# Cabrillo National Monument Shoreline Response Plan

The Cabrillo National Monument (CNM) on Point Loma has created a Cabrillo National Monument Shoreline Response Plan (CNMSRP) that provides guidance to responders in the event of a spill. The CNMSRP is technically not a part of the Area Plan but rather was developed in conjunction with the Area Committee to be a useful supplemental document. The CNMSRP is maintained by the CNM and is available for activation during an emergency spill response, which threatens their shoreline.

The Area Committee is indebted to Dr. Benjamin Pister for his efforts in providing his expertise to this plan to ensure that the CNM is readily able to respond if such an event should occur.

Dr. Keith Lombardo, the Chief of Natural Resources Management & Science at the Cabrillo National Monument, updated the document in 2018.

Dr. Lauren Pandori, Resources Management and Science Program Manager at Cabrillo National Monument, updated the document in 2022.

# Shoreline Response Plan: Cabrillo National Monument Point Loma, California


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## Introduction

The purpose of this document is to provide pre-approved shoreline cleanup guidelines in a Shoreline Response Plan (SRP) format that addresses the need to protect and maintain the natural beauty of the Cabrillo National Monument (CNM) grounds both during and after cleanup efforts.

These guidelines were created to inform emergency planners as they develop Incident Action Plans (IAPs) to manage shoreline cleanup operations during a spill response. This plan borrows information from the San Diego Area Contingency Plan (ACP) which should be referenced together with this plan during spill response at the CNM. Tables from the ACP that address oil spill cleanup methods to be used on various shoreline habitat types have been modified and expanded in this plan to address the unique environment found within the CNM boundaries. General descriptions of cleanup techniques to be used within the CNM have been included in this document to inform future CNM managers who may be unfamiliar with spill cleanup operations and find themselves responding to an oil spill emergency.

This document addresses concerns related to large spill events that may impact a significant area of the CNM shoreline. Lesser events that may evoke a response should also take these guidelines into consideration.

This document has been reviewed and approved by the San Diego Area Committee and is incorporated into the Area Plan at Sections 4640 and 9800 Section (9811).

### Environmental Sensitivity Index

The standard shoreline habitat mapping protocol used for spill response in the United States is the Environmental Sensitivity Index (ESI). The ESI assigns ranks to ten representative shoreline types using site exposure to potential wave energy combined with ecological sensitivity to injury from oiling of the predominant shoreline substrate. The ESI assigns shorelines with a sensitivity score from 1 to10 with 10 being the most susceptible and 1 being the least susceptible to injury from oiling. The 10 sensitivity ranks are further subdivided using letter designations to capture additional differences found in the environment. The CNM shoreline is comprised of several ESI shoreline types including 1(a), 2(a), 3, 4, 5, and 6 (a and b) (ACP Sec 3000, pp 3-10 and 3-11). The CNM is located within the ACP Operational Division F (Figure 1).

### Oil Threats & Spill Response Recommendations

Considering the existing military, commercial, and recreational uses of petroleum in both San Diego bay and along the California coastline there are many significant sources of oil that threaten this shoreline. A quick list of these threats includes:

1) Crude oil from offshore lightering operations;

2) Bunker fuel (IFO 160 or 380) from local coastal transport by barge and some commercial vessel traffic;
3) Diesel fuel from Naval supply shipping and active-duty vessels, local coastal barge, or private and commercial vessel traffic;
4) Jet fuel from Naval supply or duty vessel traffic or Naval or commercial air traffic;

5) Gasoline from private vessels.

All of these potential sources of spill products have been addressed in the Response Method Tables 44 through 47 inside of the existing ACP. We have adapted and modified those tables to address the specific ESI shoreline types that are present at CNM and added a list of prioritized clean-up methods that can be used during responses on this shoreline.

The primary goal of these guidelines is to identify the CNM shoreline types and pre-identification of shoreline cleanup methods considered suitable by the CNM for future emergency spill response planning.

## Basic Park Information

CNM is a unit of the National Park Service (NPS) located at the south end of the Point Loma peninsula in San Diego, CA. It consists of approximately 160 acres of land-and approximately 130 acres of intertidal shoreline. The intertidal area of the CNM is some of the most biologically rich natural shoreline in southern California. The coastal vegetation in the park represents the last remaining 1% of its type in California. Both are managed strictly by the NPS and the intertidal area includes a human exclusion zone. The CNM is visited by approximately one million visitors a year with about a tenth visiting the intertidal area making it one of the most visited national monuments in the United States. Given the sensitivity of this environment and its status as a national monument, operations in this area must address damage impact analysis of clean-up operations compared to damage from the spilled product on the natural resources.

## Park Entry and Contact Points

CNM is open daily from 9 AM – 5 PM including holidays and weekends. During these hours particularly on weekends, holidays, and days with nice weather visitor attendance at the park can be in the thousands. Access to the peninsula is controlled by Navy Base Point Loma. The Navy guards the entrance to the entire peninsula at the intersection of Catalina Blvd. and Electron Dr. from 5 PM to 5 AM on weekdays and 5 PM to 9 AM on weekends. This gate is manned and access is restricted without permission from the Navy.

To gain after hour access to the peninsula contact the Desk Sergeant at Navy Base Point Loma Force Protection (619-553-0601). Once access to Navy Base Point Loma is secured, the road to the coastal area of CNM is accessible at all hours and days. If additional help is needed from CNM staff (e.g., for access to the upper monument), contact the following staff in the specified order:

1 - Chief of Law Enforcement (vacant as of December 2022)
2 - Resources Management and Science Program Manager (619-204-8719)
3 - CNM Superintendent (760-362-2204)

## Habitat Description and Spill Management Goals

The rocky intertidal shoreline consists of flat sandstone benches bordered on the shoreward side by steep sandstone cliffs. Both the benches and cliffs are soft and are actively eroding.

There are patches of boulders distributed along these benches that consist of much harder metamorphosed volcanic rock. These boulders range in size from a basketball to the size of a small bus. There are occasional pools of ankle to knee deep water. Surf grass, kelp, turf algae, and rock weed dominate the intertidal. This shoreline topography extends the length of the peninsula from Sunset Cliffs on the western side around the southern tip to Ballast Point on the eastern side. Shallow rocky benches extend sub-tidally seaward and make approach of the shoreline by boat difficult and hazardous.

There is a single pedestrian access point to the intertidal zone at CNM, located near the "Tidepool Parking" lot on Gatchell Road. From the parking lot, walk along the Coastal Trail, down a set of stairs, and past interpretive waysides. The tidepool entrance is just past the waysides on the left (South) side. The tidepools are traversable at tides < 0.7 feet below MLLW.

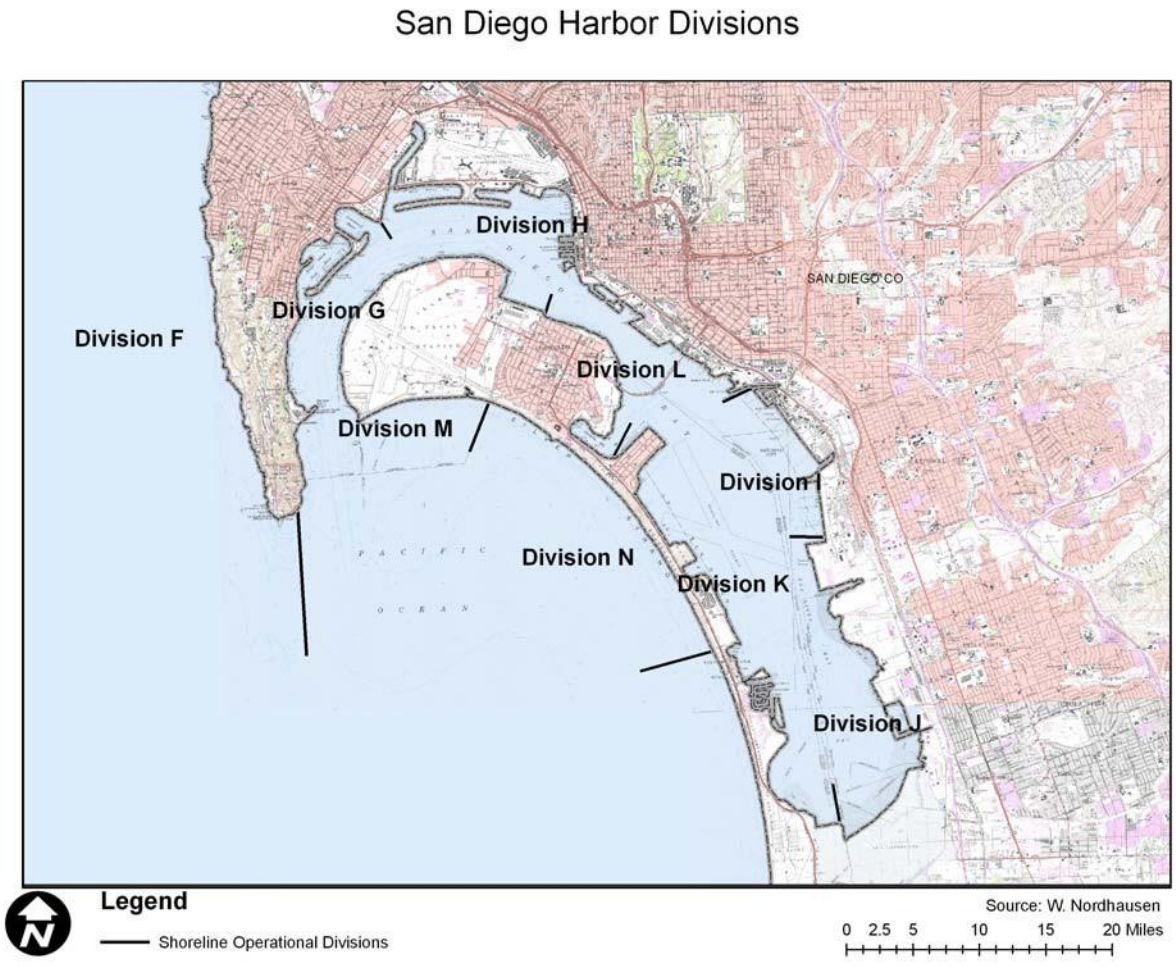


**Figure 1. Spill Response Operational Divisions in the area of Cabrillo National Monument**

The shoreline within the boundaries of CNM has been divided into three different visitor management "Zones" (Figure 3). Zones 1 and 2 (the two northern most) are open to park visitors. Zone 3 is closed to human visitation for recovery and scientific research. Zone 3 must receive the lowest visitation possible for any recovery operations. Any planned response that intends to enter zone 3 will require pre-approval by the NPS biologist before work begins there.

Coordination of access and clean-up options of the intertidal area must be made with the CNM Chief of Natural Resource Management (619-523-4290, 619-204-8719).

### Tides, Weather, and Climate

In addition to waves, the tides will have the most impact on shoreline conditions. Tides in the Point Loma area range from -2.0 ft. to +8.0 ft. At high tide water will reach the sea cliffs.

Current tide predictions for Point Loma can be found here:
https://tidesandcurrents.noaa.gov/noaatidepredictions.html?id=TWC0405
Current and near future water levels including waves and tides can be found here:
http://www.cdip.ucsd.edu/
Near future predicted swell height for southern California, including Point Loma, can be found here:
http://www.cdip.ucsd.edu/?nav=recent&sub=forecast&units=metric&tz=UTC&pub=public&map_stati=1,2,3

Weather on Point Loma is generally mild with temperatures in the 50's to 70's °F. Unless a storm is present wind is usually less than 15 knots. During Santa Ana events which originate from high pressure systems from the east-north east weather conditions can be hot, dry, and windy.

Coastal currents are subject to several local physical influence, however wind is a major contributing factor. The coast is now monitored by Southern California Coastal Ocean Observation System (SNCOOS) radar network administered by Scripps Institute of Oceanography. Rapid updates in surface current information is readily available online at: http://www.sccoos.org/data/hfrnet/.

An illustration of the generalized near shore current regime of Point Loma is presented in figure 2. The illustration presents Schematic Surface Current patterns within the San Diego region. The flow strength is represented by the line thickness. Some flows have consistent direction (black) and others can have reverse direction (gray). Letter b is a consistent southeastward flow and b', g, and h are clockwise flows.

### Other Agencies

There are four government agencies with waterfront property on the peninsula. In addition to the National Park Service the area immediately to the north of CNM is leased by the City of San Diego from the Bureau of Land Management which supports the Point Loma Waste Water Treatment Plant. The US Coast Guard owns a small piece of land at the southwestern corner of the peninsula though has no property below Mean High Water. The rest of the coastline is owned by the US Navy and federal jurisdiction extends 300 yards offshore. Any medium to large spill is likely to affect these agencies.

### Shoreline Access & Response Equipment Staging

Access to the shoreline is available on foot only. The access point is on the west side of the peninsula at the end of an approximately 100 yd. trail from Lot 1 on Gatchell Road. (Figure 4 and Table 1). An additional trail approximately ¼ mile from Lot 2 on Gatchell Road. leads to the

same access point.  This access point leads directly to Zone 1.

There is an old boat ramp on the US Coast Guard property further south on the peninsula. This ramp has long fallen into disrepair and can no longer be used.  It leads directly into Zone 3 (Figure 4 and Table 1).

There is an additional access point to the north of the Point Loma Waste Water Treatment Plant on Navy property.  This point can be accessed by Woodward Road. and requires scrambling down a steep and eroding cliff.  It is the least convenient of the three access points and is accessible by foot only (see map and table).

### Roads and Staging Areas

Staging of equipment and personnel should be coordinated with the Chief of Law Enforcement at CNM (619-523-4270), and the Park Superintendent (619-523-4260).

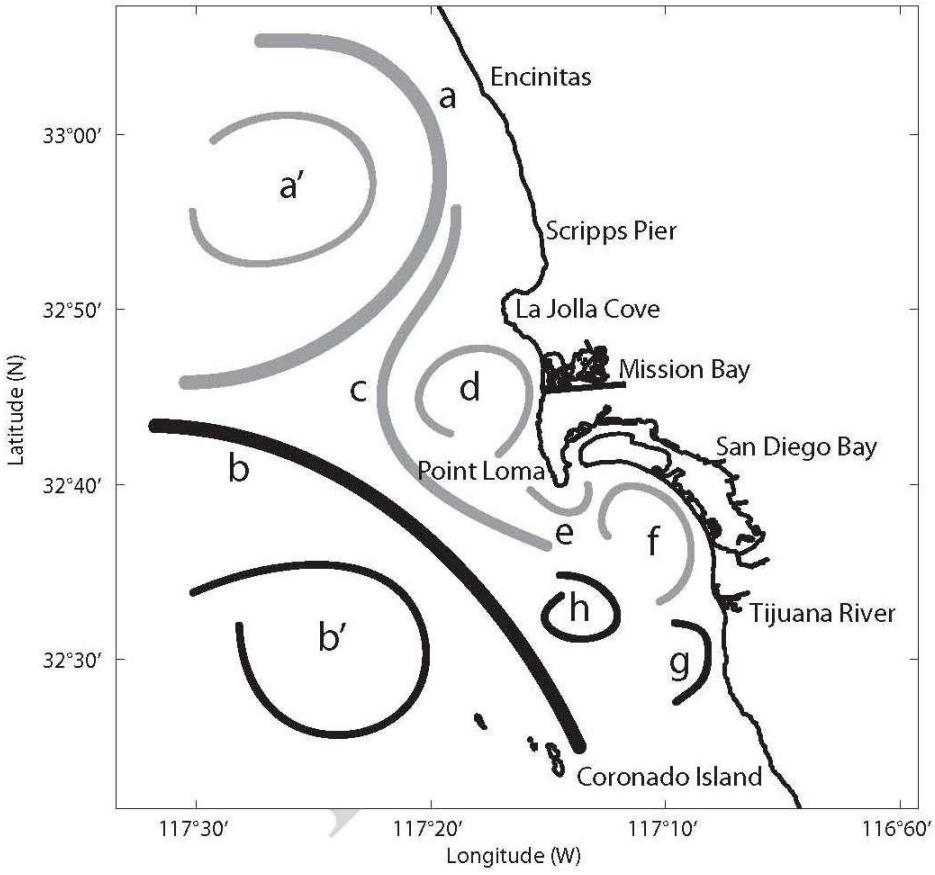


**Figure 2. Generalized coastal surface currents off shore Point Loma and surrounding areas.** From Kim, S. Y., 2009: Coastal ocean studies in southern San Diego using high-frequency radar derived surface currents, PhD Dissertation, Scripps Institution of Oceanography Technical Report.  Available online at http://repositories.cdlib.org/sio/techreport/95.

Entering the park the main road continues across the top of the peninsula and curves to the east. It leads to three parking lots near the Administration building (Table 1). These large, paved areas are suitable for staging vehicles and equipment. Past the entrance station, Cabrillo Road. extends s down the hill on the right towards the western side of the peninsula. After a 180º turn it becomes Gatchell Road. Lot 1 is the first parking lot on the left and is the largest paved area near the shoreline (Figures 3 and 4, and Table 1). It is also the closest to the main access point to Zone 1. Lot 2 and Lot 3 are further north along Gatchell Road. and are considerably smaller. After Lot 3 Gatchell Road. enters the Point Loma Waste Water Treatment Plant (PLWWTP). The road is gated on the northern end of the PLWWTP however it continues onto US Navy property connecting to Woodward Road at its northern end. Access through this gate must be coordinated with PLWWTP and the Navy. **Central Control at the PLWWTP (619-221-8770)** can be contacted on a 24 hr. basis. Woodward Road connects to Cabrillo Memorial Drive which runs along the top of the peninsula (Table 1).

The Ocean View Parking Lot is small; however, it affords a superior vantage point for the western side of the peninsula. The Cabrillo Statue or Visitor Center can provide similar views of the eastern side of the peninsula (Figure 4 and Table 1).

Main ParkingArea: 210,046 sq. feet. This area should be used as the main staging area for all equipment.

Lot1: 22,150 sq. feet. This area should be used as an advanced staging area for equipment and supplies for immediate use. There may also be room here for temporary storage of recovered oil and a HAZWOPER decontamination area.

Lot2: 7,448 sq. feet.

Lot3: 13,950 sq. feet. Lots 2 and 3 may be used for temporary storage of equipment or recovered oil.

### General Safety and Intertidal Safety

This plan does not address the most immediate concerns of human health and safety, controlling the spill at its source, or protection from petroleum exposure. Instead, these issues and the safety and medical plans should be covered in an Incident Action Plan (IAP).

Safety concerns for personnel entering the intertidal area on Point Loma should be referenced in an incident specific Site Safety Plan which should be provided to responding personnel when they sign-in, and again daily during tailgate safety briefings. Those issues are as follows:

A) The tide can rise behind work crews cutting off access to exits. Response planning should schedule activities with the tidal schedule.

B) Large waves can surprise people knocking them down and sweeping them offshore.

C) Rocks are often slippery due to water and algae covering the rock surfaces. Use caution when placing feet between rocks while walking to minimizes slips, trips, and falls. Use hands or long handled tools to assist with balance while moving over rocks. Expect all surfaces to be slippery.

D) Sandstone cliffs in the area are continually eroding and may not support the weight of a person. Crumbling terrain can easily produce falling rocks and dirt from overhead bluffs.

### Crowd Control and Security

As a unit of the National Park System, CNM must allow public access to the extent practical. However, public safety is also a priority for the National Park Service. Hazardous areas within the CNM should be closed to the public as needed. In addition there are private residences on the US Coast Guard property and in Rosecrans National Cemetery. Buildings adjacent to the shoreline and at the southern tip of the peninsula are manned and used daily by the Navy. These issues must be addressed to maintain proper public access through the CNM during an emergency response.

Limiting public access to the area due to safety or recovery operations must be coordinated with the Chief of Resource and Visitor Protection (vacant, 619-523-4270) and the Superintendent (Andrea Compton, andrea_compton@nps.gov, 619-523-4260**)** at CNM.

### Communications

One of the most important issues for emergency response is the immediate need to establish a robust and functional communications network among the responders. Cell phone reception at CNM is generally poor. Responders may have no wireless reception on the shoreline and spotty reception in the upper parking lot. The need to establish a functional communications network should be handled by the designated Communication Leader in the Logistics Section of the Incident Command structure.

## Spill Response Information

### Response vs. Assessment: About NRDA

The response guidelines identified in this plan are tailored to assist shoreline cleanup efforts on the CNM coastal property. While this document will not specifically address the need or method to be used in conducting a Natural Resource Damage Assessment (NRDA) it seems worthwhile to include helpful information to guide future spill response managers to plan or conduct a spill related NRDA.

NRDA should include state and federal agency representatives responsible for developing NRDA plans following an oil spill to address measures of response cleanup. Conducting a joint NRDA event can reduce the duplication of effort and assist in the development of professional working relationships that will be vital moving forward

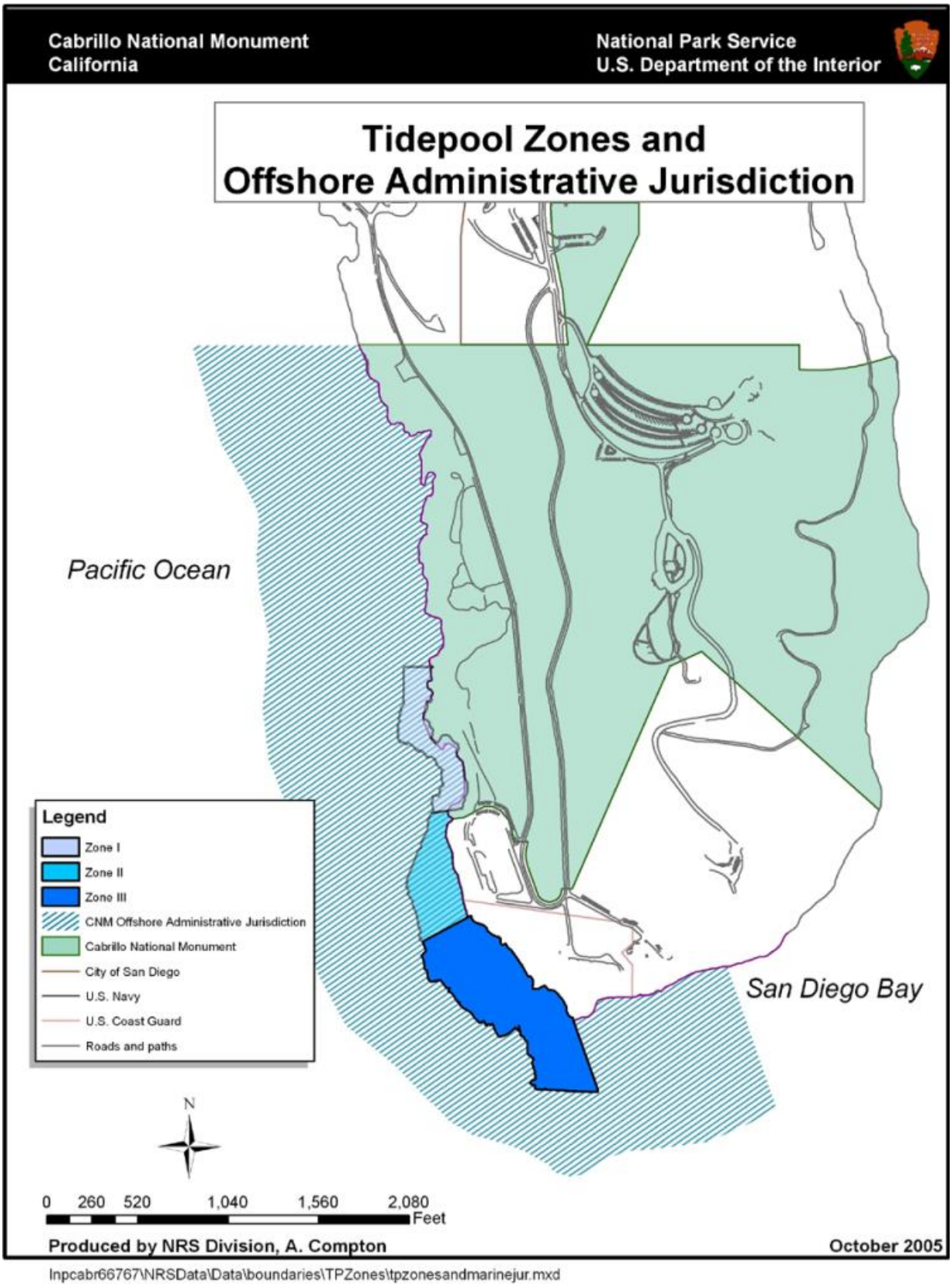


**Figure 3. Diagram of Cabrillo National Monument tide pool access zones.**

Whenever possible, it is important to begin data collection prior to shoreline impacts. Time permitting a shoreline pre-assessment should be attempted to assist in response decision making. The Minerals Management Service (MMS) and California Department of Fish and Wildlife's Office of Spill Prevention and Response (CDFW-OSPR) have commissioned the development of a Pre-Spill Assessment of Coastal Habitat Resources manual describing the methods and protocols to be used during pre-oiling assessment. This manual may also be used to conduct post-assessment impacts even if a pre-oiling assessment was not conducted. This manual can be found on line at:

https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=19886&inline

### Options Related to Spill Location

### Offshore Point Loma

Depending on the specific type, volume, and location of spilled oil several response options may be considered for offsite/offshore response efforts. Generally the greatest number of options are

**Table 1. Locations of important spill response site features at Cabrillo National Monument.** Also, see Figures 3 and 4 to correlate locations.

| Numbered locations shown of Figure 4 | Latitude | Longitude |
|---|---|---|
| 1. Entrance Station (Cabrillo Memorial Drive) | 30°40'37.42'' | 117°14'35.84'' |
| 2. Ocean View Parking Lot (west side of peninsula) | 30°40'25.32'' | 117°14'32.22'' |
| 3. Main Parking Lots | 30°40'26.97'' | 117°14'23.88'' |
| 4. Cabrillo Admin Building | 30°40'28.22'' | 117°14'22.16'' |
| 5. Cabrillo Statue Viewing Area (east side of peninsula) | 30°40'26.30'' | 117°14'20.34'' |
| 6. Access to Intertidal at Cabrillo Zone 1 | 30°40'09.35'' | 117°14'42.97'' |
| 7. Lot 1 | 30°40'05.60'' | 117°14'39.14'' |
| 8. Lot 2 | 30°40'25.63'' | 117°14'41.51'' |
| 9. Lot 3 | 30°40'30.18'' | 117°14'45.56'' |
| 10. Zone 1/ Zone 2 Boundary | 30°40'05.35'' | 117°14'41.91'' |
| 11. Zone 2/ Zone 3 Boundary | 30°40'59.09'' | 117°14'41.10'' |
| 12. Old Boat Launch of Coast Guard Property | 30°40'58.06'' | 117°14'38.30'' |
| 13. Coast Guard Gate | 30°40'59.36'' | 117°14'34.13'' |
| 14. Point Loma Wastewater Treatment Plant Entrance Gate | 30°40'00.33'' | 117°14'58.17'' |


**Figure 4. Aerial Image of Point Loma and Important Points from Table 1.**

available with persistent oils such as crude and bunkers. These oil types may be evaluated for in-situ burn, dispersant application, or mechanical recovery. The non-persistent oils (gasoline, jet fuel and diesel) are not candidates for dispersant use, but they may be evaluated for in-situ burn or mechanical recovery depending on the volume and spill location. Additionally oceanic, climatologic, and applicable regulatory variables will influence the decision-making process.

Ultimately a substantial petroleum product release off the coast of Point Loma could result in an environmental impact to the intertidal zone of the National Park. Spill Responders could be expected to employ any combination of effective shoreline cleanup methods to mitigate the effects of oiling.

### Inside San Diego Bay

Oil spills inside San Diego Bay are far more restrictive in the available response considerations. These spills are essentially limited to mechanical recovery methods on the water and a variety of shoreline cleanup options which are addressed in this guideline.

### Options Before and After Oil Contacts the Shoreline

Pre-cleaning of the intertidal zone may be accomplished by hand crews that remove the kelp wrack and other debris from the intertidal zone during low tide. Pre-cleaning can reduce the amount of oil-contaminated material that must be removed during the cleanup phase thereby expediting the clean-up phase of a spill response. Limiting the time oil is present in the environment can reduce the collateral damage to the environment. Additionally, the clean wrack may be returned to the beach after the oil has been removed thereby restoring some ecological benefit to the intertidal zone. Even if the material is sent to a landfill, the disposal cost is reduced since the un-oiled wrack is not categorized as hazardous waste.

### Clean-up Options for Diesel and Gasoline

Gasoline and diesel spills tend to evaporate within hours to days and generally they do not leave residual stains that are associated with black oils. However, response efforts can be hampered when spilled petroleum products volatilize and create an unhealthy atmospheric working condition and high fire risk. Additionally, gasoline and diesel often contain high concentrations of aromatic hydrocarbons including benzene that is hazardous to human health. For these reasons air monitoring is critical and should be conducted by properly trained and qualified personnel to ensure a safe work environment.

Diesel cleanup is usually limited to the collection of the spilled material using sorbent pads and boom that are removed and properly disposed of. Natural tidal washing or low pressure flooding may speed up the movement of oil into sorbents and are typically the only methods used for addressing this product when booming, excavation, or the use of skimming equipment is not practical.

## Oil Collection Stations

If a cleanup effort occurs on the CNM shoreline a place to safely collect and store waste will need to be designated. In general, solid waste collected during large spills is placed in roll-off bins while smaller spills use storage drums for waste accumulation. These collection stations will ideally be located near the shoreline and on a flat landing surface where trucks can operate. Additionally, it is preferable that public access to these collection areas be precluded for the duration of the response. Should these collection sites be used as temporary storage facilities (i.e. left in place for several weeks) they will need to be approved by the Federal on scene Coordinator (FOSC), Department of Toxic Substances Control (DTSC) in Cypress (714-484-5300), California Coastal Commission (CCC) (415-904-5200), Regional Water Quality Control Board (RWQCB) (858-467-2987), the City of San Diego (858-492-5051), and the S.D. Fire Department (619- 533-4400). These sites are exempt from any hazardous waste generator and facility permit requirements for a period of 30 days, per the draft MOU between OSPR and DTSC. Additional 30-day extensions may be granted by DTSC, under appropriate circumstances.

## Sources of Response Equipment

The San Diego Area Contingency Plan (SDACP) provides extensive lists of spill related response resources offered by local Oil Spill Response Organizations (OSROs). Similarly, OSROs can provide current listings of their available equipment and personnel which will most likely include resources available both locally and from more distant facilities. Collectively a substantial response capability is available within a relatively short response request timeframe. However, the nature of shoreline cleanup efforts at a rugged, limited access, and open coastal setting such as CNM will rely heavily on manpower resources with limited mechanical assistance.

## Spill Response Options

Once oil has spilled into the environment, cleanup operations must use the best achievable technology to minimize environmental injury and monetary cost of the cleanup operations. The following sections will identify and discuss the acceptable methods of cleanup that may be used during a response at the CNM. The discussion of methods deemed “Generally Disapproved” follows the discussion of “Pre-approved” methods. All of this information is summarized at the end of this document in Tables 2 through 5 (pages 22 to 25).

These guidelines attempt to apply a standard of best achievable protection in combination with the ideals of caution and prudence in evaluating the utility and applicability of each of these cleanup methods which may be used in a hypothetical spill event. The text discussion and accompanying summary tables take into consideration how each of these methods might be expected to perform under some hypothetical standard condition.

Even though a cleanup method is identified in the pages of this document as “Approved” or “Disapproved,” unforeseen considerations at a future spill response may justify the use of one or more of the “generally unacceptable” methods. Similarly incident specific variables could render some of the pre-identified acceptable methods inappropriate response options.

## Pre-Approved Spill Response Options

### Natural Recovery

Natural recovery is the decision to allow for the natural degradation of oil and to proceed without any additional clean-up efforts. Occasionally this is the first and only cleanup option when the amount or type of product does not warrant additional environmental impact associated with staging a more labor intensive cleanup effort. This may also be the last option after other clean-up methods have been exhausted or when the amount of remaining oil no longer justifies the continuation of remedial effort.

### Manual Oil Removal / Cleaning

Manual oil removal is accomplished by hand crews that collect oil from the sand and rocky shoreline substrates. The oil is stored in approved waste containers and disposed of properly after the waste stream is categorized. Manual removal is most suitable in areas of limited accessibility and high sensitivity. The net benefit of this method may include better habitat recovery since the amount of residual oil is reduced and the duration of sheening is shortened. Some amount of residual oil contamination will usually remain to weather naturally.

Manual removal can include wiping rocks using rags or sorbent pads to lift oil from hard surfaces which it has adhered to. Additionally, manual removal sometimes includes the use of hand tools such as scrapers, rakes, and shovels to remove oil from the substrate. In spills of black oil the use of hand scrapers (putty knives) to remove heavy deposits of oil from rock surfaces is a slow and tedious process. In the case of light oils sorbents and rags may remove all but a film from substrate surfaces while sediment penetration may be greater than heavy oils. Carrying or dragging bagged waste across rugged terrain is strenuous labor that can produce amplified negative impacts on the environment.

### Sorbents

Sorbents are manufactured in a variety of designs with multiple operational applications. Selection of the most appropriate type should be decided by the spill management team. Only sorbent products that are US EPA and State approved shall be used.

Sorbents are manufactured as either pads, sweeps, booms, or pom-poms. They are constructed using hydrophobic and oleophilic materials that collect floating oil. Some of these materials are configured to be anchored in place and passively catch floating oil moving with tides and currents. Pads are single sheets of spun polypropylene used for

hand-wiping oil from rocks or floated on the water surface and removed by hand when saturated. Sweeps are long rolls of the same material that are used to create a floating barrier across pooled water.

The use of free floating pads is limited to those near shore tidal areas where deployment and hand retrieval could easily occur without the threat of the pad being swept out to sea. Booms are absorbent materials shaped into tubular lengths of varying length and diameter often strung together to form barriers to prevent floating oil from drifting out of a confined area. Pom-poms resemble mops that snare (or adsorb) floating oil either on the water surface or subsurface.

### Vacuum

Vacuum trucks would have limited access to the shoreline within the park limiting their use during a response to areas where a hose could be extended to the beach while still maintaining a proper suction head. Due to this constraint, vacuum trucks would generally be a limited response option for removing oil along the CMN shoreline. Exceptions may occur if oil is near shore and thick enough to be skimmed from the water surface using a weir type nozzle or when a beached vessel's fuel tanks are within an effective reach of the suction hose.

Small portable pumps can transfer oil from the fuel tanks of stranded vessels into transport drums. This method of recovering oil from vessels is particularly useful when beach access for larger vacuum trucks is not available. The rugged shoreline of the CNM is generally more conducive to operations using small pumps rather than the larger vacuum trucks.

### Debris Removal & Wrack Pre-cleaning

Manual removal of stranded debris and wrack from low elevation beaches aims to reduce the amount of contaminated waste that will otherwise require specialized disposal as hazardous waste. This effort may be combined with strategic relocation of the wrack to higher elevation supra-tidal areas that are securely above the high tide zone. These are labor intensive efforts that are only effective before oil arrives on the beach and contaminates these same materials. Manual removal should only be done by hand crews using rakes and shovels to physically remove the debris or move the wrack to an adequate location above the high tide line as the beaches at the CNM are not accessible by equipment typically used to expedite this effort.

The general description of this work plan is as follows: debris is placed in bags and hauled away as ordinary trash, and/or the un-oiled wrack is raked or dragged to a location high enough on the beach face away from the potential oiling zone. The clean wrack can be returned to the beach after the threat from oil has passed thereby reducing disposal costs and minimizing the loss of ecological value. If the decision to haul away the clean wrack material seems feasible it can be disposed of as a non-hazardous waste only if it has not been oiled.

The practical limits placed on pre-cleaning must consider the amount and type of wrack on the beach, the ability to move the wrack out of the path of oil, and the availability of work

crews to complete the work. This effort may be futile on beaches where wrack load is heavy, especially if there is a large amount of floating material still in the water. The pocket beaches and surf line at CNM often contain copious amounts of dislodged seaweed.

### Sediment Reworking/Soil Remediation

Sediment reworking involves the tilling of oiled soils to enhance the rate of microbial biodegradation or photo-oxidation of petroleum products. Nutrients are sometimes mixed into the soil to further enhance natural degradation. This process will be limited to hand turning the sand using shovels or rakes on the pocket beaches at CNM without the addition of nutrients as the beach environment is highly energetic and not conducive to nutrient application for the purpose of enhanced bacterial growth.

### Flooding

Flooding utilizes very high volume fire fighting pumps to produce a deluge of ambient temperature water that can dislodge moderate to heavy concentrations of oil from rocks and out of the crevices and interstitial spaces among various beach substrates. The dislodged oil can be collected using floating sorbents that are placed in the immediate work area. It may be appropriate to conduct an onsite demonstration to determine if deluge washing is effective and safe before wholesale deployment on a spill response event.

### Low Pressure Flushing (Ambient Water)

Low pressure ambient water flushing (<50 psi) aims to mechanically loosen and flush heavy concentrations of oil that have become stranded on irregular rocky shoreline. The mobilized oil is typically collected using sorbent materials as the oil floats free with the rinse water. The soiled sorbents are then bagged and disposed of. This task is accomplished by using trash pumps to draw water from the ocean which is sprayed through a low pressure nozzle directly onto the oiled substrate. This method does not increase the temperature of the water. Nozzle pressure must be controlled to mitigate negative impacts to attached intertidal organisms.

It is recommended that this clean-up method be evaluated for efficacy by staging an in situ demonstration to determine the best equipment combination (pumps, hoses, and nozzles) for each of the various substrates to be flushed *before* use approval is given. During the demonstration, the water pressure and flow should be manipulated to determine the most suitable combination of pressure and flow to achieve the most acceptable level of oil removal. If the method is not effective at removing oil within environmentally acceptable parameters then the method should not be authorized for operations. Generally, the method is effective only in removing heavy deposits of oil that can easily re-float and may leave behind a significant quantity of oil that could require additional effort.

### High Pressure Flushing (Ambient Water)

High pressure (>50 psi) flushing employs a water stream that can cause significant erosion of the substrate and potentially dislodge attached intertidal organisms from the shoreline

substrate. This method is generally discouraged where more substantial attached biological resources occur because the damage to organisms from the force of the high pressure water stream may be more harmful to the biological recovery period than allowing natural recovery. The degree and type of oiling are important considerations when weighing this option.

## Generally Disapproved Spill Response Options

### Barriers / Berms

While an offshore barrier deployment could theoretically minimize the amount of oil that reaches the shoreline there is no acceptable physical location to install an effective boom deployment within the boundaries of the CNM. The shallow nearshore substrate in combination with tidal changes and wave action will preclude the effective use of boom along the shoreline off the
coast of the CNM. Offshore boom tows to collect oil may be feasible outside of the kelp beds however, the anchoring of a barrier boom to exclude or deflect oil is not reasonably expected to provide a meaningful protection strategy. Berms involve sand pushed into piles to restrict the movement of surface flow or wave action. In the CNM setting it is unlikely this control strategy will have any effective application.

### Mechanical Oil Removal

Mechanical removal refers to the operation of heavy (mechanized) equipment on beaches. The beaches and shoreline of CNM are generally not accessible and the working environment is not conducive for this kind of activity. The only notable exception to this statement could be the use of heavy support equipment on the established roadways for moving materials and waste in and out of the adjacent response area.

### Vegetation Removal

The cutting and removal of attached algae in the tidal area is generally disapproved as an initial cleanup method. The cutting and removal of contaminated shoreline vegetation is also generally disapproved. Nevertheless, the decision to cut or not to cut terrestrial or aquatic vegetation should be made only with consultation and approval by CNM management. When vegetation removal is deemed appropriate, it is advisable to have the work activity closely monitored to avoid unnecessary aggressive cutting or the denuding of substrates. The use and selection of appropriate hand tools and the removal and segregation of the oily wastes should also be included in any vegetative trim plan.

### Low Pressure Flushing (Hot Water)

Low pressure hot water flushing (<50 psi) aims to mechanically loosen and flush heavy concentrations of oil that have become stranded on irregular rocky shoreline. Hot water is generally more effective than ambient for mobilizing stranded oil however hot water will

likely increase the adverse impacts from cleaning upon the localized intertidal biological resources. The mobilized oil is typically collected using sorbent materials as the oil floats free with the rinse water. The soiled sorbents are then bagged and disposed of. This task is accomplished by using trash pumps to draw water from the ocean and then passing it through a heating unit. The hot water is then sprayed through a low pressure nozzle directly onto the oiled substrate. Nozzle pressure must be controlled to mitigate negative impacts to attached intertidal organisms.

Evaluate this method for efficacy by staging an on-scene demonstration to determine the best equipment combination of pumps, hoses, temperature, and nozzle for each of the various substrates to be flushed before use approval is given. During the demonstration the equipment pressure, temperature, and flow should be manipulated to determine the most suitable combination to achieve an acceptable level of oil removal. If the method is not effective at removing oil within environmentally acceptable parameters then the method should not be authorized for operations.

### High Pressure Flushing (Hot Water)

High pressure flushing can cause erosion of some substrates and dislodge attached intertidal organisms. With the addition of hot water this method is generally discouraged for response work at the CNM. The use of high pressure and hot water flushing is likely to be more harmful initially and may also require a significantly longer recovery period than would occur by simply allowing natural recovery. The degree and type of oiling are important considerations and the method might be acceptable in limited shoreline areas specifically on heavily oiled riprap that has minimal habitat value.

### Steam Cleaning

Steam cleaning contaminated surfaces should be limited to man-made structures such as concrete surfaces or rip-rap revetments. This method is somewhat effective at removing residual staining left behind by less aggressive cleaning methods however, it is not a commonly employed response technique for natural or biologically sensitive sites. Any proposed steam cleaning operations would need to be carefully evaluated before this method is used.

### Sand Blasting

Sand blasting is not an acceptable response method for spill cleanup on or around tide pool communities in the CNM. It offers no beneficial advantage to steam cleaning or any other technique.

### Solidifiers

Solidifiers can be used in California only with Regional Response Team (RRT) approval on a case by case basis. CDFW-OSPR is working on pre-approval for those brands marketed in contained forms such as Rubberizer® and similar products however pre-approval is not yet

available. Solidifiers work best with relatively large quantities of refined petroleum products such as diesel fuel. One of the important properties of solidifiers is the capability of collecting sheen as well however this requires relatively quiet water conditions and a “soak” period. Standard sorbents have no effect on sheen. While the use of some types of solidifiers may have a practical application for a response effort at CNM, their use is conditional on RRT approval.

### Shoreline Cleaning Agents

Shoreline cleaning agents are a specialized category of products that must be approved by both the US EPA and the State before they can be applied. Their use is regulated on a case by case basis (like solidifiers) and must be approved by the RRT. While it is possible that a limited scope of utility might be recognized under a specific set of circumstances during a CNM response effort, this option will be given serious spill specific scrutiny before it is approved for use on a spill in California.

### Nutrient Enrichment

The application of fertilizer to contaminated substrate can stimulate and accelerate the growth of natural oil eating bacteria and “kick start” the bacterial degradation of residual oil however, the nutrients must be able to remain in contact with the target population of bacteria. Given tidal fluctuation on a high energy coastal setting the prognosis for a successful outcome is poor.

### Natural Microbe Seeding

Application of seed bacteria is a potential accelerant to the degradation of residual oil. The high energy setting and tidal fluctuation may reduce the success of nutrient enrichment, limiting the success of this method.

## Oil Clean-Up Matrices Adapted From the ACP

The National Park Service at CNM is concerned not only with the impacts of an oil spill but also with the impacts associated with cleanup activity. Therefore the National Park Service wishes to utilize response cleanup strategies that will minimize secondary damages while achieving the most efficient removal of contaminates. The CNM shoreline habitat is recognized as both highly dynamic and environmentally sensitive. Response planning should utilize methods appropriate for the impacted habitat to achieve a restored shoreline capable of supporting and sustaining marine intertidal flora and fauna.

This section incorporates the four cleanup matrix tables found in the San Diego Area Plan associated with floating oil types. The tables have been modified in two ways:

1) to include only those ESI shoreline types present at CNM and
2) to prioritize the methods deemed appropriate and acceptable to the Park Service with respect to the CNM shoreline habitat (Tables 2, 3, 4, & 5).

While some adjustments may be appropriate in the event of a cleanup effort the focus should be to adhere to these preferred methods. *Any deviation should be undertaken only with the advice and consent of the National Park Service*.