Chapter 3000

Operations
Operations

3100 Operations Section
All incidents begin with operations. The Operations Section Chief must be both tactically competent in responding to the incident that they are responding to and possess a thorough understanding of the Incident Command System (ICS). Some of the primary responsibilities of the Operations Section Chief include:
- Manage tactical operations
- Ensure tactical operations are conducted safely
- Maintain close communications with the Incident Commander/Unified Command
- Identify required tactical resources to accomplish response objectives
- Identify staging areas
- Assemble & disassemble strike teams and task forces
- Assist in the development of the Incident Action Plan

3200 Wildlife Branch
The primary purpose of the Wildlife Branch is to provide the best achievable care for impacted wildlife and to minimize wildlife losses, which includes preventing injury to wildlife or habitats from both the oil and from the implementation of response countermeasures. It is the policy of the Northwest Area Committee (NWAC) that representatives of the U.S. Fish and Wildlife Service (USFWS) will assume the positions of Director and Deputy Director of the Wildlife Branch. State Fish and Wildlife representatives will assume these positions if a USFWS representative is not available, or if designated by a USFWS representative. This designation may be made on a case-by-case basis or through a pre-existing agreement. Appointment of other parties, including Tribal representatives, Responsible Parties representatives, or others to one or both of these positions may be made by a USFWS representative or their designee at any time during an incident, and for such periods of time as may be deemed appropriate. Unless otherwise indicated by USFWS, the Wildlife Branch Director position will be delegated to the Washington Department of Fish and Wildlife for spills that occur within the legal boundaries of Washington State.

The Wildlife Branch is responsible for the implementation of the Wildlife Response Plan for the Northwest Area found in Section 9310, of the Northwest
Area Plan. Wildlife Response Tools are in Section 9311. The Wildlife Response Plan describes the roles, responsibilities, and duties of the Wildlife Branch and associated personnel in detail. The Wildlife Branch is responsible for ensuring compliance with applicable Federal and State wildlife laws and mandates. Trustee agencies provide input into the selection of response methods used so that wildlife operations comply with each trustee’s governing laws and their obligations to preserve and protect wildlife and habitat. During a spill response, the wildlife trustee agencies will advise the Wildlife Branch about local wildlife resources, sensitive species or habitats, logistical considerations, and other issues that arise. Indian Tribes retain sovereign authority to manage wildlife resource issues within reservation boundaries. Consultation and coordination is necessary with Tribal governments whose lands may be impacted by an oil spill.

The Wildlife Branch will be activated when either a Federal or State trustee agency, responsible party or the Unified Command determines that an oil spill is in the vicinity of wildlife resources (mammals or birds), or has a trajectory that puts wildlife resources at risk. Activities associated with the activation of the Branch will be appropriate to the size of the spill. Activation of personnel and equipment is based primarily on anticipated adverse effects on wildlife. On every spill response, the first action of the Wildlife Branch must be to deploy trained observers to the spill site to determine the extent of the initial and anticipated wildlife impacts in a timely manner. The ability to effectively determine the size and scale of the wildlife response is highly dependent on getting trained observers on-scene quickly. The Wildlife Response Plan in Section 9310 of Chapter 9000 describes specific response strategies for oiled birds and sea otters as well as deterrence and monitoring options for killer whales.

Depending on the size of the incident, the Wildlife Branch may range in size from just the Branch Director position to full activation of the organization displayed in Figure 3000-1, including the associated equipment and personnel resources. Within the Wildlife Branch there are three Groups: The Wildlife Reconnaissance Group, the Bird Recovery & Rehabilitation Group, and the Mammal Recovery & Rehabilitation Group. The Wildlife Branch coordinates and manages the activities of all personnel in the Wildlife Branch who are under the authority of the Unified Command during a spill response. These include federal, state, and local agencies along with commercial and non-profit organizations responsible for wildlife.
The Wildlife Branch, working for the Operations Section Chief, will develop operational strategies, tactics and resource needs for operations activities for the Wildlife Branch in the Incident Action Plan. Wildlife Branch activities affect and interact with numerous other sections of the Incident Command and it is important that good communications are established and maintained between the Wildlife Branch and other responders. In particular, coordination between the Wildlife Branch and the Environmental Unit, a part of the Planning Section, is essential. The Wildlife Branch is responsible for providing information to the Unified Command, the Planning Section, and the Public Information Officer/Joint Information Center relative to the daily numbers of live and dead animals and their status.

Worker safety must be considered before any wildlife response effort is conducted. Therefore, all Wildlife Branch activities must conform to the Site Safety Plan for the response. Additional safety requirements may be included in
an incident specific Wildlife Branch Safety Plan. Appropriate bio-security measures will be utilized to reduce the risk of transmission of infectious diseases between wildlife and personnel during an oiled wildlife response.

Upon conclusion of Wildlife Branch operations, its activities are demobilized following the standard checkout procedures identified through the ICS and the Unified Command. Demobilization of the Wildlife Branch often lags behind that of other response operations for several reasons, such as animals remaining in rehabilitative care, the presence of residual oil, and the presence of visibly oiled pinnipeds and free-flying birds.

More detailed information concerning the responsibilities of the Wildlife Branch can be found in Section 9310: Wildlife Response Plan.

3300 Tactical Response Options
The Operations Section in coordination with the Planning Section develops the specific tactics for response strategy implementation.

3310 Situation Assessment
Note: At any release where the lead agency determines that there is a threat to the public health or welfare or the environment, the lead agency may take appropriate removal action to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release, or the threat resulting from that release (NCP, Section 300.415(b)(1)). At releases determined to pose a substantial threat to public health or welfare, the FOSC must direct a response to the incident.

The following checklist is intended to be used as a guideline of considerations to be referred to when developing tactical response options/strategies. This list is NOT in order of importance and may not apply to every situation. The checklist does not limit the Operations Section from choosing response options/strategies that are not listed.

- Evaluate if special circumstances exist requiring special action
  - Health and Safety Issues
  - Fire and/or Explosions (see Gasoline Response Policy Section 4650)
  - Requirements for Access Limitations (Barricades, Security Fences, etc.)
  - Vessel Collision
  - Vessel Groundings
  - Lightering Operations
  - Salvage Operations
  - Vessel Traffic Blockages
  - Sample collection and analysis for evaluation or source determination

- Implement support infrastructure
  - Determine response structure consistent with Unified Command System principles that will be used, and from there determine level of support needed to fill positions in the structure (see Unified Command
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System discussion in Chapter 2000) which include Finance/Admin, Logistics, Operations, and Planning.

- Implement Geographic Response Plan for location based on real time information and protection strategy effectiveness (See Planning Chapter 4000, Section 4400; http://www.rrt10nwac.com/GRP/Default.aspx).
- Determine and mobilize personnel necessary for initial response efforts
- Mobilize equipment: refer to http://www.wrrl.us
- Coordinate volunteers (See Chapter 4000)
- Identify initial resources at risk using GRPs or any other source of information available (See Chapter 4000, Section 4400)
  - Natural Resources – Fish, wildlife, habitats and Endangered Species Act (ESA) Issues (See Chapter 4000, Section 4314)
  - Cultural Resources – Initiate contact with a State Historic Preservation Officer (See Chapter 4000, Section 4313, NHPA: http://www.achp.gov/overview.html#top)
- Socio-economic Resources
  A. Critical Infrastructure
     - Drinking water intakes
     - Energy/Power generation intakes, Lock & Dams
     - Federal/State irrigation agricultural channels and water projects
  B. Water Dependent Commercial Areas
     - Industrial intakes
     - Agricultural irrigation intakes
     - Aquaculture
     - Marinas
     - Commercial fishing and shellfish harvest areas
     - Federal/State and private fish hatcheries
     - Specially designated residential, commercial and industrial areas (ex. Floating homes and live aboard marinas)
  C. Water Dependent Recreational Areas
     - Boating
     - Public recreational areas
     - Sport fishing
     - National/State/local parks and beaches
     - National seashore recreational areas
     - National river reach designated as recreational
- Notify and coordinate with Natural Resource Trustees (See notification section for contact information; in the state of Washington contact the Washington Department of Ecology).
- Coordinate with Federal and State Natural Resource Damage Assessment (NRDA) personnel (See notification section for contact information, in the state of Washington contact the Washington Department of Ecology)
3320  Containment and Cleanup
The following is a checklist intended to be used as a guideline of considerations to be referred to when developing tactical response options/strategies. This list is NOT in order of importance and may not apply to every situation. The checklist does not limit the Operations Section from choosing response options/strategies that are not listed.

Refer to “Characteristic Coastal Habitats: Choosing Spill Response Alternatives” Job Aid at http://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/resources/characteristic-coastal-habitats.html, Chapter 4000 Section 4600, and Chapter 9000 Section 9420 “Northwest Area Shoreline Countermeasures Assessment Manual” for detailed information on the listed options/strategies

- Natural Recovery (Which may include setting aside areas for research purposes and countermeasures effectiveness determination. Recognize that identifying set-aside sites involves a complex matrix of scientific, logistical, legal, and public relations issues.)
- Booming and containment (See Gasoline Policy Section 4660)
- Skimming (See Gasoline Policy Section 4660)
- Barriers and Berms
- Physical herding
- Manual Oil Removal/Cleaning
- Mechanical Oil Removal
- Sorbents
- Vacuuming
- Debris Removal
- Sediment Reworking/Tilling
- Vegetation Cutting/Removal
- Flooding/Deluge
- Dispersants (Chapter 4000 Section 4620 and http://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/resources/smart.html)
- In-Situ Burning (Chapter 4000 Section 4610 through 4630 & Chapter 9000 Section 9630 In-Situ Burn Policy Manual)
- Decanting (Chapter 4000 Section 4650)
- NMFS Biological Opinion for oil response

A critical element to containment and cleanup is to monitor the strategies/tactics that have been implemented for effectiveness and efficiency. It is also important to discuss and develop criteria/guidance for terminating the cleanup (e.g., How clean is clean?).

3320.1  Gasoline and Other Flammable Liquids
Spills of gasoline and other flammable liquids, including many crude oils, pose
significant response challenges as well as serious health and safety concerns for responders and communities downstream and downwind from the release. Gasoline range products are finished gasoline’s and volatile hydrocarbon fractions used for blending into finished gasoline, including straight-run naphtha, alkylate, reformate, benzene, toluene, xylene, and other refined petroleum products with a flash point below 100 degrees F (37.8 deg. C). When these types of products are spilled into the environment, it is imperative to take immediate steps to control the source of the release (where safe), to eliminate all possible ignition sources, to quickly establish isolation distances, to notify regulatory and local response agencies, and to initiate a preliminary site safety plan prior to any response activities. However, it is essential that no personnel enter a potentially unsafe environment prior to an initial safety assessment, including vapor monitoring for flammable, reduced oxygen, and toxic levels.

In many cases, highly flammable liquids should not be contained for spill response. Containing gasoline and other highly flammable liquids increases the risk of fire by delaying dispersion of vapors into the atmosphere. The risks posed by response techniques such as booming and applying foam to spilled gasoline and other flammable liquids are warranted only under very limited circumstances. However, in some cases and as judged by the Federal On-Scene Coordinator, Incident Command, or Unified Command, containment and the use of foam may be appropriate and necessary in response to an imminent threat to public health and safety and the environment. Deflection and protection booming can be used to move flammable liquids away from sensitive areas but must be conducted in a safe manner, within safe atmospheric levels. In unaffected downstream or down current areas at risk, boom should be deployed prior to arrival of the product. Though mechanical recovery of flammable liquids on water can be an effective practice under some circumstances, often the more prudent response option is to allow flammable liquids to evaporate and dissipate.

Given the inherent danger of booming flammable liquids on water, as well as the products’ rapid rates of evaporation and dissipation, the Area Committee adopts the following guidelines for responding to gasoline and other flammable liquid releases on water. **Note that these are only guidelines. Each release must be evaluated based on its particular circumstances. Safe work practices and professional judgment should always prevail:**

- Control the source of flammable liquids as quickly as possible, when safe to do so.
- Ensure that proper safety precautions are taken to prevent accidental ignition and risk to responding personnel and the general public. An evacuation may be warranted under some circumstances. In many cases, the best response option may be to allow the spilled product to spread and evaporate.
- Notify emergency and regulatory response agencies. Involve local fire jurisdictions immediately.
- Ensure proper site hazard analysis and risk assessment are conducted to
determine the scope of the release and initiate the development of a Site Safety Plan.

- Establish control zones as soon as possible. Track and predict movements of both liquid and vapors and re-establish control zones as appropriate.
- Eliminate all potential ignition sources within appropriate control zones.
- Prevent entry of the spilled product into waterways, sewers, or confined areas.
- Conduct air monitoring throughout the response.
  - NOTE: Air monitoring must be conducted with the greatest of care. Air monitoring both increases the exposure danger to responders and introduces possible accidental ignition sources. Nearby population centers should be monitored, as should the leading edge of the vapor cloud. However, in open water areas it MAY make more sense for responders to stay away from the concentrated area around the spilled material. In any area that is being monitored, the monitoring should be conducted continuously, if possible. Also, only direct reading, intrinsically-safe, continuously monitoring instruments should be used. Lower explosive levels (LEL), oxygen, H₂S and benzene levels should all be monitored.
- Coordinate response efforts with all agencies – work within a Unified Command.
- Identify and prioritize environmental concerns. Conduct exclusion, deflection, and protective booming downstream or down current as appropriate, outside of hazardous atmospheres and prior to the arrival of the released product.
- Workers should avoid touching, walking, or boating through the spilled product.
- Avoid prolonged inhalation exposure to fumes. Consult appropriate reference guides for exposure limits.
- Allow the product to evaporate and dissipate unless there is an imminent threat to public health and safety.
- When appropriate, use fire monitors/water fog spray to move product out from under docks and other collection areas where the product concentrates.
- Stage firefighting foam (appropriate to the type of flammable liquid released) and application equipment, if appropriate.
- All equipment used when handling the product must be grounded.

### 3320.2 Submerged or Sinking Oils – Policy and Operational Tactics

In the Pacific Northwest Group 5 oils are moved over the water, over highways and rail corridors, and stored in above ground storage tanks. In addition, oil sands products which are moved by vessel, pipeline and rail, may differ from other crude oils in the rate at which lighter ends of the mixture volatilize, particularly in warm...
weather. As a result spills of oil sands products may be potentially submerged or sinking, especially under high-flow and high-sedimentation conditions. It is the policy of the RRT X that communication of the potential for sinking oil must again be brought to the attention of the Unified Command at the Initial UC Meeting.

The difficulty in ramping up to detect and recover Group 5 oils in the water column or on the sea bottom is no small logistical / operational matter. For spills of Group 5 oils, or other oil products where submerging or sinking is a concern, the Northwest Area Committee considers these best practices for the Operations Section

- Recovering oil in fast-moving water is difficult, as oil tends to flow under containment booms and skimmer efficiency is greatly reduced, necessitating more rapid responses further downstream. In these situations, the Coast Guard recommends installing underflow dams, overflow dams, sorbent barriers, or a combination of these techniques.
- Develop detection strategies potentially using sonar, divers / cameras, ROV/camera, aircraft, photo bathymetry, diaper drops, dragnet, snare drops, and side-scan sonar.
- Containment strategies consist of using bubble curtains, water jets, surface-to-bottom nets/screens, silt curtain, and natural collection sites.
- Recovery strategies consist of using diver directed oil recovery operations, remotely operated vehicles, dredges, vacuum systems, integrated video mapping systems, nets, sorbents, bioremediation and pre-spill surveys.
- Consider expanding the ICS Structure to include Oil Detection Groups, Sinking Oil Recovery Groups and Sinking Oil Divisions.

Refer to section 9412 Non-floating oils response tool for details on response techniques, equipment capabilities, and considerations for non-floating oil spill response.

3320.3 Operational Safety Issues Associated with Bakken Crude Oil

Because of the presence of up to 30 percent (by volume) light volatiles in Bakken Crude oil, the potential for fire and explosion is the single largest risk to responder and public health. Accordingly, extreme caution should be exercised during the initial stages of response. Operations should refer to general response guidelines are from the 2012 Emergency Response Guidebook prepared by the U.S. Department of Transportation – Pipeline and Hazardous Materials Safety Administration and Transport Canada.

3320.4 Fast Waster Oil Spill Response

Oil spills in fast moving water above one knot require special tactics and can be difficult to control and recover due to the ease at which oil mixes with water and entrains under booms and skimmers. Fast currents also make deploying equipment and maneuvering on the water very difficult and dangerous due to the high forces exerted on boats and recovery equipment. Fast water accelerates many spill processes necessitating quicker and more efficient responses compared
to stagnant water or slow moving current conditions. More experience and skill is needed to successfully complete responses.

For the purposes of the NW Area Contingency Plan, “fast water” shall be defined as any current above 1 knot. Oil may begin to entrain under a boom at 0.7 knots, however, it is unrealistic and unnecessary to be that exact when responding to an oil spill. Therefore, we will use the more generalized 1 knot to define fast water. Areas of fast water exist throughout the NW and include Puget Sound, Straits of Juan de Fuca, the Columbia River, Harrow Straits, and most rivers. In general, fast water spill response uses the same equipment as slow water spill response, but it is deployed in ways that account for the current. Examples of this include setting boom on angles such that the oil flows along the boom rather than under it. The faster the current, the steeper an angle the boom must have to prevent boom failure. By setting up cascading booms, oil can be diverted away from sensitive areas or to containment or recovery devices near shore where currents are slower due to bottom frictional effects.

Rigging the angled booms can be time consuming. Additionally, the pressure put on the booms by the currents is substantial, and creates safety hazards. To conduct these operations safely and efficiently, it is critical that experienced responders be leading the deployment.

There are known “best practices” for responding in fast water, especially those challenging currents exceeding 2 kts. For example a 10” boom with a 4” skirt and 6” freeboard works best in fast water or that anchoring boom in fast water requires anchors and lines that can withstand 3,000 pounds of force. Additional fast water techniques and practices are applied as well.

There are some specialized pieces of equipment that are intended to improve fast water response.

A BoomVane™ is a device for deploying oil containment boom into rivers and other waterways by harnessing the power of the current. A cascade of vertical vanes under the wave-rider float are designed so that the current pulls the vane into the center of the channel, in current speeds of 0.5 to >5 knots. The system can be operated in waters with heavy traffic and debris. The light weight design and control rudder allows for easy retrieval and re-launching. The BoomVane™ can also be towed with a boat to operate a single vessel sweep system without the need for an outrigger arm. This piece of equipment can be used to hold one end a boom in the center of the channel instead of setting up rigging from the opposite shoreline. For more details, please visit http://www.elastec.com/oilspill/containmentboom/boomvane/index.php

Boom Deflectors are installed in between boom sections prior to deployment. The wing on the deflector is set at an angle against the water flow. As the water moves the deflector wing, the boom is also moved at an angle toward the shoreline. The speed of the current will determine the appropriate angle to set the wing. Faster currents will apply more force and therefore less angle on the wing is needed to achieve the desired results. The Boom Deflectors are made from aluminum and are 80 inches long and 16 inches high with a wing that is 60 inches
long and 12 inches high. Two people using the handles built in at the top can easily move a deflector. This piece of equipment can be used to hold boom at an angle and reduce the amount of rigging required. For more details, please visit http://www.nrcc.com/Services/Products/Pages/BoomDeflector.aspx

**NOFI Current Busters** are a combination booming and collection system that are intended to be towed by a single boat. This system uses two booms in a V shape that is underlain by a net to concentrate the oil. At the base of the V, the boom widens out again in a loop to create a quiescent zone which acts both as a collection area and an oil water separator. Current Busters come in different sizes and can handle currents of 3 to 5 knots. This equipment improves the ability to collect and recover oil that is moving in currents. For more details, please visit http://www.nofi.no/nofi-current-busterareg-technology.139608.en.html

The **DESMI Speed-Sweep System** is a heavy duty rubber boom recovery system designed to allow for the collection of oil at greater speeds. Once the pollutant has been collected at the cusp, a skimmer can be located at the apex and recovery can begin. The high efficiency DESMI Speed-Sweep System is designed to either connect to a Ro-Boom system or operate as an independent collection unit. It can be towed either between 2 vessels or 1 vessel with a jib arm or paravane. The Speed-Sweep can collect oil up to speeds of 3 knots which results in easier and quicker operations all round. This system allows the surface water and oil to be slowed by as much as 70%, which allows the oil to concentrate in the apex ready for collection. No head wave phenomena or planning will occur. For more details, please visit http://www.desmi.com/advanced-sweep-systems/speed-sweep.aspx.

The **MegaSecur Water Gate** is a water barrier is a technology which quickly stops the flow of a stream in order to create a water reserve, do aquatic work or stop the spread of a toxic spill. Recognized worldwide for its reliability, durability, ease to deploy, the WA category barriers adapt to all situations and all relief without exception. Models available for water depths from 15”-60”. For more details, please visit http://www.megasecur.com/water-gate-wa.

**Tactical Manuals:**
The US Coast Guard published two resources for fast water response. These remain the most commonly used manuals, and are available online with a web search:

  Available at: http://wildpro.twycrosszoo.org/000ADOBES/OilSpill/Spills_FastCurrent.pdf

- Oil Response in Fast Water Currents: A Decision Tool, USCG Research and Development Center, 2002, Report No. CG-D-03-03
3330 Monitoring Oil Movement

- Conduct over flights and collect detailed photographic, video, low visibility and/or infrared information
- Conduct computer modeling and develop oil spill trajectories. For support, contact the NOAA SSC 206-526-4911, see Chapter 9000, Section 9106.1 Federal Agency Response Partners: Roles and Contacts for more information about NOAA’s role in spill response.
- Conduct shore-side and on-water assessments to monitor proximity of spill to sensitive areas (Refer to “Shoreline Assessment” Job Aid at http://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/resources/shoreline-assessment-job-aid.html).

3340 Remote Sensing During Oil Spill Response

Many factors must be considered when contemplating the use of remote-sensing technology during an oil spill response. There are three basic arenas in which the sensors can operate.

Terrestrial platforms (land or water-based)
These platforms can support observers using visual means of detection, cameras (single frame, television, infrared, etc.), and/or radar.

Aircraft (manned helicopters, manned fixed wing, or drones)
These platforms can support visual observers, cameras (same as terrestrial), radar (of various types), infrared, lasers (of various types), microwave, and/or ultraviolet.

Satellites
These platforms typically use electronic detection means, mostly types of radar.

All sensor/platform packages provide different spatial resolutions, dwell times, on scene (“delivery”) times, planning requirements for use, swath widths, detection thresholds, analysis times and difficulty of data interpretation, false detection rates, weather limitations, and costs. Additionally, there are dramatic differences in each sensor's capabilities to accomplish specific tasks. Of interest to the response effort are such things as slick size, description, and movement; relative oil thickness; location of the thickest oil; type of oil being observed; etc. Also, various environmental conditions have a bearing on the sensor. For example, darkness, fog, rain/snow, sun location, and cloud coverage, etc. are important considerations.

The geometry of the situation also plays an important role. A sensor at high altitude is able to “see” a larger area, but typically at a lower resolution than would be obtainable by a platform operating at a lower altitude. Also, many sensors, including visual, lose detection capability at certain acute angles.

In general, increased capability comes with increased cost. At the high end, these costs can be extraordinary. Also, no single sensor package will give all the
information desired at a given spill under all conditions. At the high end, the very sophisticated laser based sensor packages MAY be able to give more information; however, most of the information is merely "nice to know" and is of little value to the actual response. For instance, absolute oil thickness is of little value added if a much less expensive sensor will provide a sufficiently reliable estimate of relative thickness for the purpose of guiding response actions. Also, classification of the oil type and characteristics would likely be of little value when such information can be easily obtained from the spiller or from the first responders on scene.

Region X currently has access to the following remote sensing tools:

**Terrestrial**
In addition to visual observation (mostly from a vessel), USCG Sector Seattle Joint Harbor Operations Center (JHOC) has the capability to view various camera feeds throughout the marine waters of northwest Washington using the Sensor Management System. This system is a joint USCG/USN application that captures federal, state, local and port partner sensor feeds and vessel track data throughout this area displaying them on a global information system display. This system also includes optical and infrared cameras.

In the event of a significant spill, the FOSC has the ability to contact the JHOC where one of the 24-hour watch standers can view the affected area on the Sensor Management System, giving a broader view of the spill and any hazards that might be present that can't be seen from the shore perspective.

**Aircraft**
In addition to customary visual observation from helicopters and fixed wing aircraft, the following are available:
- King County Sheriff helicopter with infrared capability.
- Washington State Patrol fixed wing aircraft with infrared capability.

**Satellite**
Both commercial and military platforms exist.

A literature search reveals the following sensor technologies, each with its own set of capabilities and limitations that could potentially be useful for oil spill response. The NWAC Science Response and Technology Workgroup will study these sensors in greater depth for inclusion in future updates to the Northwest Area Contingency Plan.
- Next generation infrared
- Ultraviolet
- Microwave
- Laser
- Laser-acoustic
Various satellite platforms

3350 Dispersants

According to the NCP, for areas that are not Pre-Authorized or No-Use Zones, (as described in Chapter 4640) the FOSC must request approval for the use of dispersants from the RRT, in particular – there must be concurrence from the affected state and the EPA, with consultation with DOI and DOC, for areas not already pre-approved.

In preparation for RRT approval, typically the Unified Command will trigger a process to evaluate the applicability of dispersant use for the specific conditions of that incident, by setting that as an objective. During the time that the Environmental Unit is following its procedures (Chapter 4640) for evaluating whether dispersant use is appropriate for the specific incident, the Operations Section should also be conducting its own preparations, described in further detail below.

The types of oils typically produced or transported in Washington offshore waters are oils imported from Alaska such as Alaska North Slope Crude oil, or oil imported from foreign countries into northwest ports; oils from Canadian sources which include Alberta crude and diluted bitumen; and a range of fuel oil types that could be spilled from a variety of marine industrial activities (e.g., fuel tanks from ships, cargoes of small tankers).

Dispersants typically work best on spilled oil with a relatively low viscosity at the time of treatment and when there is wave energy to mix the dispersant into the oil. Viscous and emulsified oil typically may not disperse as effectively as fresher oil, even with sufficient mixing, so the window of opportunity for application of dispersants is small and therefore all preparations, authorizations and logistics must be undertaken as expeditiously as possible while ensuring thorough adherence to all appropriate regulations and notifications.

Dispersants are applied typically using either a vessel or aircraft-mounted spraying unit. Spray systems need to be able to apply the appropriate dispersant dosage in droplets that are the appropriate size. Droplets that are too small can be subject to wind drift; those that are too large will pass right through the oil slick. Both the flow rate and the droplet size are a function of the spray bar pressure and nozzle type. Application systems should be calibrated prior to use, preferably with the specific dispersant type to be used. This determination should be made in the OPS Section during the preparation for the RRT Dispersant use approval decision. More details below.

Approved dispersants are listed in the National Contingency Plan Product Schedule (http://www.epa.gov/oem/docs/oil/ncp/schedule.pdf) as per Subpart J of the National Oil and Hazardous Substances Pollution Contingency Plan. In the Northwest, dispersant stockpiles are maintained by some of the OSROs.
As a best practice and if time allows, before dispersant applications proceed, a small test should be conducted where dispersants are sprayed on a portion of the slick. Once dispersant operations are underway, a monitoring/observation program should be established to monitor the safety of operations, and observations of wildlife in the area, in addition to SMART monitoring of the effectiveness of the application.

Operations will develop Daily Operational Plans using these guidelines as a minimum:

- Dispersant must only be applied by experienced spray applicators and in accordance with manufacturer instructions.
- The persons applying dispersant are responsible for the calibration and operation of the spraying system, and the safety and maintenance of the application platform.
- Droplet size is the key variable influencing dispersant effectiveness. Undersized droplets (e.g., fog or mist) will be lost through drift and evaporation. Oversized droplets will punch through the oil and be lost in the water column.
- Only undiluted concentrate dispersant is applied from aircraft. Dispersant should, where possible, be applied into the wind and parallel with the slick.
- Dispersant should be applied in a methodical and continuous manner to ensure the entire target area is treated.
- Spraying effort should concentrate on the thickest sections, and/or the leading edges, of oil that threaten sensitive areas. Use visual observation or remote sending to locate the thickest concentrations of oil.
- Thick portions of the slick may require several applications.
- Oil sheen should not be sprayed with dispersant.
- In general aerial application is preferred over vessel application. The altitude of the aircraft should be as low as possible.

Dispersant applications must be monitored to confirm whether or not dispersant use is effective. The Special Monitoring of Applied Response Technologies (SMART) Protocols are the accepted protocols for monitoring dispersant applications and should be utilized (http://response.restoration.noaa.gov/sites/default/files/SMART_protocol.pdf). However, dispersant applications should not be delayed simply because monitoring is not in place. The policy of the RRT is that visual observation (Tier 1 of SMART) is the minimum level of monitoring during a dispersant application. Once a dispersant application operation is a potential option, OPS should immediately request deployment of the USCG Strike Team to the spill site if dispersant use is likely. The Strike Team maintains monitoring capabilities for SMART monitoring and can typically deploy a team within 2 hours of notification. The USCG FOSC will typically deploy the Strike Team.
A decision to end dispersant application due to poor effectiveness should ideally be based on SMART monitoring results. Review all aspects of the application and monitoring for possible reasons why dispersant application may be ineffective including:

- Dispersant formulation
- Application ratios (increase or decrease oil: dispersant ratio)
- Application methods
- Monitoring methods
- Interpretation of monitoring results
- Oil weathering
- Weather conditions

Further details on the process of how the SMART field data should be interpreted and utilized to make decisions on adjustments to or termination of dispersant application can be found in the SMART Manual (http://response.restoration.noaa.gov/sites/default/files/SMART_protocol.pdf).

3360 Shoreline Cleanup
Under certain conditions it will be appropriate to take actions to remediate the effects of oil on shorelines. Other conditions may dictate that no actions should be taken. The primary goal of the implementation of any shoreline countermeasure is the removal of oil from the environment with no further injury or destruction to that environment, ideally to help enhance the treated area’s ability to recover.

In order to best assess and determine the appropriate treatment options for affected shoreline, the Shoreline Cleanup Assessment Technique (SCAT) provides a comprehensive program of assessment, monitoring and treatment recommendations for affected shorelines. On US Coast Guard spills, SCAT is typically run from the Environmental Unit within the Planning Section. EPA may choose to run this from within the Operations Section for inland spills.

Once a spill occurs, typically the Environmental Unit will commence the development of a SCAT plan within the first day of a response, and OPS will need to coordinate with the SCAT Coordinator to ensure appropriate interaction on the shoreline assessments and treatment recommendations with the shoreline cleanup tactics being undertaken. The SCAT program and process typically leads the development of the Treatment Endpoints for shorelines, which will guide OPS for when their work on shorelines is complete.

Access to Shorelines for Cleanup
Access to shoreline areas may be accomplished from the water, land, or air. Deployment from the water usually involves using shallow water platforms such as landing craft and skiffs. Access from a land-based response utilizes trucks, ATV’s, or other four-wheel drive vehicles, while access from the air may be possible by helicopter. For coastal spills in the Pacific Northwest, access by air to
some remote regions may be the only option. In some cases, permission for entry onto private property must be obtained first.

Passive Oil Recovery
Shoreline clean-up is usually carried out in stages, starting with the removal of the heaviest accumulations of oil which reduces the risk of recontamination by floating oil. Passive Recovery can be applied to shorelines that have already been oiled to help keep the re-mobilizing oil from refloating and migrating to other non-impacted shorelines. Passive recovery can be deployed along shorelines prior to shoreline assessment occurring. Passive recovery can also be used to line the inside of containment, diversion or exclusion boom as an effective collection technique.

Shoreline cleanup operations can produce a significant solid waste stream; all wastes generated must be measured, stored, and disposed of according to the approved Disposal Plan (Chapter 9000).

3370 Removal and Disposal
NOTE: Ensure adequate disposal of released substances. Moving of hazardous substances off site must comply with regulations promulgated under the Resource Conservation and Recovery Act (RCRA). Under certain circumstances, some of the procedural requirements of the RCRA regulations can be waived. The specific circumstances are described in the RCRA regulations. (Refer to Chapter 4000 Section 4315 for RCRA Guidance)

- Outline disposal plan, prepared with the Environmental Unit and in accordance with the disposal guidelines found in Chapter 4000, Section 4337 and Chapter 9000, Section 9405 (Washington State Only).
- Comply with Federal, state and local disposal laws/regulations
  - Obtain necessary permits
- Determine the volume of oil or hazardous substance for disposal and possible recovery credit
- Take measures to minimize waste
  - Segregate clean from contaminated waste
  - Line storage area to contain contaminated waste
- Identify disposal locations (onsite vs. offsite)
- Secure transportation for product disposal

3380 Demobilization
- Complete final survey
- Clean/return equipment
- Survey/replace equipment
- Restore damaged areas in consultation with appropriate Natural Resource Trustees and property owners
3390 Salvage
Before, during and/or after an oil spill, or potential incident, salvage assistance may be required. A salvage plan may be developed within the response organization for, but not limited to, vessel stranding, vessel sinkings and rescues (towing). The IC/UC will review and approve or disapprove the salvage plan based on the resulting risk to human life, port security and the environment.

Initial rescue efforts will have priority over pollution response efforts, to the extent that they may interfere. Subsequent to any rescue efforts, the pollution response efforts and salvage efforts may be conducted concurrently. The On Scene Coordinator will prioritize actions when interference between salvage and pollution response efforts cannot be eliminated.

Coast Guard Captains of the Port have jurisdiction over vessel salvage; this does not preclude any other agencies’ interests with respect to spill prevention or response. Washington Department of Ecology would normally be part of the Salvage/Source Control Group.

For general guidelines to follow in responding to an incident that requires salvage operations refer to US Navy Salvage Manual Volume 1 –6 http://www.supsalv.org/00c2_publications.asp?destPage=00c2&pageId=2.6 and Chapter 5000 Section 5614 for Resource Listings.

For additional Salvage Guidance see the Sector Columbia River or Sector Puget Sound Salvage Annex to the Marine Transportation Security Plan. For specific salvage resource lists also see the Western Response Resources Inventory at http://www.wrri.us/.

Contacts for Salvage References and Support:
- Navy Supervisor of Salvage:
  - Supervisor of Salvage Operations (202) 781-2736
  - After hours and weekends (NAVSEA Duty Officer) (202) 781-3889
  - Switchboard (202) 781-1731
  - http://www.suposalv.org

SUPSALV can provide the services of naval architects, may provide the services of naval salvage vessels, and has access to contracts, which will provide the services of commercial salvers and equipment. SUPSALV developed and has available software for rapid analysis of longitudinal strength and intact/damaged stability; the software is known as Program of Ship Salvage Engineering (POSSE).
- US Coast Guard Marine Safety Center Salvage Team:
  - During business hours: (202) 327-3985
    Duty e-mail: SERT.Duty@uscg.mil
3000  Operations

— After hours contact the USCG Headquarters Command Center: 
   (202) 327-3985

US Coast Guard Marine Safety Center Salvage Emergency Response Team (SERT) can evaluate vessel stability, hull strength, and salvage plans, and may be available to go on scene. MSC may be able to provide vessel plans, if the ship is U.S. flagged.

□ US Army Corps of Engineers:
   — Vessel PUGET Supervisor: 206-498-8795
   — Vessel PUGET Captain: 206-399-0358

US Army Corps of Engineers can respond to floating logs, debris, and navigational hazards including derelict vessel up to 30 ft. in length. A majority of this response work is conducted by the vessel PUGET, a 104 ft. vessel with a 20 ton crane, typically moored at the Hiram M. Chittenden Locks in Seattle.

NOTE: Be prepared to provide the following information when calling for support: brief description of services required, location, urgency, point of contact, and telephone number. If the task is urgent and requires immediate mobilization, that fact should be clearly articulated and include a statement that funding will be provided by separate correspondence.

□ Washington Department of Ecology
   — Through Washington Department of Emergency Management (WEMD)
     24-hour number: (800) 258-5990
     Ecology can provide response and reviews of salvage or lightering plans.

3400  Responding to Rail Incidents

Parties that offer for transportation, accept for transportation, transfer or otherwise handle hazardous material for transportation via rail are required to have available at all times: the basic description and technical name of the hazardous material, immediate hazards to health, risks of fire or explosion, immediate precautions to be taken in the event of an incident or accident, immediate methods for handling fires, initial methods for handling spills or leaks in the absence of fire and preliminary first aid measures. They must also provide an emergency response (ER) telephone number of a person who is either knowledgeable of the hazardous material being shipped and has comprehensive emergency response and incident mitigation information for that material, or has immediate access to a person who possesses such knowledge and information. The ER number may be the number for the shipper, consignee, beneficial owner or a contract services provider (i.e. CHEMTREC). When a service provider is used, the shipper must register with the company and provide Safety Data Sheets and contact telephone numbers. During an emergency when the contract provider is called they will provide responders
with shipment information and will then contact the shipper and pass along the information. At this point the shipper would contact the first responders. More info on requirements can be found in 49 CFR 172 Subpart G.

In general, rail carriers transport products on lines that they own. However, there are a variety of agreements that allow carriers to operate on lines owned by other companies. Regardless of whose trains are operating on the line, the track owner is responsible for the Emergency Response phase of the incident. Once the emergency is over, cleanup or other monitoring work may be transferred to the transporter. Where trackage rights do not exist the shipment continues to destination after transferring the material at an “Interchange Point”. At this “Interchange Point” the responsibility shifts to the new line owner.

Currently there are no requirements for the amount of response resources a track owner must have in order to respond to an incident on their lines. Below is a summary of resources available to several rail owners operating in Washington, Oregon, and Idaho. The rail companies surveyed for this information were BNSF, Union Pacific, Genesee and Wyoming (Portland and Western Railroad, Puget Sound and Pacific Railroad), and Tacoma Rail/Tacoma Municipal Belt Line.

**Air Monitoring:** Air monitoring resources vary according to organization. The initial air monitoring may be conducted by the local first responders until additional resources arrive. The capabilities of these responders can vary depending on their location and resources available to them. This air monitoring would be used to inform responder and public safety decisions. Several of the carriers rely on their response contractors to provide air monitoring.

In general this air monitoring would be specific to cleanup operations and not necessarily to support public safety decision making. BNSF has a more robust air monitoring program that consists of a Tactical Toxicology program that is designed to provide air monitoring information to the incident. BNSF has the ability to cascade additional air monitoring equipment into the region as well as toxicologists and Industrial Hygienists. BNSF’s air monitoring program will support response activities and public safety decisions. Union Pacific has the same ability to bring in contractors that specialize in toxicology and environmental health to support public health and safety decisions. In all rail incidents the decisions regarding public safety will be made by the local Incident Commander/Unified Command.

**Resources for Fire Fighting:** In general resources for combating a fire from a train incident will come from local fire departments. One carrier, BNSF, has additional resources including foam trailers staged in Montana, Washington, and Oregon. BNSF also maintains contracts with private industrial firefighting companies. The other carriers do not have additional company owned resources or contracts for firefighting.

**Spill Response Equipment:** Rail owners all contract with at least one spill response contractor whose equipment they would rely on in an incident resulting in a spill. It is at the discretion of the rail owner as to how many cleanup
organizations they contract with. One company, BNSF, has company owned spill response equipment staged throughout the region. This equipment is listed on the Western Response Resource List (WRRL).

**Mutual Aid:** Resources can be shared amongst the different rail companies if available but there are no formal mutual aid agreements.

3500  **Reserved for Future Use**

3600  **Reserved for Use**