changes as appropriate, and issue a final rule and a final SMMP. The expanded HOODS will be available for disposal activity no sooner than 30 days following publication of the final rule.

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1 INTRODUCTION

This Ocean Dredged Material Disposal Site (ODMDS) Evaluation and Environmental Assessment (EA) has been prepared by the U.S. Environmental Protection Agency (EPA) Region 9 in coordination with the U.S. Army Corps of Engineers (USACE) San Francisco District. The purpose of this document is to evaluate the potential impacts associated with a rulemaking by EPA to expand the boundaries of the existing Humboldt Open Ocean Disposal Site (HOODS) for continuing use by approved navigation dredging projects in and around Humboldt Bay, California. It also provides initial documentation for a possible future nearshore placement area for beneficial use of clean sand dredged from the Humboldt Bay entrance channel.

HOODS was originally designated by EPA in 1995 based on a full Environmental Impact Statement (EIS) (EPA, 1995, available on-line at https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents). The current evaluation will determine if the proposed expansion of the HOODS boundaries would continue to meet all criteria and factors set forth in the Ocean Dumping regulations published at Parts 228.5 and 228.6 of Title 40 Code of Federal Regulations (CFR). These regulations were promulgated in accordance with the criteria set out in Sections 102 and 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (MPRSA). Further, this document is intended to provide sufficient information to determine compliance with the National Environmental Policy Act, the National Historic Preservation Act, the Coastal Zone Management Act, and Endangered Species Act. Use of HOODS would continue to be for disposal of material dredged by USACE from the federally authorized navigation channels in Humboldt Bay, as well as for disposal of dredged material from other navigation dredging projects in the area.

The continued availability of an ocean dredged material disposal site in the vicinity of Humboldt Bay is necessary to maintain safe deep-draft navigation via authorized federal channels and other permitted shipping facilities. The HOODS site has experienced significant mounding, creating the possibility of potentially hazardous navigation conditions in the future if the mounding worsens. Today, HOODS has limited capacity to receive future dredge material disposals. While the situation does not constitute an imminent hazard, EPA and USACE have determined that expedited management action is required to prevent adverse conditions from developing. If disposal capacity at HOODS is not expanded by the end of 2020, the ability to maintain Humboldt Bay navigation channels, and the commercial and recreational uses they support, could begin to be at risk.

1.1 LOCATION

Humboldt Harbor and Bay is located in Humboldt County on the coast of Northern California (Figure 1), approximately 225 nautical miles north of San Francisco and approximately 156 nautical miles south of Coos Bay, Oregon. Humboldt Bay is the second largest coastal estuary in California. It is the only harbor between San Francisco and Coos Bay with channels large enough to permit the passage of large ocean-going vessels.

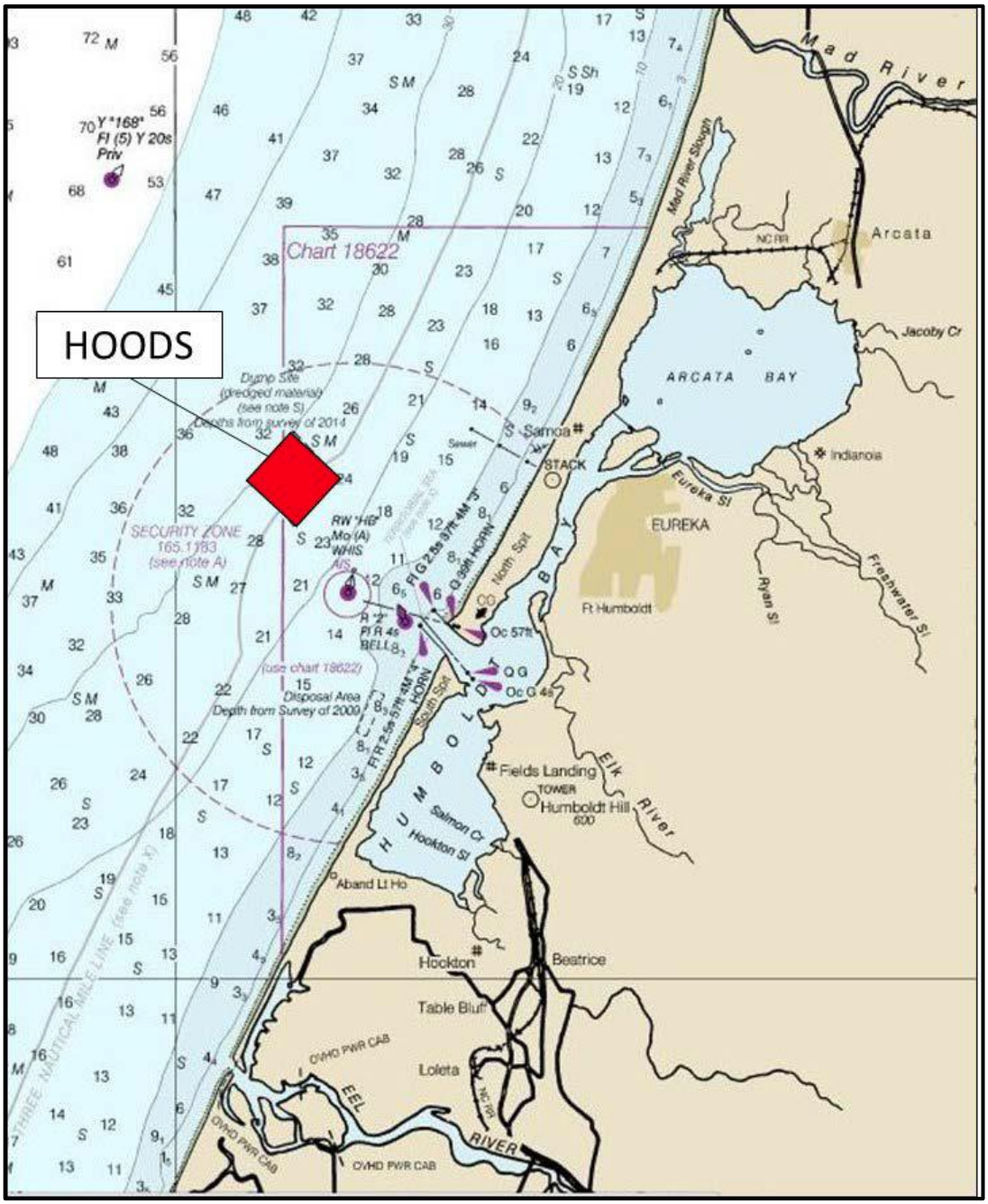

Figure 1. Humboldt Bay area, showing the location of the existing Humboldt Open Ocean Disposal Site (HOODS).

Humboldt Bay lies in a narrow coastal plain surrounded by rolling terraces, steep mountains, and narrow valleys typical of the coastal ranges in the region. Much of the forested area consists of coastal redwoods and Douglas fir. Eureka, the largest city on the north coast of California and the seat of Humboldt County, and its neighbor, Arcata, are the two largest cities bordering the Bay. Eureka, which is approximately five miles east of the entrance to the Bay, is accessible from the water by the North Bay and Eureka channels. Arcata, which is approximately seven miles north of Eureka, was once accessible from the Bay by the Arcata Channel; however, this channel is no longer in use.

Humboldt Bay is a naturally land-locked estuary composed of two large bays, the relatively shallow South Bay to the south and the larger Arcata Bay to the north. The Bay extends north and south for a distance of approximately 14 miles, covering 26.5 square miles at high tide and approximately 7.8 square miles at low tide. A long, narrow thalweg and a small bay, the Entrance Bay, connect South and Arcata Bays and provide an outlet to the Pacific Ocean. Humboldt Bay is separated from the Pacific Ocean by a sand spit that is incised by two large armored rubble-mound jetties – the North and South Jetties. These fabricated rubble-mound jetties, constructed by USACE, which are approximately 2,000 feet apart, define the entrance channel to Humboldt Harbor, which requires regular dredging to maintain safe navigation.

1.2 Humboldt Bay Navigation and Dredging History

Humboldt Bay has been dredged for navigation purposes for nearly 140 years (Table 1). USACE first began dredging Humboldt Bay's interior channels in 1881 to provide safe navigation within the bay. The first attempt at stabilizing the Entrance Channel to Humboldt Bay commenced in 1889 when USACE started constructing the North and South Jetties; they were completed in 1900. Since then, there have been periodic changes to Humboldt Harbor and Bay to provide safe navigation for ocean-going vessels of many sizes. Humboldt Bay is also a designated harbor of refuge with an important U.S. Coast Guard presence.

Today the USACE conducts annual operation and maintenance (O&M) dredging activities of the federal navigation channels in Humboldt Bay with disposal of the dredged material at HOODS (Figure 2). O&M dredging to maintain Humboldt Bay's navigation channels occurs in the Bar and Entrance Channels and in the Interior Channels (Table 2) any time between mid-March through the end of September. Typically, a large hopper dredges (e.g., the *Essayons*) works sandy areas at and near the entrance channel because smaller hopper dredges, and mechanical (clamshell) or cutterhead/pipeline dredges cannot operate safely in the rough seas encountered in the Entrance Channel. Smaller hopper dredges (e.g., the *Yaquina*) can safely work the Federal channels inside the Bay, and mechanical or pipeline dredging can be conducted in the interior marinas and commercial docks of Humboldt Bay.

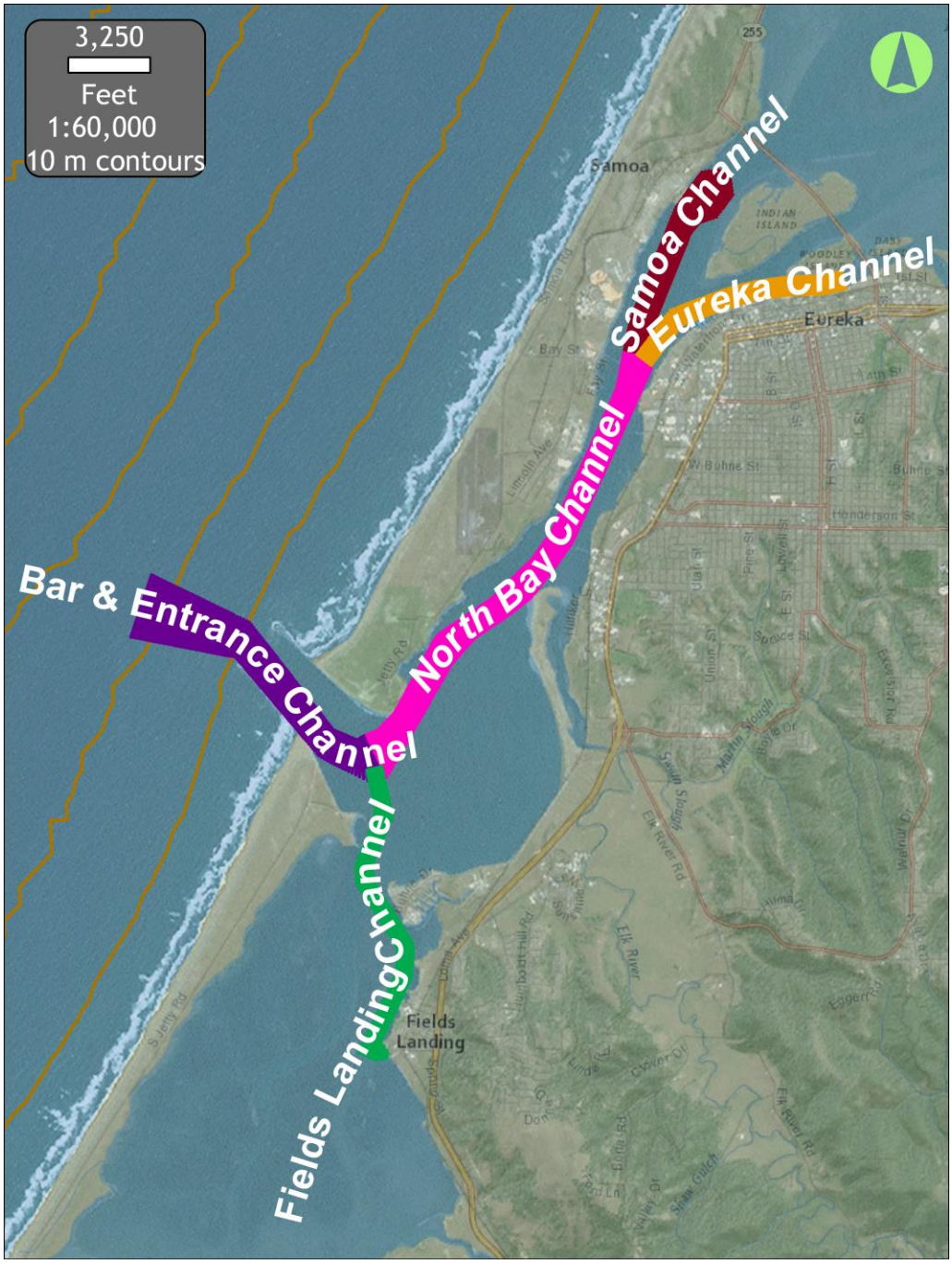

Figure 2. Federal navigation channels in Humboldt Bay.

During recent years, because of Federal budget limitations, USACE has focused on maintaining the Bar and Entrance Channel where clean sand deposits build up quickly. Entrance channel dredging alone has averaged approximately 1 million cubic yards (cy) each year, while interior channels and marinas/docks are dredged less frequently and generally dredge a relatively small volume compared the Bar and Entrance Channel (Figure 2, Table 3). However, USACE estimates that there is currently a backlog of approximately 4.5 million cy of sediment that would need to be dredged to return all of the Federal Channels to full authorized depth.

Table 1. General Chronology of Humboldt Harbor and Bay navigation improvements

Date	DESCRIPTION
1806	First recorded chart of Humboldt Bay (Bay of the Indians) by the Wiyot Indians.
1849	Humboldt Bay rediscovered and named Trinity Bay.
1850	Renamed Humboldt Bay.
1853	First marker buoys used for the Bay.
1856	Light tower construction completed on North Spit.
1871	Studies for navigation improvements begin.
1881	600 vessels per year using the Bay.
1881	Brush and plank jetties constructed but destroyed the following winter.
1881	First USACE project authorized, the Eureka Channel is dredged.
1881	Arcata, Samoa, and Hookton Channels dredged for the first time.
1883	First survey for a low water jetty on the South Spit
1884	South Jetty authorized.
1887	Training wall was shown on South Spit Jetty plans.
1888	Dual jetties authorized.
1889	South Jetty construction commences (brush and stone construction).
1891	North Jetty construction commences.
1894	North Jetty built out to Bend 420, South Jetty built out to Bend 230.
1896	Bar Channel deepened to 25 feet deep and 100 feet wide.
1900	Initial jetty construction completed: 8,000 feet long, 5 to 10 feet above MLLW.
1911–1917	Jetties damaged, repaired, and raised from original elevation of 10 to 12 feet MLLW to a reconstructed height of 18 feet above MLLW.
1939	Dual rubble-mound jetties completed.
1939	Entrance Channel completed: 30 feet deep and 500 feet wide.
1939	Eureka, Samoa, Arcata, and Fields Landing Channels initial construction completed.
1954	Entrance Channel deepening completed to 40 feet.
1954	Eureka and Samoa Channels deepening (30 feet) completed and North Bay Channel initial construction completed.
1959	Engineering and design study; repair North and South Jetties.
1960–1963	Repair jetty damage of winter 1957–1958.
1964–1965	Extreme damage to jetties, 100-ton blocks washed away.
1966–1967	Repair and maintenance on North and South Jetties.
1969	Jetty repair study and model conducted by the USACE' Engineering Research and Design Center (ERDC) in Vicksburg, Mississippi.
1971	Humboldt Bay Bridge completed, connecting the North Spit with Eureka.
1971–1973	Heads of both jetties destroyed, Dolos blocks placed on jetties.
1977	USACE names jetties a historical engineering landmark.
1995	EPA designates HOODS as a new permanent ODMDS
1999	Bar and Entrance Channel deepened to 48 feet MLLW and segments of the interior channels to –38 MLLW.
1999	Deepening of Samoa Turning Basin to 38 feet MLLW.
To Date	USACE places an average of ~1,000,000 cy/year of sand at HOODS

Table 2. Description of Humboldt Harbor Federal Navigation Channels

Channel	Authorized Depth (ft MLLW)	Width (ft)	Length (ft)	Typical Annual Volume (cy)	Sediment Type
Bar and Entrance	48	500 - 1,600	8,500	1,100,000	Sand & gravel
North Bay	38	400	18,500	100,000	Sand
Samoa + Turning Basin	38	400 -1,000	8,100 + 1,000	20,000	Sand
Eureka	35	400	9,700	25,000	Silt
Field's Landing + Turning Basin	26	300 - 600	12,000 + 800	6,000	Sand & Silt

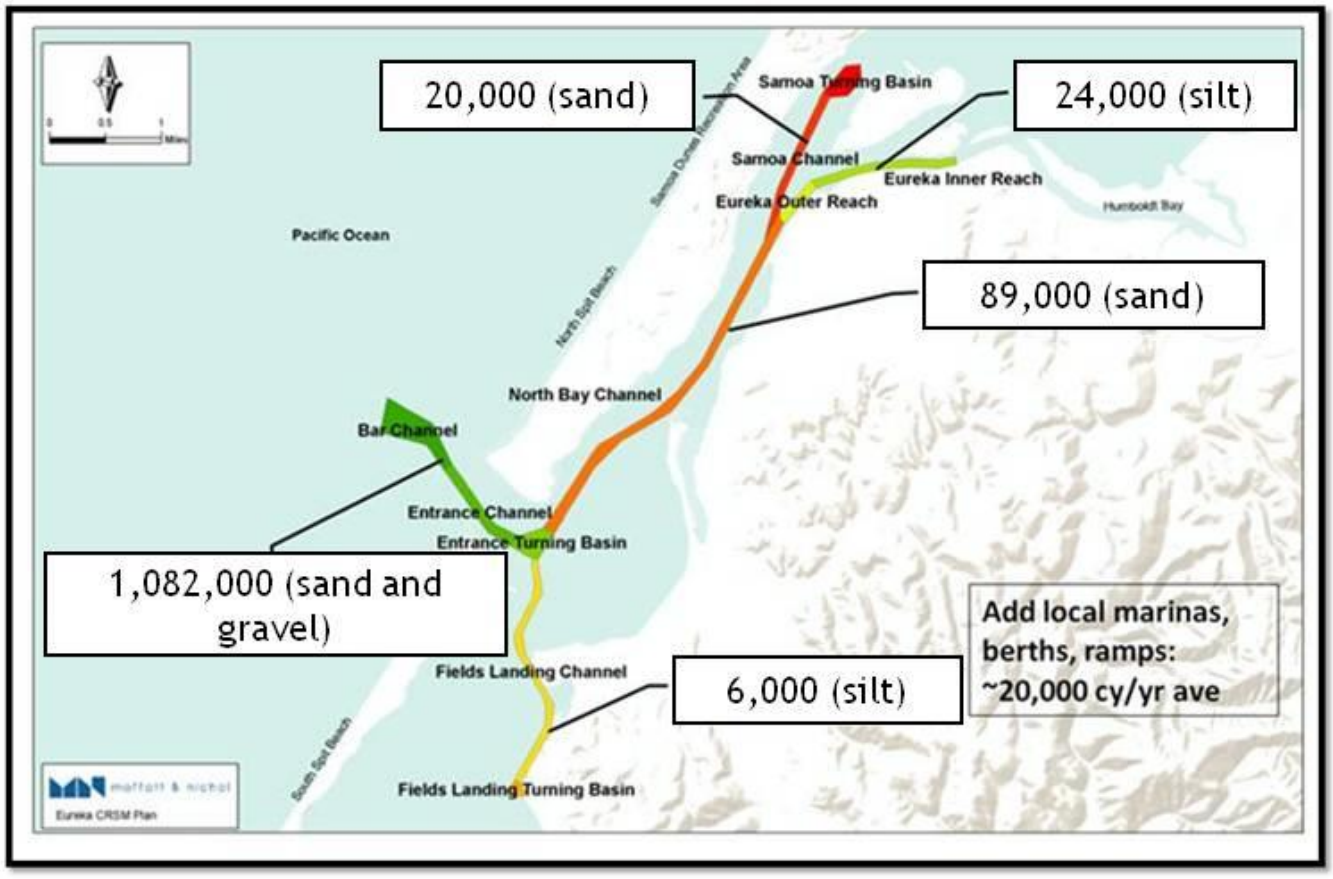

Figure 3. Humboldt Bay's federal navigation channels and the typical volume of sediment (cy) dredged from each, on an annualized basis. Note that several additional facilities are managed by other permittees (including the City of Eureka, the Humboldt Bay Harbor and the US Coast Guard).

Table 3. Recent annual dredging volumes for the federal channels, in 1,000s of cy.

Year	Bar & Entrance; North Bay Channels	Other Interior Channels
2007	1,123	173
2008	1,094	217
2009	955	108
2010	770	0
2011	1,199	155
2012	1,183	0
2013	573	102
2014	625	0
2015	715	0
2016	1,715	0
2017	1,047	0
Total	10,999	755
Average	1,000	69

1.3 Ocean Disposal at HOODS

Ocean dredged-material disposal sites around the nation are designated by the Environmental Protection Agency (EPA) under the authority of the Marine Protection, Research and Sanctuaries Act (U.S.C. 1401 et seq., 1972) and the Ocean Dumping Regulations at 40 CFR 220-228. Disposal-site locations are chosen based on several general and specific site selection factors (EPA 1995, and Chapter 6), designed to minimize cumulative environmental effects of disposal to the area where the site is located. Disposal operations must be conducted in a manner that allows each site to operate without significant adverse impacts to the marine environment, and without significant conflicts with other uses of the ocean.

The HOODS location was first used as a disposal site in September 1990, under a temporary designation by USACE pursuant to Section 103 of MPRSA. In 1995, EPA Region 9 released a final EIS entitled *Designation of an Ocean Dredged Material Disposal Site off Humboldt Bay, California* (EPA, 1995). The EPA's final rule on designating HOODS as a multi-user disposal site under Section 102 of MPRSA was published in the Federal Register on September 28, 1995 (60 Fed. Reg. 50,108). The site designation became effective on October 30, 1995 for a period of 50 years. Since then, approximately 25,000,000 yd^3 of dredged material have been placed there (EPA, 2016), the vast majority of which has been clean sand from the Bar and Entrance Channel.

HOODS is a square disposal site, currently covering one square nautical mile (nmi^2) of the sea floor (Figure 1, and Figure 4) in water depths naturally ranging from approximately 150 to 180 feet. Its centroid is located approximately 3.5 nmi offshore of the seaward end of the Entrance Channel into Humboldt Bay. Table 4 lists the corner coordinates of the overall site.

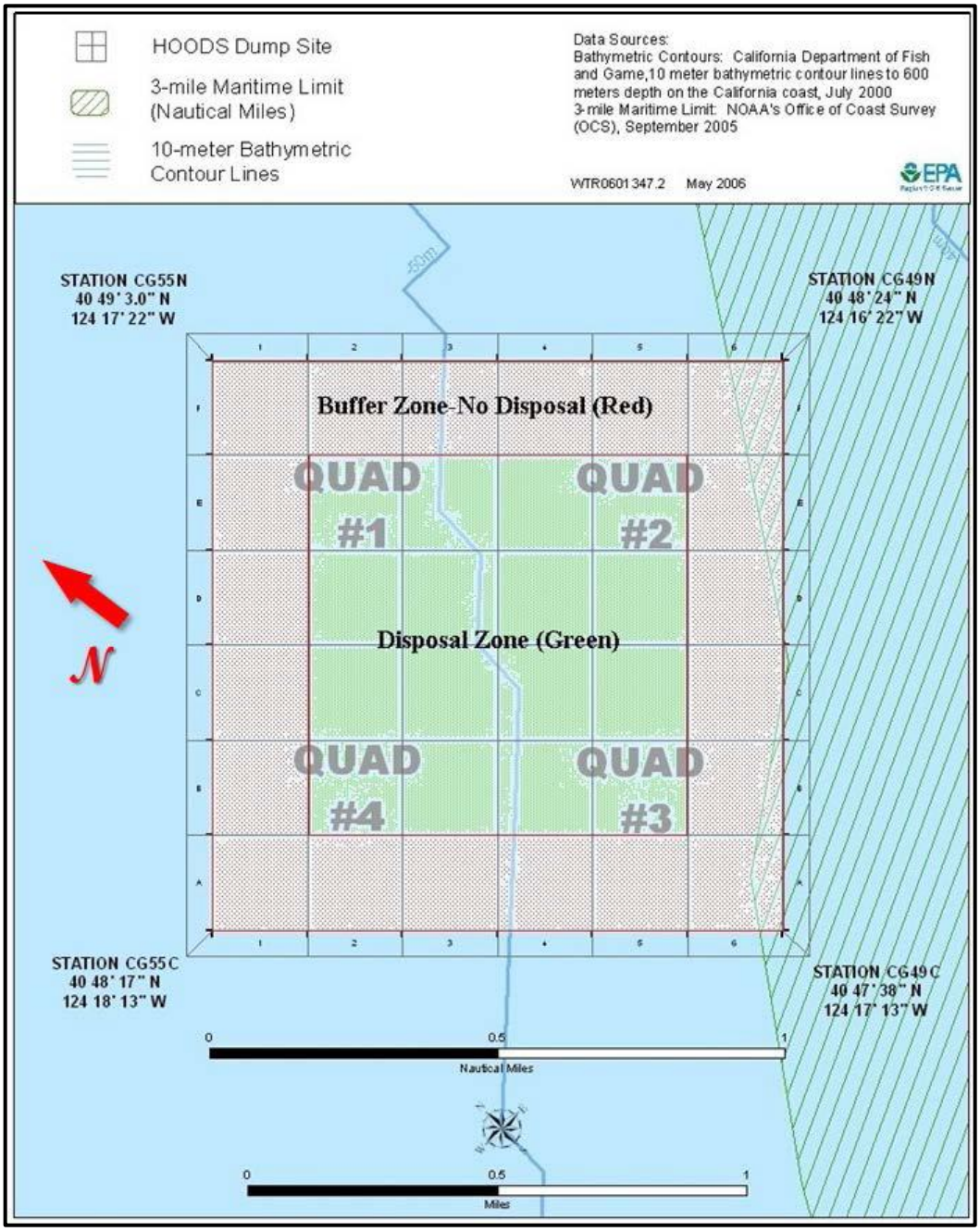

Figure 4. HOODS Detail. The site is divided into 4 quadrants and 36 individual cells. Initially, dredged-material disposal was only allowed in the green interior cells, so that material placed at the site would remain largely contained within the overall site.

Table 4. Existing corner coordinates of HOODS (NAD 83).

CORNER	LATITUDE	LONGITUDE	CENTROID LAT.	CENTROID LONG.
North	40° 49' 03" N	124° 17' 22" W	40° 48' 20" N	124° 17' 17" W
East	40° 48' 24" N	124° 16' 22" W		
South	40° 47' 38" N	124° 17' 13" W		
West	40° 48' 17" N	124° 18' 13" W		

The site-designation EIS for HOODS identified a 50,000,000-cy capacity, and an estimated life of 50 years for HOODS based on a presumed average disposal rate of 1,000,000 cy/yr. The 50,000,000-cy capacity equated to a mound at the site whose top elevation would not exceed approximately -130 feet mean lower low water (MLLW). Mounding to much higher elevations (meaning, that created water shallower than -130 feet) was predicted to be capable of starting to affect the wave climate around the site during the largest winter storms. To avoid any such effect, and thereby avoid creating any potential navigation safety concerns, EPA has strictly managed how disposal occurs at HOODS. Under the current HOODS Site Management and Monitoring Plan (SMMP), a cell-based management approach has been used to ensure that disposed material builds up (mounds) evenly at the site and does not substantially spread outside the site. Perimeter cells were used as a no-disposal buffer zone to ensure that most dredged material would be deposited on the seafloor within the overall site boundary. Individual dump loads are required to be disposed into interior cells only, and subsequent dumps must move to different interior cells. No cell can be used again until all allowable cells have been used. This method has ensured that mounding proceeds evenly, as confirmed by annual bathymetry surveys conducted by USACE. However, because the peripheral cells were used as a no-disposal buffer area, the effective capacity was reduced to approximately 25 million cy and 25 years from the original expectation of 50 million cy and 50 years.

1.4 Sand Mounding at HOODS

The USACE San Francisco District monitors bathymetric condition at HOODS typically twice each year, before and after dredging and disposal. (Hydrographic surveys going back to at least 2009 are available on a USACE web site[1]). Over the years, several cells (especially near the center of the site) began to reach the -130-foot target depth**.** As this occurred, EPA closed such cells to further disposal**.** By 2014, the majority of the inner cells had reached, and in some cases somewhat exceeded, the -130-foot target (Figure 5 and 6). In consequence, beginning in 2015 EPA authorized ongoing disposal to occur only in deeper areas over the slopes of the disposal mound, halfway into the buffer cells of the existing site (Figure 7)**.** This adaptation was expected to allow approximately 5 more years of additional disposal (at typical annual volumes), while still retaining the vast majority of the sand within the site boundaries**.** (This approach is reasonable specifically because the material being disposed by USACE is virtually all sand, which does not spread far from the placement location the way silts or clays could, before settling on the bottom). GPS-based monitoring of individual disposal events (a requirement of the SMMP for all projects using the disposal site) confirmed that the dredging equipment used by USACE is capable of successfully disposing of material with precision, in the new smaller cells (Figure 8).

[1] https://www.spn.usace.army.mil/Missions/Surveys-Studies-Strategy/Hydro-Survey/Humboldt-Bay-Channel/

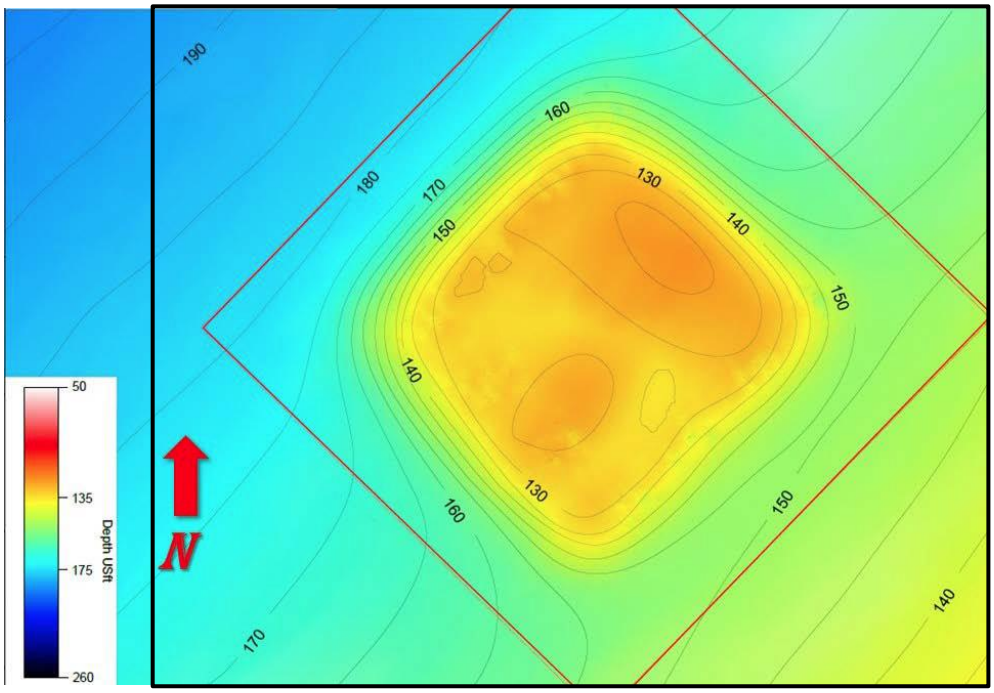

Figure 5. Shaded relief depiction of bathymetry at HOODS as of August 2014, showing mounding to -130 feet or less over much of the site. Red box is the existing disposal site boundary. Contours are in 5-foot intervals. Depths are shown in feet MLLW. (Reproduced from eTrac, 2014.)

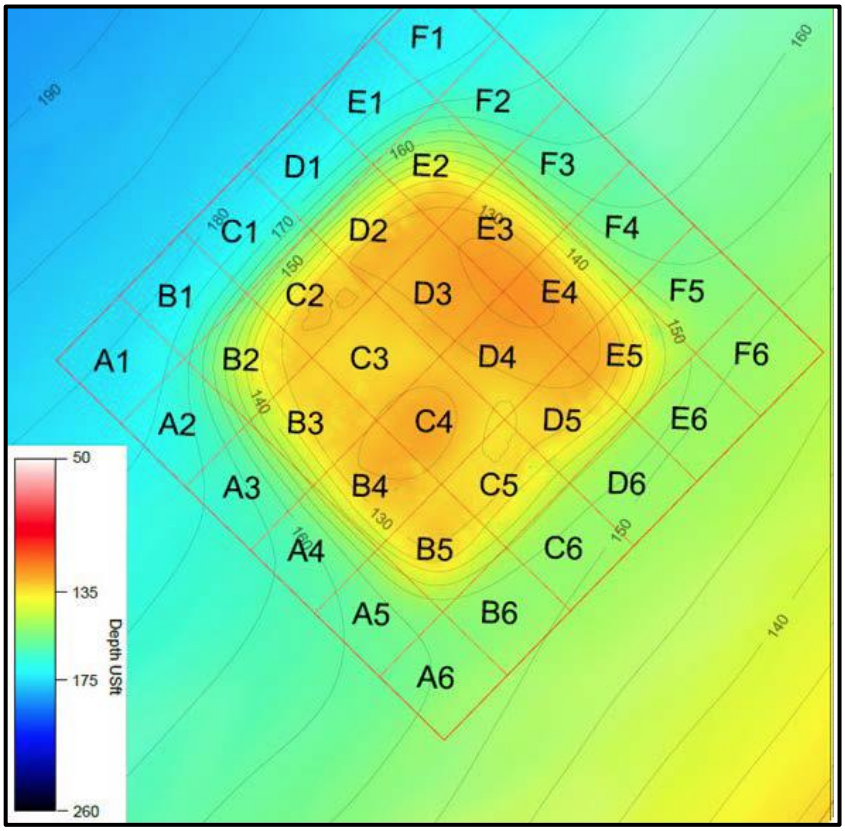

Figure 6. Map of HOODS disposal cells overlain on bathymetry from August 2014. Depths are in feet MLLW. (Reproduced from eTrac, 2014.)

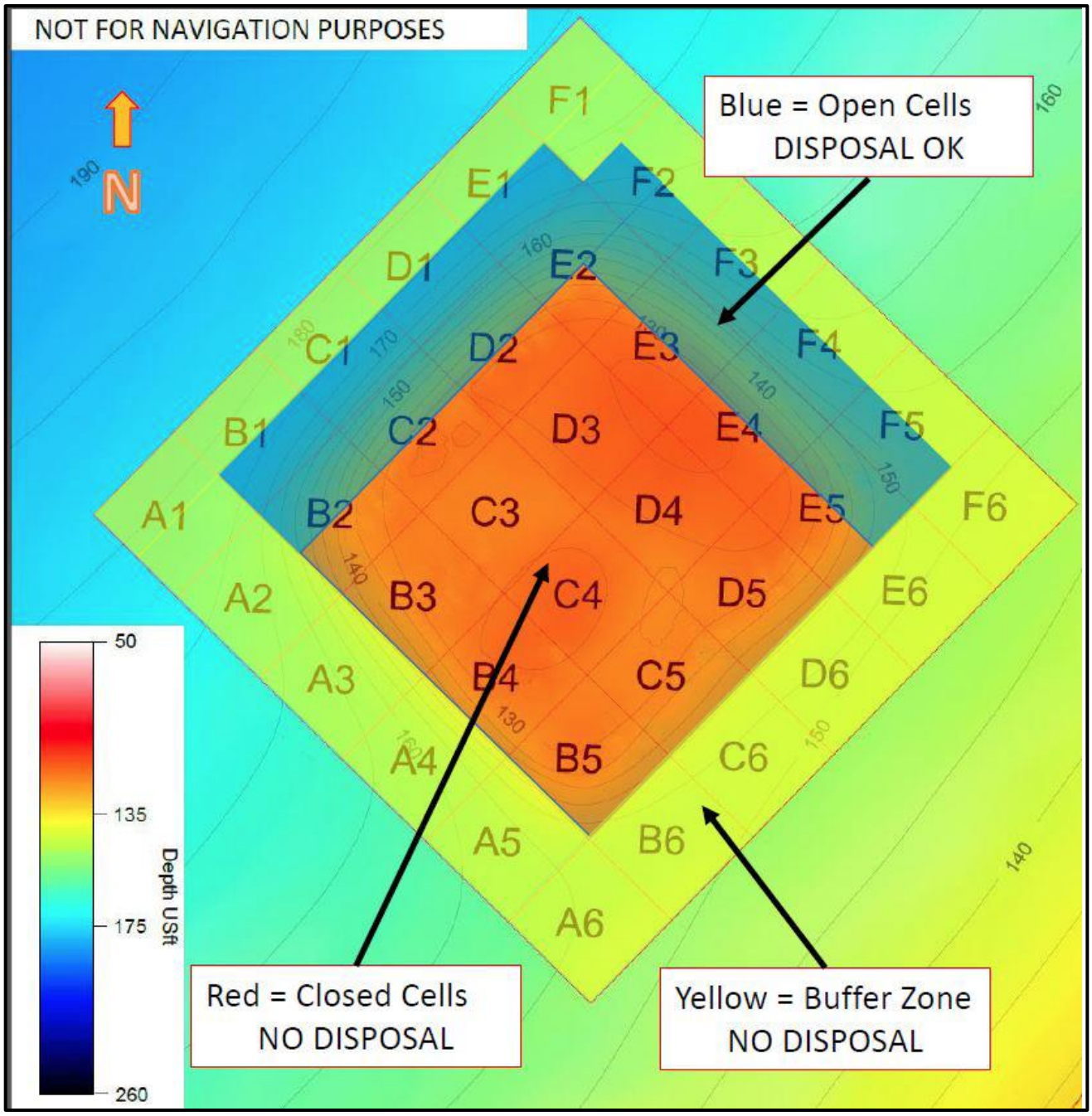

Figure 7. Open and closed disposal cells at HOODS starting in 2015. Disposal only allowed over the north and west slopes of the mound including portions of eight Buffer Zone cells on those sides. This increased short-term disposal capacity by 5.6 - 8 million cy, enough for approximately 5 more years, or through at least 2020.

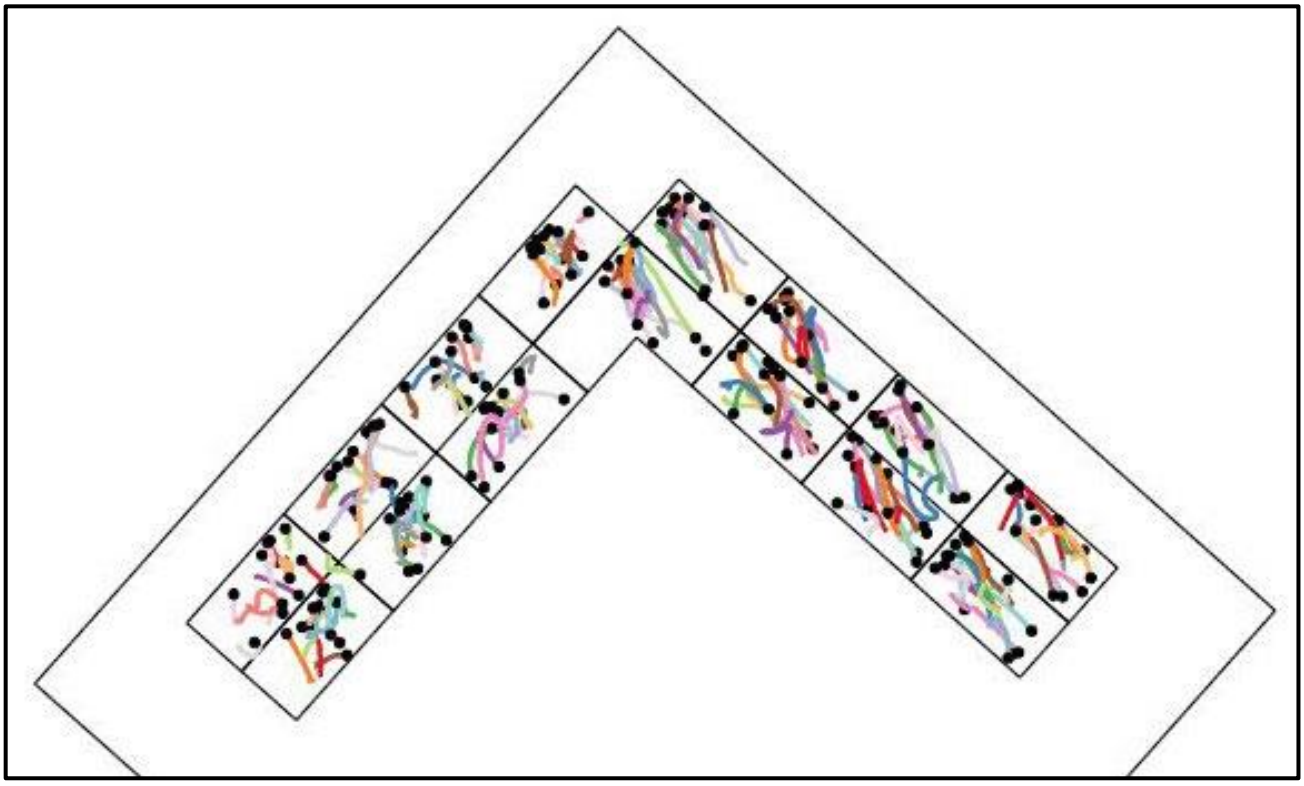

Figure 8. Locations of actual disposal events at HOODS in 2015. All disposal actions occurred successfully within the modified disposal cells, despite most of them being only ½ the size of previously allowed disposal cells. Dots with lines show starting point and track of individual disposal events. (Source: EPA compliance records for USACE 2015 West Coast Hopper contract no. W9127N-15-C-0006).

Bathymetric survey results from March 2018 led EPA to close additional portions of cells B2, C2, and D2 to further disposal in 2018 and 2019. EPA further modified the allowable disposal area for 2020 based on 2019 bathymetry (Figure 9). Using this adaptive management approach, there is adequate disposal capacity at HOODS through at least the year 2020, without material substantially spreading beyond the current site boundaries.

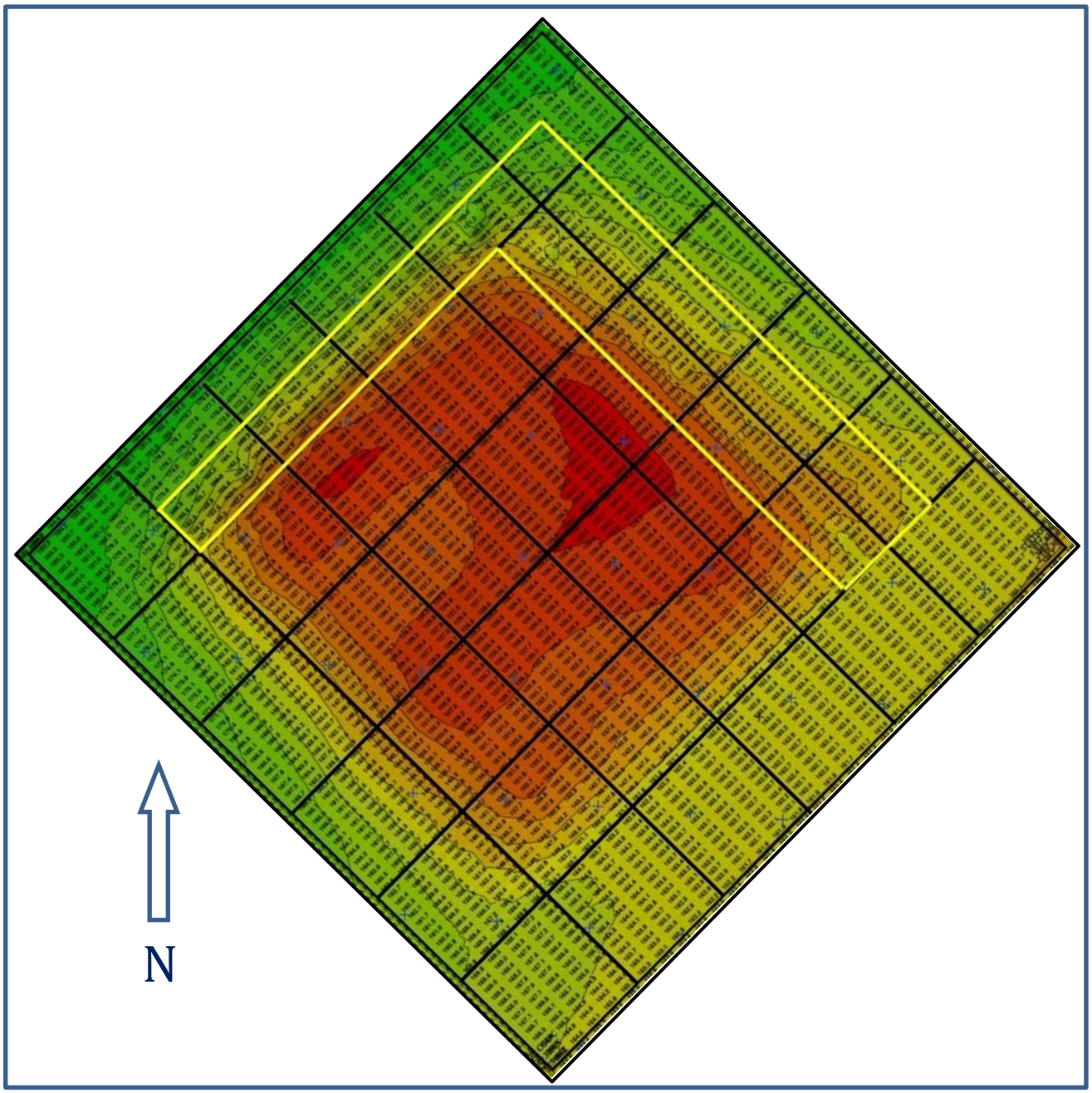

Figure 9: Open disposal cells at HOODS for 2020 are outlined by the bright yellow box. Black grid depicts the same disposal cells as shown on Figure 7. Here, disposal cell boundaries are overlain on the most recent (2019) bathymetry with green and yellow shading being deeper areas, and orange and red shading being shallower.

2 PURPOSE AND NEED FOR ACTION

2.1 STATUTORY AND REGULATORY REQUIREMENTS

The Marine Protection, Research and Sanctuaries Act of 1972, as amended (MPRSA), also known as the Ocean Dumping Act, was passed in recognition of the fact that the disposal of material into ocean waters could potentially result in unacceptable adverse environmental effects. Under Title I of the MPRSA, the EPA and USACE were assigned responsibility for developing and implementing regulatory programs to ensure that ocean disposal would not "... unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities."

The EPA administers and enforces the overall program for ocean disposal. As required by Section 104(a)(3) of the MPRSA, ocean disposal of dredged material can occur only at a site that has been designated to receive dredged material. Pursuant to Section 102(c), the EPA has the responsibility for permanent site designation, while under Section 103 USACE can designate project-specific disposal sites on a temporary basis if an EPA-designated disposal site is not available.

The MPRSA criteria (40 CFR, Part 228) state that EPA's site designations under Section 102(c) must be based on environmental studies, and on historical knowledge of the impact of dredged material disposal on similar areas. General criteria (40 CFR 228.5) and specific factors (40 CFR 228.6) that must be considered prior to site designation were addressed in the 1995 HOODS EIS, and that evaluation is updated in this EA (Chapter 6).

Related federal statutes applicable to the ocean disposal site designation process include the National Environmental Policy Act of 1969 as amended; the Coastal Zone Management Act of 1972 as amended; the Endangered Species Act of 1973 as amended; the Magnuson-Stevens Fisheries Conservation and Management Act of 1976 as amended; and the National Historic Preservation Act of 1966, as amended. Executive Orders that may apply are also addressed as appropriate in this EA (Chapter 7).

Finally, an EPA-designated site requires a site management and monitoring plan (SMMP). Use of the designated site is subject to any restrictions included in the SMMP, which is expected to be reconsidered at least every 10 years. The SMMP for HOODS was last officially updated in 2006 (EPA 2006, reproduced as Appendix C). However, the 2006 SMMP has effectively been updated each year since then, via conditions imposed on individual ocean disposal projects to adaptively manage the mounding described above. A new draft SMMP, updated to reflect the proposed expanded HOODS, is included as Appendix D to this EA. **EPA is accepting comments on the updated draft SMMP until 30 days following publication of the proposed rule in the Federal Register.**

2.2 Purpose of the Proposed Action

HOODS Expansion

The primary purpose of the proposed action is to provide capacity for ongoing safe ocean disposal of suitable dredged material (i.e., dredged material evaluated and determined to be suitable under the MPRSA and its implementing regulations) from Humboldt Harbor navigation channels and facilities. Ocean disposal currently remains necessary for most navigation dredging projects in and around Humboldt Bay, because of a lack of available upland or beneficial use alternatives. Although various efforts are under way to create upland placement and beneficial use opportunities in the area, only extremely limited capacity is presently available. Capacity for some degree of ocean disposal of suitable sediment will remain important in the future, even if new beneficial use opportunities become available over time.

Identification of a Potential Nearshore Beneficial-Use Site as an Alternative to HOODS Disposal

As noted, the vast majority of the sediment volume dredged each year from Humboldt Bay is clean sand removed from the Entrance Channel by USACE (or USACE-contracted) hopper dredges. These vessels are typically available to work the Humboldt federal channels for only a prescribed number of days each year, and their ability to place material at confined or upland sites is extremely limited by:

- *equipment* (e.g., the USACE hopper dredge *Essayons* can only bottom-dump, including thin-layer spreading) and
- *cost* (e.g., pump-off takes at least three times longer than bottom dumping).

Therefore, in parallel to the proposed action, this EA also describes a nearshore site that represents a potential long-term alternative to HOODS disposal for sand dredged by USACE. Placement of some or all of the Bar and Entrance Channel sand in the nearshore would constitute beneficial use, in that it would return sand to the littoral system north of the Humboldt Bay entrance, helping to limit or buffer against shoreline erosion there. In contrast, sand placed at HOODS is effectively removed from the littoral system and does nothing to support shoreline resiliency. In fact, it is a large net remover of sand from the littoral system, potentially adding to local shoreline erosion effects over time, particularly as sea level rise accelerates in the future. Use of sand at a nearshore site would also reduce ongoing mounding concerns at HOODS, prolong the useful life of the expanded ocean disposal site, and allow a smaller offshore disposal "footprint" to be used over time.

As part of the original designation of HOODS, USACE established the Humboldt Shoreline Monitoring Program (HSMP) because the California Coastal Commission (CCC) expressed concerns that placing large volumes of sand at HOODS could have significant adverse impacts to nearby beaches. The primary concern was that sand that would typically supply local beaches was going to effectively be removed from the local littoral cell by being placed in waters deeper than seasonal waves could move it back onshore. The objectives of the HSMP are:

- monitoring the surrounding shoreline for excessive shoreline retreat;
- determining the cause of any excessive shoreline retreat that is observed; and
- recommending corrective action should sediment disposal at HOODS be the cause.

The HSMP surveys extend from approximately seven miles south of the South Jetty to seven miles north of the North Jetty. Over the years, the HSMP identified a general shoreline trend of seaward movement (accretion) along the South Spit and shoreward movement (erosion) along the North Spit. However, because the observed changes did not exceed the "excessive-erosion" criteria agreed on by the CCC and USACE, HOODS has continued to receive all of the material dredged from the federal channels. (The HSMP is discussed further in Chapter 5.)

An appropriate potential nearshore sand placement area (Figure 10) had been identified by USACE in its "Five-Year Programmatic Environmental Assessment, 404(b)(1) Analysis, and FONSI, Humboldt Harbor and Bay Operations and Maintenance Dredging (FY 2012 – FY 2016)" (USACE 2012). (Nearshore placement was not pursued by the USACE at that time, and was not discussed in the USACE's subsequent 5-year EA.) Beneficial use sites for nearshore sand placement operations would be regulated under Section 404 of the Clean Water Act (CWA). EPA, in this site expansion EA, has drawn from and expanded upon information in the 2012 USACE EA. The potential nearshore site is discussed herein (Section 3.4 and Chapter 5) as an alternative that could be used in conjunction with disposal at HOODS to help minimize impacts and maximize the overall benefits of managing Humboldt Bay area dredged sediments. This EA provides documentation pursuant to NEPA and other applicable Acts that USACE may use as a basis for proposing to conduct future demonstration nearshore sand placement operations. But any proposal to formally establish the nearshore site would be a separate EPA-USACE action pursuant to CWA, informed by monitoring results associated with such a demonstration project. If a nearshore site is established in the future, it could be used by USACE in conjunction with HOODS but would not eliminate the need for some disposal at HOODS to continue.

2.3 Need for the Proposed Action

The need for the Proposed Action of expanding the HOODS boundaries is that the existing disposal site is effectively "full". Since the site was designated in 1995, approximately 25,000,000 cy of sand has been disposed of there, resulting in a mound with an elevation (averaging approximately -130 feet MLLW) that the original EIS identified as the maximum desirable. Ongoing mounding substantially above this elevation could begin to affect the action of waves in large storms, potentially causing navigation safety concerns for vessels transiting the area. At the same time, ongoing dredging of the Humboldt Harbor navigation channels and related maritime facilities is necessary to ensure continued safe entering, navigating within, and exiting Humboldt Bay. Such safe navigation is crucial to the maritime-related commerce of the area. Therefore, reliable capacity to accommodate disposal or beneficial use of dredged material will continue to be critically needed, and HOODS as it is currently configured will no longer be able to provide such capacity beginning in approximately 2021.

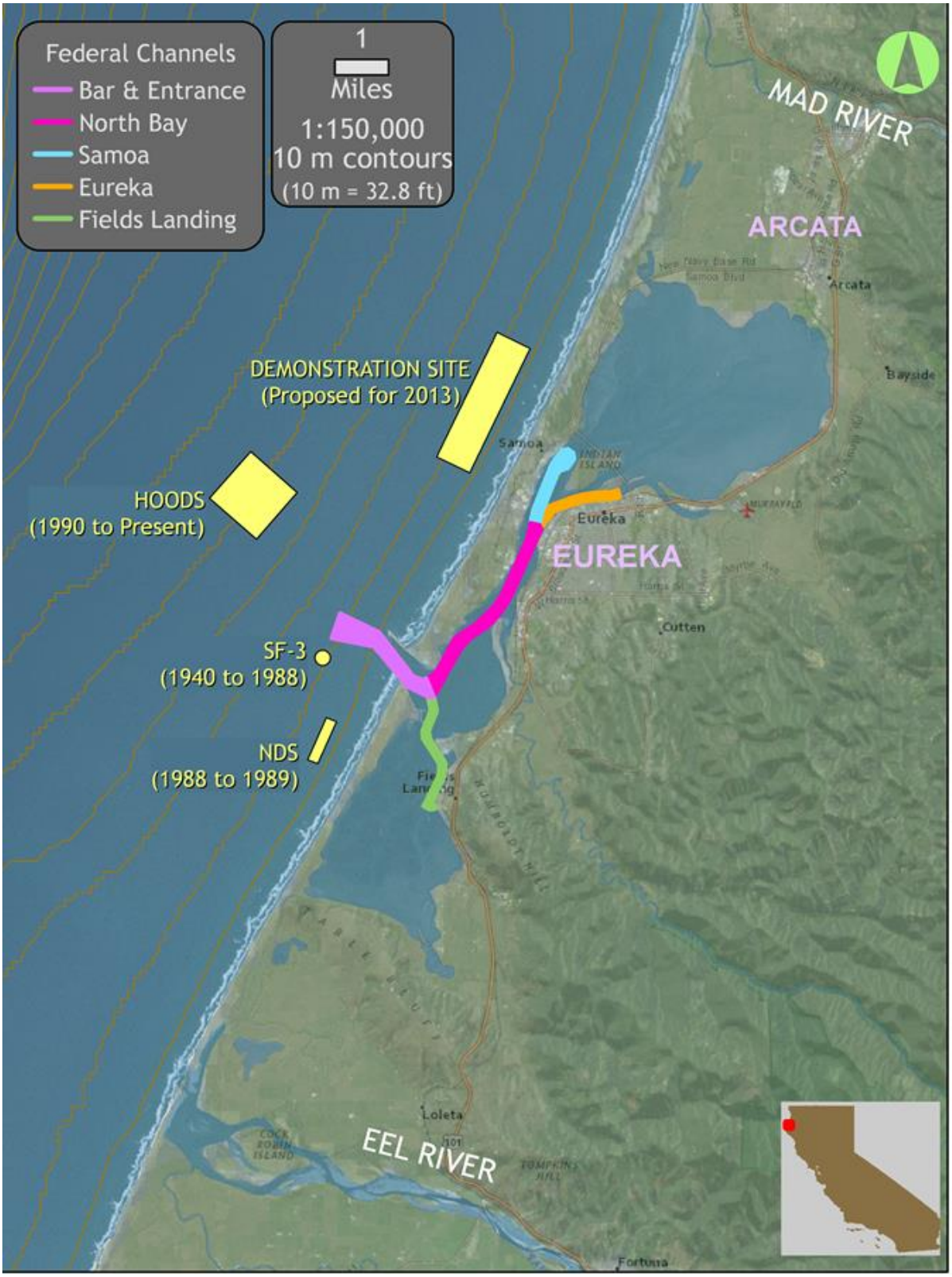

Figure 10: Proposed Action area, showing historic ocean disposal sites, the current HOODS site, and the potential nearshore beneficial use demonstration site for clean sand (as originally identified by USACE) in relation to the Humboldt Bay Federal navigation channel.

3 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

3.1 ALTERNATIVES ELIMINATED FROM CONSIDERATION

The original HOODS EIS (EPA, 1995) considered several alternatives to designating HOODS for managing the projected need for disposal of dredged material from the Humboldt Harbor area. In addition to the No Action alternative, these included only upland disposal, disposal offshore of the continental shelf, use of the historic (pre-1990) "SF-3" and "NDS' disposal sites (Figure 9), and beach nourishment (or nearshore placement).

Only Upland Disposal or Use. At the time of the EIS, upland disposal alternatives were not considered practicable because of limited availability and capacity relative to the annual dredging need. These considerations remain true today. However, before ocean disposal is approved dredging projects are evaluated on a case-by-case basis for the availability of practicable alternatives. It is possible that as additional upland disposal or beneficial use opportunities become available over time, the need for ocean disposal may diminish commensurately. But the need for adequate ocean disposal capacity will still exist. Since upland disposal or use cannot currently substitute entirely for ocean disposal, it will not be considered further here as a stand-alone alternative to ocean disposal at HOODS.

Disposal off the Continental Shelf. Similarly, designation of a disposal site off the continental shelf was eliminated from consideration in the 1995 EIS because of the economics of maintaining the Federal channels in Humboldt Bay. The continental shelf in this area is approximately 10 nautical miles (nm) offshore, or approximately 3 times the transport distance to HOODS. USACE's "Zone of Siting Feasibility" (ZSF) analysis, published with the 1995 EIS, determined based on operational and economic factors that a disposal site serving Humboldt Bay should ideally be within 4 nmi of the Bay's entrance. While the original ZSF has not been formally updated, EPA and USACE believe its basic considerations and conclusions remain valid. The vast majority of dredging for Humboldt Bay continues to be carried out by USACE using hopper dredges, for which increasing disposal transport distance equates to both increased costs and a substantially reduced dredging rate. USACE is already constrained by funding to the point that, aside from the Bar and Entrance Channel itself, maintenance dredging of the Bay's interior channels has regularly been deferred. USACE's recent Tier I evaluation for dredging in Humboldt Bay in 2018 (USACE, 2017a) indicated a backlog of approximately 4,500,000 cy of deferred dredging. Significantly increased transport distances will further reduce the volume of dredging USACE can accomplish during the number of dredging days they have available to work at Humboldt in any given year. Finally, EPA has confirmed that disposal to date at HOODS has not caused any adverse environmental impacts (see Section 4), so that designation of a completely new disposal site is not warranted environmentally. Therefore, designating a new ocean disposal site off the continental shelf will not be further considered here.

Use of Historic (Pre-1990) Ocean Disposal Sites. The 1995 EIS specifically considered two historically-used ocean disposal sites ("SF-3" and the Nearshore Disposal Site or "NDS", Figure 9) before determining that moving to HOODS would be the environmentally and operationally superior choice. SF-3, located 1.1 nmi southwest of the entrance channel in water originally about 55 feet deep, was used since the 1940s. The site was ultimately closed in 1990 because of navigation safety concerns related to mounding (to 40 feet deep) near the entrance channel. The NDS was located in 50-60 feet of water about 2 nmi south of the harbor entrance channel. It was only used in 1988 and 1989 as a demonstration site for whether material placed there would remain in the littoral zone and promote beach nourishment. Its use was discontinued after 1989, also because of mounding concerns. Both SF-3 and NDS were also objected to by fishing organizations. For these reasons, and because an environmentally appropriate ocean disposal alternative (HOODS) already exists to serve the region, use of historic ocean disposal sites will not be considered further here.

Only Beach Nourishment. The Humboldt Harbor Bar and Entrance Channel and much of the North Bay channel, are comprised of sandy sediment (Figure 3) that is typically quite compatible with nearshore placement for beach or littoral system nourishment. In contrast, much of Field's Landing Channel, and the Samoa and Eureka channels, have sediments that are too fine for beach nourishment or littoral system support. Similarly, many City and Harbor District wharfs and marinas contain sediment too fine for beach or littoral placement. Therefore, beach nourishment cannot serve as a substitute for management of all the material that is periodically dredged from Humboldt Bay, and an ocean disposal site alternative will continue to be necessary in the future.

However, much of the sediment dredged annually by USACE comes from the Humboldt Harbor Bar and Entrance Channel and is clean sand that could be beneficially used if an environmentally appropriate location existed that is practicable for USACE hopper dredges to access. This EA discusses a nearshore placement site (which would be regulated under CWA Section 404), north of the entrance channel that could be used in conjunction with HOODS. If found, via monitored demonstration placements, to be a location that can be used for placement of sand with negligible adverse environmental impacts, HOODS would continue to receive disposal of fine sediments, as well as sandy sediments on occasions when conditions do not allow safe nearshore placement. But it is expected that substantial volumes of sand could be retained in the littoral system using this approach, rather than removed from it via disposal at HOODS as is the current practice.

3.2 Alternatives Considered

After eliminating infeasible options as described in Section 3.1, the following alternatives are retained for consideration in this EA, along with the No Action alternative:

1. Proposed Action: Expansion of the HOODS boundaries by 1 nmi to the north and west.
2. Expansion of the HOODS boundaries by ½ nmi to the north and west.

Note that either action alternative could be used in conjunction with identification of a nearshore site for the beneficial use of sand to support beach and littoral system nourishment. The potential nearshore site is discussed in Section 3.4 and Chapter 5.

3.2.1 No Action Alternative

To comply with NEPA, EPA and USACE are required to consider the effects of taking no federal action on the expansion of HOODS for material dredged from Humboldt Bay. The no action alternative defines the "without project condition."

The USACE dredges an average of 1 million cy of sand each year to provide safe navigation access to the bay. Without the expansion of HOODS, the site will reach capacity and disposal of sand would have to be significantly curtailed within approximately 2 years[2]. Since there is no other currently available placement site for this material, rapid shoaling of the entrance channel would quickly render navigation unsafe, significantly affecting the economy of the greater Eureka area. In particular there would be increased wave action in the entrance, creating danger to commercial ships as well as fishing and recreational vessels. This situation would discourage shippers from using Humboldt Bay for commerce, since it requires additional vessel trips to accommodate "light-loaded" vessels, resulting in increased transportation costs, decreased vessel safety, and maneuvering problems. This would have a long-term adverse impact on the local economy. In addition, use of the bay as a port of refuge could be affected. Finally, ship groundings caused by improperly maintained deep-draft channels could result in adverse ecological repercussions (i.e., oil and fuel spills).

If, under No Action, EPA were forced to close HOODS to ongoing sand disposal, USACE would have the option under Section 103 of MPRSA to select a temporary and project-specific alternative ocean disposal location for its dredged material. However, such a site would only be available for 5 years (with an option for one additional 5-year period). Also, it would likely only be available for USACE federal channel dredging and not other Humboldt Bay dredgers or their projects. Furthermore, USACE would need to apply the same criteria as used by EPA for a permanent designation action, and EPA would need to concur with the USACE proposal. It is highly unlikely that EPA would concur in a temporary site selection action by USACE if it was in any area other than is already being considered by EPA in this EA for expansion of the HOODS boundaries, in part because EPA's site selection criteria encourage use of sites that have already been disturbed by earlier disposal actions before considering using new undisturbed areas. EPA has conducted extensive baseline environmental survey work in the proposed expansion area and confirmed no significant adverse impacts from disposal have occurred (see Chapter 4 and Appendix A). In any event, a temporary USACE site selection would expire after 5 or 10 years,

[2] It is possible that HOODS could continue to accommodate small volumes of fine sediment (e.g., from marinas and similar facilities), because unlike the entrance channel sand the fine sediment disperses much more readily and would not quickly exacerbate the mound elevation at HOODS. However, disposal of large volumes of sand from USACE entrance channel dredging could no longer occur.

leaving the region in the same situation it currently faces in terms of lack of capacity for ongoing disposal. Thus, a temporary disposal site selection under MPRSA Section 103 would only delay, not avoid, the ramifications described above.

3.2.2 Alternative 1 (Proposed Action): Expansion by 1 nmi

Alternative 1, the Proposed Action, is to slightly reorient and expand the existing HOODS boundary by 1 nmi to the north (upcoast) and 1 nmi to the west (offshore) (Figure 10). Map coordinates for Alternative 1 are given in Table 5. Alternative 1 is the Proposed Action because it would provide environmentally acceptable disposal capacity for many years without causing any significant adverse impacts, while also affording the most operational flexibility for managing the dredged material in a manner that would further minimize even physical impacts over time (see Appendix D). This configuration would result in the total area of the site increasing from 1 square nmi to 4 square nmi, in water depts of approximately 150 to 210 feet mllw. The effective total capacity of the site would increase from the original 25 million cy (see Section 1.3) to over 100 million cy (i.e., allowing for 75 million cy of additional disposal to occur), before mounding to -130 feet could again occur across the entire site. If today's disposal practices were to continue unchanged (i.e., if 1 million cy of entrance channel sand per year were to continue being placed at HOODS indefinitely), the site would reach capacity again in about 75 years. However, the effective life of the expanded site could be much longer than 75 years if nearshore placement for beach or littoral system support were to begin at some point for the clean dredged sand. In that event, disposal of fine sediment would continue in the expanded HOODS footprint, but it could be managed in such a way that little or no additional long-term mounding would occur at all. Alternative 1 would be operated under a Site Management and Monitoring Plan (SMMP), that includes adaptive management provisions to ensure that significant environmental impacts do not occur (see Appendix D).

3.2.3 Alternative 2: Expansion by 1/2 nmi

Alternative 2 is the expansion of the existing HOODS boundary by 1/2 nmi to the north (upcoast) and 1/2 nmi to the west (offshore) (Figure 10). Map coordinates for Alternative 2 are given in Table 5. This configuration would result in the total area of the site increasing from 1 square nmi to 2.25 square nmi, in water depths of approximately 150 to 190 feet mllw. The effective total capacity of the site would increase from the original 25 million cy (see Section 1.3) to approximately 56 million cy (i.e., allowing for approximately 31 million cy of additional disposal to occur), before mounding to -130 feet could again occur across the entire site. If today's disposal practices were to continue unchanged (i.e., if 1 million cy per year of entrance channel sand were to continue being placed at HOODS indefinitely), the site would reach capacity again in about 31 years. However, the effective life of the expanded site could be much longer than 31 years if nearshore placement for beach or littoral system support were to begin at some point for some or all of the clean dredged sand.

Table 5. HOODS Expansion Alternatives corner coordinates (NAD 83)

Alternative 1 (Proposed): Expand by 1 nmi to North and West				
Corner	Latitude	Longitude	Centroid Lat.	Centroid Long.
North	40° 50' 18" N	124° 18' 01" W	40° 48' 56" N	124° 17' 32" W
East	40° 49' 16" N	124° 15' 46" W		
South	40° 47' 33" N	124° 17' 05" W		
West	40° 48' 34" N	124° 19' 18" W		

Alternative 2: Expand by 1/2 nmi to North and West				
Corner	Latitude	Longitude	Centroid Lat.	Centroid Long.
North	40° 49' 36" N	124° 17' 45" W	40° 48' 35" N	124° 17' 25" W
East	40° 48' 50" N	124° 16' 06" W		
South	40° 47' 33" N	124° 17' 05" W		
West	40° 48' 19" N	124° 18' 43" W		

Like Alternative 1, even if nearshore placement were to divert some or all of the sand from disposal at HOODS, fine sediment would continue to be disposed in the expanded HOODS footprint. Also like Alternative 1, Alternative 2 would be operated under a Site Management and Monitoring Plan (SMMP), that includes adaptive management provisions to ensure that significant environmental impacts do not occur (see Appendix D). However, unlike Alternative 1, the space available to manage ongoing disposal in such a way as to minimize ongoing mounding within the site boundaries would be reduced.

3.3 Elements Common to Alternatives 1 & 2

3.3.1 Sediment Quality

In accordance with MPRSA and the Ocean Dumping Regulations (40 CFR 227), USACE can only permit ocean disposal, and EPA will only concur in such disposal, when the dredged sediment is "suitable" for ocean disposal. Suitable for ocean disposal means that the sediment has no more than "trace" levels of chemical pollutants, as determined by bioassays showing that it is not directly toxic to marine organisms, and that any chemical pollutants present would not bioaccumulate in the food web to levels of ecological or human health concern. Clean sand dredged from high energy areas that are removed from immediate sources of pollution can often be determined by EPA and USACE to be suitable for ocean disposal without conducting extensive physical, chemical, and biological testing each year. This is true of Humboldt Bay entrance channel sand.

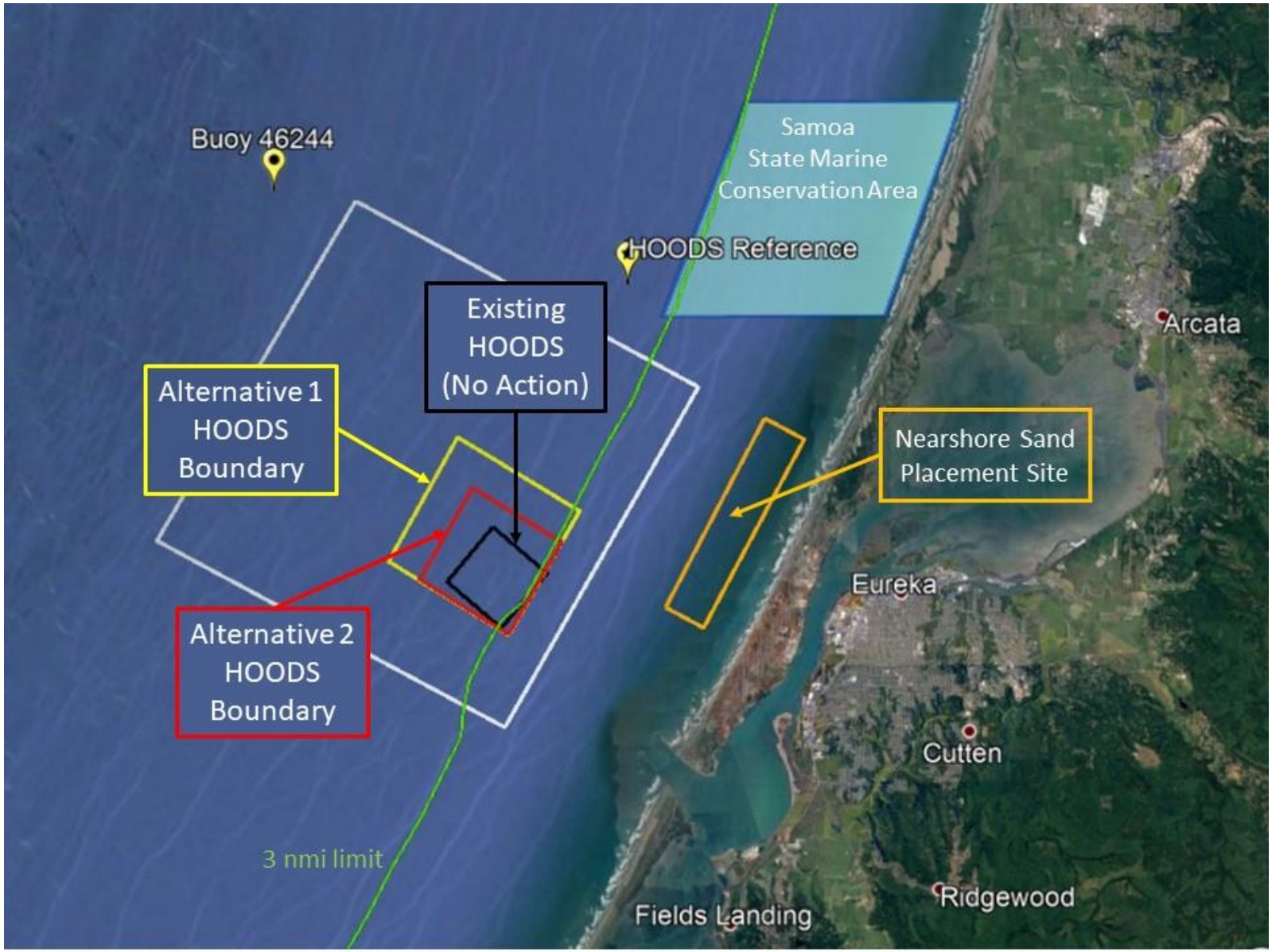

Figure 11. Proposed Action area, showing the current HOODS site and the two boundary expansion alternatives in relation to Humboldt Bay, the City of Eureka, and the Samoa State Marine Conservation Area. Alternative 1 (proposed action) would expand the existing boundaries by 1 nmi to the north and west, while Alternative 2 would expand the boundaries by ½ nmi. Also shown is the location of the potential Nearshore Sand Placement Site and the HOODS sediment reference testing site.

However, other sediments (such as those along the Eureka waterfront and in other Humboldt Bay marinas and docks) must be tested to support a suitability determination. In these cases, EPA and USACE first approve a Sampling and Analysis Plan (SAP) to ensure that the testing to be done is representative of the sediment to be dredged. The representative sediment samples are characterized physically and chemically, and a suite of seven bioassays is conducted for potential toxicity and bioaccumulation. [Sediment testing requirements for ocean disposal are detailed in the national "Ocean Testing Manual" (OTM) published jointly by EPA and USACE (EPA and USACE, 1991).] Only sediments that pass all of the bioassays can be considered for ocean disposal. Periodic monitoring of the various ocean disposal sites managed by EPA Region 9 has consistently confirmed that pre-dredge testing conducted in accordance with the OTM does adequately represent the sediment that is later dredged and dumped. (Such monitoring was recently completed for HOODS and is described in Chapter 4 and Appendix A.) Only sediment determined by EPA and USACE to be suitable for ocean disposal will be allowed for placement at HOODS in the future under either Alternative 1 or Alternative 2.

3.3.2 Need for Ocean Disposal

Designation of an ocean disposal site does not mean that any future project will be approved to use it, even if the project's sediment is "suitable." The MPRSA and the Ocean Dumping Regulations (40 CFR 227.14) also direct that dredged sediment may only be permitted to be discharged at an ocean disposal site if there is a "need for ocean disposal." A need for ocean disposal exists when EPA and USACE find that there are no practicable alternative locations and methods of disposal or recycling available for an individual dredging project. For dredged material, an important alternative to consider is whether there are "beneficial use" options available that would be practicable to use given the project's location, timing, and logistics. A site for beneficial use that is not already permitted or otherwise authorized may not be practicable.

The need for ocean disposal is determined on a project-by-project basis. Thus, if beneficial use is not feasible for an episodic dredging project in one year, it could be feasible in a future year if an appropriate site becomes available. Cost associated with taking dredged material to a beneficial use site is a legitimate factor to consider, but cost need not be equal to or less than ocean disposal; a beneficial use site may be practicable if it is available at a "reasonable incremental cost" compared to ocean disposal (40 CFR 227.16(b)). Expansion of HOODS does not mean that beneficial use alternatives will cease to be evaluated for every project. EPA and USACE will continue to approve ocean disposal at HOODS only for projects that do not have a practicable alternative to ocean disposal available to them.

3.3.3 New Reference Site for HOODS

Reference sediment test results are an important point of comparison for determining suitability of a dredging project's sediments for disposal at the particular ocean disposal site. The OTM defines Reference Sediment as follows:

> *A sediment, substantially free of contaminants, that is as similar as practicable to the grain size of the dredged material and the sediment at the disposal site, and that reflects the conditions that would exist in the vicinity of the disposal site had no dredged-material disposal ever taken place, but had all other influences on sediment condition taken place. These conditions have to be met to the maximum extent possible. If it is not possible to fully meet these conditions, tests should use organisms that are not sensitive to the grain-size differences among the reference sediment, control sediment, and dredged material. The reference sediment serves as a point of comparison to identify potential effects of contaminants in the dredged material.*

The original reference site for HOODS was to the north of the site, in water approximately 170 feet deep, at 40 deg 50.021 min N and 124 deg 15.372 min W. This location met the OTM definition and was used by EPA and USACE for project reviews from 1995 through 2014. However, the original HOODS reference site is within the proposed footprint of the expanded HOODS. As such, disposal in the future could take place there, and it would no longer qualify as a reference for HOODS.

EPA identified a new location that will continue to meet the OTM definition of an appropriate reference site, even after the HOODS boundary is expanded. The new site was identified in the 2014 monitoring survey as station H-14-45 (see the HOODS monitoring synthesis report at: https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents). This new reference site, which has been in use since 2015, is offshore of the southwest corner of the Samoa State Marine Conservation Area. It is in water approximately 180 feet deep (similar to HOODS) but is farther to the north and outside of the direct influence of any future disposal activity in the expanded HOODS. The coordinates for the new HOODS reference site are: **40 deg 52.450 min N and 124 deg 14.870 min W** (NAD 83).

3.4 Nearshore Placement Site for the Beneficial Use of Sand

Although monitoring at HOODS has confirmed that there have been no adverse impacts from offshore disposal (Chapter 4, Appendix A), neither does offshore disposal provide any direct environmental benefits. Sand placed at HOODS is in water too deep, and too far offshore, for normal seasonal transport processes to move it into the active littoral sand transport zone. Placing sand at HOODS therefore is considered "disposal", as opposed to "beneficial use". An obvious potential alternative to ocean disposal of clean sand at HOODS would be to place it at a shallower nearshore site to nourish the littoral system. Shallow-water placement of clean sand

happens at many locations in California, elsewhere on the west coast, and nationwide. Such placement can help buffer against coastal erosion and the effects of sea level rise.

A nearshore sand beneficial use site could be operated in concert with either Alternative 1 or Alternative 2 and would directly extend the operational life of either HOODS expansion alternative by reducing the amount of sand disposal (and therefore mounding) occurring there. If such a site is ultimately shown (via monitored demonstration placements) to have no significant environmental impacts, EPA and USACE could formally establish it for ongoing use**.** Establishing such a site would involve a separate CWA notice and public comment process (under 40 CFR 230.80). Chapter 5 describes the recommended location, management and monitoring of the demonstration Nearshore Sand Placement Site.

The physical, biological, and socioeconomic setting relevant to the Humboldt Harbor area, including HOODS, have been described in the site designation EIS for HOODS (EPA, 1995), as well as in more recent environmental assessments prepared by USACE in support of dredging in Humboldt Bay with subsequent disposal at HOODS (e.g., USACE, 2017b). Those descriptions remain valid and expansion of the existing HOODS site will not affect them for the most part; therefore, many of those descriptions are not repeated here, but are incorporated by reference. Please refer to the referenced documents for more details if desired. This chapter focuses on physical, biological, and socioeconomic impacts associated with the proposed expansion of the existing HOODS boundaries.

4.1 Physical Setting and Impacts

The physical environmental conditions of the action area (offshore of Humboldt Bay, California), including its climate, oceanography, air quality, water quality, and sediment quality, provide context for the evaluations of biological and socio-economic resources presented in this chapter. These physical conditions have been described in detail in the site designation EIS for HOODS (EPA, 1995), as well as in more recent assessments prepared by USACE in support of dredging in Humboldt Bay with subsequent disposal at HOODS. Those descriptions remain valid and apply to the area of expansion of the existing HOODS site under both Alternative 1 and Alternative 2. With the exceptions of oceanography (specifically waves) and sediment quality, a detailed description of the physical setting of the study area is not repeated here. Please refer to the referenced documents for more details if desired.

4.1.1 Oceanography and Waves

The proposed action area is located in the Pacific Ocean offshore of Humboldt Bay in water depths ranging from approximately 150-350 feet (45-106 meters). The existing HOODS is approximately 3 to 4 nautical miles (nmi) from the mouth of Humboldt Bay (Figures 1 & 11). It is 1 square nautical mile (nmi^2) in size, in natural water depths between 160 and 180 feet (49-55 meters). Ocean current monitoring in the vicinity of HOODS has confirmed both up- and down-coast current directions (depending on the season), with near-surface current velocities on the order of 25 cm/sec (0.5 knot), and deeper-water current velocities being slower (20 cm/sec (0.4 knot) at 45 meters deep, and 15 cm/sec (0.3 knot) at the bottom.

The 1995 EIS indicated that sediments in waters deeper than 40 m (131 feet) in the area were generally unaffected by surface waves, whereas in shallower depths, bottom sediments began to be subject to remixing and redistribution due to surface wave energy. A management objective in the Site Management and Monitoring Plan associated with the original designation of HOODS was therefore to manage disposed sediments from mounding and creating seafloor depths shallower than about 130 feet in order to avoid any significant wave energy interaction with the

bottom that could result in alteration in surface wave behavior. Dredged material disposal mounds with bottom seafloor depths greater than 130 feet would not be expected to cause even the largest storm waves to significantly steepen or break near the mound itself. However, some large waves may refract as they travel shoreward after contacting the elevated seafloor; that is to say, these waves could begin to locally change direction in the "wave shadow" of the site as they pass over it. A refocused wave pattern could concentrate wave energy and wave heights in a manner that would not naturally be experienced in this otherwise bathymetrically uniform nearshore environment. This could in turn change wave patterns, especially during storms, near the only entrance channel to Humboldt Bay, which is a navigational "harbor of refuge."

Although portions of the existing HOODS mound have become somewhat shallower than 130 feet (for example see Figures 5 and 9), to date there has been no indication that wave energy has been refocused or wave patterns substantially changed. Expansion of HOODS under ether Alternative 1 or 2 would be managed to ensure that shallower mounding does not occur (see Appendix D), so that any adverse impacts to navigational safety will continue to be avoided. As such, no wave-related impacts are expected.

4.1.2 Sediment Quality

Over 25 million cy of suitable dredged material has been disposed at HOODS since 1995. EPA conducted physical, chemical, and biological (benthic community) monitoring at and around the site in 2008 (Figure 12), and then conducted much more extensive monitoring throughout a larger site expansion study area in 2014 (Figure 13). The more extensive 2014 monitoring included high-resolution multibeam bathymetry, seafloor imagery (both downward looking and sediment penetrating cross-sectional photography), and retrieval of sediment samples that were then analyzed for physical, chemical, and biological (benthic community) properties. Together, the two years of surveys occupied 70 sampling locations that included the existing disposal site itself as well as "offsite" stations at various depths across the larger study area. The results of the site monitoring surveys are presented in the "Humboldt Open Ocean Disposal Site (HOODS) 2008 and 2014 Monitoring Synthesis Report" (EPA, 2016; available at https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents).

Detailed results of the sediment physical and chemical analyses from each sampling station are presented in the Monitoring Synthesis Report. Table 6 summarizes that information, showing the average values and ranges for "Inside" (onsite, with dredged material) vs "Outside" (offsite, without dredged material) stations from 2014 (the more extensive survey). The table also shows NOAA sediment quality screening guidelines for comparison. Sediment chemistry values are similar onsite vs offsite, and levels of contamination are very low throughout the study area. Where screening values are exceeded, they are exceeded both onsite and offsite, indicating that these levels are natural regionally (not associated with dredged material disposal). In several

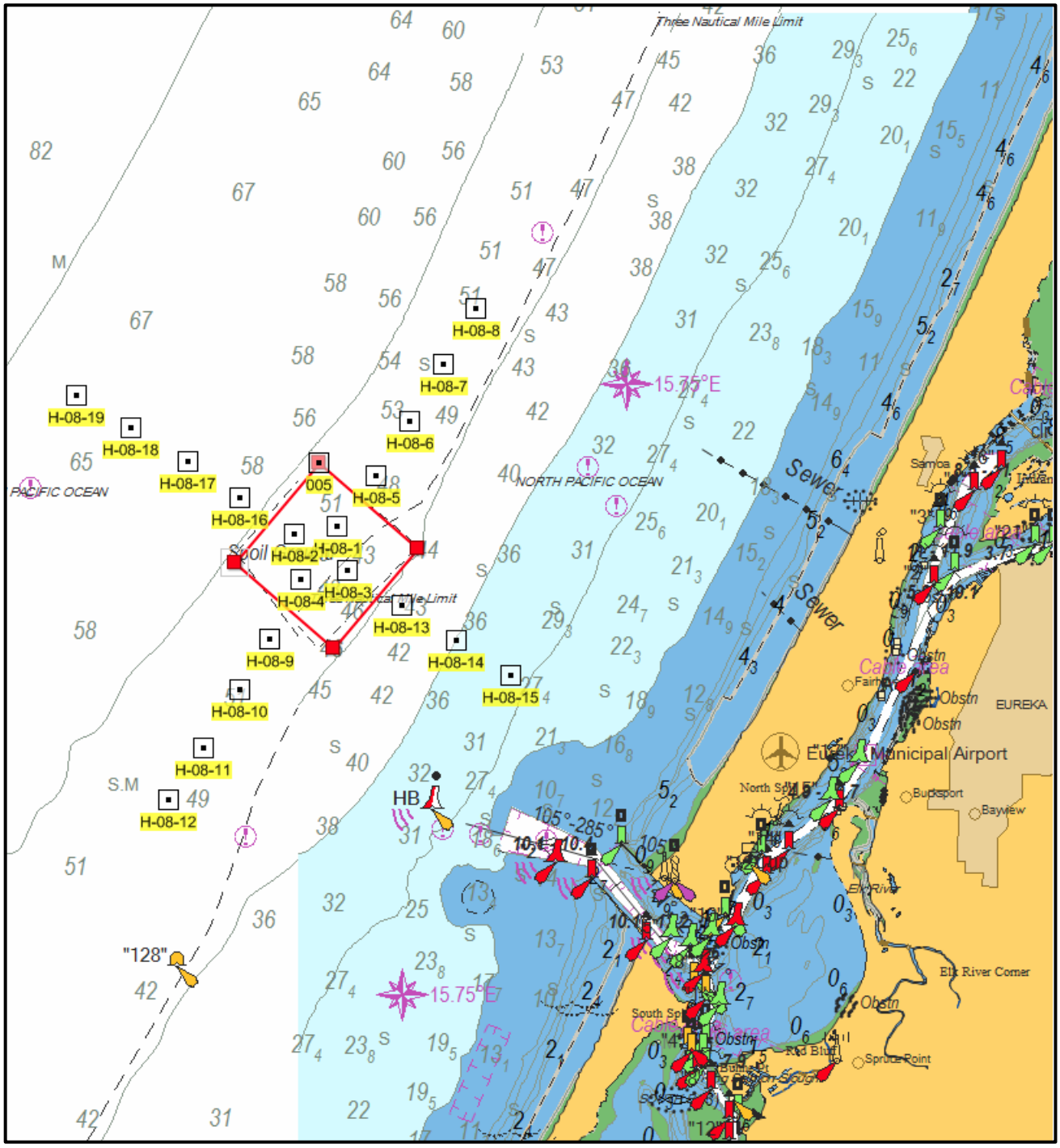

Figure 12. **Sediment sampling stations occupied in the 2008 EPA monitoring survey at HOODS.** Surface sediment grab samples were obtained from 19 stations (4 inside the site boundary - red box) for physical, chemical, and benthic community analysis. (Mapped on NOAA chart 18620A, 10-19-2009 update; soundings in meters.) (EPA 2016)

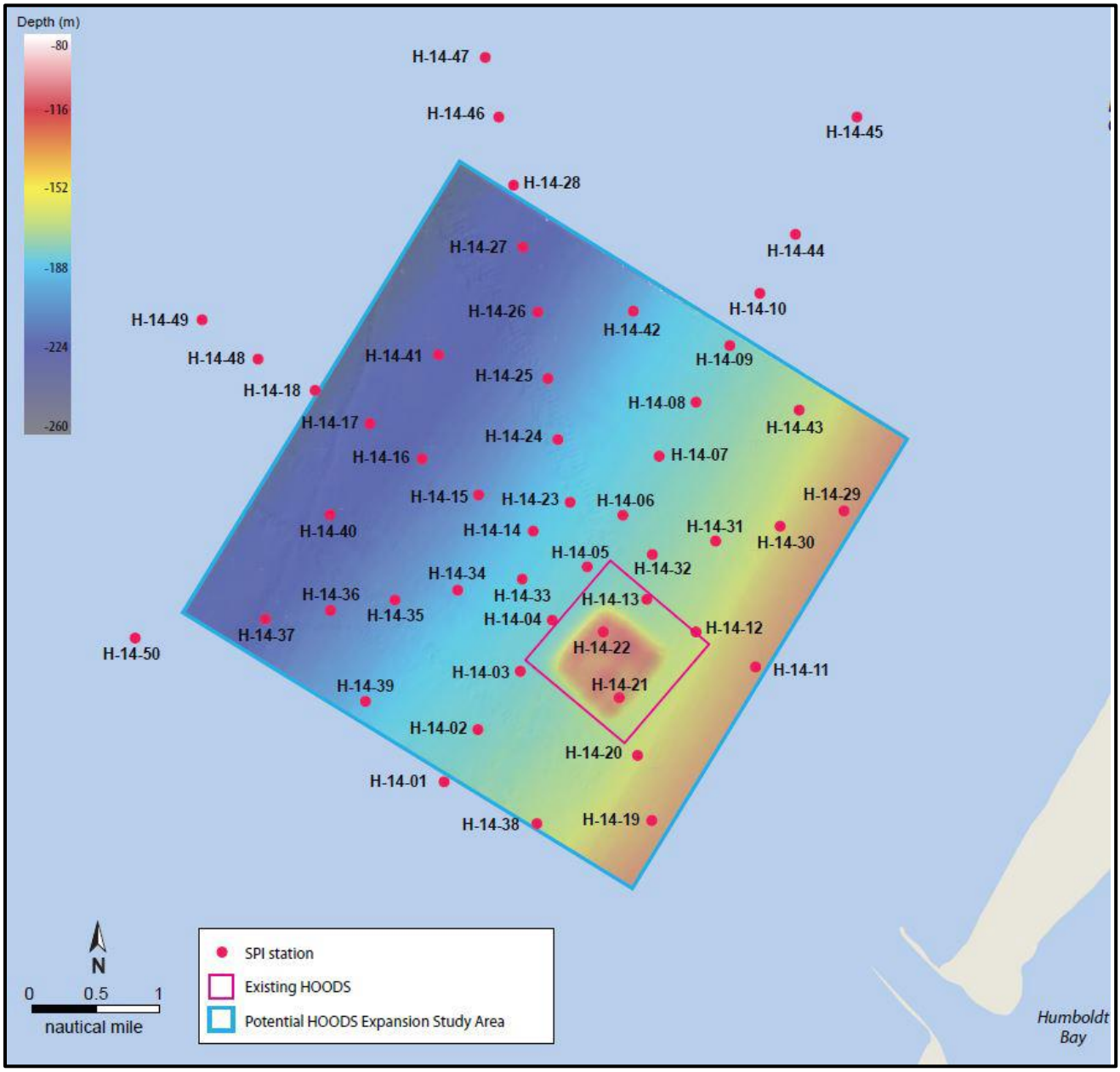

Figure 13. **Sampling stations for the 2014 EPA monitoring and baseline surveys at HOODS.** Red box is the existing HOODS boundary, while the larger blue box shows the expanded study area within which expansion of HOODS is being considered. Shaded relief bathymetry depicted within the expanded study area was obtained from a high-resolution MBES survey in August 2014. September 2014 sampling included sediment images obtained from all 51 stations, sediment grab samples for physical and chemical analysis collected from 26 stations, and benthic community samples collected at 25 of those stations (EPA 2016).

Table 6. Averages and ranges of sediment physical and chemical parameters at "Inside" vs "Outside" sampling stations in 2014. "Inside" stations are within the existing disposal site boundary or at locations with some dredged material present, while "Outside" stations are outside the existing site boundary and without dredged material present. NOAA ER-L and ER-M sediment chemistry screening values are included for comparison[3]; green indicates some values exceed their corresponding ER-L; yellow values exceed their corresponding ER-M. (EPA 2016)

		"Inside" *		"Outside"		NOAA Screening	
Analyte	**Units (dw)**	**Average**	**Range**	**Average**	**Range**	**ER-L**	**ER-M**
Gravel	%	0.06	0-0.16	0.07	0-0.56	--	--
Sand	%	48.58	27.75-56.93	22.53	1.07-78.94	--	--
Silt	%	40.31	30.34-60.07	62.48	13.1-76.8	--	--
Clay	%	11.04	6.93-12.58	14.92	3.9-31.55	--	--
Total Organic Carbon	%	0.82	0.54-1.23	0.90	0.31-1.51	--	--
Arsenic	mg/kg	6.28	5.4-7.1	6.38	5.4-7.8	8.2	70
Cadmium	mg/kg	ND	ND	ND	ND	1.2	9.6
Chromium	mg/kg	74.60	69-84	78.30	70-89	81	370
Copper	mg/kg	17.40	16-20	22.09	11-31	34	270
Lead	mg/kg	6.16	4.5-7.5	7.65	5.7-10	46.7	218
Mercury	mg/kg	0.11	0.05-0.36	0.06	0.026-0.096	0.15	0.71
Nickel	mg/kg	88.60	83-99	92.30	76-110	20.9	51.6
Zinc	mg/kg	61.00	55-67	67.70	56-84	150	410
Dioxins - Total TEQ	ng/kg	0.13	0.078-0.182	0.13	0.013-0.594	--	--
Total DDTs	ug/kg	ND	ND	ND	ND	1.58	46.1
Total Organotins	ug/kg	2.00	1.51-2.56	2.25	1.54-4.28	--	--
Total PAHs	ug/kg	21.28	14.6-31.8	18.37	9.8-44.3	4022	44792
Total PCB Congeners	ug/kg	0.44	0-2.17	0.00	0	22.7	180

instances the onsite dredged material has *lower* chemistry than native offsite sediments. This is because most of the dredged material present is clean sand, with relatively less organic carbon to absorb trace contaminants than the finer native sediment outside the disposal site. The overall conclusion documented in the Monitoring Synthesis Report (EPA 2016) was:

> *It is clear that the bulk of dredged material discharged at HOODS in the last decade or more has been deposited properly within the site boundaries. There are minor and localized physical impacts from dredged material disposal, as expected, but there has been no significant contaminant loading and no significant adverse impacts are apparent to the benthic environment outside of the site boundaries. It therefore appears that the EPA/USACE pre-disposal sediment testing program, coupled with a strict site management approach, has protected HOODS and its environs from adverse chemical or biological impacts. However, mounding of dredged material (primarily due to the large volumes of clean sand dredged annually from the Humboldt Bay Entrance Channel) has resulted in the site, as it is currently configured, effectively reaching capacity.*

[3] NOAA ER-L ("Effects Range – Low") values reflect sediment chemical concentrations at or below which adverse effects generally would not be expected, while ER-M ("Effects Range – Median") values reflect concentrations above which adverse effects could be expected (Long et al., 1995).

Continued disposal of suitable non-toxic dredged material at HOODS under either Alternative 1 or 2 is expected to have similar, insignificant impacts on chemical sediment quality. Site expansion will provide flexibility to manage disposal events for reduced physical impacts in the future as well. Specifically, management of the expanded HOODS could allow for either:

- spreading material throughout the site so that there would be more time for benthos to recolonize and to re-work disposed sediment into the native sediment between disposal events); or
- concentrating material to slowly build the edges of the existing mound so most of the site is not disturbed at all by disposal for many years.

Alternative 1, the larger site expansion, provides the greatest flexibility and would allow for the greatest benefit/least impact in this regard. If a Nearshore Sand Placement Site is established in the future and a proportion of the sand currently disposed at HOODS is diverted there for littoral cell support, changes to physical sediment quality within HOODS will be even less.

4.1.3 Disposal Plume Dynamics

Disposal Plumes At HOODS

For moderated depth disposal sites such as HOODS, fine sediment that is initially dumped from a scow or hopper dredge descends as a mass and hits the bottom with some momentum. That momentum then continues laterally near the bottom, carrying fines with it for some distance before the momentum dissipates and the fines can settle. (Also, the point of release from the USACE hopper dredge Essayons starts at about 35 feet below the surface to begin with.) Thus, the suspended sediment plume is substantially larger near the bottom than at the surface, and the worst case for potential turbidity-related impacts would be to organisms occurring near the bottom, rather than those living in surface waters.

Two plume monitoring studies conducted in San Francisco Bay are relevant to estimating the potential intensity and extend of suspended sediment plumes that would occur with disposal at HOODS. Both used acoustic tracking techniques calibrated with suspended sediment sampling to document the behavior of suspended sediment plumes near the bottom (most relevant to near-bottom plume spreading following disposal at HOODS). The first study (USACE and Weston, 2005) found suspended sediment concentrations were at least 600 mg/L (~175 NTU) immediately adjacent to the dredging equipment, but that it had dissipated to less than 200 mg/L (~60 NTU) within 5-6 minutes, and to 100 mg/L (~40 NTU) within 7-9 minutes. "Residual" plumes of 50 mg/L (~20 NTU) lasted for 13 minutes or more but could not be distinguished from local background after that. Depending on the tidal current velocities at the time of each survey transect, plume concentrations dissipated to background within 50-200 m on this project. The second study (Clarke et al., 2005) found similar results even though different kinds of dredging equipment generated the plume. In this case, suspended sediment concentrations exceeding 275 mg/L were measured only in immediate proximity to the dredging, and concentrations greater than 100 mg/L were observed only in relatively small

pockets of water that dispersed along the bottom. Acoustic signatures generally decayed to background concentrations of 25-50 mg/L within 200-400 m.

Of course, these studies were conducted under conditions that differed from those at HOODS in some important ways. First, water depths were shallower than at HOODS. However, the study results still provide an indication of potential spread and movement of suspended sediments that are near the bottom, where plumes from sediments disposed at HOODS will be of greatest extent as noted above. Second, the sediment in the plume tracking studies was substantially finer than even the siltiest projects typically disposed at HOODS (as noted above only 2-10% of the total volume disposed at HOODS is sediment that includes any appreciable percentage of fines). Therefore, the concentration of suspended fines in the monitored plumes, and the extent of their subsequent spread before settling out or dissipating to background, was likely much greater than would occur at HOODS. Finally, although the surface current velocities at HOODS (which can vary seasonally from 0.5 to 2 knots, or 25 to 100 cm/sec) are often greater than the weak currents (roughly 0.5 knot, 25 cm/sec) encountered during the San Francisco Bay tracking studies, the velocities near the bottom at HOODS are actually similarly weak (0.3-0.4 knots or 15-20 cm/sec). Overall, it is likely that the results of the San Francisco Bay studies substantially over-estimate the spread of suspended sediment plumes associated with HOODS disposal operations.

Nevertheless, based on these studies a conservative estimate for a typical disposal event at HOODS is that the plume is minimal at the surface, but that it spreads upon encountering the seafloor to affect an area with a radius of up to 200 m (660 feet) (i.e., a circular area of ~125,500 sq m or~1,350,000 sq ft). This is equivalent to the area of 1.3 of the 36 existing HOODS disposal cells or 3.7% of the overall area of the existing site. Individual worst-case disposal events would result in some increased near-bottom turbidity over at most 3.7 % of the existing site, or if site expansion Alternative 1 is selected (expansion by an additional nautical mile to the west and north), slightly less than 1% of the expanded site. Since the duration of the elevated turbidity from worst-case disposals would last for only approximately 15 minutes before dissipating to background concentrations (based on the San Francisco Bay plume tracking studies), and since disposal events at HOODS generally occur no more frequently than every 2 hours, there would be no cumulative turbidity impact at the site over time. As discussed earlier, 90% or more of all disposals at HOODS consist of clean entrance channel sand that includes very little in the way of fines. Therefore, the vast majority of disposal events should have turbidity effects that are even smaller than the negligible effects conservatively estimated here.

Sand Disposal Plume Monitoring at Mouth of Columbia River

An even more relevant example comes from video monitoring conducted by NOAA in 2014 and 2015 off the mouth of the Columbia River. That work documented sand disposal events by the USACE hopper dredge *Essayons* (the same disposal vessel that often dredges Humboldt Bay and discharges sand at HOODS). Videos captured the effects of sand disposal plumes on dungeness

crab, flatfish and gastropods on the seafloor at different depths, including a shallow nearshore site where sediment was placed for beach nourishment, and a deeper (70 m, or ~230 ft) disposal site.[4] The shallow nearshore site is similar to the potential NSPS along Samoa Spit off Humboldt Bay (Figure 11), while the 70 m disposal site is in somewhat deeper water than HOODS. At the shallow site, the disposal vessel purposely released the dredged sand slowly, while moving forward. The intent of this disposal technique is to nourish the nearshore littoral zone by adding sand thinly and evenly, as opposed to creating mounds from point-dumping. This kind of "thin layer placement" is likely what would occur at any NSPS off Humboldt Bay.

For shallow water placement, the NOAA videos documented temporary displacement of crabs and flatfish as the sand plumes passed by (gastropods were less affected). However, the plumes had cleared from the monitoring stations within about 4 minutes. Crabs and fish then returned after 30-60 minutes. At the 70 m disposal site, the plume was slower moving and diffuse enough (less dense) that flatfish were not displaced and instead stayed in place as the suspended sediment passed by. The plume at the deeper site also cleared the monitoring station in about 5 minutes.

4.1.4 Air Quality

The project area is presently in attainment for all National Ambient Air Quality Standards (NAAQS). As outlined below, the proposed action is not expected to change this.

Air emissions associated with the proposed action will be generated during transit to and from the HOODS (or, in the future, possibly to HOODS and the NSPS). These emissions would consist of dredge exhaust fumes. The California Air Resources Board (CARB) enacted the Commercial Harbor Craft Regulation in 2009 in order to accelerate the reductions of emissions of diesel particulate matter (PM) and oxides of nitrogen (NOx) from commercial harbor craft operating in California Regulated Waters. The *Essayons'* and *Yaquina's* engines meet Tier II level standards as defined by CARB. Also, the Portland District USACE recently applied for and received approval to operate the engines installed on the dredges *Essayons* and *Yaquina* under CARB's statewide Portable Equipment Registration Program (PERP). PERP registration allows portable engines, including marine engines, to operate in California while providing minimal notification to the local air quality management districts.

The *Essayons* makes use of:

- Two, Tier II, C-280-12 Diesel Main Propulsion Engines;
- Three, Tier II, C-3512 Ship Service Generator Engines; and
- Two, Tier II, C-280 Diesel Dredge Pump Engines.

[4] NOAA's monitoring videos are available at https://www.youtube.com/user/Fish00Head. A synopsis video is available at https://www.youtube.com/watch?v=c49s8_f5ivU.

The *Yaquina* makes use of:

- Two, Tier II, MTU 8V4000 M60 Main Propulsion Engines; and
- Two, Tier II, MTU 12V2000 P8 Ship Service Generator Engines.
- Two, Tier, II MTU 12v 2000 P12 Dredge Pump Engines.

The Tier II engines installed on the *Essayons* and *Yaquina* greatly reduce NOx emissions compared to older engines. They also allow the use of low sulfur oxide diesel fuel, resulting in a reduction in SOx (sulfur oxides) emissions. New electronic governors also reduce the amount of visible particulate matter released into the atmosphere while making more efficient use of fuel.

Expanding HOODS will not increase the volume of material to be dredged, and it will cause only a minor increase the transport distance to HOODS. Due to this, as well as the use of CARB-compliant Tier II engines on the *Essayons* and *Yaquina* (as well as contracted hopper dredges), and the limited duration of annual dredging episodes, it is anticipated that the proposed action will not significantly increase disposal-related emissions compared to no action. Other dredging-related air quality effects must be evaluated on a project-specific basis by USACE.

4.2 Biological Resources and Impacts

The open-water environment along the Humboldt coast provides habitat to plankton, benthic (bottom-dwelling) organisms, fish, birds, amphibians, and marine mammals, some of which are protected or sensitive. The location of the existing HOODS disposal site (see Figures 1 and 11) was selected in the 1995 EIS specifically because it had the least potential for impacts to important fish and shellfish resources (particularly including smelt, flatfish, and decapods which are all most abundant in waters shallower than 50 m in the area, closer to shore). Please see the 1995 EIS for general descriptions of biological resources in the vicinity of HOODS. This section updates those discussions where appropriate based on more recent monitoring data, changes to protected species status, etc.

4.2.1 Planktonic Community

The open waters off Humboldt Bay are part of the California current region, typified by biological components from a variety of marine and biotic provinces. Plankton biomass and species composition in the Humboldt Bay region are influenced by the southerly flowing California current and the Davidson current that flows northward in the winter.

Disposal of dredged material at the HOODS temporarily increases turbidity (reduces light penetration into the water column) resulting in a temporary reduction in primary productivity. Zooplankton may experience a temporary clogging of gills and feeding appendages, which could reduce growth, survival, and zooplankton biomass. Additionally, increased turbidity may interfere with the respiratory mechanisms of both planktonic and zooplankton communities.

Implementation of the proposed action would result in less than significant impacts to planktonic communities for several reasons. Only suitable dredged material is allowed to be disposed at HOODS (or any other ocean disposal sites); the suitability determination process includes confirming that the material is not toxic to sensitive water column organisms and that water quality standards will not be violated following initial mixing. Disposal plumes are much smaller at the surface than near the sea floor to begin with, because the discharge point is already roughly 35 feet below the surface. As described above, suspended solids associated with disposal at HOODS are temporary and return to ambient conditions within minutes after the discharge with no cumulative effects of turbidity or suspended solids on the water column. Finally, the vast majority of material disposed at HOODS is clean sand which has the shortest residence time in the water column before settling out, and which also has the least potential to carry contamination which may strip off into the water column before settling.

4.2.2 Benthic Community

Potential detrimental effects of non-toxic dredged material disposal on benthic communities (benthos) mainly include direct physical effects within the site boundaries, including burial of invertebrates living on or in the seafloor sediments, and physical changes to the substrate (such as grain size differences) which can affect recolonization and subsequent invertebrate community structure. (Benthic fishes are generally able to avoid burial by plumes of disposed sediment, and although they may be displaced from the immediate vicinity of disposal events that displacement would generally be temporary. Groundfish are discussed in more detail in Section 4.2.3.

The benthic habitat at HOODS and throughout the HOODS expansion study area is a gently sloping, essentially featureless sedimentary plain that grades evenly from fine sand in shallower depths to silts in deeper areas. As described in the EIS and confirmed via the monitoring surveys in 2008 and 2014 (EPA 2016, Appendix A), the benthic communities supported by this habitat are virtually identical (i.e. infaunal organism density and richness are not significantly different) at similar depths north to south across the entire study area. Density and richness do each increase going from shallower to deeper areas, as expected based on the substrate's gradation from fine sand to silt. But across the entire study area, there are no unique or distinctive benthic community differences.

The initial monitoring in 2008, and the more extensive monitoring in 2014, each documented a community of infaunal invertebrates (living in or on the sediment) in the vicinity of HOODS that is dominated by small polychaetes (marine worms), crustaceans, and mollusks. Table 7 summarizes the invertebrates identified in the 2014 monitoring across the study area. Only directly atop the disposal mound itself, which is annually disturbed by disposal of large volumes of clean sand, was there any effect on the infaunal community at all as indicated by organism density, species richness, or diversity (Figure 14).

Table 7. **Summary of the dominant (5 most abundant) taxa in each major group of benthic invertebrates** collected around HOODS in 2014. In all, 61,215 individual organisms and 323 taxa were collected. (EPA 2016)

Polychaetes n=32,461 individuals (53.0% of all individuals); 138 taxa (42.7% of all taxa)

Taxon	Count	Percent of total Polychaetes
Siophanes spp	5,745	17.7
Cirratulidae	2,719	8.4
Mediomastus spp	2,571	8.0
Owenia f.	1,684	5.2
Maldanidae	1,472	4.5
Total	14,191	43.7

Crustaceans n=10,247 individuals (16.7% of all individuals); 69 taxa (21.4% of all taxa)

Taxon	Count	Percent of total Crustaceans
Photis spp	2,515	24.5
Diastylis spp	996	9.7
Cheirimedeia spp	892	8.7
Isaeidae spp	800	7.8
Protomedeia spp	796	7.8
Total	5,999	58.5

Mollusks n=9,999 individuals (16.3% of all individuals); 58 taxa (18.0% of all taxa)

Taxon	Count	Percent of total Mollusks
Axinopsida	3,470	34.7
Bivalva spp	1,986	19.9
Ennucula	923	9.2
Macoma spp	620	6.2
Gastropoda app	567	5.7
Total	7,566	75.7

Other Taxa n=8,508 individuals (13.9% of all individuals); 58 taxa (18.0% of all taxa)

Taxon	Count	Percent of total Other Taxa
Edwardsiidae spp	4,075	47.9
Nematoda spp	1,985	23.3
Echiuridae	955	11.2
Ophiurida spp	353	4.1
Echinoidia	208	2.4
Total	7,576	89.0

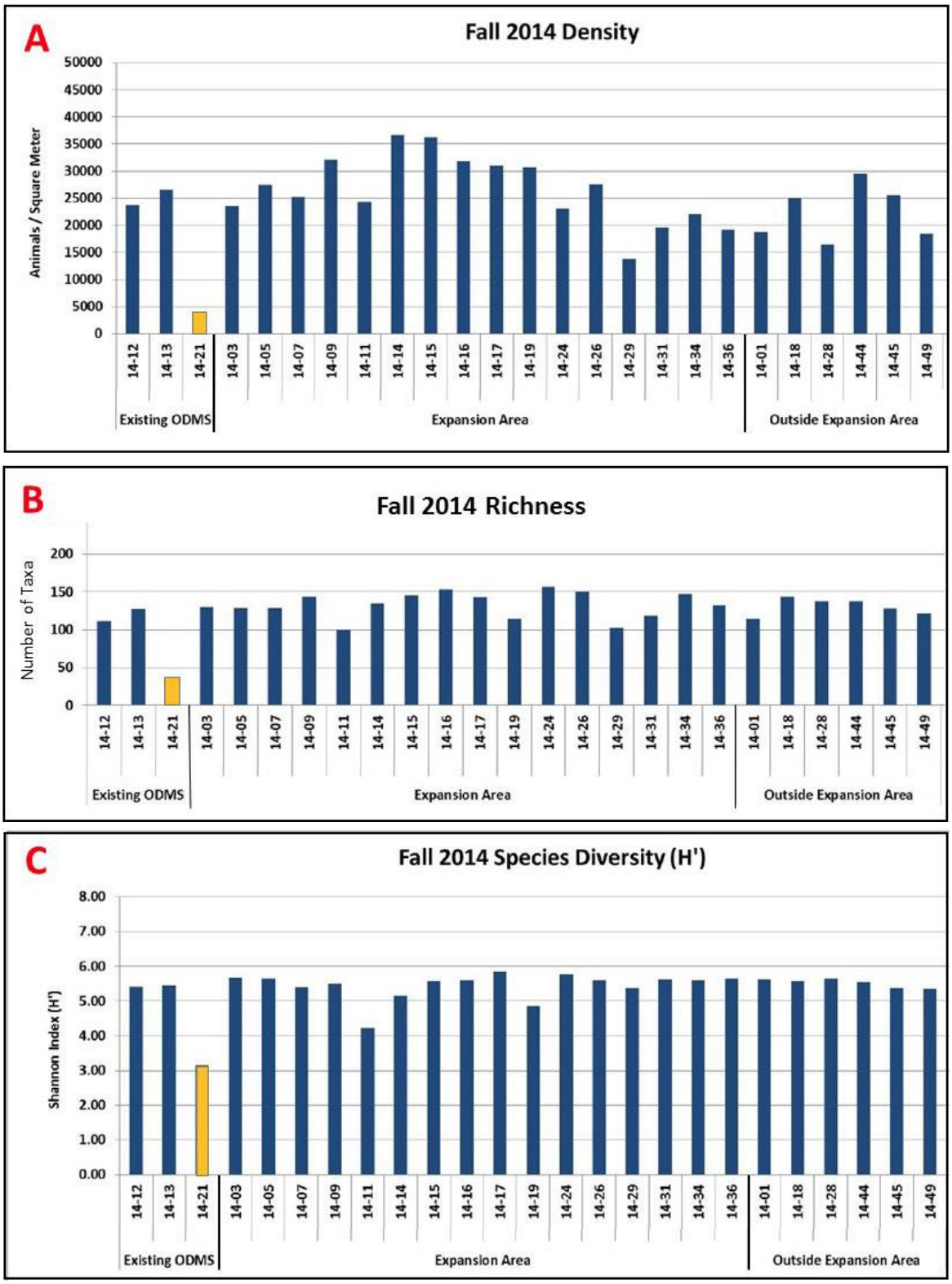

Figure 14. **Density (Panel A), richness (Panel B), and diversity (Panel C) of infaunal organisms captured at each station around HOODS in 2014,** grouped by stations within the existing disposal site, in the expansion area, and outside the expansion area. Stations 12 and 13 were inside the HOODS boundary but on the periphery; only Station 21 (shown in yellow) was on the disposal mound itself. (EPA 2016)

Expansion of HOODS will allow flexibility to manage disposal in the future to reduce the frequency of repeated deposition (and build-up) of sand in the same location. More time for benthos to recover (recolonize) and to re-work disposed sediment into the native sediment between disposal events will result in substantially increased benthic habitat quality and biological productivity compared to the thick sand mound currently existing at HOODS. Alternative 1, the larger site expansion, provides the greatest flexibility and would allow for the greatest benefit/least impact in this regard. If a Nearshore Sand Placement Site is established and a proportion of the sand currently disposed at HOODS is diverted there for littoral cell support in the future, changes to physical sediment quality within HOODS will be even less. Thus, no significant adverse impacts are anticipated under either Alternative 1 or Alternative 2.

4.2.3 Fish Communities, Including EFH

A variety of life history stages of both pelagic (water column) and benthic (bottom-associated) fish species may be present in the vicinity of HOODS and its expansion alternatives (e.g., see EPA 1995 and USACE 2017b). The HOODS area was identified in the 1995 EIS as having the least potential for impacts to important fish and shellfish resources (including smelt, flatfish, and decapods which are all most abundant in waters shallower than 50 m in the area, closer to shore). It concluded that the potential for impacts to other more pelagic and/or mobile species (including salmonids and other fishes, as well as seabirds, marine mammals, and turtles) was negligible due to the seasonal nature of disposal activity, the fact that the majority of material disposed was expected to be sand (i.e., having lowest potential for lasting turbidity or contaminant effects), and the lack of any unique habitat features that would make the disposal site's location more attractive, productive, or valuable to these species than the surrounding region. This section updates those discussions and focuses particularly on how Fishery Management Plan (FMP) species and Essential Fish Habitat (EFH) may be affected by disposal at an expanded HOODS, as well as special status species managed under the Endangered Species Act. (See Appendix B for details of the completed EFH consultation with NMFS.)

The existing HOODS boundaries as well as the expansion alternatives overlap with species/habitats managed under the 2016 Pacific Salmon Fisheries Management Plan (FMP), the 2016 Pacific Coast Groundfish FMP, and the 2019 Coastal Pelagic Species FMP. EPA has determined that under either Alternative 1 or Alternative 2 there will be no effect on fish species addressed in these FMPs, or their EFH for the reasons discussed below.

<u>Pacific Salmon FMP</u>

The Pacific Salmon Fisheries Management Plan (PFMC, 2016a) describes potential adverse effects to salmon that may occur as a result of dredging and disposal activities. Consistent with the discussion above, potential adverse effects are much more likely to be associated with dredging itself than with disposal. Potential effects from disposal are described in the FMP as follows:

> *"When not used for beneficial purposes, spoils are usually taken to marine disposal sites and this in itself may create adverse conditions within the marine community. When contaminated dredged sediment is dumped in marine waters, toxicity and foodchain transfers can be anticipated, particularly in biologically productive areas. The effects of these changes on salmon are not known."*

Specific to HOODS, the location of the disposal site and the kind of sediment disposed there (mainly clean sand), coupled with EPA's active management and monitoring program, have assured that no contaminant-related effects have occurred (including via toxicity or foodchain transfers).

The Pacific Salmon FMP also generally describes potential conservation measures that may reduce impacts of dredging and disposal on EFH. As above, most of the potential conservation measures relate to dredging itself rather than disposal. The potential measures that are most relevant to potential disposal effects are listed below. EPA agrees that these are appropriate kinds of measures to consider, and we note that they (as well as other specific measures we institute) are already incorporated into our management of disposal operations at HOODS.

> *"When reviewing open-water disposal permits for dredged material, identify direct and indirect effects of such projects on EFH. Consider upland disposal options as an alternative. Mitigate all unavoidable adverse effects and monitor mitigation effectiveness."*

The potential effects on EFH of the dredging aspects of projects using HOODS are assessed on a case by case basis during the interagency permit review process. This is appropriate because dredging has the greatest potential to cause adverse effect, and because the potential effect of each dredging project is different based on location, timing, presence of contaminants, proximity to habitats of particular concern (such as eelgrass), etc. However, the ocean disposal aspects are much less variable, and can appropriately be assessed programmatically, because:

- only suitable sediment (shown through extensive testing to be clean and non-toxic) is considered for disposal at HOODS;
- even suitable sediment is only approved when other practicable alternatives do not exist;
- the vast majority of material disposed is sand, which settles to the bottom very quickly (minutes) and does not substantially spread outside the disposal site boundaries; and
- water column effects (turbidity) are extremely temporary with no cumulative effect between disposal events.

The only effect is the physical sand mound which is constrained to the site boundaries as was predicted in the original site designation EIS. The presence of the sand mound (which does not extend into waters shallower than 120 feet) does not limit the amount or quality of open water migratory or foraging habitat for salmon (and in fact may somewhat enhance habitat quality by providing the only physical "feature" in this otherwise uniform habitat area. If beneficial reuse

of sand (for example at the Near Shore Placement Site) starts to occur regularly in the future, the already negligible effects of disposal at HOODS on salmon EFH will be further minimized.

> *"Test sediments for contaminants prior to dredging and dispose of contaminated sediments at upland facilities."*

This measure is already fully incorporated in both the Ocean Dumping regulations, and the HOODS SMMP. All projects are evaluated for potential contaminant effects prior to being approved for ocean disposal at HOODS. Unsuitable sediment must be managed in an alternative manner, including at appropriate upland or confined facilities.

> *"Determine cumulative effects of existing and proposed dredging operations on EFH."*

As noted earlier, expansion of HOODS would not increase the need for dredging in Humboldt Bay or the amount of ocean disposal activity that occurs there. Instead, expanding the site affords the opportunity to manage ongoing disposal at the site in a manner that could further reduce the already negligible impacts of disposal (especially under Alternative 1) while allowing more time for benthic recovery via active bioturbation before subsequent disposal events affect the same location again. Also as noted above, there would be no cumulative water quality impacts due to the extremely rapid settlement of discharged sediment (predominantly sand), compared to the interval between disposal events (averaging 3-4 minutes of discharge once every 2-3 hours during the relatively short 3-5 week dredging season). For these reasons there would be no cumulative effects of continued disposal operations at HOODS on EFH for salmon.

> *"Explore the use of clean dredged material for beneficial use opportunities."*

Chapter 5 of this EA describe a potential Nearshore Sand Placement Site (NSPS) that would help retain clean sand dredged from the Humboldt Entrance Channel in the shallow littoral system along Samoa beach (see Figure 11). This EA does not propose to designate the NSPS, but provided that further analysis and pilot placements confirm this location to be environmentally appropriate, EPA and USACE could move to formalize the site. At that point EPA would consider placement at the NSPS to be a beneficial reuse alternative to ocean disposal of dredged sand at HOODS. However, for the time being, there are extremely limited available reuse options in the Humboldt Bay area, especially for the large quantities of sand needing to be dredged each year to maintain safe navigation into and out of Humboldt Bay.

<u>Pacific Coast Groundfish FMP</u>

The Pacific Coast Groundfish FMP (PFMC, 2016b) manages 90-plus species over a large and ecologically diverse area. It includes all west coast offshore waters less than 3,500 m deep (Figure 15), as well as specified seamounts that are greater than 3,500 m deep and other specific areas identified as habitat areas of particular concern (HAPC, Figure 16). Although HOODS and the proposed HOODS expansion alternatives lie within the overall groundfish

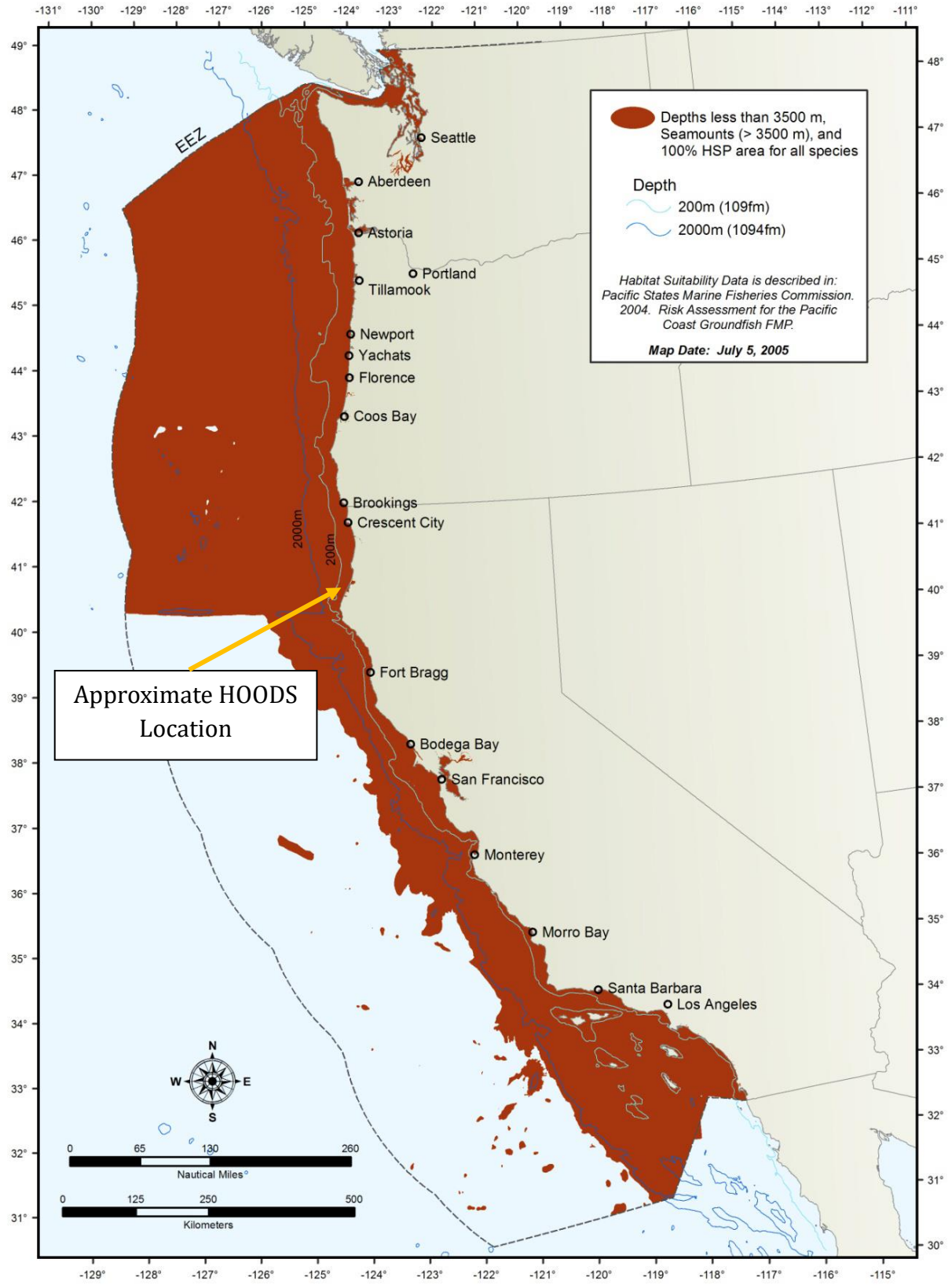

Figure 15. Overall Groundfish EFH zone. (From PFMC, 2016.) (http://WWW.PCOUNCIL.ORG)

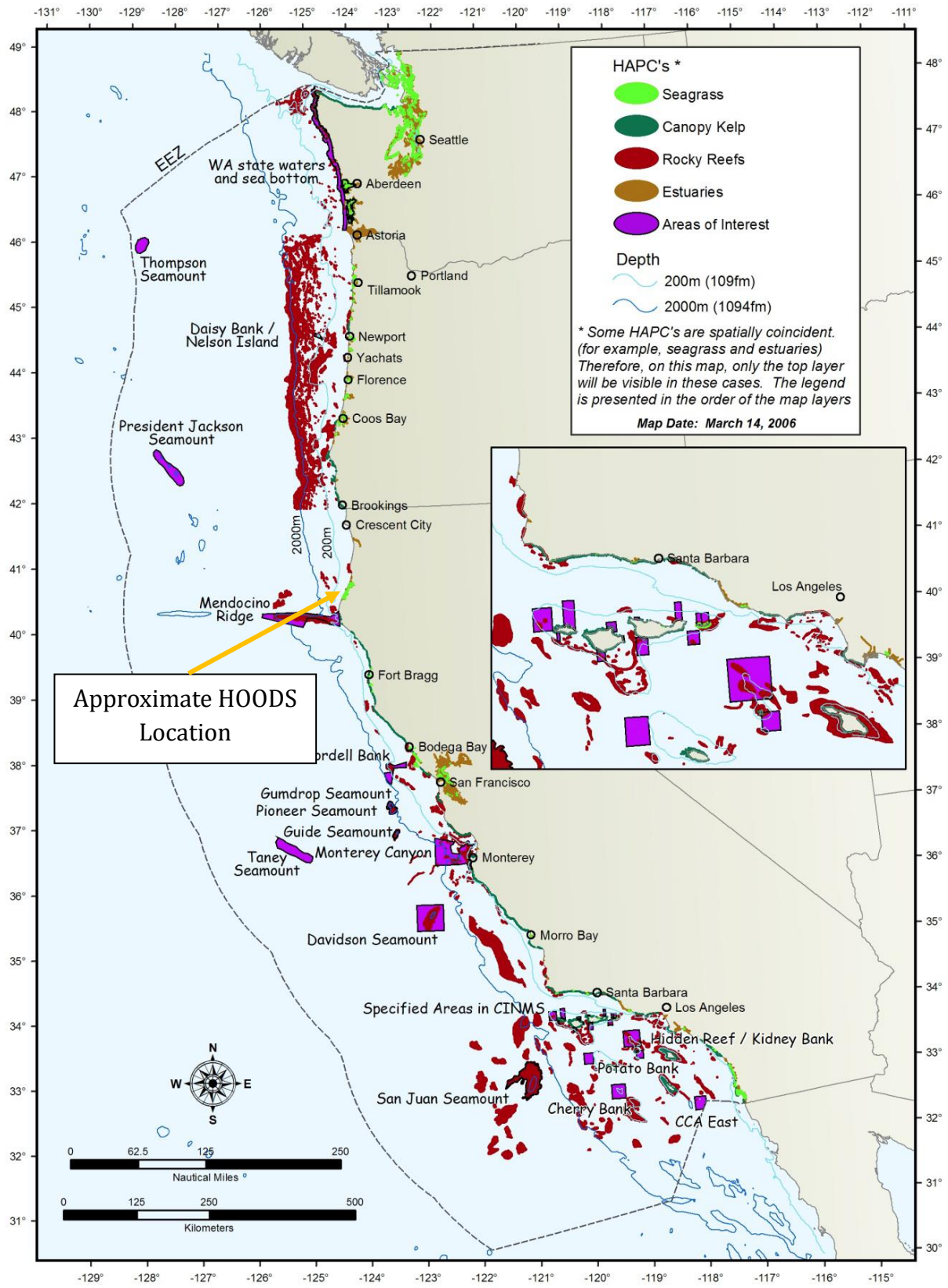

Figure 16. Habitat Areas of Particular Concern (HAPC) in the Groundfish FMP. (From PFMC, 2016.) (http://WWW.PCOUNCIL.ORG)

EFH zone, there are no HAPCs or other ecologically important habitat closure areas that are affected by disposal operations at HOODS. The nearest areas of concern listed in the Groundfish FMP are summarized below:

- The Klamath River Conservation Zone (KRCZ, a long-term bycatch mitigation closure area) is approximately 40 miles to the north.
- The Eel River Canyon (a bottom trawl closure area) is approximately 17 miles to the south.
- The Bottom Trawl Footprint Closure begins at the 700 fathom (4,200 foot) isobath, which in the vicinity of HOODS is anywhere from 25 to 45 miles offshore to the west.
- Estuaries (Humboldt Bay), rocky reefs, canopy kelp, and seagrass areas.

Ongoing disposal at HOODS of suitable dredged material, which is predominantly clean sand, will have no effect on any of these nearby areas of special concern. Dredging within the estuary (Humboldt Bay) could affect seagrasses, but these are assessed (and mitigated as appropriate) during the permit review process; dredging impacts are not included in this assessment for ocean disposal.

In addition, HOODS itself is not off limits to commercial, recreational or tribal fishing activities, and expansion of HOODS would not result in curtailment of ongoing allowable fishing operations. As discussed earlier, the benthic and water column habitat around HOODS is uniform, with no physical characteristics that distinguish it from extensive similar habitat in the surrounding area. The only "effect" on groundfish EFH is the physical sand mound which is constrained to the site boundaries as was predicted in the original site designation EIS. The presence of the sand mound (which does not extend into waters shallower than 120 feet) does not independently limit the kind of fishing that may conducted, and the mound in fact may somewhat enhance groundfish habitat quality by providing the only physical benthic "feature" in this otherwise uniform habitat area. If beneficial reuse of sand (for example at the Near Shore Placement Site) becomes routine in the future, the already negligible effects of disposal at HOODS on groundfish EFH under either Alternative 1 or 2 will be further minimized.

<u>Coastal Pelagic Species FMP</u>

The Coastal Pelagic Species FMP (PFMC, 2019) includes four finfish (Pacific sardine, Pacific [chub] mackerel, northern anchovy, and jack mackerel) the invertebrate market squid, and all euphausiid (krill) species that occur in the West Coast EEZ. CPS finfish are pelagic (in the water column near the surface and not associated with substrate), because they generally occur or are harvested above the thermocline in the upper mixed layer. For the purposes of EFH, the four CPS finfish are treated as a complex because of similarities in their life histories and similarities in their habitat requirements. Market squid are also treated in this same complex because they are similarly fished above spawning aggregations.

EFH for the Coastal Pelagic finfish includes all coastal waters of California, Oregon and Washington offshore to the limits of the EEZ and above the thermocline where sea surface temperatures range between 10°C to 26°C. For krill, the EFH extends from the shoreline to the 1,000 fathom (6,000 ft) isobath and to a depth of 400 meters. There are currently no systematic closure areas or seasonal fishing limits under this FMP.

Similar to the discussion above concerning the Pacific Salmon FMP, the existing HOODS site has had no effect on Coastal Pelagic Species EFH. Expanding the HOODS boundary will continue to have no effect under either Alternative 1 or 2, for the following reasons:

- only suitable sediment (shown through extensive testing to be clean and non-toxic) is considered for disposal at HOODS;
- even suitable sediment is only approved when other practicable alternatives do not exist;
- the vast majority (90+%) of material disposed is sand;
- disposed sand settles to the bottom very quickly (minutes) and does not substantially spread outside the disposal site boundaries; and
- water column effects (turbidity) are extremely temporary with no cumulative effect between disposal events.

The only effect is the physical sand mound which is constrained to the site boundaries as was predicted in the original site designation EIS. The presence of the sand mound (which does not extend into waters shallower than 120 feet) does not limit the amount or quality of open water habitat for coastal pelagics themselves, or for fishers targeting them. If beneficial reuse of sand (for example at the Near Shore Placement Site) becomes routine in the future, the already negligible effects of disposal at HOODS on coastal pelagic EFH will be further minimized.

The Samoa State Marine Conservation Area

The California-designated Samoa Offshore State Marine Conservation Area (which prohibits take of marine organisms with certain specified commercial, recreational, and tribal exceptions) is about 5 miles from the center of the existing HOODS, and at its closest point is just over 3 miles from the northernmost boundary of HOODS expansion Alternative 1 (see Figure 11). (CDFW, 2012: http://californiampas.org/mpa-regions/north-coast-region/samoa-smca)

The location of the Samoa SMCA was not designated to protect particular distinct habitat features. Rather, it was chosen "to meet beach habitat spacing and replication guidelines" together with other SMCAs that protect beaches and soft-bottom habitats (0-30m and 30-100m) up and down the California coast. This category of SMCA is designed to maintain a moderate to high preliminary level of protection (LOP). Species likely to benefit include species that are directly targeted by fisheries, those which are caught incidental to fishing for the target species (bycatch) and which cannot be returned to the water with a high rate of survival, and those which may be indirectly impacted through ecological changes within the SCMA itself.

Thus, although it was not created under the auspices of EFH, the presence and management of the Samoa SCMA are directly complementary to EFH goals. Vessels engaged in ongoing ocean disposal operations will not enter into the Samoa SMCA. In fact, EPA has established a location just outside the southwestern boundary of the Samoa SMCA as the reference sediment station for HOODS (see Section 3.3.3, and Figure 11). This is the clean "unaffected" reference sediment against which the acceptability of dredged sediment for proposed ocean disposal at HOODS is tested.

4.2.4 Special Status Species (ESA Consultations)

When HOODS was originally designated in 1995, the ESA consultation with NMFS focused on the endangered Sacramento River winter-run chinook salmon and the threatened Steller sea lion (no EFH consultation was conducted), while the ESA consultation with USFWS focused on tidewater goby, marbled Murrelet, and green sturgeon. Since 1995 there have been changes to the listed species that could potentially occur in the vicinity of HOODS. This section summarizes the updated ESA consultations with NMFS and USFWS for expanding HOODS.

Pursuant to Section 7 of the Endangered Species Act (ESA) (16 U.S.C. § 1536(c)), as well as the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) regulations (50 C.F.R. § 600.920(e)(3)), EPA prepared ESA and EFH analyses and informally consulted with USFWS and NMFS regarding these analyses. The consultation materials are presented in Appendix B (including updated species lists and distribution maps) and are summarized below.

An additional special status fish species, the longfin smelt (*Spirinchus thaleichthys*), is listed as threatened under the California Endangered Species Act (but not under the federal ESA). The 1995 EIS for HOODS noted that smelt were present in the area but were much more abundant in shallower nearshore waters (and inside Humboldt Bay) that in the deeper offshore water in the vicinity of HOODS. However, coordination with the California Department of Fish and Wildlife (CDFW) indicated that at least one recent study (Mulligan and Jones, 2011) had identified longfin smelt in samples taken in the immediate vicinity of HOODS. On this basis, it must be considered that longfin smelt could be present within the expanded HOODS.

Marine fishes, sea turtles, marine mammals, and sea birds are generally much more susceptible to potential impacts from activities associated with dredging itself, rather than from open water disposal. Dredging typically occurs in relatively enclosed waterbodies that may have restricted movement pathways that can limit animals' ability to avoid or minimize exposure to noise, turbidity, or physical disturbance. If the sediment being dredged is contaminated, there may also be increased risk of exposure to resuspended contaminants (depending on the presence and effectiveness of dredging control measures such as silt curtains or timing limitations). Dredging may also temporarily or permanently damage or remove important habitat features such as seagrasses.

In contrast, no matter where or when the dredging occurs, disposal of the sediment at an appropriate offshore disposal site such as HOODS has significantly less potential to adversely affect species for several reasons:

1. HOODS was originally located to minimize impacts by avoiding any unique or limited habitats. As noted above, the benthic habitat is quite uniform throughout the entire expanded HOODS study area, with no physical features that would be expected to attract marine life differentially compared to the surrounding areas.
2. Only "suitable" (clean, non-toxic) dredged material is permitted to be disposed at HOODS. As confirmed by EPA monitoring, no short- or long-term contaminant exposure concerns are associated with the discharged sediment, on-site or off.
3. Disposal at HOODS by USACE is distinctly seasonal and typically occurs over 3-5 weeks in the spring (late May to early July), although occasionally USACE dredges in the fall as well. Tracking of USACE disposal events shows that approximately 200 individual disposal trips to HOODS occur each year, with an average of just over 8 disposals per day during peak times. Each disposal event lasts only 3-4 minutes.
4. Disposal vessels placing dredged material at HOODS typically travel at 7-10 knots when transiting the approximate 3-4 nmi from the Humboldt Bay entrance. (They then slow to a virtual stop during the 3-4-minute disposal operation.) These speeds are already consistent with the vessel speed limitations recommended by NMFS (and imposed in certain areas) to minimize vessel strikes to whales.
5. The vast majority (more than 90%) of sediment placed at HOODS to date has been sand from the Bar and Entrance Channel. Sand not only has the least potential to carry contaminants, it also descends to the bottom and settles very quickly. Turbidity from individual disposals is thus very localized and short-term (minutes), with ample time for water column turbidity to disperse between events in the immediate vicinity of the disposal cell.

For these reasons, EPA determined that the expansion of the HOODS boundary under either Alternative 1 or 2 will have no effect on marine mammals or sea turtles and is unlikely to adversely affect anadromous fish species (salmonids, Eulachon, and green sturgeon) as discussed in Appendix B. EPA has also determined that the proposed action is unlikely to adversely affect longfin smelt. (Note that this determination does not necessarily extend to the potential future NSPS.)

To ensure that any impacts of ocean disposal operations will continue to be negligible, short term, and highly localized EPA has included overall ocean disposal site use conditions in its proposed updated SMMP for HOODS (Appendix D). These conditions are then included (and updated or supplemented as necessary) as enforceable provisions in EPA's project-specific concurrence letter for each ocean disposal project. EPA believes that all practicable avoidance and minimization measures are incorporated into the proposed expansion of HOODS, and that further mitigation measures are not needed. Also, as noted, additional management options to

further reduce the already negligible effects of disposal at HOODS may be available if a Nearshore Sand Placement Site (NSPS) is established in the future to be an environmentally appropriate alternative for some or all of the Federal channel sand dredged each year.

As part of the EFH consultation NMFS included a Conservation Recommendation for continued mounding (below -130 feet), rather than distributing the sediment evenly across the expanded site. According to the NMFS Conservation Recommendation. "Mounding spoils to the maximum allowed height is likely to provide higher frequencies of usage by managed species, and may allow for a larger area to remain undisturbed." The draft updated SMMP presented in Appendix D includes a proposed disposal management approach that would result in greater seafloor complexity within the greater HOODS boundary over time, as well as limiting the area disturbed by deposition in any one year.

4.3 Other Potential Impacts

Recreation (boating, fishing, other):
The majority of recreational uses near HOODS (or the potential NSPS) center on fish, wildlife, and aesthetic values. Recreational opportunities include, e.g.: beach walking, wildlife viewing, boating and kayaking, surfing, and fishing. Dredging activities may affect recreationists utilizing the waters offshore of Humboldt Bay for boating, kayaking, windsurfing, and fishing by displacing them from the immediate vicinity of HOODS during active disposal. HOODS and the waters surrounding it are not off-limits to fishing, boating, etc., at any time, so any displacement would be very short term. In addition, given that the disposal site boundary begins 3 miles offshore, the immediate area of potential impact would be small compared to the offshore area available for recreation and would be temporary in nature (i.e. four to six weeks). Finally, expansion of the HOODS boundary will not increase the amount of dredging or disposal activity at HOODS. (In facts, possible future placement of sand at a NSPS would reduce disposal activity, and therefore any recreational disturbance, at HOODS.) For these reasons, potential effects to recreation are expected to be less than significant under either Alternative 1 or 2.

Navigation:
During active dredging and disposal activities, there is the potential for minor conflicts with navigation in the project area. However, the purpose of dredging the Bay's navigation channels is to maintain safe conditions for navigation, and the purpose of expanding the HOODS boundary is similarly to allow ongoing disposal of sediments to avoid any impacts to navigation (as a result of mounding). Either Alternative 1 or 2 would therefore have significant long-term benefits to navigation for commercial deep-draft vessels and recreational vessels alike.

Public health and safety:
The proposed action would avoid creation of potentially unsafe navigation condition offshore of Humboldt Bay, minimizing the risk of ship groundings and subsequent fuel release and other hazardous materials into the natural environment. Thus, either Alternative 1 or 2 would result

in a beneficial impact. Under the no action alternative, mounding at HOODS could affect local wave climate, potentially affecting navigation safety, which could result in substantial public health and safety issues.

Cultural, historical and archeological resources:

The implementing regulations of Section 106 of the National Historic Preservation Act (36 C.F.R. Part 800) require federal agencies to assess a project's effects on historic and cultural resources listed or eligible for listing in the National Register of Historic Places. Impacts are considered significant if such resources would be physically damaged or altered, isolated from their historic context or if project elements were introduced that are out of character with the significant property or setting. California law also protects some shipwrecks as archeological sites. The California State Lands Commission's (CSLC) shipwreck database[5] documents five historic shipwrecks in the general vicinity of HOODS (Figure 17), two of which - the Brooklyn and the Milwaukee[6] - are on the shoreline adjacent to the potential NSPS. The Brooklyn broke up, but some remains of the Milwaukee's bulkheads remain visible a short distance offshore of Samoa during very low tides (look for the rock monument just off Hwy 255 south of Cookhouse Rd.).

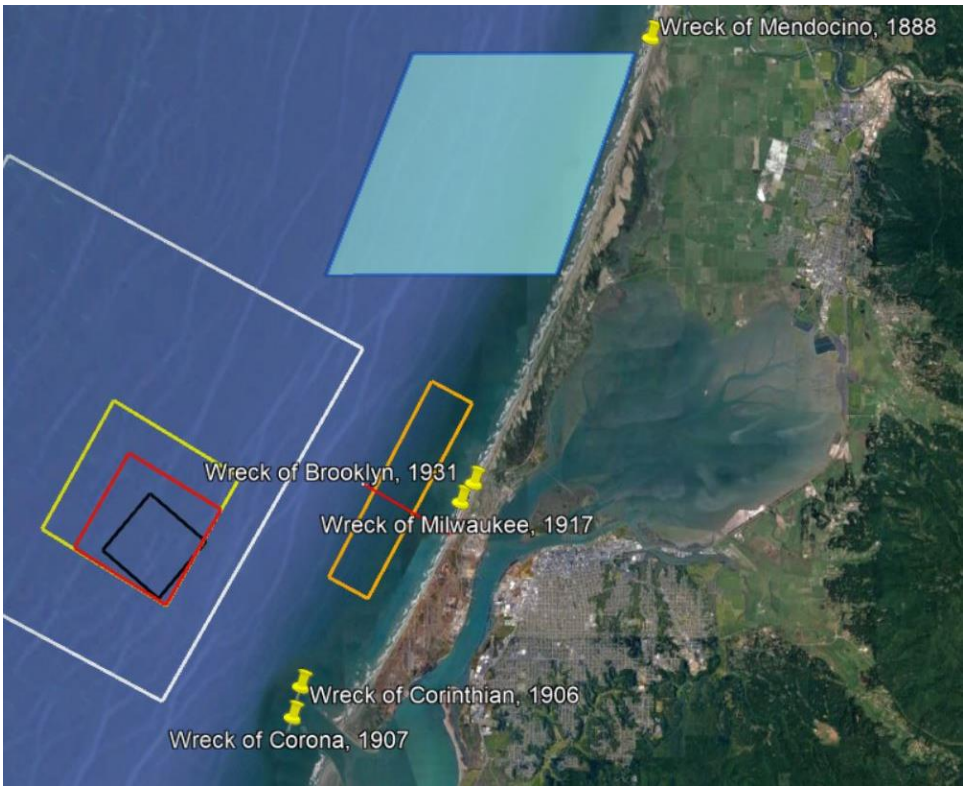

Figure 17. Locations of historic shipwrecks near HOODS and the NSPS. None of these shipwrecks would be affected by disposal activities at HOODS. Similarly, no impacts would be anticipated from possible future placement of sand in a NSPS, because these wrecks are in areas too shallow for direct placement of sand.

5 https://www.slc.ca.gov/wp-content/uploads/2018/12/ShipwreckInfo.pdf

6 https://en.wikipedia.org/wiki/USS_Milwaukee_(C-21)

The 1995 EIS also documented three potential magnetic anomalies in the vicinity of HOODS that could represent the remains of shipwrecks. The 2014 high-resolution multibeam bathymetry survey of HOODS found no indication of structures or debris extending above the sediment surface at the locations of these three magnetic anomalies. Figure 18 shows the locations of the magnetic anomalies relative to the existing HOODS disposal mound. Since these anomalies do not extend above the surface now, and apparently have not since at least 1991 (when the survey cited in the 1995 EIS was conducted), their exact character remains unknown. Ongoing disposal operations under either Alternative 1 or 2 may effectively bury these features further but will not harm or otherwise directly affect them.

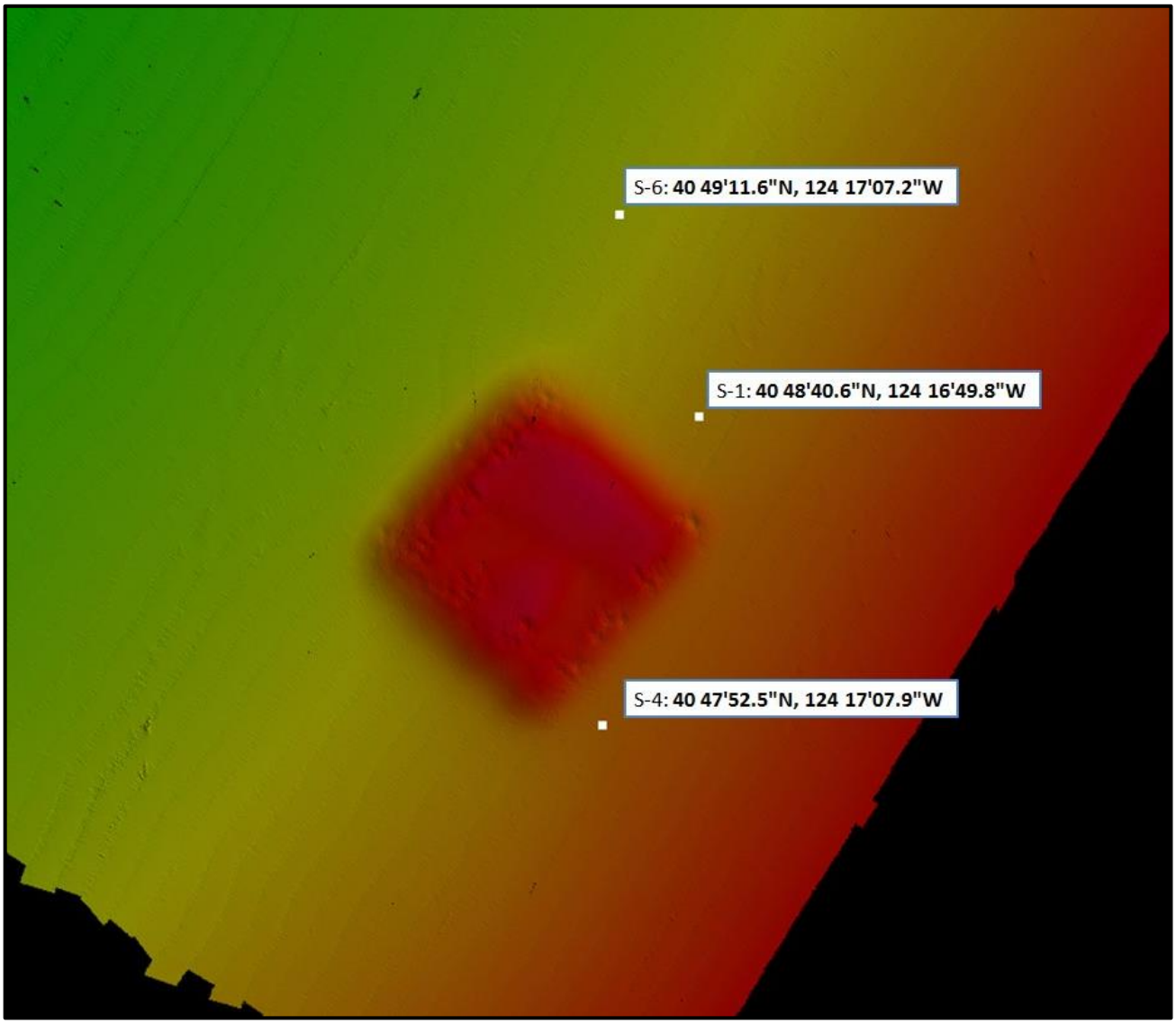

Figure 18. **Locations of three "magnetic anomalies" near HOODS.** Evaluation of high-resolution data from the 2014 multibeam echosounder survey confirmed that these features, if still present at all, are buried and do not project to or above the sediment surface. (Red shading is the existing HOODS mound.)

Historic monuments, parks, national seashores, wilderness areas, etc:
The proposed action area does not lie within the boundaries of any historic monument, parks, national seashores, wild or scenic rivers, wilderness area or research site. Thus, no impacts to such areas are anticipated. However, California recently established the Samoa State Marine Conservation Area a few miles north of HOODS (Figure 11). The Samoa SMCA is discussed in Section 4.2.3 above. For the reasons discussed there, expansion of HOODS under either Alternative 1 or 2 is expected to result in no impacts on the Samoa SMCA.

Hazardous and toxic materials:
Expanding the boundaries of HOODS will not increase the volume or frequency of ocean disposal activity there. Therefore, no increase in the use of or risks from hazardous or toxic material such as diesel fuel, lubricants, and solvents are anticipated, compared to No Action. The handling, transport, and disposal of such materials would be of limited nature, but nonetheless would be guided by Best Management Practices (BMPs) associated with each government-owned or contracted disposal vessel. In the event of any spills to surface water bodies, a Spill Control Plan will specific to each dredging project be adhered to, and containment clean-up activities would be implemented, among other activities identified in the Spill Control Plan. Thus, no impacts are expected under either Alternative 1 or 2.

Socio-economic conditions:
The average 1 million cy of annual maintenance dredging of Humboldt Bay's navigation channels and maritime facilities is imperative to the economy of Humboldt County. Without an available, environmentally appropriate disposal site for clean dredged material, dredging could slow or cease, and the channels would eventually shoal thereby generating unsafe navigation conditions. Expansion of the boundaries (and therefore the disposal capacity) of HOODS is needed in order to facilitate ongoing dredging, and the maritime-related economy it supports. Either Alternative 1 or Alternative 2 would result in improved socioeconomic conditions when compared with the no action alternative.

Energy consumption or generation:
Under either Alternative 1 or 2, disposal within the expanded HOODS boundaries would have a minor impact on energy consumption associated with the dredge vessels experiencing a slightly (up to 1 mile) longer transport distance depending on the location of open disposal cells in any particular year. This effect is considered to be negligible in comparison to no action.

Environmental justice:
Environmental justice conditions in and around Humboldt Bay would remain unchanged under either Alternative 1 or 2 or the no action alternative. No impacts are anticipated.

Growth inducing impacts (community growth, regional growth):
The proposed action would not increase the need for dredging in the area, and therefore would not have any growth inducing impacts. Community and regional growth in Humboldt County

and in the Humboldt Bay area would remain unchanged under the either Alternative 1 or 2 or the no action alternative. No impacts are anticipated.

Conflict with land use plans, policies or controls:
Alternative 1 or 2, and the no action alternative, would not directly conflict with any land use plans, policies, or controls governing the area, including for the Samoa SMCA. No impacts are anticipated.

Irreversible changes, irretrievable commitment of resources:
The slightly increased use of fossil fuels to continue accessing the expanded disposal site would be an irretrievable commitment of resources under either Alternative 1 or 2, but would be limited and minor.

Cumulative effects potentially related to the proposed action:

Past and Present Activities

Expansion of HOODS under either Alternative 1 or 2 will result in a cumulatively greater area of the seafloor off Humboldt Bay having non-toxic dredged material placed on it. For the past 25 years, benthic disturbance from sediment disposal has been limited to less than the one square nautical mile defined by the existing disposal site boundary. In the future an area of up to 4 square nautical miles (under Alternative 1) would be subject to disturbance from disposed sediment. However, as noted elsewhere in this EA, effects from past disposal at HOODS have been negligible and limited to physical impacts (mounding). It is expected that future impacts would continue to be negligible under either Alternative 1 or 2.

The only other discharge in the vicinity of HOODS is from DG Fairhaven Power LLC's Fairhaven Power Facility on the Samoa Peninsula. Fairhaven Power is permitted to discharge a maximum of 0.35 million gallons per day of powerplant-related process water, cooling tower water, and other wastewater under terms of their current National Pollutant Discharge Elimination System (NPDES) permit No. CA0024571, issued by the State of California's North Coast Water Board. The company discharges through an existing outfall into ocean waters adjacent to the Samoa Peninsula (Figure 19). The NPDES permit prohibits discharging wastewater in violation of effluent standards or prohibitions established under Section 307(a) of the Clean Water Act, and it also prohibits discharging sewage sludge. The 800-foot diffuser section at the end of the 48-inch diameter steep pipe is located approximately 1.3 nautical miles (2.5 kilometers) offshore in approximately 80 feet (25 m) water depth. It is approximately 1.6 nmi (3 kilometers) east (inshore) of the nearest HOODS boundary. Prevailing nearshore currents would direct discharge plumes from this outfall up or down the coast, depending of the seasonal current regime, not offshore towards HOODS. EPA believes that there will be no adverse cumulative or synergistic impacts between the use of HOODS (under either Alternative 1 or 2) and discharges from the outfall described.

If a NSPS is established in the future, the area of cumulative disturbance within the expanded HOODS boundary would be substantially less but the total area of temporary disturbance from sand placement could increase. Also, the existing outfall pipe extending through (and past) the site (Figure 19) could be subject to sand placement over the top of it. It is expected that thin layer sand placement over and around this existing steel outfall will not affect either its ongoing operation, or its potential future use(s). The diffuser structure is offshore of the NSPS in deeper water and would not receive any direct placement of sand. The potential NSPS is discussed in detail in Chapter 5.

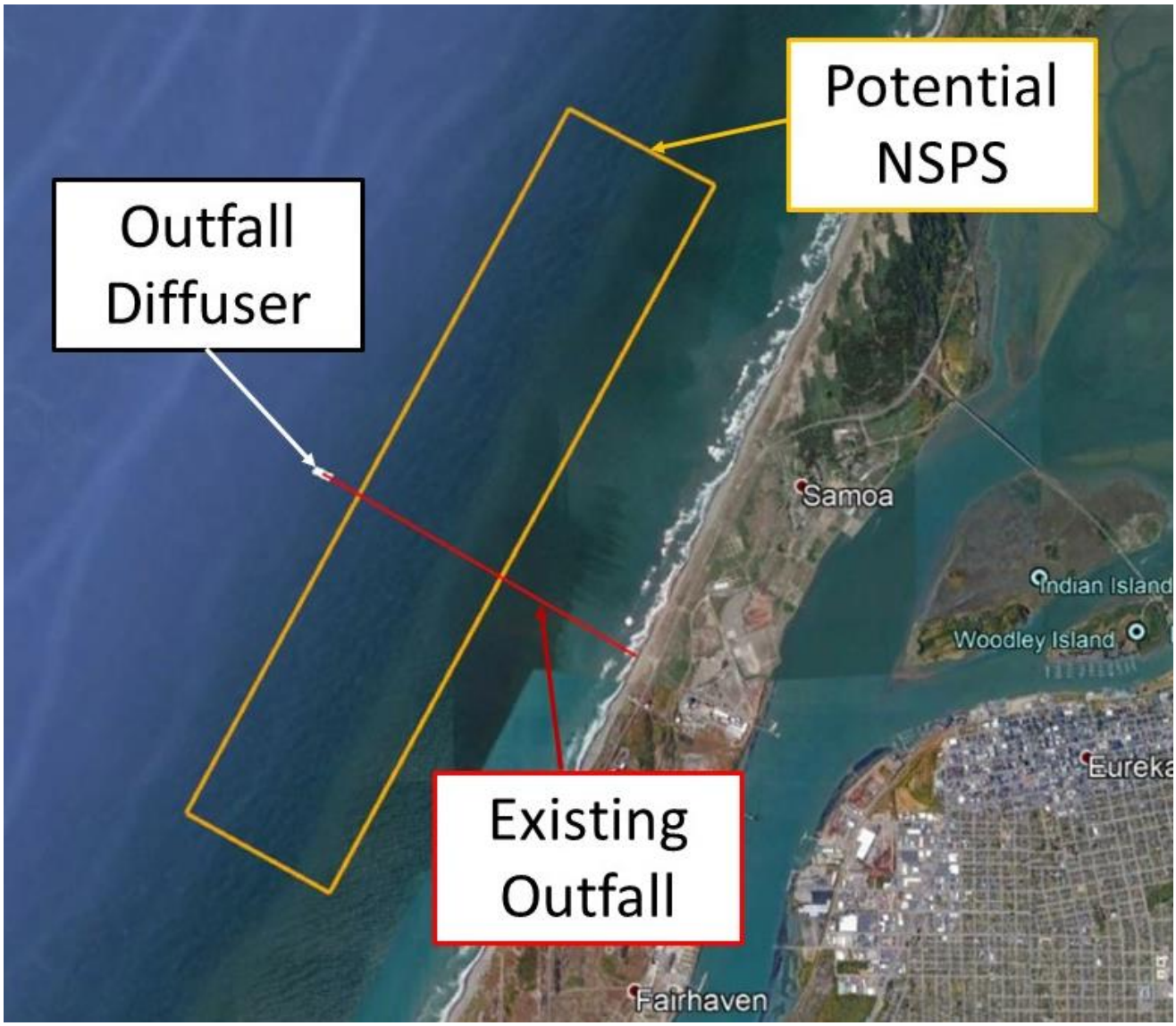

Figure 19. Location of existing outfall relative to the potential Nearshore Sand Placement Site (NSPS).

Activities likely to occur within the foreseeable future

In the foreseeable future, possible activities that could be affected by expansion of HOODS include offshore wind energy development and placement of new communications cables. The US Bureau of Ocean Energy Management (BOEM) is considering possible wind energy lease sales several miles offshore of HOODS. The lease area itself would not be in any conflict with expansion of HOODS as proposed; but if wind energy production does occur in the future any energy transmission equipment would have to come ashore via a route that does not pass through HOODS or its immediate vicinity. The same is true for any future communications cables, such as fiber-optic cables.

Unburied or thinly covered cables or other equipment on the seafloor near HOODS would be incompatible uses, because:

1. Disposal operations could directly damage the cables or equipment when sand loads of 5,000 cy or more each are discharged.
2. EPA's ability to monitor and manage ocean disposal sites requires periodic collection of sediment samples. Samplers can penetrate up to 2 feet into the sediment, depending on the equipment used. This necessary sediment sampling could also damage or destroy unburied cables of equipment.

During site monitoring, sediment samples are taken both within the disposal site itself as well as for some distance outside the disposal site. Unburied cables or equipment would be at similar risk in the potential NSPS discussed in Chapter 5. Thus, while expansion of HOODS, and possible future establishment of the NSPS, would not preclude future offshore activities (such as wind power), it would require any such projects to route any equipment (such as cables) around the immediate vicinity of HOODS (and the potential NSPS if designated).

Placing clean sand in the nearshore along the open California coast can help mitigate the effects of coastal erosion and sea level rise. If such placement can be accomplished without significant adverse impacts on resident species and human uses, it is considered beneficial use and is regulated under the Clean Water Act (CWA) as "fill" as opposed to being regulated under the MPRSA as ocean disposal of dredged material. Sand placement for beach nourishment or littoral-zone support already occurs at a variety of locations in California and nationwide. Offshore of Eureka, California there is the potential for economically viable use of sand dredged from the Humboldt Bay Bar and Entrance Channel, if a suitable nearshore placement site can be identified.

The USACE identified a potentially appropriate nearshore sand-placement site in its "*Five-Year Programmatic Environmental Assessment, 404(b)(1) Analysis, and FONSI, Humboldt Harbor and Bay Operations and Maintenance Dredging (FY 2012 – FY 2016)*" (USACE 2012). The USACE did not pursue designating a nearshore site at that time. The current EA, however, draws from and adds to the 2012 USACE EA and discusses a potential nearshore site (Figure 20) as an alternative that could be used in conjunction with disposal at HOODS to help minimize impacts and maximize the overall benefits of managing Humboldt Bay area dredged sediments. This EA provides documentation pursuant to NEPA and other applicable Acts that USACE may use as a basis for proposing to conduct future demonstration nearshore sand-placement operations. Any proposal to formally establish a nearshore site would be a separate EPA-USACE action pursuant to the CWA Section 404(b)(1) Guidelines (40 CFR Part 230.80), informed by monitoring results associated with such a demonstration project.

5.1 NEED FOR A NSPS

As part of the designation of the Humboldt Open Ocean Disposal Site (HOODS), USACE established the Humboldt Shoreline Monitoring Program (HSMP). The HSMP was established because the California Coastal Commission (CCC) expressed concerns that the disposal of large volumes of sand in the relatively deep water at HOODS (130 to 160 feet) could have significant adverse impacts to nearby beaches (Figure 21). The primary concern was that sand, which would typically supply local beaches, was going to effectively be removed from the littoral cell by being placed in water deeper than the limiting depth of sediment movement. The HSMP was therefore developed to: (1) monitor the surrounding shoreline for excessive shoreline retreat, (2) determine the cause of any excessive shoreline retreat that is observed, and (3) recommend corrective action should sediment disposal at HOODS be the cause.

The criterion for "excessive shoreline retreat" was established in an agreement between USACE and the CCC (USACE, 1995), based on historical shoreline change rates derived from an analysis of aerial photographs (Moffatt & Nichol Engineers, 1991). The initial analysis found that rates of shoreline change had varied substantially for different periods at several locations. The analysis

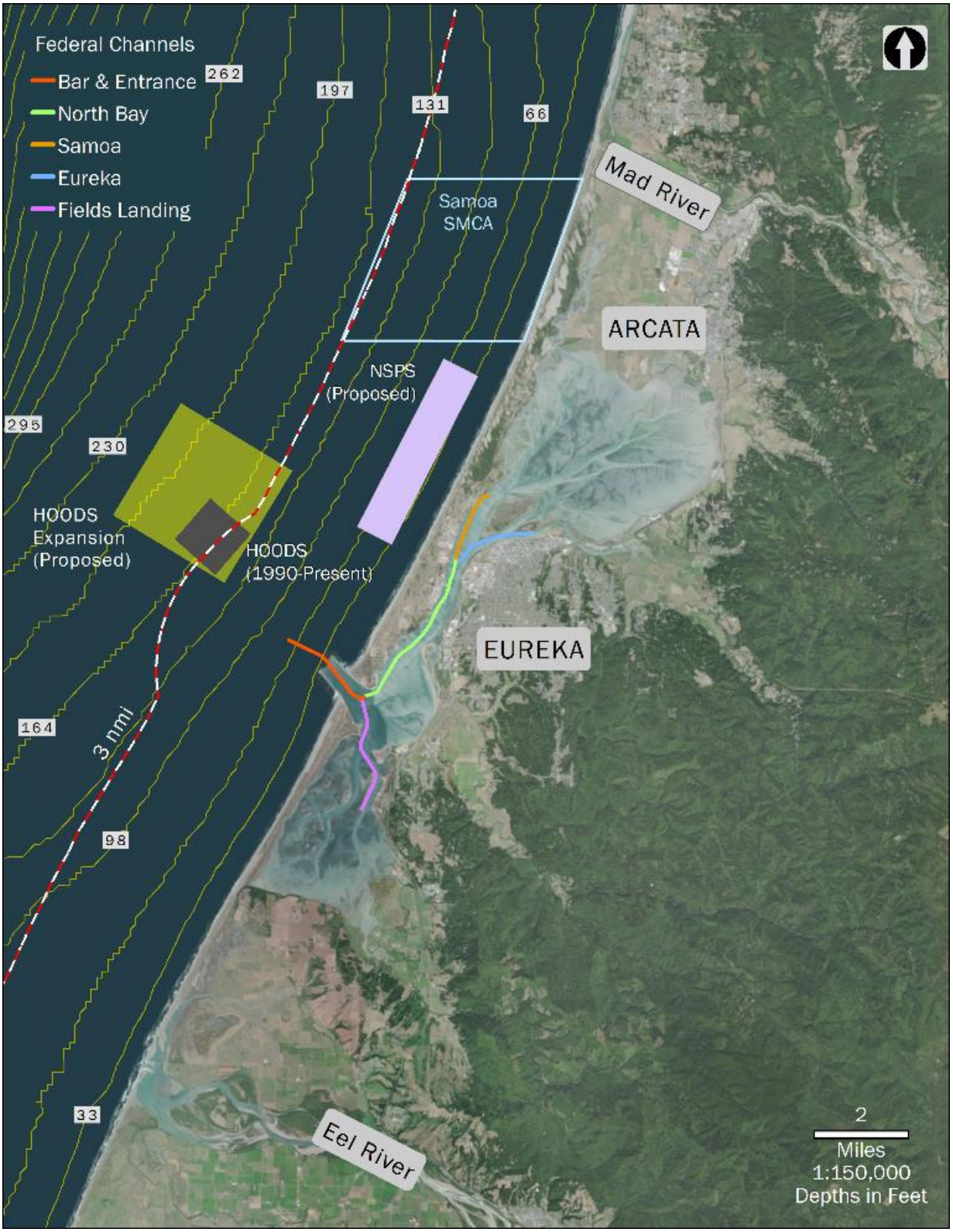

Figure 20. **Location of a potential Nearshore Sand Placement Site (NSPS) for demonstrating beneficial use of clean dredged sand,** in relation to the Humboldt Bay federal navigation channels, HOODS, and the Samoa SMCA.

Figure 21. **Looking northeast toward the Humboldt Entrance Channel and Jetties.** Note the spits with beaches and extensive dune systems to the north and south of the Entrance Channel (photograph by Gary Todoroff).

estimated "natural" shoreline change rates based on the 1948 to 1974 period, the 1974 to 1990 period, and the 1948 to 1990 period. In the absence of specific guidance, USACE initially defaulted to the more recent shoreline change rate (1974 to 1990) as the basis for comparison.

Using the 1974 to 1990 period as the baseline, USACE concluded that the excessive shoreline retreat criterion had not been exceeded. However, USACE and the CCC are reconsidering whether the 1948 to 1974 period may be more representative of natural shoreline retreat at this location, based on evidence that jetty repairs in the 1970s may have caused an anomalous period of shoreline adjustment. When the 1948 to 1974 period is used as the baseline for comparison, it is possible that the excessive shoreline retreat criterion may have been exceeded at times for several of the reference stations along the north spit.

Independent of any final determinations from USACE and the CCC on this issue, it is clear that there is often net erosion to the north of the Humboldt Bay entrance channel, and that placement of dredged sand back into the littoral zone in this area could help address this erosion.

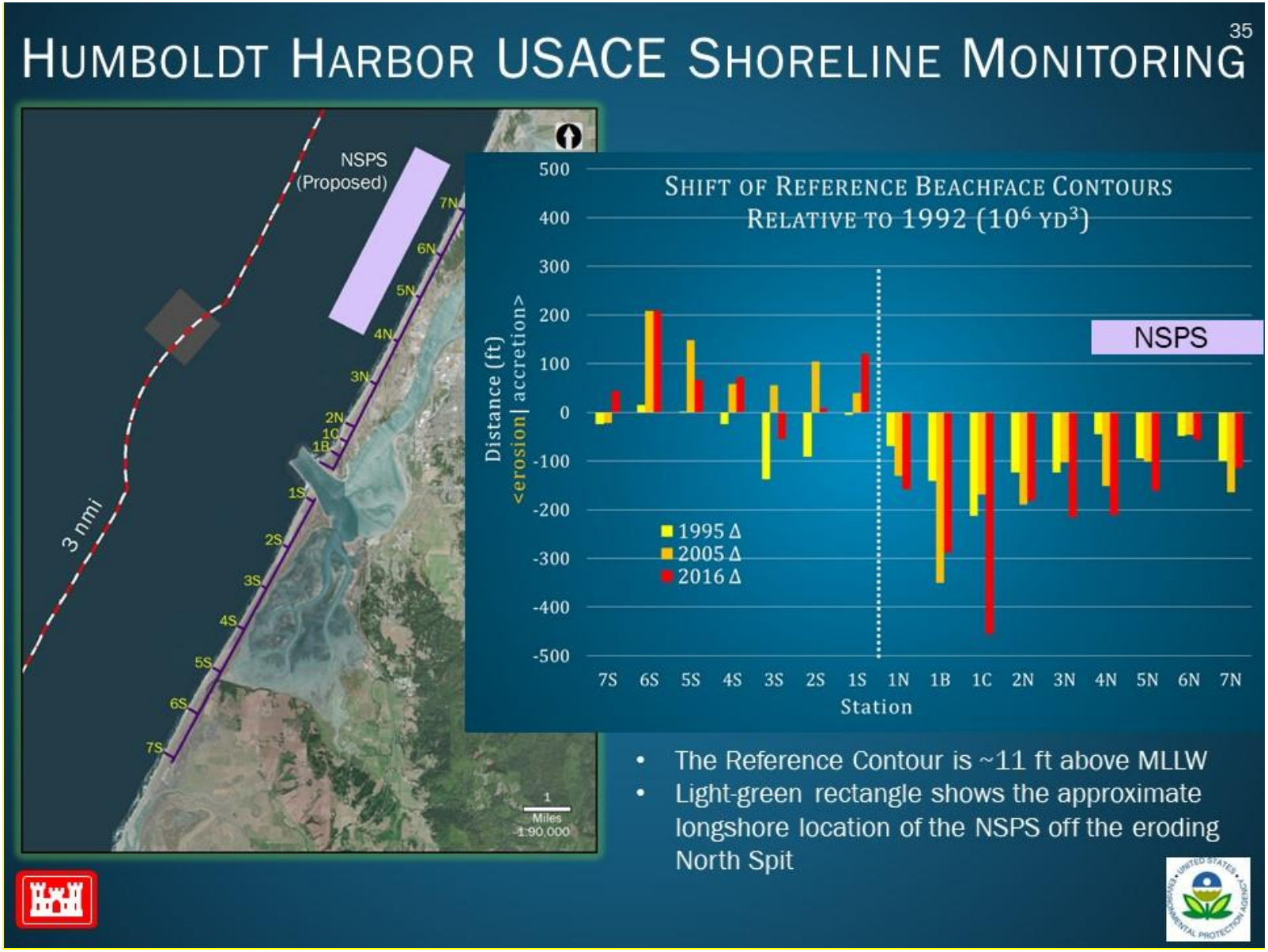

Figure 22. **Reference stations and shoreline shifts at selected surveys** (1995, 2005, and 2016) relative to the initial survey (1992).

5.2 Minimum and Maximum Depths for a Potential NSPS

Nearshore placement of sand for littoral system support is generally more effective the shallower it can be placed. Relatively shallow initial placement allows relatively smaller waves to transport and spread sand grains within the littoral cell. Even if placed sand grains do not end up being transported to the beach (i.e., at intertidal elevations or higher), the additional sand can help mitigate coastal erosion by broadening the subtidal zone and causing waves to break farther offshore. To successfully reintroduce sand into the littoral zone[7] that supports the shoreline and beach, however, sand must be placed in water shallower than the "depth of closure" (DOC) for the area. Depth of closure is the depth beyond which wave energy at a given location is unable to transport sediment particles between the nearshore and the offshore.

Recent analyses suggesting that DOC is generally -40 to -80 feet annually under typical wave conditions near the Humboldt Bay entrance (Brutsché et al., 2016). As a result, sand placed at HOODS (depths of -130 to -180 feet) would not be subject to onshore transport to beaches.

The USACE's online Sediment Mobility Tool[8] estimates depth-of-closure based on site-specific parameters including wave characteristics from nearby wave-monitoring buoys. The "Hallermeier Inner (Simplified)" theoretical relationship was used to estimate the depth of closure in the nearshore zone off Humboldt Bay. Applying parameters appropriate to the area (Table 8), the Sediment Mobility Tool estimates that the depth of closure along the Samoa spit for sand with an average diameter of 0.2 mm (similar to the material dredged from the bar and entrance channel) is about -63 ft MLLW. Consequently, a nearshore beneficial-use site should be in water depths no greater than approximately 70 feet.

However, to be practicable for USACE to use with its currently available equipment, placement must be in water deep enough for USACE's hopper dredges to operate safely. The USACE hopper dredge *Essayons* is the vessel most often used for dredging sand from the Humboldt Bay Bar and Entrance Channel. Because the *Essayons* draws about 35 ft fully loaded, -35 to –40 ft MLLW is considered the minimum practicable depth for a NSPS.

Based on -40 ft as the minimum depth for safe operation, and -70 ft as the maximum depth above which sand is likely to be transportable within the littoral zone, any NSPS in the area north of the Humboldt Bay entrance channel should span the -40 to–70 ft depth range. Sand placed within this depth range should not result in permanent mounding, as has occurred at HOODS, because seasonal wave and current action would be able to move the sand within the littoral system.

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[7] The *littoral zone* (or *shoreface*) is situated seaward of the low water line. This zone extends seaward to some distance beyond the breaker zone. In this zone, dynamic littoral processes take place, related mainly to longshore sediment transport and cross-shore sediment transport.

[8] http://navigation.usace.army.mil/SEM/SedimentMobility

Table 8. Sediment Mobility Tool inputs and results for the nearshore area off Humboldt Bay.

Model Input Parameters	
Shoreline Angle	31°
Placement Site Latitude	40.85° N
Placement Site Longitude	-124.21° W
Wave Monitoring (WIS) Station	83046
Years of WIS Data	1980 - 2016
Mean Grain Size (d50)	0.2 mm
Average Placement Depth	45.00 ft
Mean Annual Significant Wave Height	8.5 ft
Average Period of Significant Wave	11.7 sec
Std Dev of Significant Wave Height	4.2 ft
Height of Largest 10% of Waves	14.2 ft
Greatest (0.137%) Wave Height	26.5 ft
Period of Greatest Wave	17.2 sec
Estimated Depth of Closure	
Hallermeier Inner Simplified	63.39 ft

An effective potential NSPS should be located to enhance the prospects for incident waves to transport sand shoreward into the shallower part of the littoral zone where it could act as a source of beach sand or, at the least, could act as a sacrificial supplement to existing littoral sand that supports the beach. Conceptually, sand placed at the NSPS during the spring and early summer, a time of smaller, accretionary waves, would move shoreward and help provide a buffer to coastal erosion the following winter, a time of larger, erosive waves.

The USACE's 2012 dredging EA identified a "Humboldt Bay Demonstration Site" (HBDS) north of the entrance channel, where net erosion is occurring, but where movement of sand back into the navigation channel was not expected. The HBDS was somewhat larger than the NSPS currently proposed. At the time, USACE identified an overall area approximately 4.8 nmi (9 km) long by 1.3 nmi (2.1 km) wide (Figure 23).

Based on the information presented in this EA, including recognition of the relatively new Samoa State Marine Conservation Area to the north, the EPA and USACE reduced the overall area of the potential NSPS to approximately 3 nmi (5.5 km) by 0.6 nmi (1.1 km) (Figure 24).

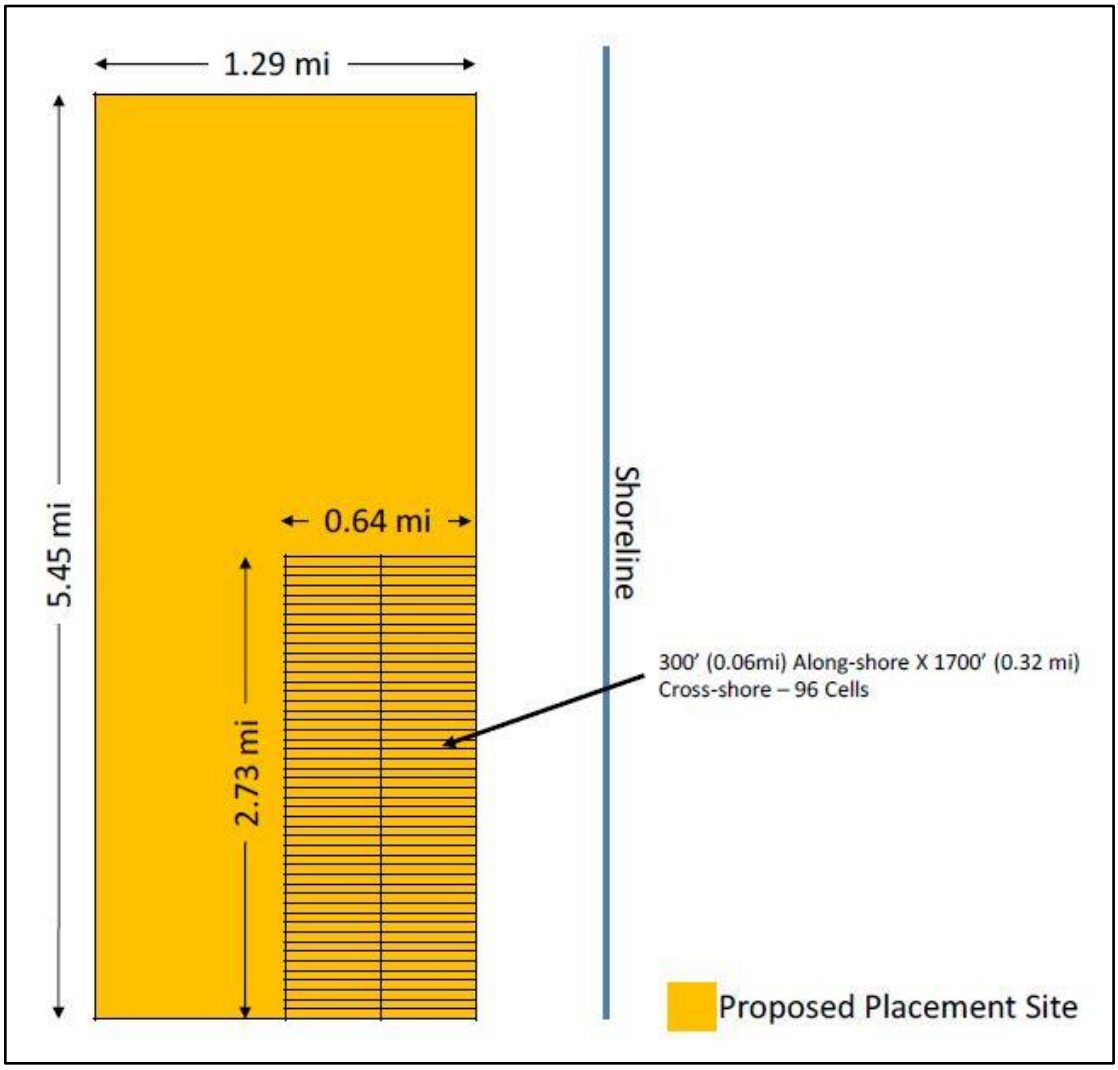

Figure 23. Humboldt Bay Demonstration Site as proposed by USACE in 2012. Cross-hatching shows the Target Placement Area (TPA) recommended at the time for monitored placement of up to 1.5 million cy of sand.

These dimensions for the potential NSPS are similar to the TPS shown in Figure 23 and could still accommodate the average 1 million cy of sand dredged annually from the Humboldt Bay Bar and Entrance Channel with less than 1 ft of mounding on average, as discussed below. Depending on how quickly an addition of this much sand to the nearshore is reworked within the littoral zone by seasonal waves (which would be determined by monitoring), the long-term capacity of the potential NSPS could effectively be unlimited.

The corner coordinates for the potential NSPS are given in Table 9. As depicted on Figure 24, the 3.2 nmi transport distance from the end of the harbor's north jetty to the center point (centroid) of the NSPS is slightly less than the 3.7 nmi distance to the centroid of the expanded HOODS.

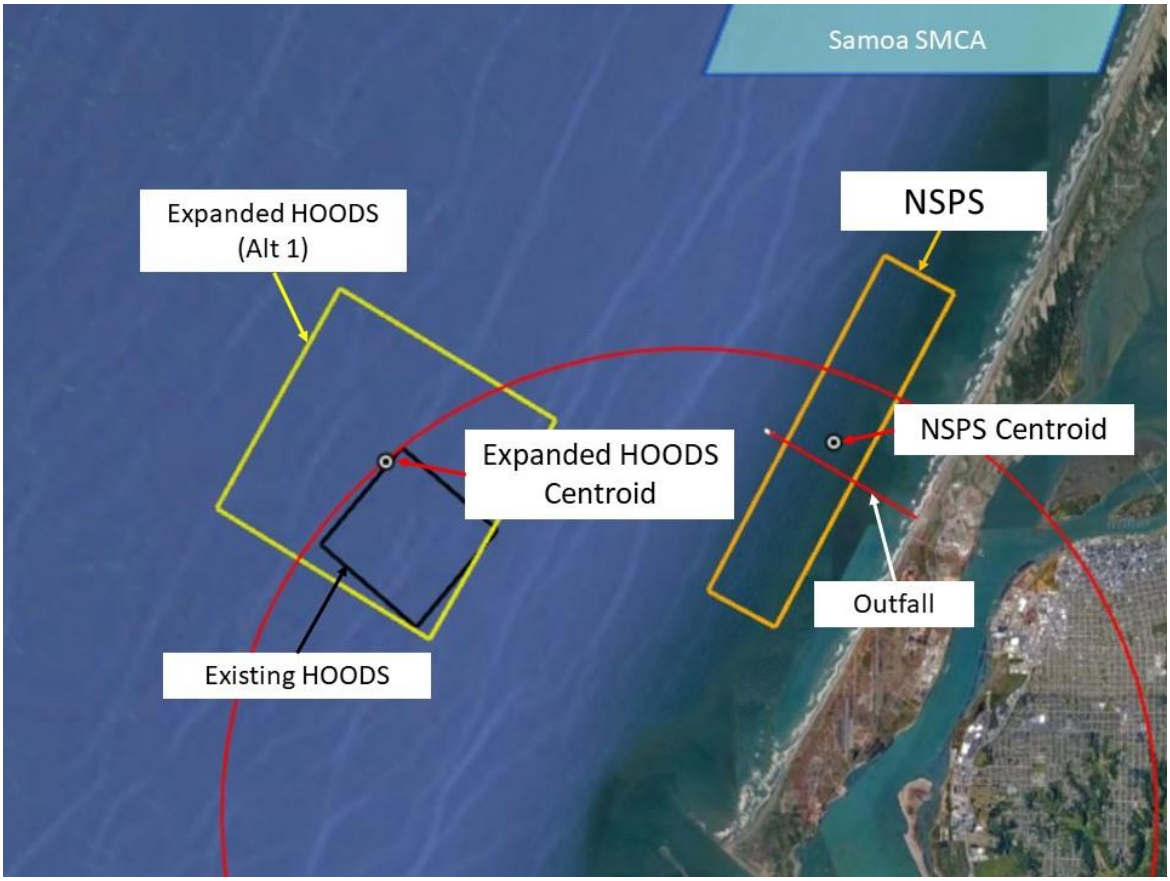

Figure 24. Location of the potential Nearshore Sand Placement Site (NSPS) in relation to the Samoa SMCA, HOODS, and the Fairhaven Power Plant outfall. The red arc is set at the distance (3.7 nmi) from the north jetty to the HOODS center point (centroid), showing that transport distance to much of the NSPS is shorter than to HOODS.

Table 9. Corner and centroid coordinates for the potential NSPS (NAD 83).

Corner	Latitude	Longitude	Centroid Lat.	Centroid Long.
Southeast	40° 47' 38.38" N	124° 13' 28.29" W	40°49' 6.26"N	124°12' 51.13"W
Southwest	40° 47' 55.50" N	124° 14' 09.91" W		
Northwest	40° 50' 33.07" N	124° 12' 20.05" W		
Northeast	40° 50' 16.21" N	124° 11' 36.67" W		

In addition, offshore transport distance to the southern half of the NSPS would be only 1.6–3 nmi: closer than areas that will still be available for disposal at HOODS after it is expanded (most of the cells in the original HOODS will be permanently closed when the site is expanded, so transport distance to the new disposal cells will be slightly greater than in the past). Shorter average transport distances to the placement site can help offset increased fuel costs (and any increased air emissions) associated with the extra time needed for each nearshore thin-layer placement event (which can take 10-30 minutes) compared to disposal events at HOODS (which typically take 2-5 minutes).

The water depth at the potential NSPS ranges from about 30–80 ft, encompassing the preferred sand placement depth range of 40-70 feet discussed above while providing for some operational and navigation flexibility, as well as a buffer zone if needed. The ocean bottom at and near the NSPS is completely covered by sand and is essentially featureless with no hard-bottom outcrops (similar to the greater HOODS expansion study area).

5.3 "Thin-Layer" Sand Placement Operations in the Potential NSPS

On average, the Essayons holds a dredge-material volume of approximately 5,200 cy in one large compartment (120 ft long and 48-ft wide) in the vessel hull. Dredged material exits the vessel from 12 independently opening doors (each one is 10-ft long by 8.7-ft wide) located on the ship's bottom. The doors are positioned in two rows of six with one row along the starboard side and the other row along the port side of the vessel. The doors can open simultaneously or in pairs. For thin layer placement in shallow nearshore waters, the doors are opened only partially, while the vessel moves forward slowly (Figure 25).

Figure 25. **Aerial view of the Essayons during nearshore thin-layer sand placement operations near the mouth of the Columbia River.** The disposal vessel moves forward slowly with hull doors only partially opened, so that sand is spread thinly in long, narrow tracks. The ship's propellers help to further disburse the sand.

As the sand falls through the water column, it spreads out (Figure 26), creating a narrow mound whose height can be regulated by how fast the *Essayons* moves during placement. The total duration for thin-layer placement of each full load is approximately 10 to 30 minutes. For a dredged-sand volume of 1 million cy, the *Essayons* will make approximately 200 trips to the NSPS over the course of 3-5 weeks, releasing the sand in an overlapping pattern to create a layer only a few centimeters thick each time. This beneficial-use technique has been successful at the Mouth of the Columbia River where the USACE Portland District has a nearshore, beneficial-use site in a depth of about 35–60 feet, outside of the south jetty (see Section 4.1.3 above).

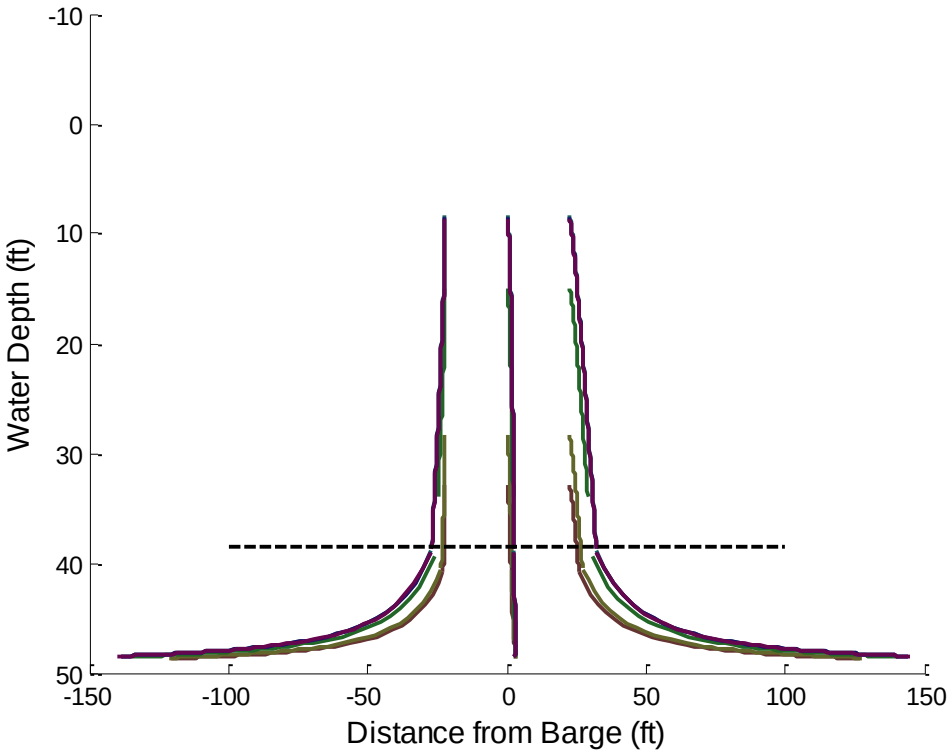

Figure 26. **Trajectory of the dredged sand during placement.** The dashed line represents the collapse zone, or where the material begins to interact with the bed.

5.4 Recommended Monitoring of Demonstration Sand Placement

Only clean sand from the Bar and Entrance and interior channels of Humboldt Bay would be approved for placement at the NSPS. Silty dredged material from interior channels and other facilities would continue to be placed at HOODS. In addition, whether during a demonstration project or in the future if the NSPS is ultimately designated for ongoing use, the captain of the dredge vessel will only place material in the NSPS if it is safe to do so based on sea conditions and other navigational or operational considerations. If on a load-by-load basis, the captain determines that the NSPS is not safe to operate in, that load may be placed at HOODS instead. Both HOODS and the NSPS are expected to have adequate placement capacity for dredged material, singly or in combination with each other, for many years.

A monitored demonstration project for sand placement at the NSPS should be conducted in such a manner as to provide performance information about the site itself, as well as to help generate sufficient environmental information for its possible designation as a permanent beneficial-use site in the future. Specifically, monitoring should include pre-placement (baseline) environmental surveys (including for fish and macroinvertebrates) in addition to monitoring various operational and physical aspects of initial sand placement and the effects of subsequent littoral processes on the placed sand as described below.

To better understand the littoral processes in the system and to track the evolution of the material placed in the nearshore, a monitoring program should include bathymetric and topographic surveys, grain-size analyses, and instrument deployments. Additional techniques could be included if warranted by initial monitoring results. The recommended measures summarized below are modeled after the established, successful monitoring of similar nearshore placement that was implemented at the Mouth of the Columbia River (see Section 4.1.3 above). Demonstration nearshore sand placements and associated monitoring efforts would depend on annual funding levels.

5.4.1 Tracking of Sand Placement Events

Ocean disposal at HOODS requires satellite tracking of disposal vessel locations, coupled with collection of data from other sensors that indicate precisely when and where material is being discharged. Figure 8 above shows how individual placement events can be mapped and indicates that placement locations can be precisely controlled. Similar tracking should be required of any vessels placing sand in the NSPS, whether during a demonstration project or during routine placements if the site is ultimately established as a permanent use site.

In addition, similar to monitoring conducted by NOAA at the Mouth of the Columbia River (see Section 4.1.3) video monitoring on the seafloor should be performed in conjunction with enough demonstration nearshore placements to illustrate the extent and duration of plumes, and any effects on megafauna (such as displacement).

5.4.2 Bathymetric and Topographic Surveys

Pre- and post-placement, high-resolution multi-beam surveys should be used to evaluate the bathymetric changes and coverage area. Additional multi-beam surveys should be conducted bi-annually to assess temporal changes to the placement mound and placement footprint. Topographic and jet-ski bathymetric surveys should be conducted quarterly to measure the change in the nearshore profile in areas too shallow to utilize multi-beam survey equipment.

5.4.3 Grain-Size Assessments

In the area of the NSPS, the bottom is covered by well-sorted, medium-to-fine sand that contains relatively little or no silt or clay (Evans, 1994). Grain-size analyses of the dredged material show

that the most similar sediment would come from the Bar and Entrance Channel and the North Bay Channels, which typically comprise greater than 90 percent fine sand with a median particle size of approximately 0.2 mm. Dredged material from the Samoa or Fields Landing Channels is slightly less sandy (80-90%) but could also be beneficially used in the NSPS if dredged using vessels like the *Essayons* that have the capability of safely maneuvering in the nearshore environment adjacent to Humboldt Bay. But for demonstration project purposes, it is presumed that only material from the Bar and Entrance Channel and the lower section of the North Bay Channel (the areas typically dredged every year) will be initially placed at the NSPS.

Benthic sediment grain size samples should be taken along transects perpendicular to the shoreline within and in-shore of the NSPS, before (baseline) and after a demonstration placement project, as an adjunct to the bathymetric and topographic surveys noted above.

5.4.4 Instrument Deployments

Acoustic Doppler Current Profilers (ADCP) and Optical Backscatter Sensors (OBS) should be deployed at various water depths in the study area. The ADCP measures waves, vertical structure of currents, backscatter, and water levels in a specified time interval. The OBS measures sediment concentration that later would be correlated to ADCP data to estimate sediment flux in the water column.

5.4.5 Demonstration Project Monitoring Results

Results from the demonstration project monitoring outlined above should be compiled by USACE and made available to the public. The report(s) should address whether there were any adverse environmentally impacts from the nearshore sand placement operations, and if not, whether the NSPS would be feasible for USACE to continue to use in the future. If results are positive, EPA and USACE could propose to establish the NSPS for ongoing use under the Clean Water Act 404(b)(1) Guidelines (40 CFR Part 230.80).

6.1 OVERVIEW

The determination to designate (or in this case expand) an ocean disposal site for dredged material is based on consideration of four general criteria and eleven specific factors listed at 40 CFR 228.5 and 228.6, respectively. These criteria and factors (which overlap to a degree) are listed below and evaluated relative to each action alternative in the sections 6.2 and 6.3 below.

6.1.1 Four General Criteria for Selection of Ocean Disposal Sites

a) The dumping of material into the ocean will be permitted only at sites or in areas selected to minimize the interference of disposal activities with other activities in the marine environment, particularly avoiding areas of existing fisheries or shell fisheries, and regions of heavy commercial or recreational navigation.

b) Locations and boundaries of disposal sites will be chosen so that temporary perturbations in water quality or other environmental conditions during initial mixing caused by disposal operations anywhere within the site can be expected to be reduced to normal ambient seawater levels or to undetectable contaminant concentrations or effects before reaching any beach, shoreline, marine sanctuary, or known geographically limited fishery or shell fishery.

c) [*Effective January 9, 2009, 40 CFR Part 288.5 was amended by removing and reserving paragraph (c) which referred to "Interim" ocean disposal sites.*]

d) The sizes of ocean disposal sites will be limited in order to localize, for identification and control, any immediate adverse impacts and to permit the implementation of effective monitoring and surveillance programs to prevent adverse, long-range impacts. The size, configuration, and location of any disposal site will be determined as a part of the disposal site evaluation or designation study.

e) EPA will, whenever feasible, designate ocean dumping sites beyond the edge of the continental shelf and other such sites that have been historically used.

6.1.2 Eleven Specific Factors for Selection of Ocean Disposal Sites

a) Geographical position, depth of water, bottom topography, and distance from coast.

b) Location in relation to breeding, spawning, nursery, feeding or passage areas of living resources in adult or juvenile phases.

c) Location in relation to beaches or other amenity areas.

d) Types and quantities of waste proposed to be disposed and proposed methods of release, including methods of packaging the waste, if any.

e) Feasibility of surveillance and monitoring.

f) Dispersal, horizontal transport, and vertical mixing characteristics of the area, including prevailing current velocity, if any.

g) Existence and effects of present or previous discharges and dumping in the area (including cumulative effects).

h) Interference with shipping, fishing, recreation, mineral extraction, desalination, shellfish culture, areas of special scientific importance and other legitimate uses of the ocean.

i) Existing water quality and ecology of the site, as determined by available data or by trend assessment or baseline surveys.

j) Potential for the development or recruitment of nuisance species within the disposal site.

k) Existence at or in close proximity to the site of any significant natural or cultural features of historical importance.

6.2 Evaluation of the Four General Criteria

As described in the 1995 EIS, HOODS was specifically selected to comply as much as feasible with the general site selection criteria. First, HOODS is not a significant fishery area, is not a major navigation area and otherwise has no geographically limited resource values that are not similarly abundant in other parts of this coastal region. Second, dredged material disposed of at the site does not to reach any significant area such as a marine sanctuary, beach, or other important natural resource area. Third, the site was limited size and allows for effective monitoring. Fourth, although the site is not located beyond the continental shelf, it is located in an area historically used for dumping and its use has not resulted in any significant adverse environmental impacts. Extensive site monitoring since designation has confirmed the EIS evaluation. The following sections update the original EIS evaluation with respect to the alternatives for expansion of the original site boundaries.

6.2.1 Minimize Interference with Other Activities

The original (1995) EIS evaluated the potential for an ocean disposal site offshore of Humboldt Bay to interfere with other activities and uses of the ocean. It concluded that there would be no significant conflicts with other activities including but not limited to fishing, recreational boating, commercial navigation, etc. Even though several such activities may spatially overlap with the site, the disposal of dredged material within either of the proposed HOODS expansion alternatives would not interfere with the activities at a level that would result in significant effects to the activity. For example, baseline studies determined that while smelt and several flatfish species, as well as shrimp and dungeness crab, were abundant in shallower waters (<40 m deep), they were nearly absent in the deeper water where HOODS is situated. So the potential for direct conflicts with fishing activities focused on those species would be negligible. Similarly, fishing for pelagic species such as salmon certainly occurs across the region (including within the existing HOODS as well as either expansion alternative's boundaries). However,

commercial and recreational fishing are not precluded within the disposal site boundaries. And since the vast majority of disposal occurs for a finite number of days per year (USACE dredging averages 3-5 weeks annually), any interaction between dredge vessels and vessels engaged in pelagic fishing at and near HOODS should be limited. Finally, expansion of HOODS will not in itself result in an increased number of disposal site trips or an increased volume of sediment being disposed there. The number of disposal trips and the volume of sediment disposed is directly related to USACE dredging budgets that have not been constrained (to date) by the size or capacity of HOODS. So the potential that expansion of HOODS would cause an increase in direct interference with other uses of the ocean, compared to the status quo of the past 25 years of operations at the existing HOODS site, is negligible.[9]

In terms of potential interference with other uses of the ocean, there are two main changes that have occurred since HOODS was designated. First, the state of California has established the Samoa State Marine Conservation Area (SMCA) to the north of HOODS. As shown on Figure 10 there is no overlap between the Samoa SMCA and any of the HOODS expansion alternatives. At its closest point, the fully expanded (Alternative 1) site boundary for HOODS would be approximately 2.9 nmi (5.4 km) away from the southern boundary of the Samoa SMCA. The closest point to the smaller Alternative 2 HOODS boundary would be nearly 3.5 nmi (6.4 km). Therefore conflicts between disposal operations at HOODS and any uses or activities of the SMCA are not expected.

Second, on October 19, 2018 the US Bureau of Ocean Energy Management (BOEM) published in the Federal Register a "Call for Information and Nominations" for commercial leasing of certain outer continental shelf areas off the California coast for possible wind power development, including an area several miles offshore of Humboldt Bay.[10] The potential wind power lease blocks off Humboldt Bay do not directly overlap with either of the HOODS expansion alternative or with the NSPS. However, power transmission infrastructure routes from any future offshore wind power installations in the area would likely need to come ashore somewhere in the vicinity of Humboldt Bay. Power transmission infrastructure would be incompatible with an ocean dredged material disposal site, because both disposal activity and periodic site monitoring work within and around the disposal site could damage the line. EPA has advised BOEM to avoid the footprints of the HOODS expansion alternatives and of the NSPS in their planning for energy transmission corridor(s) from any potential offshore wind energy lease blocks that may be developed in the future.

[9] This is separate from potential interferences that may be associated with placement at the NSPS.

[10] https://www.regulations.gov/docketBrowser?rpp=25&so=DESC&sb=commentDueDate&po=0&D=BOEM-2018-0045

6.2.2 Minimize Changes to On-Site Water Quality and Other Conditions

The second of the four general criteria is that ambient water quality conditions outside the disposal site must be within water quality criteria, and that contaminants should not reach beaches, shoreline, sanctuaries, or geographically limited fisheries or shellfisheries. No significant contaminant or suspended solids releases outside the HOODS boundaries are expected. This is first addressed when initially sizing a new disposal site: modeling is done to predict whether any water column plumes from discharges of suitable material will meet water quality criteria before dispersing outside the disposal site boundaries. Potential impacts are further avoided because EPA and USACE require pre-disposal testing to confirm that sediments are not toxic or significantly contaminated. Clean sand disposed at HOODS (which is the majority of what has traditionally been placed there) settles quickly and thus has the least impact on water quality. Suitable fine-grained material disposed at HOODS also settles quickly, with water column plumes dissipating to background levels within the site boundaries. Expansion of HOODS would allow for even greater mixing and dilution. Therefore, water quality effects from disposal within the boundaries of either HOODS expansion alternative would not reach any beach, shoreline, known geographically limited fishery or shellfishery, or the Samoa SMCA.

6.2.3 Limit the size of sites to facilitate management and monitoring

The location, size, and configuration of the proposed expanded HOODS boundaries provide long-term capacity, while permitting effective site management and monitoring, and limiting environmental impacts to the surrounding area to the greatest extent practicable. EPA considered two alternatives for expanding HOODS: expansion by ½ nmi to the north and west; and expansion by 1 nmi to the north and west (the proposed action). Under the proposed action, the effective total capacity of the site would increase from the original 25 million cy to over 100 million cy (i.e., allowing for 75 million cy of additional disposal to occur), before mounding to -130 feet could again occur across the entire site. If today's disposal practices were to continue unchanged (i.e., if an average of 1 million cy of entrance channel sand per year were to continue being placed at HOODS indefinitely), the site would reach capacity again in about 75 years. In contrast, the smaller expansion alternative would provide effective capacity for about 30 years of disposal. However, this smaller footprint would also limit on-site management options more than the proposed action.

When determining the size of the proposed site, the ability to implement effective monitoring and surveillance programs was considered to ensure that the environment of the site could be protected, and that navigational safety would not be compromised by the mounding of dredged material. EPA and USACE have demonstrated that the expanded HOODS area is feasible to manage and monitor, as shown by successful surveys in 2008 and 2014. The draft SMMP describes the future monitoring and management activities EPA and USACE will implement to confirm that disposal at the site is not significantly affecting adjacent areas.

6.2.4 Locate sites off the continental shelf or where historical disposal has occurred

The continental shelf break is approximately 10 mni offshore at Eureka, California. The Zone of Siting Feasibility (ZSF) analysis prepared by USACE in support of the original (1995) HOODS designation determined that an economically practicable ocean disposal site serving Humboldt Harbor could not be located off the continental shelf, but rather would have to be within approximately 4 nmi from the ends of the entrance channel jetties. The original HOODS boundary was 2.5 to 3.7 nmi from the jetties. The expanded HOODS boundary will extend from 3 nmi to 5 nmi from the jetties. While portions of the expanded site will be slightly beyond the original ZSF threshold of 4 nmi, the expansion area remains as close to the entrance channel as practicable while allowing capacity for future disposal needs without creating potentially unsafe mounding. Also, the expansion of HOODS will occur immediately adjacent to where disposal of virtually identical material has occurred for the past 25 years. This allows the least area to be disturbed overall from ongoing and future disposal activity.

6.3 Evaluation of the Eleven Specific Factors

6.3.1 Geographical Position, Depth of Water, Bottom Topography and Distance from Coast

The proposed expanded HOODS boundary is on the continental shelf three to five nmi offshore of Eureka, California in water depths of approximately 150 to 200 feet (45 to 61 m). The seafloor in this area is comprised of a gently sloping, essentially featureless sedimentary plain that grades evenly from fine sand in shallower depths to silts in deeper areas. Pre-designation baseline surveys and subsequent monitoring confirm that the HOODS expansion is in a depositional area. The site's depositional nature and natural topography helps minimize the extent of potential impacts to the benthos and facilitates long-term containment of disposed material as well as site monitoring activities.

6.3.2 Location in Relation to Breeding, Spawning, Nursery, Feeding, or Passage Areas of Living Resources in Adult or Juvenile Phases

The HOODS area provides feeding and breeding areas for common resident benthic organisms, fish, marine mammal, turtle, and seabird species. Floating larvae and eggs of various species are expected to be found at and near the water surface at the site as well as throughout the area. However, the proposed modified HOODS boundaries have been selected to avoid the presence of any unique or limited breeding, spawning, nursery, feeding, or passage areas for adult or juvenile phases of living resources and designation of the site is not expected to affect any geographically limited (i.e., unique) resources or habitats. ESA and EFH consultations with USFWS and NMFS, respectively, confirmed that ongoing disposal operations in an expanded HOODS will not have significant impacts to sensitive living resources or their habitats.

6.3.3 Location in Relation to Beaches and Other Amenity Areas

The proposed expanded HOODS boundaries begin at approximately three nmi offshore and the square site extends two nmi further offshore. It is therefore well removed from beaches or amenity areas, and currents in the area are not expected to transport material disposed at HOODS toward shore. No significant impacts to beaches or amenity areas associated with the existing HOODS have been detected, and none are expected in the future.

6.3.4 Types and Quantities of Disposal, and Proposed Methods of Release

Only suitable dredged material that meets the Ocean Dumping Criteria in 40 CFR 220-228 and receives a permit or is otherwise authorized for dumping by the USACE, and concurred with by EPA, will be disposed in the proposed expanded HOODS. Dredged materials dumped in this area will be primarily sand with some fines, and most will originate from Humboldt Harbor. Average yearly disposal of dredged material is expected to continue to be approximately 1,000,000 cubic yards, primarily by government owned or contracted hopper dredges. However, if a Nearshore Sand Placement Site (NSPS) is established nearby in the future, the volume of sand disposed at HOODS could substantially decrease. None of the material is packaged in any manner.

6.3.5 Feasibility of Surveillance and Monitoring

EPA expects monitoring and surveillance at the proposed expanded HOODS to continue to be feasible and readily performed from ocean or regional class research vessels. The area of the proposed expanded HOODS has been successfully surveyed and sampled in 2008 and 2014. The EPA and USACE will continue to periodically monitor the site for physical, biological and chemical attributes, as described in the updated SMMP for the site (Appendix D).

6.3.6 Dispersal, Horizontal Transport and Vertical Mixing Characteristics of the Area, including Prevailing Current Direction and Velocity

Ocean current monitoring in the vicinity of HOODS has confirmed both up- and down-coast current directions (depending on the season), with near-surface current velocities on the order of 25 cm/sec (0.5 knot), and deeper-water current velocities being slower (20 cm/sec (0.4 knot) at 45 meters deep, and 15 cm/sec (0.3 knot) at the bottom. These conditions have not adversely affected the ability to successfully and precisely dispose of approved sediments at HOODS in the past and are not expected to affect disposal in the future.

6.3.7 Existence and Effects of Current and Previous Discharges and Dumping in the Area (including Cumulative Effects)

Previous disposal of dredged material at the existing HOODS has resulted in mounding of sand and burial of benthic organisms within the site but no discernable physical, chemical, or

biological effects offsite. Water quality effects from active disposal are temporary, spatially limited, and return to background levels prior to the next disposal event. Short-term, long-term, and cumulative effects of dredged material disposal in the proposed expanded HOODS would be negligible, and similar to those for the existing HOODS.

The only other discharge in the vicinity of HOODS is from DG Fairhaven Power LLC's Fairhaven Power Facility on the Samoa Peninsula. Fairhaven Power is permitted to discharge a maximum of 0.35 million gallons per day of powerplant-related process water, cooling tower water, and other wastewater under terms of their current National Pollutant Discharge Elimination System (NPDES) permit No. CA0024571, issued by the State of California's North Coast Water Board.

The company discharges through an existing outfall into ocean waters adjacent to the Samoa Peninsula. The NPDES permit prohibits discharging wastewater in violation of effluent standards or prohibitions established under Section 307(a) of the Clean Water Act, and it also prohibits discharging sewage sludge. The outfall is located approximately 3.5 nautical miles (6.5 kilometers) east of the HOODS. Prevailing nearshore currents would direct discharge plumes from this outfall up or down the coast, depending of the seasonal current regime, not offshore towards the HOODS. EPA believes that there will be no adverse cumulative or synergistic impacts from the use of HOODS and discharges from the outfall described.

6.3.8 Interference with Shipping, Fishing, Recreation … and Other Uses of the Ocean

Minor, short-term interferences with commercial and recreational boat traffic may occur within Humboldt Harbor during dredging operations. However, interference as a result of the transport and disposal of dredged material to HOODS would be even less because disposal vessels move slowly, remain in established navigation channels, and their operations are announced via US Coast Guard Notice to Mariners. There may be minor, temporary interferences with recreational fishing in the offshore area during disposal operations, but HOODS is not closed to fishing or other uses. HOODS has not been identified as an area of special scientific importance. There are no aquaculture areas near the site. The likelihood of direct interference with such activities is therefore negligible.

6.3.9 Existing Water Quality and Ecology of the Sites as Determined by Available Data or Trend Assessment of Baseline Surveys

Water quality of the existing site is typical of the open northern California coast. Monitoring conducted in the vicinity of the proposed modified HOODS and experience with past disposals in the existing HOODS have not identified any adverse water quality impacts from ocean disposal of dredged material. Water column plumes associated with disposal events rapidly return to background, before subsequent events occur. The seafloor in this area is comprised of a gently sloping, essentially featureless sedimentary plain that grades evenly from fine sand in shallower depths to silts in deeper areas. The site supports benthic and epibenthic fauna

characteristic of the region, but there are no unique or limited habitats in the vicinity. No adverse impacts to benthos outside the disposal site have been identified based on comprehensive monitoring.

6.3.10 Potential for Development or Recruitment of Nuisance Species

Nuisance species, considered as any undesirable organism not previously existing at a location, have not been observed at, or in the vicinity of, the proposed modified ODMDS. Disposal of dredged material, as well as monitoring, has been ongoing for the past 25 years. The dredged material to be disposed at HOODS is expected to be from similar locations to those dredged previously; therefore, it expected that any benthic organisms transported to the site would be relatively similar in nature to any that may already present.

6.3.11 Existence of Significant Natural or Cultural Features of Historical Importance

EPA evaluated state records and coordinated with the State Lands Commission concerning historic shipwrecks near HOODS. The nearest recorded shipwreck sites are close to shore and would not be affected by ongoing disposal at HOODS. In addition, USACE conducted a survey for potential shipwrecks near the existing HOODS in 1991 (prior to designation of HOODS). The USACE survey identified three magnetic anomalies that could potentially be associated with unrecorded shipwrecks. Each of these anomalies is off the existing HOODS disposal mound. EPA collected high-resolution multibeam echo sounder data in 2014 at the locations of each magnetic anomaly, and confirmed that no debris, structures, or other material extended above the sediment surface at any of these locations. Since these anomalies do not extend above the surface now, and apparently have not since at least 1991, their exact character remains unknown. Ongoing disposal operations may effectively bury these features further but will not otherwise directly affect them.

7 SUMMARY OF COORDINATION, AND COMPLIANCE WITH RELEVANT ACTS AND ORDERS

7.1 PUBLIC SCOPING AND OUTREACH

EPA and USACE held a series of public scoping meetings in Eureka, California in early August 2019 (see Appendix B). These meetings included presentations on the need for and alternatives to the proposed action. EPA and USACE also met separately with Eureka area staff from USFWS and NMFS and gave an informational presentation to the California Coastal Commission (CCC) at their hearing which was held in Eureka during the same week. No significant conflicts or controversies were identified from the scoping process related to the expansion of HOODS. Materials presented at the scoping meetings and to the CCC are available on EPA's HOODS web site: https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents.

7.2 TRIBAL CONSULTATION

EPA sent scoping information in February and April 2019 to 10 recognized Tribes potentially affected by the proposed action (see Appendix B). This information included detailed project descriptions and a discussion of alternatives. EPA and USACE also offered to meet separately with these tribes when the public scoping meetings occurred in Eureka in August. No substantive comments were received during the scoping phase. The ten tribes contacted include:

- Bear River Band, Rohnerville Rancheria
- Big Lagoon Rancheria
- Blue Lake Rancheria
- Cher-Ae Heights, Trinidad Rancheria
- Hoopa Valley Tribe
- Karuk Tribe
- Quartz Valley Reservation
- Resighini Rancheria
- Wiyot Tribe
- Yurok Tribe

In addition, government-to-government consultation offer letters, along with links to this EA and its supporting documents, will be sent to these same Tribes before EPA takes any final action to expands HOODS.

7.3 National Environmental Policy Act

Environmental information has been compiled on the project and alternatives, and this EA has been prepared. The project is in compliance with NEPA.

7.4 Endangered Species Act and Marine Mammal Protection Act

The EPA initiated informal consultation under Section 7 of the Endangered Species Act of 1973, as amended (16 United States Code (U.S.C.) Sections 1531 to 1544) with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. Those consultations were completed in December 2019 and January 2020, respectively. Appendix B includes the consultation materials and determinations.

7.5 Magnuson-Stevens Fisheries Conservation and Management Act

EPA prepared an essential fish habitat (EFH) assessment pursuant to Section 305(b), 16 U.S.C. 1855(b)(2), of the Magnuson-Stevens Act, as amended, 16 U.S.C. 1801 to 1891d, and submitted that assessment to the National Marine Fisheries Service. NMFS completed its review of the EFH assessment and provided a single Conservation Recommendation in December 2019. The EFH consultation materials are included in Appendix B.

7.6 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA), as amended, 16 U.S.C. 1451 to 1465, requires federal agencies to determine whether their actions will be consistent to the maximum extent practicable with the enforceable policies of approved state programs. The California Coastal Commission (CCC) developed the California Coastal Management Program (CCMP) pursuant to the requirements of the CZMA. The enforceable policy components of the CCMP are contained in Chapter 3 of the California Coastal Act of 1976, as amended (Division 20, Cal. Pub. Resources Code).

EPA will submit a Consistency Determination (CD) package to the CCC following the close of the public comment period on this Environmental Assessment and the related proposed rule. The CD package will specifically address how the proposed action to expand HOODS is consistent to the maximum extent practicable with the Coastal Act Chapter 3 policies. EPA will not take final action on the proposed HOODS expansion until CCC review of EPA's consistency determination is complete and any comments have been addressed.

7.7 National Historic Preservation Act

The National Historic Preservation Act, as amended, 16 U.S.C. 470 to 470a-2, requires federal agencies to take into account the effect of their actions on districts, sites, buildings, structures, or objects, included in, or eligible for inclusion in the National Register. EPA determined in 1995. that no historic properties were affected, or would be affected, by the original designation

of HOODS. EPA has similarly determined that the proposed expansion of the existing HOODS boundaries will have no effect on historic properties.

7.8 Clean Water Act

As the proposed expansion area is located outside of the jurisdictional limits of the Clean Water Act, a Section 404(b) evaluation is not applicable to this project and was not prepared.

7.9 Farmland Protection Policy Act

This act is not applicable, because no prime or unique farmland would be impacted by implementation of this project.

7.10 Wild and Scenic River Act

This act is not applicable, because no designated Wild and Scenic river reaches would be affected by project related activities.

7.11 Estuary Protection Act

No designated estuary would be affected by project activities. This act is not applicable.

7.12 Submerged Lands Act

The project would not occur on submerged lands of the State of California, so this act is not applicable.

7.13 Rivers and Harbors Act

The expansion, and continuing use, of HOODS would not obstruct navigable waters of the United States. The proposed action is in full compliance with this act.

7.14 E.O. 11990, Protection of Wetlands

No wetlands would be affected by project activities. This project is in compliance with the goals of this Executive Order.

7.15 E.O. 11988, Flood Plain Management

This project does not occur in any floodplain; therefore, this Executive Order does not apply to project activities.

7.16 E.O. 12898, Environmental Justice

The proposed activity would not result in adverse human health or environmental effects or exclude persons from participating in, deny persons the benefits of, or subject persons to

discrimination because of their race, color, or natural origin. Further, the proposed activity would not impact "subsistence consumption of fish and wildlife." The proposed project complies with this Executive Order.

7.17 E.O. 13089, Coral Reef Protection

There are no coral reefs in the project area. This order is not applicable to the propose action.

7.18 E.O. 13112, Invasive Species

The proposed action will not positively or negatively affect the status of invasive species.

Based on the evaluation in this EA, including consultation with resource agencies and consideration of the four general criteria and eleven specific factors for selecting ocean disposal sites listed at 40 CFR 228.5 and 228.6, respectively, EPA has determined that the proposed action - Alternative 1 (expansion of the existing HOODS boundaries by one nmi to the north and one nmi to the west) - will have no significant adverse impacts and therefore no Environmental Impact Statement (EIS) is necessary. Simultaneously with this EA, EPA is issuing for public comment a proposed rule to implement Alternative 1. The proposed rule, which is functionally equivalent to a preliminary Finding of No Significant Impact (FONSI), is available both at: www.regulations.gov (Docket ID No. EPA-R09-OW-2020-0188); and at https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents. **EPA is accepting comments on this EA and the proposed rule until 30 days following publication of the proposed rule in the Federal Register.**

Disposal of suitable material (i.e., dredged material evaluated and determined to be suitable under the MPRSA and its implementing regulations) at the existing HOODS has resulted in no significant adverse impacts over 25 years of continuous site use, and EPA's conclusion based on the analysis in this EA is that the expansion proposed under Alternative 1 would similarly have no significant adverse impacts if managed under an updated Site Management and Monitoring Plan (SMMP) that includes site use requirements similar to those in the existing SMMP. A draft updated SMMP is included with this EA as Appendix C, and is also available separately for download and review at https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents. **EPA is also accepting comments on the draft updated SMMP until 30 days following publication of the proposed rule in the Federal Register.**

HOW TO COMMENT

Written comments on the EA and proposed rule and/or the draft SMMP must be received on or before **30 days following publication of the proposed rule in the Federal Register.** Note that due to the ongoing COVID-19 pandemic EPA's office building in San Francisco is closed, and physical mail may not be received for some time. Therefore, written comments should be submitted by one of the following methods, and must reference Docket ID No. **EPA-R09-OW-2020-0188**:

- www.regulations.gov: Follow the on-line instructions for submitting comments and accessing the docket, including materials related to this action (Docket ID No. **EPA-R09-OW-2020-0188)**.
- E-mail: ross.brian@epa.gov

Following the close of the comment period, EPA will respond to any comments received on both the draft updated SMMP and the proposed rule, incorporate any changes as appropriate, and issue a final rule and a final SMMP. The expanded HOODS will be available for disposal activity no sooner than 30 days following publication of the final rule.

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APPENDICES

Each of the four appendices to this EA is available as a separate file. They are available for download via www.regulations.gov (Docket ID No. EPA-R09-OW-2020-0188) and at this EPA wen site: https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents.

Appendix A – HOODS 2008 and 2014 Monitoring: Synthesis Report

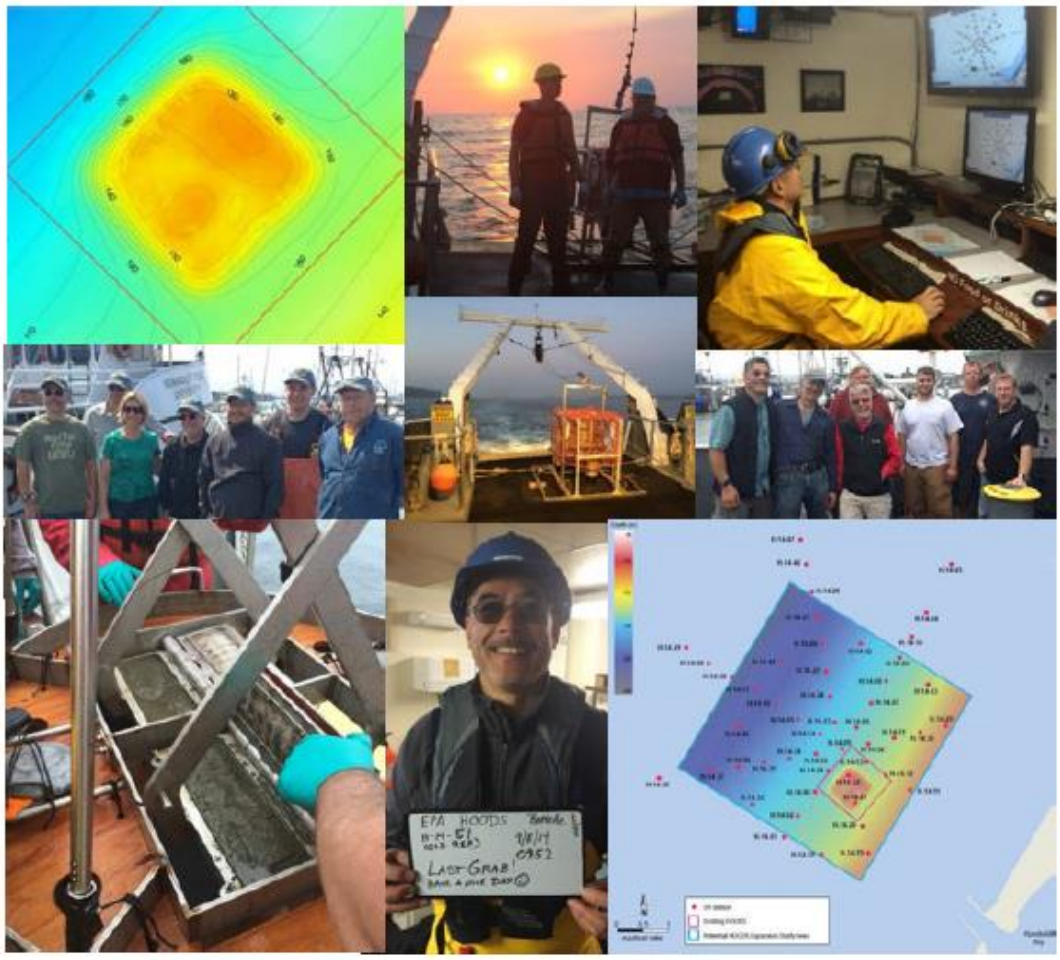
Appendix B – Scoping Meetings, and Resource Agency and Tribal Consultations

Appendix C – Existing (2006) Site Management and Monitoring Plan

Appendix D – Proposed Updated Site Management and Monitoring Plan

Appendix A

Humboldt Open Ocean Disposal Site (HOODS)
2008 and 2014 Monitoring
SYNTHESIS REPORT



Prepared by

U.S. EPA Region 9
Dredging & Sediment Management Team
San Francisco, CA

September 2016

This report is available for download via www.regulations.gov (Docket ID No. EPA-R09-OW-2020-0188) and at: https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents.

Appendix B

Public Scoping Meetings, and Resource Agency and Tribal Consultations

This Appendix includes information about public and agency scoping meetings and agency and Tribal consultations regarding the proposed expansion of HOODS, including:

- Scoping meeting comments
- Informal ESA consultation with USFWS
- Informal ESA, MMPA, and EFH consultations with NMFS
- Coordination with potentially affected tribes

This appendix is available for download via www.regulations.gov (Docket ID No. EPA-R09-OW-2020-0188) and at: https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents.

Appendix C

Existing (2006-2020)
Site Management & Monitoring Plan for HOODS

EPA-designated ocean disposal sites require a Site Management and Monitoring Plan (SMMP). Disposal at a designated site is subject to any project-specific restrictions from EPA or USACE, as well as the overall conditions included in the SMMP. SMMPs also lay out the periodic monitoring plan for each site, as well as potential management actions that will be considered in the event that monitoring identifies any adverse impacts. SMMPs are expected to be reconsidered at least every 10 years, based on the results of the periodic site monitoring.

The current SMMP for HOODS may be downloaded via the link below. It was last officially updated in 2006; however, it has effectively been updated each year since then, via conditions imposed on individual ocean disposal projects to adaptively manage sand mounding at the site.

The current (2006) SMMP for HOODS is available at:
https://www.epa.gov/sites/production/files/2015-10/documents/r9_hoods_smmp_2006.pdf

A new draft SMMP, updated to reflect the proposed expanded HOODS, is included as Appendix D to this EA. **EPA is accepting comments on the updated draft SMMP until 30 days following publication of the proposed rule in the Federal Register.**

This appendix is available for download via www.regulations.gov (Docket ID No. EPA-R09-OW-2020-0188) and at: https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents.

Appendix D

Draft Updated
Site Management & Monitoring Plan for HOODS

EPA-designated ocean disposal sites require a Site Management and Monitoring Plan (SMMP). Disposal at a designated site is subject to any project-specific restrictions from EPA or USACE, as well as the overall conditions included in the SMMP. SMMPs also lay out the periodic monitoring plan for each site, as well as potential management actions that will be considered in the event that monitoring identifies any adverse impacts. SMMPs are expected to be reconsidered at least every 10 years, based on the results of the periodic site monitoring. This Appendix presents a draft SMMP, updated to reflect Alternative 1 for expanding HOODS as described in this EA.

EPA, in coordination with USACE, will finalize this updated SMMP based on comments received on it and on the proposed rule being published simultaneously in the Federal Register. The updated SMMP would take effect beginning in 2021. However, even after it is finalized, the SMMP may be updated further as needed at any time by EPA and USACE, following opportunity for additional public comment.

This updated SMMP is also available separately for download at: https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents. **EPA is accepting comments on this draft updated SMMP until 30 days following publication of the proposed rule in the Federal Register.**

This appendix is available for download via www.regulations.gov (Docket ID No. EPA-R09-OW-2020-0188) and at: https://www.epa.gov/ocean-dumping/humboldt-open-ocean-disposal-site-hoods-documents.