Recommendations for Conducting Cooperative Natural Resource Damage Assessment

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West Coast Joint Assessment Team

PREFACE

The purpose of this document is to provide guidance to state and federal natural resources trustee agencies (trustees) and parties responsible for oil spills or other pollution events (Responsible Parties) on how to: (1) initiate a cooperative natural resource damage assessment (NRDA) during an oil spill, and (2) move from the initial chaotic phase of response to a cooperative injury assessment as soon as possible. Although this document focuses on marine oil spills, the concepts expressed here could be used for any other incident requiring a NRDA.

This document summarizes the goals, key elements, and boundaries of cooperative assessments, with the objective of educating both trustees and responsible parties on the guiding principles for a successful cooperative assessment as envisioned by the West Coast Joint Assessment Team. The West Coast Joint Assessment Team (JAT) is an ad hoc group of representatives from various state and federal trustee agencies, spill response organizations, and representatives from the oil industry, including major and independent oil companies and oil transportation companies. The JAT was formed in 1996 to explore avenues for conducting cooperative NRDAs in the event of an oil spill. The JAT meets twice a year to discuss a variety of topics related to conducting cooperative assessments including collection of ephemeral data, injury assessment, NRDA case histories, recent developments in NRDA, available resources, and many more.

The active members of the JAT include:

- Alaska Tanker Company
- BP
- California Department of Fish and Wildlife, Office of Spill Prevention and Response
- Chevron
- Conoco-Phillips
- Kinder Morgan
- National Oceanic and Atmospheric Administration
- Oregon Department of Environmental Quality
- Oregon Department of Fish and Wildlife
- Pacific States-BC Oil Spill Task Force
- Shell Oil Company
- U.S. Fish and Wildlife Service
- Washington Department of Ecology
- Washington Department of Fish and Wildlife

These recommendations were initiated and developed jointly and collaboratively by industry and trustee agency representatives. It is important to note that these recommendations do not have the force of law and are not in any way enforceable, and do not necessarily represent the policies of the member entities of the JAT. These recommendations are solely intended to help the parties involved in a spill incident to understand the potential benefits and typical attributes of a cooperative effort. Specifically, they outline factors to consider early during the response phase of an incident to facilitate cooperation and expedite the damage assessment process. Guidance is provided for:

- Notifying NRDA Team members;
- Coordinating NRDA activities with the response unified command;
- Developing a coordinated NRDA organization, including command structure and technical working groups;
- Developing an interim cooperative assessment agreement;
- Conducting various ephemeral data collection activities;
- Managing data;
- Communicating NRDA activities to the public; and
- Including NRDA in response oil spill drills and exercises.

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Background

The Oil Pollution Act of 1990 (OPA), 33 U.S.C. § 2701 *et seq.*, establishes liability for cleanup costs and for damages for the restoration of natural resources and related services injured by oil spills. When a spill occurs, trustees may conduct a natural resource damage assessment (NRDA) to evaluate injuries to natural resources and determine the need for associated restoration actions. The NRDA process is conceptually simple but the quantification and restoration of oil spill impacts can be complicated from a technical and legal perspective. This factor, combined with the possibility of litigation, has historically led to an assessment process where both the Responsible Party (RP) and the trustees conducted separate and carefully guarded studies. However, these independent assessments were expensive and often led to drawn out and unproductive debates, and ultimately litigation, over the underlying technical issues and data. The adversarial experience of the Exxon Valdez damage assessment and other early cases led trustees and industry to seek alternative approaches.

Early experiences with cooperative assessments were mixed but mostly positive. Therefore, the National Oceanic and Atmospheric Administration (NOAA) promoted the concept of cooperative assessments in the 1996 regulations for conducting NRDAs under OPA (15 C.F.R. Part 990, § 990.14). NOAA believed that open and cooperative assessments are likely to be more expeditious and cost-effective. Furthermore, the end goal of restoration may be achieved earlier, benefiting the environment and all stakeholders by reducing interim lost services.

The regulations require that RPs be given the opportunity to participate in the damage assessment process and, when appropriate, to jointly conduct a coordinated and open damage assessment with the trustees. This has allowed trustees and RPs to negotiate satisfactory agreements for cooperative assessment which are now commonplace, but the extent of cooperation and the roles of the trustees and the RP vary by incident. Furthermore, while the regulations encourage cooperation, the guidance on the specific terms and nature of that cooperation is limited. This has also led to misunderstandings over the extent, timing, and degree of cooperation as well as delays in initiating a cooperative assessment and the collection of critical ephemeral data.

1.2 Overview and Organization of the Guidance

These guidelines were developed jointly and collaboratively by industry and trustee agency representatives. As guidelines they do not have the force of law and are not in any way binding to any party, and do not necessarily represent the policies of the member entities of the JAT. These guidelines are solely intended to help the parties involved in a spill incident to understand the potential benefits and typical attributes of a cooperative NRDA effort.

The sections that comprise the remainder of this document along with a brief explanation of their contents include:

- Section 2 Spill Notification - provides an example template that can be used to display contact information from the various trustee and industry representatives on a cooperative NRDA team.
- Section 3 Cooperative Assessment Process - details recommendations for conducting a cooperative assessment, including the benefits and available regulatory guidance.
- Section 4 Communication and Coordination - provides key elements to guide communication and coordination between the NRDA and spill response efforts.
- Section 5 NRDA Team Organization - summarizes command structures that can be adapted by the cooperative NRDA Team depending upon the size and scope of the spill.
- Section 6 Ephemeral Data Collection - outlines ephemeral or time-critical data collection activities that should be considered in the event of a spill.
- Section 7 Technical Working Groups – describes the use of Technical Working Groups as it applies to larger spills and in situations where spill-related cleanup and assessment activities are expected to take months or longer.
- Section 8 Data Management – provides guidance on managing large volumes of data and maintaining its integrity which also generally applies to larger spills.
- Section 9 Communication and Outreach - provides recommendations for early, closely coordinated communication and outreach to the public about NRDA activities.
- Section 10 NRDA Drills and Exercises - concludes with recommendations for including NRDA in response oil spill drills and exercises as a means to understand and practice the guidelines provided herein.

2.0 SPILL NOTIFICATION AND CONTACT INFORMATION

In the event of an incident, prompt notification and mobilization of the RP and trustee NRDA practitioner is critical in conducting a successful cooperative NRD assessment. To that end, contact information for the state and federal trustees with jurisdiction over potentially injured natural resources as well as contractors that can assist with the data collection and analysis should be compiled in advance. Contact information for industry representatives from a relevant JAT that can provide NRDA related mutual aid should also be included where applicable. The RP will typically make these notifications following the discovery of a significant oil or hazardous material release but a trustee can also initiate the process or work with the RP to complete the notifications.

The inclusion of the aforementioned contact list in NRDA pre- or oil spill response plans for industry facilities and operations will further facilitate rapid notification of the appropriate personnel to implement a cooperative assessment. Table 2-1 provides a template that can be used to compile trustee, contractor and industry representative contact information for inclusion in response plans or for general use by trustees and/or JAT members.

Table 2-1. Notification Contact Information

Information	**Trustee Agency**		
Name			
Title			
Office Phone			
Cell Phone			
FAX			
E-Mail			
Address			
Information	**Responsible Party**		
Name			
Title			
Office Phone			
Cell Phone			
FAX			
E-Mail			
Address			

3.0 COOPERATIVE ASSESSEMENT PROCESS

3.1 Cooperative Assessment Process

A cooperative natural resource damage assessment is one where the trustees and the RP are jointly involved in conducting one or more phases of the NRDA process, including natural resource injury assessment, restoration planning, and implementation. The degree of cooperation can vary, from simply sharing assessment plans and data, to a fully cooperative process where the trustees and the RP jointly design and conduct studies and work together to develop and implement a restoration program.

One of the key factors in a successful cooperative assessment is obtaining agreement from all parties on the principles that will guide the assessment process to reach the goal of restoration. Obtaining a common vision of the endpoint of the assessment and the process by which that endpoint will be achieved (e.g., how to evaluate the type and extent of injuries to natural resources and the scale of restoration projects) is critical in successful cooperative assessments. This common vision can be used as the basis for developing a framework to provide specific guidance on how the assessment will be conducted and restoration will be achieved.

Some potential elements or attributes of a cooperative assessment are provided below to assist in design and implementation of a successful assessment process:

- Timely funding provided by the RPs;
- Active participation by the trustee and RP representatives with decision-making authority;
- Open discussion of logistical needs and sharing of available resources;
- Joint development of injury assessment studies and restoration planning;
- Equal access by trustees and RPs to samples;
- Agreement on joint use of analytical laboratories and analysis protocols;
- Agreement on joint organization and management of data including real time access by both trustees and RPs;
- Joint selection and use of scientific experts;
- Unified approach to providing information to the public;
- Shared decision records (administrative record);
- Commitment to a shared common goal of timely restoration; and/or
- Timely execution of the participation and funding agreement and other documentation for the cooperative agreement.

Due to the legal framework of NRDA, the trustees and RPs may reserve the right to do independent studies but should agree to communicate with others about any such

studies. Studies conducted without the knowledge of the other party ("shadow studies") are discouraged as this will take away from the cooperative atmosphere and intent.

3.2 Benefits

There are many benefits to the cooperative process that have been shown on a wide variety of NRDA cases. The cooperative assessment can result in cost savings, reduce the potential for litigation and shorten the time to get to the goal of restoration. For example, a fully cooperative assessment would rely on a single set of studies, which increases the likelihood for reaching similar conclusions and of settling the case without litigation. The cooperative process should also include early discussions of restoration which can help to frame the size of the damage claim thereby facilitating settlement discussions. The benefits of settlement include time and cost savings and the opportunity to proceed more quickly to restoration. Hence, if technical consensus on injuries can be reached along with discussions of appropriate restoration, efforts can be shifted to restoration planning and implementing projects rather than preparing for litigation. Below is a summary of the benefits of a cooperative assessment:

- Allows both parties to conduct studies that neither may have the expertise or funds to conduct individually;
- Allows both parties to pool resources such as vessels, aircraft, laboratories, etc.;
- Develops trust and promotes a more open assessment process where data can be openly shared between parties, with the response agencies, academic researchers and the public; and
- Promotes an expedited assessment process that will likely be less costly than a non-cooperative damage assessment and provide for earlier restoration.

3.3 Regulatory Guidance

The nature of a cooperative assessment is up to the trustees and the RP to negotiate, but the OPA regulations (15 C.F.R. § 990.14) provide guidance as described below.

3.3.1 Timing and Duration (15 C.F.R. § 990.14(c)(2))

Trustees must invite identified RPs to participate in the assessment as early as practicable, but no later than the delivery of the "Notice of Intent to Conduct Restoration Planning" to the RP as required by the OPA regulations.[1] The invitation to participate

[1] Cooperative efforts often begin during the first few days of an incident but may not be formalized for several weeks or months and depend on:

- whether the RP has been identified;
- willingness of the RP to participate in the assessment;
- willingness of the RP to fund assessment activities;
- willingness and ability of the RP to conduct assessment activities in a technically sound and timely manner and to be bound by the results of jointly agreed-upon studies;
- degree of cooperation of the RPs in response to the incident; and
- actions of the RPs in prior assessments.

should be in writing, and a written response by the RPs is required to confirm the desire to participate. E-mail invitations and responses are generally discouraged but can be used if necessary. Cooperation need not be limited to the conduct of assessment studies; cooperative work can extend through data interpretation, restoration planning, and restoration implementation.

3.3.2 Control and Decision-Making (15 C.F.R. § 990.14(c)(4))

Although a cooperative NRDA process involves representatives from the RP and their contractors and consultants, the process is generally led by the trustees. The trustees retain the authority to determine to what extent an RP may participate, and trustees can terminate or limit RP participation if it interferes with trustees fulfilling their statutory obligations. The trustees are required to objectively consider all written comments, proposals or recommendations provided by the RP and, while the trustees will attempt to reach consensus with the RP, the final authority to make determinations regarding injury and restoration rests solely with the trustees.

3.3.3 Level of Participation (15 C.F.R. § 990.14(c)(4)), (15 C.F.R. § 990.14(c)(5)(i-vi))

The RP is not required to participate and there is no predetermined level of participation. However, if the RP accepts the invitation to participate, participation includes, at a minimum, notice of trustee determinations as required in the OPA regulations, and notice and opportunity to comment on documents or plans that significantly affect the nature and extent of the assessment. Increased level of participation by the RP may be developed at the mutual agreement of the trustees and the RP. As noted above, the trustees retain the authority to determine the scope of the RP's participation.

3.3.4 Agreements (15 C.F.R. § 990.14(c)(3))

Regulations strongly encourage formal funding and participation agreements between trustees and RPs on how the cooperative process will be structured. The parties are also encouraged to develop a set of agreed-upon facts concerning the incident and/or assessment. Though not specified in the regulation, these might include the natural resources injured, the extent of the injury, the most appropriate assessment procedures to determine injury and/or restoration needs, and how the results of the procedures will be used in the assessment. Immediately following a spill, it is generally not practical or possible to prepare a funding and participation agreement that: (a) provides a framework for the collection and analysis of ephemeral data and the execution of injury studies; and (b) obligates the RP to pay the trustees for their assessment costs. Often times these agreements take several months and even years to prepare and negotiate. Consequently, the preparation of a commitment letter by the RP will usually suffice and allow the cooperative process to proceed. The commitment letter should include an agreement by the RP to advance funds and/or reimburse the trustee's reasonable assessment costs for a specified period and amount of money. The letter may also include an assurance that the RP will negotiate a formal funding and participation

agreement at a later date for conducting the cooperative assessment with the trustees. An example of a commitment letter, developed during the 2004 Spill of National Significance drill in San Diego and Long Beach, is provided in Attachment A.

3.3.5 Public Involvement (15 C.F.R. § 990.14(d))

The trustees represent the public and, therefore, any cooperative process between the trustees and RP must be open and allow for public involvement as assessment and restoration plans are developed. Any data or reports generated through a cooperative assessment may be released in accordance with agency requirements and guidelines. While the trustees must provide the opportunity for public involvement after the trustees' decision to develop restoration plans or issuance of any notice to that effect, the trustees may decide to provide earlier opportunities for public involvement if such involvement may enhance the trustees' decision-making or avoid delays in restoration.

3.3.6 Alternative Assessment Procedures (15 C.F.R. § 990.14(c)(6))

The participating RP may request that the trustees use alternative assessment procedures provided that they can demonstrate that the alternatives are: technically adequate and appropriate for the incident and associated injuries, advance the funding for a reasonable cost estimate of using the proposed alternatives to the trustees and agree not to challenge the results of the proposed procedures. Following objective consideration of proposed alternatives, the trustees may reject the RP's proposed alternatives if, in the sole judgment of the trustees, the procedures are not technically feasible, not technically or scientifically sound, cannot be carried out in a reasonable timeframe or do not meet the requirements of 15 C.F.R. § 990.27.

3.3.7 Disclosure (15 C.F.R. § 990.14(c)(7))

The trustees must document in the administrative record and Restoration Plan the invitation to the RP to participate in the NRDA and describe the nature and extent of the RP's participation, including termination of the RP's participation, if applicable.

3.4 Cooperative Process Considerations

Several specific activities tend to maximize the likelihood of success of cooperative assessments and are discussed below. The success of the cooperative assessment also directly depends on the expertise, experience and decision-making abilities of those involved. It is critical that decision-makers be knowledgeable about the resources that may be affected and the cooperative NRDA process.

3.4.1 Pre-Spill Coordination

Building trust before a spill is helpful to successful cooperative assessments. Trustee and industry managers are encouraged to meet regularly and be aware of each other's concerns and issues before an actual spill. These discussions should attempt to identify

potential concerns and issues and their resolutions so that identified issues can be avoided or resolution can be achieved in the most expeditious manner possible during a spill. These discussions could include opportunities for generating awareness of agency- or corporation-specific policies, requirements, or limitations that may affect NRDA activities (e.g., safety training requirements). The West Coast JAT is an important forum for pre-spill coordination. Additionally, training and certification opportunities and incorporating NRDA into oil spill drills (see Section 10) provide important opportunities for coordination.

3.4.2 Funding

Advance funding is not a formal requirement for cooperation, but as a show of good faith by the RP, it can be a significant motivation for the trustees to enter into a cooperative relationship. In addition, it can save the RP direct and indirect costs associated with the trustee's effort in working with the National Pollution Funds Center to obtain funding and National Pollution Funds Center's time and effort as well.

3.4.3 Early Technical and Logistical Coordination

Response and cleanup are the first priority during spills and assets such as boats and aircraft may be difficult to obtain for NRDA activities. Both parties should set time aside in the first few days of a spill to openly discuss logistical needs and agree to share available resources. Working together well during the emergency phase of an incident helps to build the trust necessary for a successful cooperative assessment, and successful logistical coordination helps set the stage for future cooperation.

3.4.4 Strong Leadership and Decision Making

Cooperative assessments work best when the trustees and RPs provide leadership and are directly involved in the process. While there is a clear role and need for consultants and experts, the trustees cannot, and the RPs should not, abdicate their responsibilities for decision-making and management to third parties. Most cooperative assessments evolve from the early technical leadership of the government and RP personnel responding to an incident for the cleanup and preliminary damage assessment. Thus, good early leadership sets the stage for the assessment.

3.4.5 Commitment to Timely Restoration

All parties in a cooperative NRDA should be committed to the goal of achieving timely restoration. The parties are encouraged to begin restoration planning early during the assessment process as information collected during restoration planning is vital to reaching consensus regarding damages during settlement discussions. Restoration planning during the assessment can include soliciting the public for restoration ideas, discussion of restoration project evaluation criteria, and assembling information on potentially viable restoration projects. In some cases, the parties may be able to reach

consensus on the overall need for, and type of, restoration and limit costly and time-consuming assessment studies

3.4.6 Technical Working Groups (TWG)

Depending on the size of the spill and natural resources and uses impacted, the parties should consider developing small working groups to investigate injury. Most often, groups break up the assessment based on resources injured or assessment strategy. Each working group should have representatives of both the RP and the trustees and all decisions should be documented in writing. Each TWG should report its progress to the larger NRDA group. Further detailed information about TWGs is found in Section 7.

3.4.7 Joint Development of a Focused Assessment Strategy

The parties should jointly develop an assessment strategy and plan studies. The parties should prioritize their assessment efforts and focus on their highest priority injuries and lost uses. If the injury assessment is divided by technical working groups, these strategies and plans should be specific to each technical working group. Cross TWG coordination is critical since there are often study plan components or entire study plans that can benefit assessment of multiple injury categories thereby increasing efficiency during assessment. Studies that are technically interesting, but are not focused on determining injury or useful in restoration planning are inappropriate and cannot be implemented as part of the NRDA. Efficiency can be further increased and cooperation enhanced by coordinating the following associated issues:

3.4.7.1 Data Quality Objectives

When determining what data to collect or studies to perform during an injury assessment, many disagreements can arise over what data should be collected or how the data will be used. Data quality objectives (DQOs) can be used to help determine what injury questions need to be answered and the data required to answer those questions.

3.4.7.2 Common Laboratory

The JAT recommends that the parties try to reach agreement on the analytical laboratories and analysis protocols to be used to ensure the consistency, quality and acceptability of the analytical results. Ideally, the parties should consider having the same jointly selected laboratory/laboratories conduct as many of the analyses as possible. It is also advisable that an independent firm audits the laboratories and performs 3rd party validation of laboratory results in accordance with specifications developed for the case. A common laboratory can reduce the potential for data interpretation problems and result in significant cost savings. The trustees and the RP consultants should consult each other on which samples should be analyzed, the type of analyses, and the prioritization of the samples and analyses. If agreement cannot be reached on particular types of analyses or which samples should be analyzed, either party can have additional analyses done, but they should let the other party know of

their action. Furthermore, additional analyses should not compromise the integrity or quality of samples that were collected cooperatively. This can be achieved by using split samples, verifying sufficient sample volume or other means.

3.4.7.3 Information Management

The JAT recommends that a shared data management system should be developed containing structured data and other files such as images, reports, etc., and maintained appropriately. Further detailed information about data management is found in Section 8.

3.4.8 Joint Experts

If the opportunity exists, the parties may consider jointly designating experts to conduct studies. If joint experts are designated, any technical directions and communications with an expert should be in writing and agreed upon by both parties. The expert's raw data and draft and final documents should be shared simultaneously.

3.4.9 Stipulations

Stipulations to certain aspects of an NRDA, such as the level of injury to a specific species or habitat, may allow the parties to narrow the scope of the investigation and avoid incurring unnecessary costs on studies that may or may not better define an injury or reduce uncertainty. Any stipulations should be formally documented under the direction of the legal advisors of all parties. The West Coast JAT acknowledges that it can be difficult to agree on stipulations in the legal framework of NRDA and stipulations are not a requirement to a successful cooperative assessment.

3.4.10 Clear Decision Records and Administrative Record

Throughout the course of a cooperative assessment, many technical and administrative decisions will be made between the parties. These decisions need to be clearly documented to avoid later confusion. An administrative record should be developed that includes documents relied upon during the assessment such as any notices, draft and final restoration plans, public comments, relevant data, investigation reports and scientific studies, work plans, quality assurance plans, literature, and agreements (not otherwise privileged) among the trustees and the RPs. This type of record is necessary for an open public process and is required by the National Pollution Funds Center.

3.4.11 Common Public Communication

The parties should attempt to work together when communicating with the public, the media and the Joint Information Center, recognizing that the trustees represent the public and have a legal requirement to involve the public in decision making. Divergent communications can quickly derail a cooperative assessment especially if parties make antagonistic (real or perceived) statements. Trustees and RPs should provide each other with advance notice of key aspects of external communications prior to their

dissemination to the media or general public. Further detailed information about public communication and outreach is found in Section 9.

3.4.12 Addressing Disagreements

The trustees and RPs will have disagreements, but they should not undermine the entire cooperative process. The inability to reach a consensus on all aspects of an assessment should not be a barrier to cooperating on other activities. As stated in 1.5.1 above, building trust before a spill is also helpful as initial data can be uncertain and positional bargaining is commonplace. The parties may be able to cooperate on some or most of the activities and proceed separately on the remaining tasks. If consensus can't be reached on a task, parties should be able to do independent studies, but should be in communication with each other in regard to the study(ies).

4.0 COMMUNICATION AND COORDINATION BETWEEN NRDA AND THE SPILL RESPONSE INCIDENT COMMAND SYSTEM (ICS)

4.1 The Importance of Coordinating NRDA and Spill Response Activities

The West Coast JAT recognizes that NRDA activities often have separate responsibilities, authority, funding, staff, and resources from a spill response [Incident Command System (ICS) structure]. Operating in a parallel timeframe and in the same geographic area, however, necessitates coordination with the spill response organization. Effective coordination improves both response and the NRDA efforts. It enhances personnel safety, reduces operational conflicts, increases overall situational awareness and improves data quality. Improved communication also facilitates appropriate allocation and coordination of scarce operational resources and decreases overlapping efforts, which reduces overall response costs.

The purpose of this section is to detail the necessary communication and coordination methods to be implemented when NRDA and response activities are conducted simultaneously during a large spill event. Facilitating communication and coordination begins with locating the NRDA Command Center in or near the Incident Command Post, having a dedicated NRDA Liaison (a.k.a. NRDA Representative), and by this liaison working through the ICS Liaison Officer to communicate with the response organization at the strategic level as outlined in the U.S. Coast Guard's 2013 Incident Management Handbook. While this method of strategic communication and coordination between the two organizations is adequate, it is imperative that coordination of tactical activities and the transfer of information occur directly between the NRDA practitioners and key personnel within the appropriate response organization Sections and Units.

4.2 Goals for Effective Communication and Coordination

The following goals for effective communication and coordination between the spill response and NRDA efforts should be considered:

- Immediately establish lines-of-communication and information exchange between the spill response and the NRDA teams during a spill incident;
- Inform the Incident or Unified Command (UC) of all NRDA field activities and coordinate with the appropriate response Section, Unit, Branch, etc.;
- Require all NRDA staff, including the responsible party, natural resource trustees, and contractors to have appropriate health and safety training, as determined by the response Safety Officer, before entering oiled or other restricted access areas; and

- Foster two-way communication including:
    - Ensure the response effort provides a minimum of basic spill-related information, logistical needs, and source-sampling support to NRDA during a spill incident; and
    - Ensure the NRDA effort provides technical and resource-specific expertise to the response (i.e., Environmental Unit, Wildlife Branch) as appropriate, including potential environmentally sensitive area prioritization and protection measures, measures to minimize injuries caused by on-water and shoreline response options, and emergency restoration alternatives.

In addition to field responder and NRDA staff training, the most effective way to achieve the objectives detailed in this guidance during an actual spill response is to include an NRDA component within spill drills and exercises. Recommendations for including various degrees of NRDA scenario complexity within drills and exercises are provided in Section 10.

4.3 Communication and Coordination Points between NRDA and Spill Response Incident Command Structure

The NRDA for a large spill may include the involvement of numerous natural resource trustee agencies, responsible party representatives, university researchers, NGOs, and private contractors. Such participation is essential given regulatory mandates and authorities, as well as acquiring the necessary resources for pursuing a complex NRDA. Nevertheless, it is critical that these participants are aware of the response incident management team (IMT) organization (based on the ICS), maintain a pre-defined command structure to manage NRDA activities, and coordinate all field activities with the response IMT Safety Officer and other appropriate IMT positions or functions.

An example of where communication and coordination is critical between the NRDA team and IMT is during the collection of “ephemeral” data. Such data or information is only measurable during or shortly following a spill and is essential in documenting and assessing the spatial extent and degree of natural resource injuries. Types of data that often require collection immediately following an oil spill include:

- Source oil samples to determine toxicity and enable the comparison of the associated fingerprint with the fingerprint of hydrocarbons that may be found in various field samples;
- Potential petroleum constituent concentrations in water column, sediment, or tissue samples prior to, and shortly after, oil contact to determine baseline and assess exposure and injury; and
- Aerial photography or video footage of shorelines prior to and after oiling.

This information may or may not be considered necessary for response effort but essential for the NRDA. NRDA sampling and data collection activities must be

coordinated with the response due to the limited resource (vessels, helicopters, ground transport, etc.) availability that is common in the early stages of a response.

The typical ICS organization following a large oil spill event includes the Unified Command, Command Staff, Operations Section, Planning Section, Logistics Section, and Finance Section. During the initial response period for a large spill (i.e., within 24 to 48 hours), an NRDA spokesperson or liaison (hereafter referred to as the 'NRDA Representative') should establish communication with UC via the Command Staff Liaison Officer. Roles and responsibilities of the NRDA Representative and communication and coordination needs with each response section are further described below.

4.3.1 NRDA Representative

The NRDA Representative will be the primary point of contact for establishing communication channels between the NRDA and the response effort, and will be a representative designated by the NRDA team following a large spill event. Depending on the scope and complexity of the spill, the NRDA Representative may designate or assign other NRDA personnel to directly communicate with Safety, Planning, Operations, Logistics, or Finance Section staff. Accordingly, the NRDA Representative will be responsible for coordinating the incident command post access and oversight of such staff (Section 4.3.2).

The primary role of the NRDA Representative will be to ensure the health and safety of NRDA field staff and to inform the Incident Commander or Unified Command of the current and planned NRDA field activities and obtain information on the current and planned response activities. Other NRDA team personnel will generally be tasked with exchanging more detailed or tactical information with the appropriate IMT personnel and coordinating the various field activities. They will also be tasked with acquiring daily information related to the location, trajectory, and magnitude of the spill, as well as potentially affected resources for NRDA planning purposes.

The NRDA Representative should be provided work space adjacent to or within the IMT Command Staff. Other NRDA personnel may need work space associated with the Environmental Unit (Planning Section) with whom the majority of coordination and information exchange will occur.

Ongoing duties of the NRDA Representative and/or their designees to facilitate communication and coordination between the NRDA and response efforts will include the following [adapted from the U.S. Coast Guard IMH (May 2014)]:

- Attend appropriate meetings (e.g., the initial 201 Briefing) to facilitate communication between NRDA team and the UC;
- Provide status reports to the UC and to the NRDA team;
- Support the UC's information needs through the Command Staff Information Officer;

- Coordinate with the Command Staff Liaison Officer, or the UC in the absence of a Liaison Officer, to ensure that NRDA field activities do not conflict with response activities;
- Obtain necessary safety clearances for NRDA field staff access to sampling sites;
- Request logistical support for NRDA field activities;
- Seek the Federal or State On Scene Coordinators (SOSC) cooperation in acquiring response-related samples or results of sample analysis applicable to NRDA (e.g., spilled petroleum product from source and/or oil from contaminated wildlife); and
- Interact with appropriate ICS units to collect and ensure appropriate documentation of response information requested by the NRDA team.

For a further understanding of the NRDA effort and its command structure, including key personnel assignments, initial response actions, and tasks; see Section 5.

4.3.2 Incident Command Post

Upon first arriving at the Incident Command Post, the NRDA Representative should prepare ICS Form 213, General Message requesting, via the Command Staff Liaison Officer, that the Unified Command approves coordination of the spill response effort with the NRDA. Initial duties of the NRDA Representative will be the following:

- Obtain a secure room or work space within walking distance to the Incident Command Post for establishing an NRDA Command Post. The NRDA Command Post should have at a minimum: chairs, tables, electrical outlets, telephone outlets, internet access, and restroom facilities scalable for up to 30 individuals; and
- With permission of the Liaison Officer, introduce him/herself to the UC representatives, Command Staff Safety Officer, Command Staff Information Officer, Wildlife Operations Branch Director, Planning Section Chief, and Environmental Unit Leader.

When possible, the NRDA Representative should attend UC meetings to provide updates of the NRDA field activities and ensure coordination with the response efforts. The NRDA staff also should provide the IMT Information Officer information regarding the NRDA effort that may be of interest to the public. During Command and General Staff Meetings, the NRDA Representative may be requested to provide updates as to the progress and field activities associated with the NRDA.

4.3.3 Health and Safety

It is the responsibility of each NRDA Technical Work Group Leader or the Field Operations Manager (Section 5) to inform the NRDA Representative of planned field activities and the whereabouts of NRDA field teams. The NRDA Representative or designee (i.e., NRDA Safety Officer) will then notify and coordinate these activities with

the IMT Safety Officer, including a safety briefing and confirmation that NRDA Field Teams have received necessary hazardous waste operator and emergency response (HAZWOPER) training. Communications between the IMT Safety Officer and the NRDA Representative will be documented in ICS Form 213, General Message. The NRDA Representative or staff will also ensure that Operation and Planning Section staff are informed of the planned activities and whereabouts of the NRDA field teams (see Planning and Operations discussion below).

NRDA field team staff and their contractors must comply with health and safety restrictions established by the UC in the Incident Action Plan. As such, NRDA Field Team members will be required to read and sign the site safety plan (ICS Form 208 or equivalent). The NRDA team, through the NRDA Representative and by coordination with the response ICS, must:

- Ensure that the collection of NRDA samples will not interfere with response activities;
- Ensure that all NRDA field teams have appropriate health and safety training; and
- Obtain clearance and safety information from the IMT Safety Officer before entering potentially hazardous areas affected by the spill.

NRDA field team members also will implement proper decontamination and hazardous waste disposal practices to eliminate potential contamination of unaffected areas.

4.3.4 Investigations

The NRDA Representative will coordinate with the federal and state incident investigators to confirm that the response effort includes sampling of the spilled material (e.g., oil) from its source and make them aware of any special NRDA concerns. Source oil sample collection is overseen by the incident investigators and collections are normally done by trained specialists. Source sampling by NRDA personnel is not usually recommended because of the hazards and expertise needed to sample fuel tanks, pipelines, or vessels following a spill (see Section 6.4). Source samples are necessary for criminal investigation purposes, for fingerprinting spilled material to its source, and for possible toxicological investigations.

4.3.5 Planning Section

The NRDA team will require information and updates from the Planning Section, particularly the Situation and the Environmental Units, and the NOAA Oil Spill Scientific Support Coordinator (SSC). The Planning Section is responsible for collecting, evaluating, and disseminating all spill data and information. The NRDA Representative or designees may request daily updated spill information, including location and extent of spill, type of material released (e.g., crude oil, fuel oil, petroleum distillates), source, affected shorelines, trajectory analysis, Shoreline Cleanup and Assessment Team (SCAT) observations, and cleanup recommendations; and identified resources-at-risk. Likewise, via the NRDA Representative or NRDA staff, the Environmental Unit may

request technical support from trustee technical experts who are familiar with the flora and fauna and habitats potentially affected by the spill or cleanup efforts. The NRDA Representative or staff should be allowed to participate in scheduled Planning Section meetings, including those attended by the Environmental Unit.

Coordination of environmental sampling efforts between NRDA and response personnel is crucial for avoiding duplicative sampling efforts or any misunderstandings regarding the roles and responsibilities of NRDA and the response effort to collect environmental samples for criminal or civil investigation purposes. Sample coordination between NRDA and the Planning Section will typically include the following:

- The NRDA Representative and/or designees will establish lines-of-communication (i.e., liaison positions) with Planning Section staff, including the Environmental Unit Leader, the Sampling Technical Specialist, and the SCAT Coordinator. Communication and requests between the NRDA and the Planning Section should be documented by ICS Form 213, General Message
- The NRDA effort will require samples of spilled material (e.g., tar balls) to identify its source. These samples will be collected throughout the spill affected area; however, special attention will be paid to collect samples before cleanup actions and along distal locations to document the full spatial extent of the spill. It is possible that SCAT may collect samples of spilled material; however, there should not be an expectation of the NRDA team that SCAT will collect these samples, particularly during the early days and weeks following a large spill. In most cases, NRDA field teams will be deployed to collect these samples.

4.3.6 Operations Section

The NRDA team must coordinate its field observation and collection activities with the Operations Section, primarily Air Operations and the Wildlife Branch. The Wildlife Branch's primary mission is the reconnaissance, recovery, and transport of oiled wildlife. The Wildlife Branch collects data and evidence that can be used in NRDA, as well as by law enforcement for a penalty or non-civil case; however, the mission of the Wildlife Branch does not include collecting all data and evidence that may be useful for pursuing an NRDA. The NRDA team should coordinate with the Wildlife Branch to collect additional information and wildlife observation data that will support the NRDA injury assessment, but NRDA staff should do so in a manner that does not interfere with the Wildlife Branch mission.

The NRDA Representative and a designated NRDA Wildlife Operations Coordinator should establish lines-of-communication with Wildlife Branch staff, primarily the Wildlife Branch Director. Communication and requests between the NRDA and the Wildlife Branch should be documented by ICS Form 213, General Message.

Preparation and implementation of wildlife search effort documentation and sampling protocols are critical for NRDA purposes, as the NRDA benefits from a thorough, well-documented response that includes live and dead bird and mammal intake and

search effort logs. The NRDA Wildlife Operations Coordinator should coordinate all NRDA data and documentation needs with the Wildlife Branch Director and ensure that wildlife operations staff is familiar with the needs and objectives of the NRDA. For example, in addition to bird intake and search effort logs, the NRDA team should request that any Wildlife Branch overflight observations related to wildlife identification and abundance be documented and shared with the NRDA team. Similarly, NRDA field teams should report any observed oiled or dead wildlife to the Wildlife Branch. Decisions whether NRDA field teams collect oiled or dead birds in the field will be made in coordination with the Wildlife Branch Director and Wildlife Law Enforcement.

As previously discussed, NRDA requires ephemeral data that will exist for only a brief time following the spill, including baseline conditions and the maximum spatial extent and magnitude of oiled plants and animals (i.e., live or dead). In the event of a large spill, the Wildlife Branch may receive information from spill responders or the public regarding oiled or dead pinnipeds, cetaceans, birds, fish, invertebrates (e.g., crabs), or plants. Since the recovery and transport of many of these organisms may be outside the mission of Wildlife Branch because they cannot be rehabilitated, the NRDA may choose to perform reconnaissance (i.e., photographic evidence, counts, fingerprint sampling) related to these observations and document the spatial extent and magnitude of observed level of organism oiling and/or deaths. The Wildlife Branch should inform the NRDA Wildlife Operations Liaison of any observations/reconnaissance related to these types of wildlife, and the NRDA Wildlife Operations Liaison should coordinate with the Wildlife Branch to ensure that this information flow is occurring.

Likewise, if NRDA field teams observe pinnipeds or other marine mammals showing signs of distress or oiling, the numbers and types of wildlife in distress should be directly reported to the Wildlife Branch using procedures established for that incident. The Wildlife Branch will then be responsible for any notifications or response actions per state-specific wildlife action plans.

With respect to the selection of the most appropriate response options, particularly shoreline cleanup, Planning and Operations personnel may request input from NRDA team members regarding the potential environmental impacts of candidate options. The goal of such input would be to avoid or limit natural resource injuries associated with the response operations themselves.

4.3.7 Logistics and Finance/Administration Sections

The Logistics and Finance/Administration Sections are involved in the procurement and distribution of supplies, equipment, staging areas, personnel, contractors, documents, and other resources for coordinating the spill response effort. While most NRDA resource requirements and costs will fall outside the response ICS, coordination is important and it may be possible to utilize the IMT Finance Section to track NRDA costs separately. Coordination with the Logistics Section will eliminate competition for limited resources through proper scheduling of resources or modifications of work schedules. Any resource needs of the NRDA within the spill response should be requested by the

NRDA Representative or staff using ICS Form 213, Resource Request, and by obtaining necessary approvals from the UC.

Examples of NRDA resource requests from the spill response may include the following:

- Space, including tables, chairs, and office supplies, for establishing an NRDA command post within walking distance of the Incident Command Post;
- A secure staging area for sampling supplies and sample storage;
- A freezer or freezer space for storing environmental samples;
- Courier services for moving samples from remote locations;
- Possible aircraft and boat time for observing wildlife or collecting environmental samples;
- Personal protective equipment; and
- HAZWOPER Training for NRDA Field Teams.

5.0 NRDA COOPERATIVE TEAM ORGANIZATION

5.1 General

Although the early stages of an incident may not allow for the establishment of a structured and organized team, to the extent practicable it is generally beneficial to do so both in the short term as well as in the event of a prolonged assessment effort. Immediately following an oil spill incident, the rapid collection of ephemeral data is critical and should be facilitated by the formation of an NRDA leadership structure (Section 5.2) and an EDC Team (Section 5.3). This team can be expanded into a larger NRDA Team with individual TWGs, specializing in various resource assessment activities (Section 5.4). The larger NRDA Team would continue data collection as well as interpret the data and manage and conduct all aspects of the NRDA.

The NRDA organization during a response should be designed to be easily expanded or contracted depending on the situation and size of the incident. For purposes of these guidelines, the team organization presented is scaled to a large spill or incident known or foreseen to have significant wildlife impacts across a large area (e.g., miles) of shoreline.

NRDA teams should be designed to:

- Facilitate effective and efficient decision making;
- Determine data needs and coordinate the collection of such data;
- Provide effective communications to all team members as well as the UC and other groups within the IMT;
- Manage and disseminate the data collected among the trustees and responsible parties; and
- Coordinate the NRDA activities within the ICS.

The organization, management, and actions of a large spill NRDA are usually divided into distinct phases that are further described below (Section 5.3 and 5.4). Phase I involves the first few hours to days immediately following the spill and the formation of an EDC Team. The transition to Phase II, in the weeks and months following the spill, depends on the complexity and scale of spill injuries. During this time, additional tasks and roles may need to be incorporated into the leadership and management structure for the NRDA. Phase II involves the formation of various TWGs to address resource injuries, damages, and identify restoration concepts. Finally, as the NRDA progresses, Phase II may transition into Phase III where more long term and intensive studies designed to assess resource injuries and human use losses are initiated.

5.2 NRDA Team Leadership Structure

5.2.1 Trustee NRDA Lead

The trustee agencies should appoint, on a rotating basis during Phase I of the spill, and then on a consistent basis later during Phase II and III of a spill, one of the trustee agency leads to act as a coordinator and an administrative lead for the NRDA Team. This individual will be responsible for leading and organizing meetings of the NRDA Team, disseminating plans and information, developing a team contact list, achieving consensus among the NRDA Case Management Team (Section 5.2.2) on the direction and scope of field sampling and survey operations, and monitoring daily field sampling and survey activities (Phase I) and later TWG activities (Phase II & III) during a spill.

5.2.2 NRDA Case Management Team

The NRDA Case Management Team leadership structure should include agency representatives from each of the RP, federal trustee, state trustee, and tribal/local trustee agency involved in the NRDA. Each representative or “Agency Lead” should have equal authority and should strive to obtain consensus on the scope and intent of all activities conducted by the Case Management Team. The Case Management Team is responsible for managing all activities related to the NRDA, including health and safety, information collection, and coordinating NRDA activities with the UC for the duration of spill response. In the context of cooperative assessments, these positions are staffed by trustee and RP Representatives (Figures 5-1 & 5-2).

Examples of specific duties and responsibilities of the Case Management Team include:

- Secure a NRDA Command Post location at or near the Incident Command Post;
- Assist in developing a Cooperative Assessment Agreement among trustee agencies and RP(s);
- Implement the NRDA Cooperative Agreement;
- Provide incident briefings to the NRDA Team;
- Schedule and provide assignments to NRDA Team personnel;
- Determine and execute funding/cost-tracking mechanisms for NRDA activities specific to each agency or company;
- Initiate NRDA planning meetings to develop action plans and identify resource needs; and
- Coordinate NRDA planning with the UC operational planning cycle as appropriate.

5.2.3 NRDA Representative (Liaison to UC)

Under the supervision of the Case Management Team, this person serves as the primary liaison to the Planning/Environmental Units as well as the UC. Examples of specific duties and responsibilities of the NRDA Representative are described in Section 4.0. Activities of the NRDA Representative may be delegated across several individuals. For example, depending on the complexity and scope of the spill, separate liaison positions to different sections of the IMT may be required and include coordination and communication with the Incident Health and Safety Officer, the Environmental Unit, and Wildlife Operations.

5.2.4 Legal Team

Working with the Case Management Team, the Legal Team is responsible for providing legal oversight and consultation for NRDA activities. In the context of cooperative assessments, this position can be jointly staffed by lead trustee and RP legal representatives. Examples of specific duties and responsibilities of the Legal Team include:

- Negotiate terms of the Cooperative Assessment Agreement (Section 3) and develop a written document for the signatures of participating trustees and RP(s);
- Assist in the development of contracts for external experts utilized for NRDA studies;
- Provide consultation on all other legal matters pertaining to NRDA in federal and state laws, regulations and mandates (e.g., OPA 90, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), federal Clean Water Act (CWA), California Lempert-Keene Seastrand Oil Spill Prevention and Response Act, Washington Compensation Tables, etc.); and
- Ensure that an adequate Administrative Record is developed and maintained.

5.3 Phase I NRDA Team Organization

The primary effort during Phase I, in the hours and days immediately following a spill, is to initiate ephemeral data collection as described in Section 6.0 and acquire information that helps establish baseline (i.e., pre-spill) conditions. Ephemeral Data Collection (EDC) Teams will generally be staffed by RP and trustee personnel and fall under the direction of the Case Management Team (Section 5.2.1) and the EDC Coordinator (Section 5.3.1; EDCC). Assignments to specific positions made at the time of the incident are based primarily on expertise and/or desire to conduct specific activities. Teams also will likely be supplemented by technical experts from both the private and public sectors to assist with the study design and data collection. Additionally, the IMT response organization can generally be requested to provide some support to the Team in the areas of safety, logistics, and procurement.

5.3.1 Ephemeral Data Collection Team and Coordinator

An example of an EDC Team Organization Chart is provided in Figure 5-1. The scope and duration of activities conducted by the EDC Team are overseen by the Case Management Team. Day to day activities are coordinated and directed by the EDCC. The EDCC may be one of or be independently appointed by the NRDA Team Agency Leads. Depending on sampling effort required, more than one person may need to fill this role. This person should have a solid foundation of NRDA experience to be able to lead the initial injury assessment effort when persons who have little NRDA experience may be involved. For example the EDCC may assist in prioritizing ephemeral data needs when resources, logistics or personnel limit ephemeral data collection options. All personnel involved in implementation of the ephemeral data collection are responsible for reporting progress and results to the EDCC.

Major Duties:

- Manage implementation of the Agency Lead approved sampling plans and coordinate with UC/IMT via the NRDA Representative;
- Ensure that NRDA appropriate endpoints are sampled and that NRDA field teams collect NRDA appropriate data;
- Make and document field assignments, review and disseminate health and safety procedures, monitor all field activities, data management, and provide the field team leaders with information containing specific guidelines (e.g., health and safety, sampling locations and sites, sample collection procedures, etc.) for field activities; and
- Ensure that all field sampling team members have read and signed a copy of the incident health and safety plan.

The EDC Teams are comprised primarily of sampling teams designated to collect water, sediment or biological samples and/or survey data related to key resources or media (*i.e.,* offshore, onshore*,* wildlife, source oil, human use). Most likely, a sampling team designated by the Unified Command or Investigations Unit, will collect a source oil sample. NRDA personnel typically do not have the training nor expertise to collect a source sample from the point of release (e.g., a vessel, pipeline, or other source). Nevertheless, the EDC Team will coordinate with the spill response and investigations officials to ensure samples are taken (Section 6.0).

5.4 Phase II and III NRDA Team

In the weeks and months following a spill, the NRDA Team may be expanded to include various roles and tasks, including administrative support, public outreach, TWGs, sample coordination, restoration planning, and data management. An example of the organization of a full NRDA Team is provided in Figure 5-2 and further described below. Similar to the IMT, individuals may fulfill more than one role, particularly for roles with closely related functions (*i.e.*, NRDA Safety Manager and NRDA Field Operations Lead).

Depending on the scope and complexity of a given spill, some roles or tasks discussed herein may not be staffed or implemented. Alternatively, new staff positions, roles, or tasks may be created. Nevertheless, the NRDA Team should be sufficiently large and adequately structured to effectively manage all aspects of a cooperative assessment.

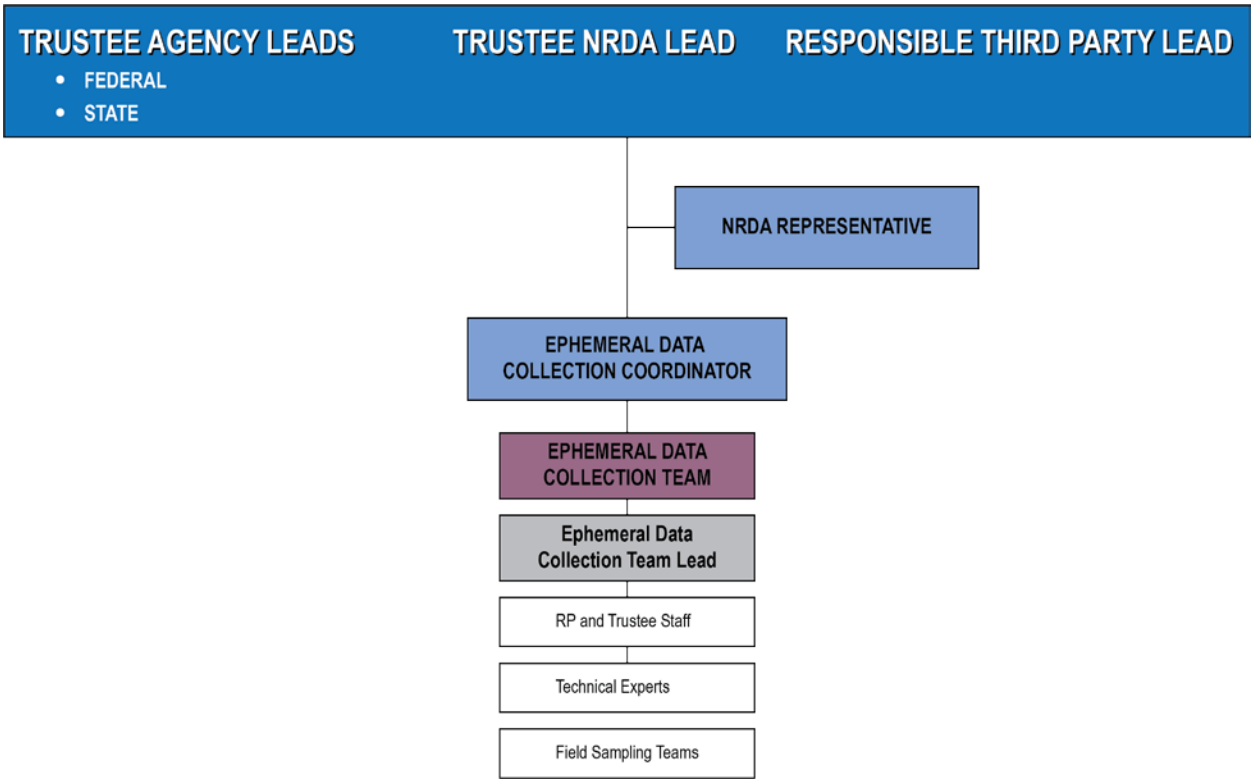

Figure 5-1. Ephemeral Data Collection in Phase I

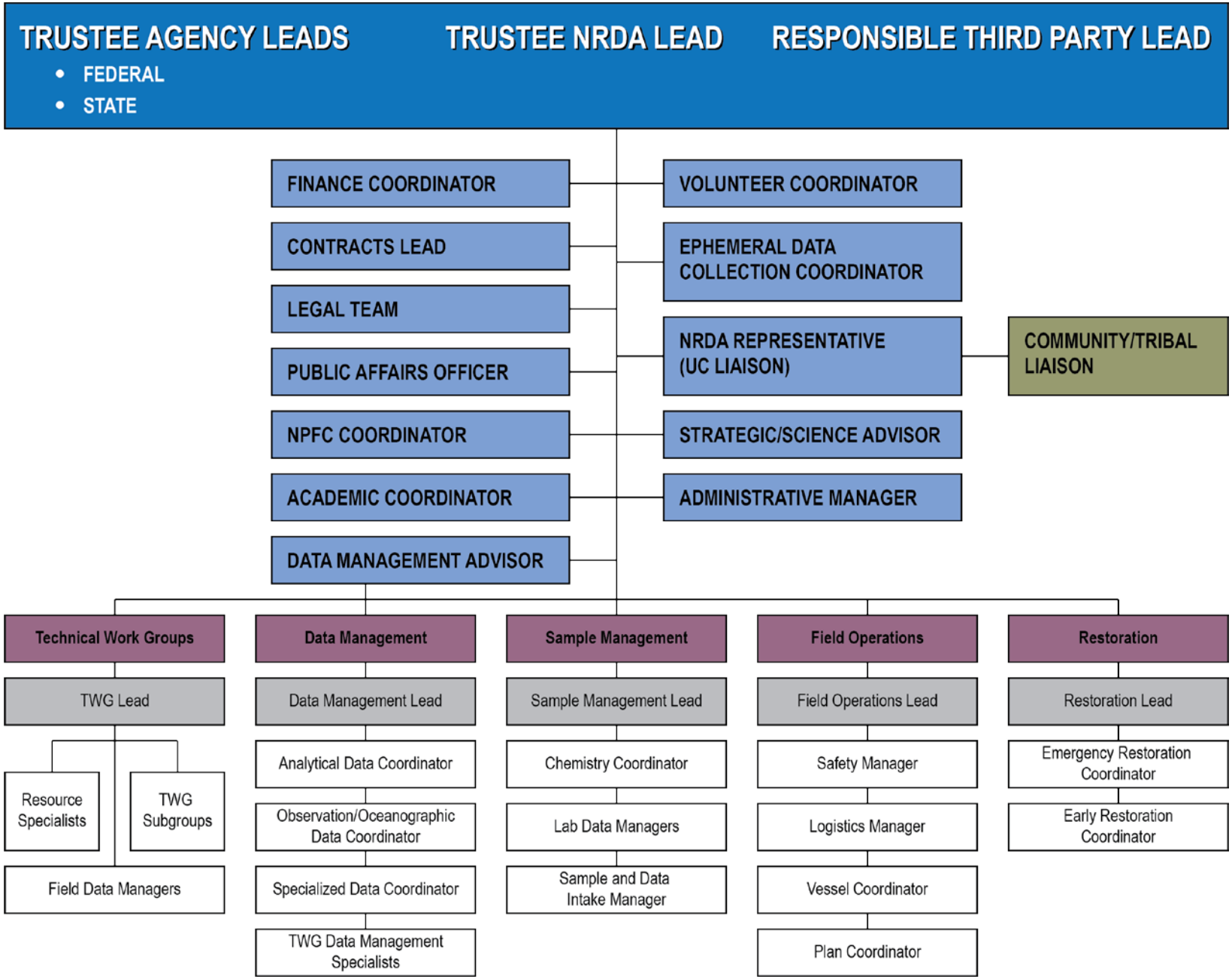

Figure 5-2. Example Phase II and III: NRDA Team Organizational Structure

5.4.1 NRDA Team Leadership and Support Staff

5.4.1.1 Case Management Team

As described in Section 5.2, the Phase II and III leadership and administrative core (Case Management Team) remains as the trustee and RP Agency Leads and Legal Team. An NRDA Representative continues to function as long as the spill response effort is ongoing (Section 4.0). During Phases II and III, the EDCC and Strategic/Science Advisor may be considered the same role.

Major Duties:

- Communicate staffing plans, rotational schedules, roles/responsibilities, and work progress expectations to all NRDA participants;
- Organize NRDA Team planning and senior management meetings;
- Resolve incident-related personnel issues among staff or contractors, if necessary;
- Work to achieve consensus and coordinate various issues, including:
    - NRDA work plans;
    - Field operations;
    - Acquisition of field gear or equipment (including transportation such as vessels);
    - Work place and field safety;
    - NRDA budget;
    - Sampling issues such as holding times, splits, Chain-of-Custody, and storage;
    - Coordination with the response; and
    - Outreach and public affairs; and
- Provide status updates and activity reports to their respective agency leadership.

5.4.1.2 Administrative Manager

The Administrative Manager oversees administrative duties associated with Case Management Team and NRDA work plans.

Major Duties:

- Coordinate conference calls and webinars;
- Distribute work plan information;
- Maintain database of contact information; and
- Maintain list of deployed personnel.

5.4.1.3 Strategic/Science Advisor

The Strategic/Science Advisor provides guidance on the overall strategic plan for the NRDA in consultation with the Legal Team. Oversees all NRDA science-related activities for the incident and is responsible for development and implementation of litigation-quality science across all technical workgroups in conjunction with TWG Leads. There should be at least one Strategic/Science Advisor for each TWG (and potentially more if the TWG has sub-groups).

Major Duties:

- Develop the strategic plan for the injury assessment in a resource category(s), more than likely across multiple TWGs or technical teams;
- Identify assessment priorities for TWGs and review/develop appropriate studies to evaluate injury hypotheses;
- Participate as a member of the Case Management Team. Be present on case management calls or meetings with the NRDA lead, legal team, and other appropriate individuals;
- Identify broad restoration activities for resource categories/injuries with restoration specialists;
- Assist in reporting status updates and activities (in coordination with other key NRDA staff);
- Assist with development of technical materials for Congressional or Public communications;
- Identify gaps in research/knowledge that may impede case progress;
- Provide guidance and direction to the TWG's on scaling, habitat-to-habitat and resource-to-habitat conversions;
- Aid in the development of monitoring and evaluation protocols;
- Guide NRDA case development (science and data);
- Work with NRDA Field Ops Lead and TWG Leads to oversee all science-related and technical aspects of the incident and maintain situational awareness of activities by trustees and RP representatives. This duty includes monitoring and participation of workgroup calls, as appropriate;
- Work with Data Management Lead to integrate data and information management activities with technical and science-related activities;
- Work with laboratories and other researchers and other programs to ensure litigation-quality science and to take advantage of other research or science opportunities that have a nexus to the NRDA;
- Serve as the technical lead, as appropriate, during relevant trustee Council discussions and regional-level trustee or stakeholder discussions;

- Work with the TWGs that are compiling baseline data and ensuring data and information transfer and archival for the incident;
- Coordinate science across related TWGs; and
- Contribute to building the injury assessment story across TWGs.

5.4.1.4 Academic Coordinator

The Academic Coordinator coordinates technical NRDA issues with the Academic community.

Major Duties:

- Identify key academic stakeholders to coordinate with;
- Communicate research and recommendations of academic community to NRDA team;
- Coordinate meetings or panels with academic community;
- Monitor the literature to keep informed of the academic studies related to NRDA activities;
- Identify people and research for potential recruitment into the NRDA process; and
- Respond to claims by the academic community on potential injuries.

5.4.1.5 Finance Coordinator

The Finance Coordinator oversees the agency budget and spending for the NRDA effort. This administrative role may or may not fall to the Lead Administrative trustee (LAT). This position is likely to have a deputy or other back up and support staff.

Major Duties:

- Act as or coordinate with Federal Lead Administrative trustee (FLAT) to track expenditures;
- Support preparation of Initiate Request for NRDA funding and request reimbursable project code;
- Coordinate with cost documentation team on cost package requests; and
- Work with Technical Work Groups and Agency Leads to estimate budget needs.

5.4.1.6 National Pollution Fund Center Claim Coordinator

The National Pollution Fund Center (NPFC) Claim Coordinator coordinates the process of preparing claims for the NPFC.

Major Duties:

- Coordinate directly with the NPFC to prepare the federal trustee claim(s); and
- Work with key NRDA personnel including the Finance Coordinator and TWG Leads to prepare claim(s) including budget, proposed work, and justification of work.

5.4.1.7 Contracts Lead

The Contracts Lead (agency-specific) serves as the primary contract officer for the NRDA. This position is likely to have a deputy or other back up and support staff.

Major Duties:

- Oversee contracts under his/her purview for the NRDA effort;
- Ensure that contract requests are appropriate and complete, are responded to in a timely manner, and are providing the desired support; and
- Work with the Finance Coordinator to ensure that there is funding for contracts and coordinates oversight of billing and payments.

5.4.1.8 Volunteer Coordinator

The Volunteer Coordinator coordinates any volunteer efforts for the NRDA. The coordinator addresses the unique challenges of using both affiliated[2] and convergent[3] volunteers. If filled, this position should be a coordinated effort with response.

Major Duties:

- Identify skill sets that affiliated volunteers can offer;
- Identify appropriate volunteer duties and determine number of volunteers needed Coordinate with NRDA lead and TWG leads on this;
- Identify any safety requirements (coordinated with safety officer) for volunteers and ensure they are implemented;
- Track and maintain accountability for volunteers;
- Address/consider liability concerns for volunteers; and
- Coordinate any volunteer operations with Field Ops Lead/Coordinator.

5.4.1.9 NRDA Community/Tribal Liaison

The Community/Tribal Liaison provides two-way communication between local communities/Tribes (i.e., Tribes that have not elected to be formal participants in the

[2] Members of public that are associated/sponsored by an NGO or other organization. Likely already have training that will allow them to fill specific role(s).
[3] Members of the public without preexisting training or associations.

NRDA) and the NRDA team. Some agencies or RPs may have a fulltime Community/Tribal liaison that could fulfill this role.

Major Duties:

- Discuss community/Tribal knowledge about resources at risk and priorities for NRDA and communicate this to NRDA team;
- Ensure that NRDA field activities do not unnecessarily interfere with or impact subsistence activities;
- Communicate NRDA plans and results to communities and Tribes as appropriate.
- Investigate, record and communicate traditional ecological knowledge that could inform NRDA; and
- Ensure that NRDA team members and contractors receive adequate cultural awareness training.

5.4.1.10 Public Affairs Officer

The Public Affairs Officer manages communications regarding the NRDA with the public and other outside parties. During a long response, it may be necessary to have more than one person in this role to allow rotational assignments.

Major Duties:

- Serve as the primary point of contact with the Joint Information Center and the media for NRDA;
- Provide support to NRDA staff on responding to requests for information from media or the public;
- Prepare and/or oversee press releases and other material for public release in a timely manner for review and approval by trustee Council;
- Assist with the planning and provide representation for public meetings;
- Recommend public outreach and education strategies to the trustee Council; and
- Oversee development and implementation of public outreach efforts (i.e., newsletters, web sites, etc.).

5.4.1.11 Data Management Advisor

The Data Management Advisor is responsible for the coordinating all data management activities across the case.

Major Duties:

- Oversee all data management activities;

- Identify staff for data management positions;
- Work closely with Data Management Lead, EDCC, Scientific Advisor(s), NRDA Lead, Legal Team, and trustee Council to ensure data management needs and litigation quality data protocols are being met; and
- Work with EDCC to ensure data collection activities are being properly conducted and meet the needs of the case.

5.4.2 Technical Work Group Organization and Leads

As further described in Section 7.0, TWGs are formed and staffed over the days, weeks and months following a spill.

5.4.2.1 TWG Lead

Each TWG is under direction of the TWG Lead for the duration of the NRDA effort. The TWG Lead reports to the Case Management Team for the spill. Depending on the amount of work proposed or anticipated for the TWG, there may need to be a back-up or deputy for the TWG Lead. It may also be necessary to divide the TWG into sub-groups for short periods of time for a specific component of the TWG assessment.

Major Duties:

- Coordinates and provides overall direction for TWG, including leadership for activities defined in the bullets under “Technical Working Group”;
- Serve as the primary liaison on technical matters that relate to the TWG;
- Directs and reviews development of conceptual models, work plans, and supporting documents with Principle Investigators;
- Guide the identification, development, and implementation of field studies for resource categories, including planning field operations for baseline and post-impact data collection;
    - Coordinates with the trustee and RP agencies; and
    - Works with consultants/contractors as may be necessary to design and implement large plans;
- Provide final work plans for review by the Case Management Team;
- Transmit work plan design documents to Data Management for document management;
- Work with Data Management, other TWG Leads, and other parties to communicate to capture relevant baseline data for technical studies;
- Direct compilation and analysis of data related to assigned TWG;
- Report TWG actions and plans to Strategic/Science Advisor and to NRDA Field Ops Lead and/or other case management and agency leadership as required;

- Coordinate/prepare TWG related actions related to NPFC and other funding activities; and
- Work with Field Ops Safety Manger to ensure field teams are following guidance for field activities.

5.4.2.2 TWG Resource Specialists

Resource Specialists provide key expertise for TWGs in their discipline. The number of specialists needed will depend on the activities of the TWG, as determined by the Strategic Science Advisor and TWG Lead.

Major Duties:

- Provide in depth subject matter expertise for the TWG;
- Obtain relevant toxicology information for spilled product(s);
- Evaluate the exposure pathway based on spill conditions, survey data, and other available information;
- Assist in the planning and implementation of resource surveys;
- Assess data needs for resource injury determination;
- Assist in the preparation of sampling and analysis plans; and
- Ensure that data collection needs for restoration planning are incorporated into the field sampling plan.

5.4.2.3 TWG Subgroups

Sub-category of a TWG, created when the activities of the TWG would be more efficiently managed by breaking the work into smaller tasks handled by a few members of the TWG.

Major Duties:

- Same as duties for the TWGs.

5.4.3 Field Operations and Safety

5.4.3.1 Field Operations (Ops) Lead

The Field Ops lead oversees the NRDA field operations with regards to safety, implementation, environmental compliance, and logistics.

Major Duties:

- Supervise the NRDA administrative support and field ops staff;

- Coordinate and supervise, on a daily basis, all logistics associated with deploying NRDA staff in the field;
- Supervise the safety of all field operations in coordination with Safety Manager and report any incidents according to established protocols;
- Provide oversight and approval for all procurements for field operations;
- Ensure that all work plans have required approvals and coordinate as needed;
- Work with Legal Team to ensure compliance with all applicable environmental and other regulations;
- Work with the NRDA Representative to coordinate field operations with the response; and
- Provide approval on any deviations to work plans in coordination with TWG lead.

5.4.3.2 Field Ops Safety Manager

The Field Ops Safety Manager ensures the safety of all NRDA field operations.

Major Duties:

- Develop and implement a health and safety plan for NRDA operations;
- Develop job hazard analyses (in coordination with Field Ops Plan Coordinator) for each major operational task;
- Develop and implement safety inspections for vessels and other transportation methods;
- Develop and implement plans for severe weather and evacuations of field staff;
- Conduct periodic audits including site visits to assess compliance with safety practices and share results with NRDA case managers;
- Develop and conduct safety presentations for incoming field samplers on an as-needed basis;
- Respond to and investigate safety incidents;
- Coordinate and approve vessel safety inspections; and
- Coordinate with response on safety standards and practices.

5.4.3.3 Logistics Manager

The Logistics Manager oversees all logistics associated with implementation of NRDA work plans.

Major Duties:

- Coordinate the ordering and delivery of supplies and equipment for work plans and coordinates with the RP on this as appropriate

- Coordinate the distribution and demobilization of supplies and equipment for work plans;
- Track field supplies and equipment;
- Track warranties for equipment and coordinate repairs as necessary;
- Coordinate lodging and/or food for field staff as needed; and
- Ensure that field teams have the proper equipment to continue sampling activities necessary to complete the NRDA work plan.

5.4.3.4 Vessel Coordinator

The Vessel Coordinator oversees the procurement and deployment of vessel support for NRDA field work.

Nearshore Major Duties:

- Identify and find sources for appropriate vessels for NRDA field work;
- Coordinate with contracting staff for procurement of vessels;
- Coordinate with TWG lead and Field Ops Plan Coordinator on vessel deployment including determination of type of vessel, number of vessels, location of work, and duration of work to schedule vessel support;
- Work with Safety Manager to ensure vessels are inspected and safety plans are implemented;
- Work with Plan Coordinator to coordinate staffing of vessels and ensure that staff are properly trained and have security clearance (if needed); and
- Work with contracting staff to ensure proper documentation of vessel use so vessel owners can be paid.

Offshore Major Duties:

- Provision, schedule and equip and all other large vessel logistics.

5.4.3.5 Plan Coordinator

The Plan Coordinator oversees the implementation of NRDA work plans.

Major Duties:

- Ensure that boats, vehicles, or other needed forms of transportation, sampling, communication, and personal protective equipment (PPE) supplies have been procured and are available;
- Identify staging areas or boat launch facilities;

- Identifying potential safety hazards (e.g., weather, exposure, deployment times) in the field and directing field activities accordingly through appropriate coordination with Safety Manager and Field Ops Coordinator;
- Ensure deployed field staff has appropriate PPE and supplies;
- Obtain and manage freezers or other storage containers for NRDA samples;
- Identify qualified staff for each field effort;
- Develop and coordinate training sessions for field work;
- Work with Legal Team to identify, secure, and ensure compliance with relevant state and/or federal permits;
- Communicate with staff in the field (i.e., cell phone/VHF calls with field teams during their deployment) during regular safety check-in calls;
- Ensure and document each team member has required health and safety training (coordinated with Safety Manager);
- Track locations and progress of deployed field teams;
- Manage demobilization activities in coordination with IMT Logistics Manager;
- Work with Field Ops to ensure that field staff are properly trained and equipped to implement the plan;
- Be available to Strategic Advisor and/or TWG leads to provide updates on status of plan implementation and can coordinate any needed changes;
- Work with TWGs on their sample methodology plans ensuring they are coordinated across TWGs;
- Coordinate field activities with trustees and Responsible Party representatives; and
- Coordinate daily or weekly conference calls on field activities with field teams.

5.*4.3.6 Compliance and Permit Coordinator*

The Compliance and Permit Coordinator determines which work plans will require review for compliance with existing regulations (including Endangered Species Act and National Historic Preservation Act and applicable state environmental laws) and permitting requirements, and facilitates those processes.

Major Duties:

- Work with Plan Coordinator when work plans are being developed to determine whether permits or review for compliance will be necessary;
- Develop a check list for Plan Coordinators to help them determine what kind of activities trigger a review or permitting;
- Facilitate the review or permit application process with the appropriate agency on behalf of the TWG;

- Track the status of the permitting or review and coordinate that timeline with the Plan Coordinator and TWG Lead to ensure a smooth implementation;
- Maintain a permanent record of all permits and reviews; and
- Provide Plan Coordinator with any Best Management Practices developed by the reviewers/permitters and facilitate their implementation.

5.4.4 Sample Management and Chemistry

5.4.4.1 Sample Management Lead

The Sample Management Lead is responsible for ensuring/maintaining the scientific and evidentiary integrity of NRDA samples. This responsibility includes involvement in all aspects of NRDA physical sample collection, labeling and associated field collection documentation, intake and subsequent transfers under Chain-of-Custody, lab analysis, short term storage and long term archiving, and ultimate retention and disposal.

Major Duties:

- Establish and disseminate standards and guidance for sample management that ensure integrity of the samples throughout the process from collection to data reporting and sample retention/disposal;
- Review work plans and SOPs to ensure sample integrity throughout the life of the program;
- Review and approve TWG sampling analysis plans and labeling procedures;
- Oversee sample intake, storage, tracking, and shipping to ensure consistency and compliance with established standards;
- Ensure availability of means for short term preservation and security of samples until they may be shipped to laboratories;
- Ensure development and operation of systems to review and maintain records of Chain-of-Custody for all physical samples as prescribed in NRDA work plans and guidance; and
- Brief the Data Management Lead on activities and provide updates of data analyses as needed.

5.4.4.2 Sample & Data Intake Manager

The Sample & Data Intake Manager handles all aspects of sample intake and data intake from the field for further processing.

Major Duties – Sample Intake:

- Provide sample intake, short term storage, tracking, and shipping on behalf of the field teams;

- Coordinate NRDA sample collection efforts with the UC via the NRDAR Representative;

Major Duties – Data Intake:

- Review and complete records of Chain-of-Custody required for all samples as prescribed in NRDA work plans;
- Track and inventory all NRDA samples and data collected for the duration of the NRDA;
- Brief the NRDA Sample Management Leader and Field Operations Lead on activities and provide updates on needs for additional equipment and supplies; and
- Provide intake on all field collected data including forms, digital media, instrument logs, etc.

5.4.4.3 Chemistry Coordinator

The Chemistry Coordinator oversees the Quality Assurance (QA)/Quality Control (QC) of sampling and analysis for NRDA.

Major Duties:

- Track the status of analysis for samples;
- Work with attorneys to determine which samples must be held and which can be disposed of and how this should be done;
- Identify and select labs to perform analyses;
- Work with TWGs to identify appropriate analyses;
- Work with TWGs and case management to prioritize the sample analysis queue;
- Work to develop new analysis methods; and
- Review work plans.

5.4.4.4 Laboratory Data Managers

The Laboratory Data Managers ensure the quality of lab data and compile data for Data Management Team.

Major Duties:

- QA/QC and third party validation of lab data as agreed upon by Case Management Team;
- Provide status updates on samples to Chemistry Coordinator; and
- Provide data to Data Management team for entry in to database(s) and dissemination to users (trustees, RP, others).

5.4.5 Data Management

5.4.5.1 Data Management Lead

The Data Management Lead provides leadership for implementation of systems that support the collection, management and dissemination of litigation quality data for the entire case.

Major Duties:

- Ensure that proper systems are in place for Chain-of-Custody protocol and associated QA/QC;
- Implement efficient systems for the collection, management and dissemination of case related data;
- Ensure proper quality check policy and protocol is conducted;
- Work with TWGs to ensure their data management needs are being met; and
- Coordinate with Sample Management Lead for information for sample tracking and ensuring labs are following correct data management protocol.

5*.4.5.2 Analytical Data Coordinator*

The Analytical Data Coordinator manages data recording involving the collection and chemical analysis of samples, implementing and utilizing proper systems for data collection, management and dissemination.

Major Duties:

- Organize the collection of analytical sample data with TWG field data managers and sample management;
- Ensure proper Chain-of-Custody data is maintained throughout the sample collection, intake, analysis, and lab delivery process;
- Work with data management lead to identify the appropriate field data management and collection system;
- Develop the schema design for the field sample database and associated tracking database;
- Work with the lab data managers and QA officer to ensure field data, lab data and validation data are combined correctly and efficiently;
- Assist Logistics Manager and/or NRDA Representative with ordering/requesting sampling equipment;
- Coordinate sampling logistics with Field Ops Plan Coordinator;
- Work with TWG lead, Field Ops Staff, and Data Management lead to identify appropriate personnel for sampling events; and

- Work with Field QA officer in the validation of the field data.

5.4.5.3 Observational Data Coordinator

The Observational Data Coordinator coordinates the collection, management and processing of observational data that are collected either concurrently or separate from analytical samples. Types of data include recorded field observations, geo-referenced photos, instrument data (e.g., salinity and other measurements), remote sensing data, and others.

Major Duties

- Organize the collection of instrument data, photos, field observation sheets, GPS etc.;
- Work with TWGs to develop and implement observation data collection plans;
- Work with Logistics Manager and/or ICS Liaison to find and provide requested instruments;
- Coordinate the purchase, rental and tracking of all of observational instrumentation with Logistics Manager;
- Work with Sample and Data Intake Manager to ensure proper Chain-of-Custody in delivery of data to processing personnel and to the NRDA data management system;
- Work with Field QA officer to ensure validation and proper calibration;
- Develop the schema design for the observational instrument tracking database in coordination with the Logistics Manager; and
- Train and provide operation support for Field Data Managers.

5.4.5.4 Specialized (Alternative) Data Coordinator

The Specialized Data Coordinator manages data recording on the collection and analysis of types of samples that undergo alternative analyses such as taxonomic identification, plant biomass, and other biological and physical analyses either concurrently or separate from analytical chemistry and observational data collection efforts. Types of data include biological and emerging technologies data.

Major Duties:

- Implement special case data collection work plans to support the case as identified by TWG leads, Data Management Lead and Ephemeral Data Coordinator;
- Coordinate data collection efforts with Sample Data Coordinator and Instrument Data Coordinator and Sample Management;
- Work with Logistics Manager to find necessary equipment and data collection logistics;

- Coordinate the purchase, rental and tracking of necessary sampling equipment with Logistics Manager;
- Ensure proper Chain-of-Custody of data as it is delivered to processing labs and to the NRDA data management system;
- Work with Field QA Officer to ensure validation and proper calibration;
- Work with Sample and Data Intake Manager to ensure proper Chain-of-Custody in delivery of data as it is delivered to processing personnel and to the NRDA data management system;
- Develop/augment sample tracking databases as designed by the Sample Data Coordinator to allow for the inclusion of differently formatted data; and
- Train and provide operational support for Field Data Managers.

5.4.5.5 Field Data Manager

The Field Data Manager leads data collection efforts out in the field for individual work plans.

Major Duties:

- Work with Strategic Science Advisor or TWG-specific leads to carry out data collection according to a developed work plan;
- Ensure proper data collection techniques are used, in coordination with Field QA/QC Officer;
- Work with Sample and Data Intake Manager to ensure digital and hardcopy data is transferred appropriately;
- Implement proper data collection protocols and Chain-of-Custody is followed; and
- Train TWG field teams on proper use of GPS, camera, sampling, and survey forms.

5.4.5.6 Data Management Specialists

Data Management Specialists process data for distribution to TWGs.

Major Duties:

- Process data as it comes in from the field;
- Load data into Environmental Response Management Application (ERMA) and Photologger;
- Create maps;
- Assist with dissemination of data;
- Create metadata;

- Demonstrate ERMA and Photologger to NRDA Team; and
- Work with TWG's and case team to develop appropriate map products/displays to facilitate operational decisions, analysis, inreach and outreach.

5.4.5.7 Field QA/QC Officer

The Field QA/QC Officer provides quality assurance/quality control for field work verifying correct equipment and supplies are used, correct methods are followed and documentation is complete and accurate.

Major Duties:

- Review sampling protocols and actual operations to ensure that correct sampling and other data gathering methods were followed;
- Ensure instruments are properly calibrated and that calibration documentation is archived;
- Ensure labels and storage and handling of samples is correct;
- Ensure data forms are complete and accurate;
- Review Chain-of-Custody forms and coordinate with Sample Management Lead to ensure archiving of records; and
- Brief the Chemistry Coordinator on activities and any problems encountered.

5.4.6 Restoration

5.4.6.1 Restoration Lead (trustee)

Oversees early and ongoing identification of potential natural resource restoration alternatives to be considered during the pre-assessment and restoration planning phases of the NRDA. Also oversees restoration activities that trustees may undertake during the emergency response phase of a spill (emergency restoration); and other restoration that the trustees may decide to undertake prior to the completion of the NRDA (early restoration). Eventually, restoration is overseen by a formal natural resource trustee council. The Restoration Lead coordinates restoration project identification, planning, implementation, and monitoring to the extent it occurs prior to the formation of the trustee council. Coordinates restoration groups to ensure that a cohesive and comprehensive restoration plan is developed, implemented and monitored.

Major Duties:

- Oversees the restoration staff from all trustee agencies;
- Supervises all logistics associated with deploying restoration staff in the field;
- Provides information on restoration options to the Joint NRDA Team and TWG science leads;

- Serves as the technical lead, or assigns appropriate restoration staff, during relevant Joint NRDA Team discussions;
- Works with Science Lead to identify assessment priorities that maximizing potential restoration outcomes from NRDA;
- Identifies gaps in research/knowledge that may impede restoration planning or scaling;
- Works with the NRDA Liaison to the UC to coordinate field operations with the response;
- Assists in reporting status updates and activities;
- Provides information to the Public Affairs Team as needed for outreach and communication;
- Ensures that all restoration work plans have required approvals and coordinates as needed;
- Works with Legal Team to ensure compliance with all applicable environmental and other regulations;
- Works with Data Management Lead to integrate restoration data and information;
- Aids in the development of monitoring and evaluation protocols; and
- Works with Finance to document restoration costs.

5.4.6.2 Emergency Restoration Coordinator

Coordinates emergency restoration actions identified and conducted by the trustees prior to completing the full restoration planning process. Emergency restoration is defined as: actions taken by trustees prior to the completion of a natural resource damage assessment and restoration planning process to prevent or reduce continuing natural resource injuries and avoid potentially irreversible loss of natural resources. Emergency restoration may be implemented during the active response phase of a spill, or after the response is concluded, but pre-assessment or restoration planning is still ongoing.

Major Duties:

- Notifies the UC (if the response is active) that the trustees have identified restoration activities that should be implemented during the emergency response;
- Provides technical information on emergency restoration options;
- Provides information on emergency restoration to the Case Management Team directly or through the NRDA liaison; and
- Documents restoration activities implemented.

5.4.6.3 Early Restoration Coordinator

Coordinates restoration planning and scaling for any early restoration undertaken by the trustees during the NRDA. Sometimes the trustees may determine a need to conduct certain restoration actions prior to the completion of the overall natural resource damage assessment, even if the actions do not meet the legal requirements of emergency restoration as defined under the OPA regulations at 14 CFR Part 990.26. Such early restoration is rare and still necessitates preparation and public review and comment on a restoration plan and environmental compliance. This role also coordinates with the larger NRDA team on damage assessment and restoration planning.

Major Duties:

- Identifies early restoration options for injured resources;
- Works with the Restoration Lead and Science Lead to prioritize ephemeral data collection and data collection that maximize potential restoration outcomes; and
- Coordinates the development of restoration plans and restoration scaling for injured resources.

6.0 EPHEMERAL DATA COLLECTION

Immediately following a spill and the formation of an Ephemeral Data Collection Team, an Ephemeral Data Collection Plan should be prepared to facilitate the identification of the critical data collection activities and procedures and their communication to the team members and the relevant ICS representatives. Examples of the various components that may be included in an Ephemeral Data Collection Plan are provided below.

6.1 Goals and Objectives of the Ephemeral Data Collection Plan

Goals: To (1) confirm the source of the spilled oil(s); (2) determine environmental conditions in water, sediment, and selected marine organisms prior to contact by the oil; (3) document concentrations of petroleum hydrocarbons in the water column, sediments and biota, subsequent to oil contact; and (4) document extent of wildlife and human uses of the local area at the time of, or shortly after, the incident.

Objectives: To collect source oil, water, sediment, and select biological samples (or survey data) as well as make wildlife and human use observations within the first hours or days after a spill. Because of the narrow window of opportunity for collection of these data, they are referred to as "ephemeral" data (*i.e.*, if the samples are not collected, the opportunity to collect them will be lost permanently). Ephemeral data aids in understanding baseline environmental conditions prior to oil contact and can be critical in identifying the need for, and scope of, subsequent environmental sampling, and injury assessment.

Focus of Sample Collection: Collection of ephemeral data related samples should generally focus on the following media and areas: (1) source oil(s) to confirm the release is the source of the oil found in the environment and for possible toxicological testing; (2) water and sediment samples from areas not yet oiled but likely to be oiled (reference/baseline conditions) particularly sensitive areas such as sea grass and oyster beds to document pre-oil contact conditions; (3) biota (clams, oysters, mussels, macro-invertebrates, etc.) samples from areas that will likely be oiled to also document pre-oil contact conditions; (4) wildlife and human use observations/photo documentation of the general spill area; and (5) water samples under the slick to obtain information on the concentration of selected petroleum constituents in the water column.

Study Area: Primarily the area likely to be impacted in the first few days following a spill but should also include other ecologically or culturally sensitive areas within the entire zone that could be impacted.

6.2 Safety

Safety is the most important consideration when implementing data collection activities. All field team members will read the incident-specific site safety plan and receive a daily safety briefing before going into the field. Field team members collecting samples by

boat will receive a boat safety briefing by the boat operator prior to leaving the dock. When on the water, field team members will wear personal floatation devices at all times. Good judgment must be used, particularly when considering fieldwork during inclement weather. No sampling will be conducted in the dark. While working on the shoreline, field team members should be mindful of slippery surfaces (e.g., rocks) and sharp objects. Field team members should wear safety glasses, sunscreen, appropriate footwear, and other personal protective equipment (PPE) as might be required by the Safety Officer. Any incident will be promptly reported in accordance with the site-specific safety plan. All individuals responding in the field must have appropriate HAZWOPER training and documentation. Sampling activities must be conducted in accordance with the incident-specific site safety plan for the response, including the determination that vapor concentrations in the work area are below those required for safe operations. When working in oiled areas, field sampling team members will wear appropriate protective equipment (e.g., Tyvek suits or rain gear, rubber boots, gloves, etc.). Nitrile gloves will be worn when collecting samples and must be changed between each sampling site to avoid cross-contamination.

6.3 General Sampling Procedures

6.3.1 Introduction

This section describes suggested general methods for collecting source oil, water, sediment, and biological samples as well as conducting aerial surveillance and remote sensing for documenting wildlife and human use and oil distribution. The methods described herein are not intended to be prescriptive. The trustees and the RP must determine, on a case by case basis, appropriate methods given their particular data needs as well as situational and resource limitations. Methodologies will often be determined by specialists hired to collect specific types of data. Regarding samples collected for chemical analyses, sampling methods and other protocols should be coordinated, to the extent possible, with the laboratory that will be conducting the analyses. Finally, some or all of the data discussed are potentially collected as part of spill response activities and should not be duplicated by the NRDA team unless sampling or QA/QC procedures are not adequate for NRDA purposes. Further resources and guidelines regarding oil spill sampling and data collection can be found at: http://response.restoration.noaa.gov and http://www.researchplanning.com/services/damage-assessment-restoration/.

6.3.2 Top Data Collection Priorities

- Collection of source oil(s);
- Water, sediment, and biological samples (e.g., bivalves) in areas that are not yet oiled but are expected to be oiled based on trajectory analyses;
- Aerial and ground surveys of sensitive wildlife areas and public use areas; and
- Water, sediment, and biological samples (e.g., bivalves) in oiled areas, provided it is safe and permitted by the ICS.

6.3.3 Recordkeeping and Chain-of-Custody

Record keeping should include the following:

- Field sampling record for each field team. Each team should assign this to a specific member of the team. At the end of each day or field sampling trip, the time and date should be noted and the record keeper should sign the field record. Information in the record should include sampling details (i.e., sampler name, sample type, location, and time) and other observations (i.e., presence of wildlife and humans, oil observations, weather);
- Photo log, signed and time/dated at end of each field day;
- Chain-of-custody forms for all samples properly filled out and signed per Chain-of-Custody procedures;
- Contact list for all sampling team members with address, phone, cell phone, pager, fax, email, etc.; and
- Record GPS positions as follows: lat NDD.ddddd; lon WDD.ddddd; WGS 84 datum.

Chain-of-custody must be maintained at all times. Chain-of-custody means that the sample or data are under the possession and control of the person identified on the form for the period specified on the form. Possession and control can mean literally in possession, within sight, or in secure storage where the access is limited to the person in possession. The person relinquishing the samples and the person taking control of the samples need to sign the Chain-of-Custody form.

Before shipping samples:

- Make sure that each Chain-of-Custody form is filled out completely and properly;
- Check that the sample identification on sample bottles matches the sample identification on the Chain-of-Custody; and
- Ensure that the date, time, type, matrix, container types, and analyses requested are clearly indicated.

After the Chain-of-Custody has been checked and verified, sign where indicated in the “Relinquish By” box at the bottom of the form. Make sure that the date and time that you relinquished the samples are recorded on the chain-of custody forms. Put the chain-of-custody forms in a zip lock bag and place the bag in the ice chest. Remember to put ice in the ice chest and tape the lid shut with evidence tape. If direct transport and drop-off at the lab or evidence collection site is not possible, take the ice chest to an over-night courier service and ship the samples to the lab as directed. When the ice chest is received at the lab, the person accepting the samples will sign his or her name in the “Received By” box on the bottom of the Chain-of-Custody form.

The original Chain-of-Custody form always goes with the samples. Upon receipt of the samples, request the laboratory to send a copy of the Chain-of-Custody to the sender.

6.3.4 Sample Storage

Most samples can be temporarily stored in appropriate containers in ice chests with ice cubes or crushed ice, or placed in a refrigerator. During the holding period, the sample temperature should not exceed 6ºC, or become frozen. Keeping the samples well packed in wet ice will keep the sample in the required temperature range.

6.3.5 Labeling

Label sample jars using a permanent marker just before collecting samples if possible and cover label with clear tape. Include the following information on the sample label:

- Sample number;
- Sample type (e.g., source oil, sediment, water, etc.);
- Date, time, and location of sample collection; and
- Collector's name.

6.3.6 Photo-Documentation

Prior to conducting any sampling and after marking the station location and/or recording the GPS coordinates, photographs or videos should be taken of the sampling site. It is recommended to use a program that will automatically put GPS coordinates on your digital photographs. For onshore samples, take video and/or photos in both directions along the shore as well as from the waterline toward the backshore, and from the backshore to the waterline. For offshore sites within reasonable distance from the land, take photos or video directly towards the shore as well as up-shore and down-shore directions. In both cases, try to get permanent and distinctive landmarks in some photos and/or videos for future reference. In all cases, include a permanent or distinctive landmark or some measure of scale in photos or videos for future reference.

6.3.7 Field Sketch

When collecting sediment samples, make a quick sketch of the beach and sampling area in the field book showing the general beach configuration, sampling locations and pattern of sample collection. A similar sketch should be made for documenting biological sample locations.

6.3.8 Airborne Contamination

Avoid sampling or storage of equipment downwind of solvents or engine exhaust. This is particularly the case for samples that will be analyzed for volatile organic compounds

(VOCs). Usually avoidance may occur by approaching the sampling location into the wind and current if practical.

6.3.9 Decontamination and Waste Handling

Clean sampling equipment with an Alconox® and water solution followed by two distilled water rinses between each sample collection. Methanol may also be used to clean sampling equipment. When decontaminating sampling equipment, wash and rinse over a plastic bucket with a lid and retain the wash water. Store all oily rags, gloves, and other material in a plastic bag. Dispose of rinse water and oil material in accordance with the waste management plan prepared by the Environmental Unit.

6.3.10 Shipping

Sample shipment must be consistent with federal Department of Transportation regulations governing the shipment of flammable materials.

6.4 Source Oil Sampling

It is critical that all sources of spilled oil be identified and sampled to enable forensics analyses and toxicity testing of the source oil as well as comparison to the oil that may be detected in samples collected from various media (water, shoreline, subtidal, etc.) during the injury assessment. Analytical methods are discussed in Section 6.9. Source oil sample(s) should be separated from other samples to avoid contamination. An additional sampling protocol can be found at:
http://www.researchplanning.com/wp-content/uploads/2012/10/SourceOil.pdf

- **Timing:** Collect as soon as possible.
- **Where to Sample:** If possible, collect oil samples from the facility storage tank(s) or vessel compartment(s) where the spill originated. If all of the oil has been released from the tank or compartment, then collect the sample from the water or land surface as close as possible to the source as long as it is safe to access.
- **Sample Equipment:** Sample equipment for collecting source oil generally consists of a drum thief, sample bomb, bailer, air-driven metallic pump or other similar devices. In many cases, samples can be collected by simply dipping a sample jar into the oil by hand, using a grab sampler pole (1-L bottle strapped to a pole) or a Volskom® sampler (bottle holder frame attached to a rope).
- **Sample Container:** Pre-cleaned, 1-liter, wide-mouthed glass jars with Teflon lined caps.
- **Sample Volume:** 1-liter if the sample is oil and water; or at least 30 ml if the sample is neat oil. Collect in triplicate.
- **Sample Collection:** Samples shall be collected using the above sampling equipment. If there is only sheen on the water, slowly drag four 3x12 inch pieces of fiberglass or polytetrafluoroethylene (PTFE; Teflon®) cloth through the sheen,

allowing the oil to be collected directly onto the cloth. Place the sheen sample cloths into wide-mouth glass jars with caps. When sampling, do not let gloves come in contact with petroleum, however if they do, change them and take another sample. Gloves must be changed between sampling locations to avoid cross contamination. Each sample must be labelled with the information listed below and placed in a cooler on ice. Following sample collection a Chain-of-Custody form must be filled out and accompany the samples when stored and transported.

- **Labeling:** Mark the label as "Source Oil" using a permanent marker and, being as specific as possible, include the following information:
  - Type of product spilled (e.g., diesel, bunker fuel, gasoline);
  - Source of the spilled product (e.g., name of the vessel transporting product; fuel tank of vessel transporting the product);
  - Sample number;
  - Date and time; and
  - Collector's name.

6.5 Water Sampling

The primary purpose of collecting water samples is to determine baseline conditions by collecting samples in un-impacted areas as well as to determine the concentrations of petroleum components in the water as a result of the release by sampling the impacted area. The more toxic components generally include VOCs (e.g., benzene, toluene, ethylbenzene, and xylenes) and low molecular weight polycyclic aromatic hydrocarbons (PAHs), as well as other PAHs that may contribute to chronic toxicity (e.g., benzo[a]pyrene). Analytical methods are provided in Section 6.9.

The secondary purpose is to determine the concentration of the petroleum hydrocarbons (both baseline and post-release) that may have entered the water column from physical processes such as mixing, dispersion, dissolution, etc. and/or adsorption to suspended particles or other materials. The concentrations of petroleum hydrocarbons in the water column are highest in the first few hours to one day following a release and then decrease rapidly. Therefore, it is critical that samples be collected as soon as possible during the first day after the release occurs.

Water samples should be collected from both oiled and unoiled areas and from both the intertidal/surf zone (near-shore) and, if sampling boats are available, off-shore areas. Near-shore samples can be collected by wading into the water and collecting samples about mid-way between the bottom and the water surface. At a minimum, off-shore water samples should be collected from the upper 1 m (near-surface water). An additional sampling protocol can be found at: http://www.researchplanning.com/wp-content/uploads/2012/10/WaterSampling.pdf.

- **Timing:** Prior to oil impacting the sampling area or as soon as possible after impact and periodically thereafter if practical.

- **Where to Sample:** Sampling locations should be representative of the areas that have been, or are likely to become, impacted by the spill (open water, sheltered bays, industrial waterfronts, undeveloped shorelines, etc.). Sampling locations should be identified by GPS. On-shore water samples can be collected in conjunction with on- shore sediment sampling described in Section 6.6 and illustrated in Figure 6-1. Collect at least one set of water samples from the seaward end of the three transects at each sample site (Figure 6-1).
- **Sampling Equipment:** For off-shore samples, a sub-surface grab sampler should be used. The sub-surface sampler can also be used to collect samples from the intertidal areas. If a subsurface sampler is not available, the top of the sample jar can be positioned beneath the water surface and the lid removed to fill the jar and then replaced prior to bringing the jar to the surface.
- **Sample Container**: Pre-cleaned, 1-L amber glass, wide-mouthed jars with Teflon lined caps and 40 ml glass, screw-cap vials with Teflon-faced silicone septum.
- **Sample Volume:** 1-liter water sample with approximately 1 inch headspace and a 40mL water sample, with no headspace. The 1-liter sample will be used for analyses of PAH/TPHs and the 40 ml sample for VOCs.
- **Number of Samples and Collection Depth:**
    - **Off-shore:** Collect at least one 1-liter and three 40 ml water samples at depths of approximately 0.5 m and 3.0 m, if possible, from each location.
    - **Near-shore:** Collect at least one 1-liter and three 40 ml water samples between the surface and the bottom in the surf/intertidal zone, or at approximately 0.5 m if the water is more than 1 m deep at the sampling point. Near-shore water samples can be collected in conjunction with sediment sampling described in Section 6.6 and illustrated in Figure 6-1.
    - **Sampling Through Slick:** If visible oil is present on the water surface, it should be moved aside with a water hose, compressed air, or paddle. Care should be taken not to disperse oil into the water column.
- **Collection of VOA Samples in 40 ml Vials:** To virtually eliminate the potential for loss of volatile hydrocarbons, collect a sub-surface sample by lowering the VOA vial beneath the surface, removing the lid allowing the vial to fill completely, and replacing the lid while it is still under water. The VOA vial should be at least 1 foot beneath the surface while collecting the sample to prevent surface oil from entering it If necessary, a bulk sample can be collected and water transferred to VOA vials. From the bulk sample, gently pour some of the water sample into the VOA vial to avoid bubble formation. Fill vial until the meniscus forms over the vial's lip. If sea conditions are difficult, collect the best sample possible and note conditions of sample collection in the field book. Cover with screw-cap lid, tighten lid and invert the bottle and tap end to check for air bubbles. If bubbles are present, pour out the sample and resample with a new VOA vial.
- **Trip and Field Blanks:** Both near-shore and off-shore field teams should carry one trip blank and one field blank each for the VOA and PAH/TPH analyses. Before leaving for the field, each field team should prepare one trip blank by

filling one 40 mL VOA vial with distilled water. Trip blanks are to remain sealed and in the ice chest during sample collection.

In the field, each field team should prepare one field blank by filling one 40 mL VOA vial with distilled water. Field blanks should be opened at one sampling site, exposing the sample to any airborne contaminates that could be present, while samples are being collected. After all the samples at that site have been collected, the field blank will be sealed and placed in the ice chest with the rest of the samples. Distilled or de-ionized water blanks (un-opened bottle from the same production lot, if possible, as the make-up water for the trip and field blanks) should be sealed and saved for possible analysis, if necessary.

Samples shall be collected using the above sampling equipment and methods. Gloves must be changed between sampling locations to avoid cross contamination. Each sample must be labelled and placed in a cooler on ice. Following sample collection a Chain-of-Custody form must be filled out and accompany the samples when stored and transported. Samples should be collected from clean sites first to avoid contaminating equipment and other samples.

6.6 Sediment Sampling

Sediment samples should be collected in both oiled and un-oiled areas along the shoreline. The purpose of sampling in un-oiled areas is to determine baseline conditions of oil components, especially toxic compounds such as PAH that existed prior to being impacted by an oil spill. The sampling of impacted areas is intended to determine what portion of the petroleum hydrocarbon mixture is present in the sediments as a result of the spill by comparison to baseline conditions. If oil is present in samples, fingerprinting may be conducted to determine the source. Where practical, collect samples in areas with fine-grained sediments and avoid gravel or cobble beaches. If samples must be collected in areas with coarse-grained materials, remove the overlying gravel/cobble layer and sample the underlying finer-grained sediment. Analytical methods are provided in Section 6.9. An additional sampling protocol can be found at: http://www.researchplanning.com/wp-content/uploads/2012/10/IntertidalSediments.pdf.

- **Where to Sample:** For un-impacted (baseline) shorelines, first conduct a brief survey of the beach to look for obviously oiled sediment, rock, intertidal organisms, feathers, or debris that may be present from previous spills. If hydrocarbons or hydrocarbon stains are observed, collect a sample of the oiled material and place it in a sample jar. Note on the label and in the field book that it appears to be pre-existing oil. Subsequent sediment sampling in both un-impacted and impacted areas should proceed as described below.
- **Sample Transects:** At each site, three transects, equally spaced and perpendicular to the shoreline should be established with Transects 1 and 3 being at least 100 m apart where practical (Figure 6-1). Try to select an area of the beach with fine sediments, and avoid gravel or cobble beaches, where practical. If coarse

material (gravel/cobble) is encountered and a sample is required, remove the cobble/gravel layer and sample the underlying finer-grain sediment.

- **Sampling Equipment:** Pre-cleaned or disposable stainless steel trowel, spoon, spatula, or scoop and stainless steel bowl.

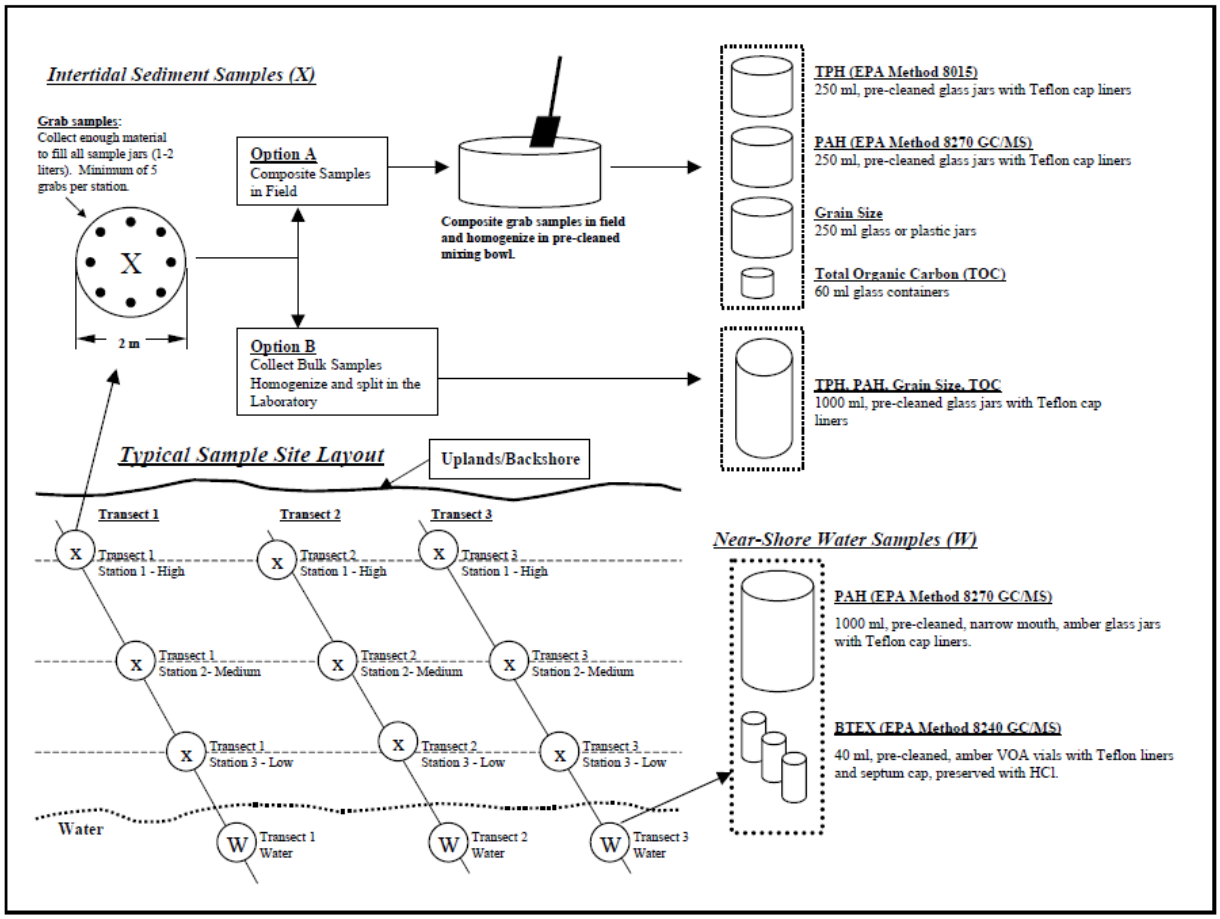

Figure 6-1. Example of sediment and water collection layout at intertidal/near-shore sampling sites.

- **Sample Containers and Volume by Analytical Method (See Figure 6-1):**

  Option A. Field Compositing

  TPH: pre-cleaned 8-oz. wide-mouth glass jars, screw-cap with Teflon liner.

  PAHs: pre-cleaned 8-oz. wide-mouth glass jars, screw-cap with Teflon liner.

  TOC: pre-cleaned 4-oz. wide-mouth glass jars, screw-cap with Teflon liner.

  Grain size: 4 to 8 oz plastic jar, Ziploc bag, or whirl-pack baggie (fill adequately to the equivalent of a 4 to 8 oz plastic jar).

Option B. Collection of Bulk samples for Laboratory Compositing

TPH, PAHs, TOC and grain size: Collect bulk samples in pre-cleaned 1-liter wide-mouth glass jars, screw-cap with Teflon liner. Laboratory will homogenize and split for appropriate analyses.

- **Number of Samples:** Collect separate composite samples from the high, mid, and low tide elevations (if possible, depending on current tidal elevation) on each transect. This will result in a total of **nine** composite samples at a site. The high tide elevation may be determined by the upper limit of the wetted area and/or the presence of drift material (=strand line). Low tide elevation may be estimated based on time of sampling relative to predicted low tide but may be, by default, the lowest portion of the intertidal zone above the current waterline. Use a tape measure to record the distance from the high tide line to each sampling station along the transect.

- **Collection Method:** Each composite sediment sample should include at least five sub- samples collected within a 2 m radius from each of the three sample stations on each transect (see Figure 6-1 for illustration). Collect sediment with a pre-cleaned stainless steel spoon.

  Depth of Sample: Approximately 2 cm deep.

  Option A. Field Compositing (Figure 6-1):

  Place sediment into a pre-cleaned stainless steel bowl, collecting enough sediment to fill the sample jars above three quarters full. Once enough sediment has been collected, mix the sub-samples thoroughly until the sediment appears homogeneous. Remove rocks and debris that are not representative of the typical sediment type being sampled. Use the spoon to fill the four sample containers from the composite sample in the bowl. Decontaminate (or discard disposable equipment between each sample collection.

  Option B. Collection of Bulk samples for Laboratory Compositing:

  Place sediment samples into a pre-cleaned 1-liter jar, collecting enough sediment to fill four sample containers. The laboratory will homogenize and process samples for total petroleum hydrocarbons (TPH), PAHs, total organic carbon (TOC) and grain size as appropriate.

Each sample must be labelled and placed in a cooler on ice. Following sample collection, a Chain-of-Custody form must be filled out and accompany the samples when stored and transported.

Avoid cross-contamination by cleaning boots and changing gloves between sampling sites. If disposable Tyvek shoe covers are available, they may be used and changed between sample locations. Place the shoe covers in a plastic bag and dispose of

according to the waste management plan prepared by the Environmental Unit. Samples should be collected from clean sites first to avoid contaminating equipment and other samples.

6.7 Biological/Tissue Samples

There are a variety of types of biota that can be sampled to establish baseline contamination as well as to assess the extent of potential injuries but bivalves may be preferred since they generally do not metabolize hydrocarbons well. Species suitable for collection include mussels, clams, oysters, crabs, surf smelt eggs, surf grass and others. The person collecting the samples may be required to have a scientific collection permit or appropriate fishing license and all sampling activities should be coordinated with the appropriate resource agencies. Other commonly sampled tissues are feathers and fur from contaminated live and dead birds and mammals. Analytical methods are provided in Section 6.9. An additional sampling protocol can be found at: http://www.researchplanning.com/wp-content/uploads/2012/10/Shellfish.Tissues.pdf

- **Where to Sample:** Shoreline areas where mussels, clams, oysters, etc. are present and easily accessible in the intertidal area. Oiled birds, mammals and other wildlife can often be sampled at a centralized intake/processing center.
- **Sample Equipment:** Pre-cleaned or disposable stainless steel trowel or shovel for exposing subsurface bivalves or stainless steel trowel, large knife or similar tools for removing surface bivalves.
- **Sample Volume and Containers:** From 15-30 individuals of the same species (enough for at least a 30 g tissue/ sample) should be collected. Feather and fur sample sizes should be coordinated if possible with the analytical lab. In general, 5 oiled feathers are a sufficient sample size for PAH analyses.
- **Collection Method:** When collecting invertebrates, remove primarily live animals, of similar shell or body size, from the rocky shore or surface of the sediment, and rinse debris and sediment from their shells using (in order of preference) distilled water, clean tap water, or clean seawater. After rinsing they shall be wrapped in heavy duty aluminum foil (dull side facing sample) and double-bagged in appropriately sized, re-sealable freezer bags. Fur and feathers can be stored in foil (dull side facing sample) or in clean glass sample jars with Teflon cap liners. Gloves must be changed between samples to avoid cross contamination. Each sample must be labelled with a waterproof label. The label must be placed in between the re-sealable bags or on the sample jar and lid. All samples must be placed in a cooler on ice. Following sample collection a Chain-of-Custody form must be filled out and accompany the samples when stored and transported. Samples should be collected from clean sites first to avoid contaminating equipment and samples.
- **Sample Storage:** Transport as soon as practical (within 12 hours for bivalves) to the laboratory or a secure freezer where the samples can be stored at 20°C until a decision about subsequent analyses can be made.

6.8 Quality Control Samples

In addition to collection of primary samples for characterizing field conditions (see Sections 6.5 to 6.7), there are five types of samples that are considered quality control (QC) samples.

These QC samples are:

- Field replicates are unknown to the laboratory and are independently collected samples at the same station as the primary field sample (i.e., they are two separate composites collected at the same station and at the same time);
- Laboratory duplicate samples check the precision of the analyses;
- Matrix spikes verify recovery of the chemicals requested for analysis from the particular medium being tested;
- Rinsate from equipment to determine if there is contamination of equipment that might be carried over to another set of samples. Collection of equipment rinsate is discretionary and is only a concern with cross-contamination, which can be avoided by using disposable sampling gear when available, strictly adhering to decontamination procedures, described in Section 6.3.9, and changing gear entirely when moving from a contaminated area to another area; and
- “Trip” blanks accompany the samples in the cooler and require no handling. They are provided to the laboratory when VOA samples are being collected for the analysis of volatile organic compound (VOC). Trip blanks are unnecessary for other kinds of analyses.

For laboratory QC testing, QC samples are typically collected at five percent of the total number of sampled stations. For example, if 40 stations are to be sampled, extra material is needed from two stations for laboratory duplicate samples and from two other stations for laboratory matrix spike samples. These QC samples are in addition to any field replicate samples.

6.9 Chemical Analyses

Two important considerations are:

- Exposure of natural resources to oil that is present in the water or sediment, and/or on/in organisms; and
- Detected oil is from the spill and not some other source.

A qualified laboratory under the direction of the Chemistry Coordinator, or other qualified NRDA chemist, should analyze the ephemeral samples of oil, sediment, water, and tissues. The chemist will make decisions about what samples will be analyzed, methods to be used and necessary Quality Control/Quality Assurance standards. The

following sections are for background information and provide a general description of the typical analyses that may be requested from the analytical laboratory.

In all cases, a complete data reporting package should be requested from the laboratory including the standard operating procedures (SOPs), complete gas chromatograph/mass spectrometer/selective ion monitoring (GC/MS/SIM) chromatograms and results, and the associated QA/QC analyses. Data and chromatograms should also be provided as electronic files on CD (PDF files of initial and final reporting packages can also be requested of the laboratory for e-mail delivery).

6.9.1 Methods and Analyses

The following methods and analyses may be requested. The NRDA Chemistry Coordinator and Analytical Data Coordinator will make decisions on sample analyses prior to expiration of holding times.

Volatile Organic Compounds (VOCs)

VOCs, including BTEX (benzene, toluene, ethylbenzene and xylene) as well as other aromatic and non-aromatic compounds, are easily dispersed in water but evaporate quickly. For this reason, sampling for BTEX and other toxic volatile compounds are of high priority during ephemeral sampling efforts following oil spills.

For oil spill applications, the standard purge and trap extraction and analysis by EPA Method 8260B (GC/MS with capillary column) should be modified by running the GC/MS in SIM or in full scan mode to include the higher alkylated benzenes (i.e., a benzene ring with alkyl side chains containing 3 to 5 carbons). Detection limits should be less than 2 parts per billion (ppb) for individual analytes; 0.1 ppb is easily achievable in SIM mode.

Total Petroleum Hydrocarbons (TPH)

Total hydrocarbons are often referred to as total petroleum hydrocarbons (TPH), but most TPH methods do not differentiate among petroleum, petrogenic, and biogenic hydrocarbons when simply reported as totals. For NRDA, results from these methods will not provide the data needed to support calculation of toxic effects from BTEX or PAH exposure. The TPH results, however, can be used to track oil weathering and map extent of exposure of water column resources, if meaningful detection limits can be reached. TPH also can be used as a screening tool to estimate the presence and amount of hydrocarbons in the sample media and provide an indication of which samples should receive highest priority for more extensive analyses.

TPH by EPA Method 8015 (aliphatic and aromatic hydrocarbons, and other non-chlorinated volatile organic compounds) is often the preferred method for analysis of “total hydrocarbons”. This method, which uses a GC and flame ionization detector (FID), provides a direct measure of total hydrocarbons in the gasoline- and diesel- and heavy oil-range and has a low detection limit compared

with that of infrared methods. This method does not detect low boiling compounds (below n-C8).

Polycyclic Aromatic Hydrocarbons (PAH)

Quantification of PAHs can be useful for NRDA because it provides an indication of the toxicity of a given spill to range of organisms. However, PAH analyses are relatively expensive and require some special considerations. In addition to the standard PAH priority pollutants ("parent" PAH compounds), the list of PAH analytes should, if possible, include the alkylated homologues and other compounds of interest, using GC/MS in SIM mode. EPA Method 8270 (GC/MS) for semi-volatile compounds would be the method of choice for this analysis. Detection levels should be 0.1 ppb for individual PAHs to support injury assessment using toxicity thresholds.

Biological Markers

Analysis of biological marker compounds (i.e., steranes, hopanes and others) may also be desired if oil fingerprinting is needed. Analytical fingerprinting methods vary by laboratory and should be reviewed by the interested parties (trustees and RP) prior to analyses. EPA Method 8270 can be modified for biomarker analyses.

6.9.2 Recommended Analyses by Media

- **Source Oil Sample:** Complete characterization, including PAH's (EPA Method 8270-GC/MS); BTEX (EPA Method 8260B GC/MS); TPH (EPA Method 8015); density; boiling curve; metals; sulfur content; and weight fraction in oil of aromatics, naphthenes, total paraffins, asphaltenes/resins, and sulfur. Fingerprinting should be conducted if needed.
- **Water Samples:** TPH (EPA Method 8015, GC/FID, extended range), PAH's (EPA Method 8270-GC/MS), BTEX (EPA Method 8240 GC/MS). Fingerprinting should be conducted if needed.
- **Sediment Samples:** TPH (EPA Method 8015, GC/FID, extended range), PAH's (EPA Method 8270 -GC/MS). Ask the laboratory to determine total organic carbon of the sediment. Fingerprinting should be conducted if needed.
- **Tissue Samples:** PAH's (EPA Method 8270- GC/MS), BTEX (EPA Method 8240 GC/MS). Request lipid and water content and report the results as dry weight. Fingerprinting should be conducted if needed.

6.10 Aerial Surveys

Specific goals of aerial surveys for wildlife and human use impacts include:

- Obtain information on wildlife (species and numbers) that may be affected by the spill;
- Obtain information on numbers of humans that may be affected by the spill;
- Obtain information on offshore spill distribution relative to wildlife and human uses; and
- Support identification and mapping of sensitive resources.

Aerial surveys should be conducted by experienced contractors and trained wildlife observers. Use of a high-wing aircraft, such as a Partenavia, facilitates observations below and to the sides of the plane. The survey route and transect design is established just prior to the flight to accommodate the specific areas, issues, and species of concern for a particular spill. The transect design should efficiently and effectively sample areas in and around the spill site which represent areas of potential impact and/or which potentially contain resources at risk of oiling. In addition, designations of critical habitats such as rookeries or colonies as well as associated buffer strips should be determined prior to the survey so that the aircraft can avoid disturbance of sensitive areas.

Surveys may include near shore, offshore, or bay/estuarine components. Offshore surveys usually consist of multiple long legs running perpendicular to the shoreline. Smaller areas of interest (highly sensitive areas or areas especially likely to be affected by a spill) may be surveyed using fairly closely spaced parallel lines. Birds in the nearshore environment tend to be grouped in linear patterns, just seaward of the surf line. These birds are best sampled by flying parallel to the coast, about 100 m seaward of the breakers. Within small bays and estuaries, repeated circling allows observers to estimate the entire population of the various bird species within the area.

Recording observations/data is challenging due to the speed of the aircraft. Flying at 200 feet altitude and at a speed of 90 knots, it is possible to record all species within a 50 m transect on either side of the plane, which provides estimations of densities. Observations should be recorded by a dedicated person who can record wildlife, human densities (if applicable), spatial, and ambient data onto a laptop computer connected to a Global Positioning System (GPS). In addition, observations can also be recorded by each observer using a hand-held tape recorder. These audio data can be transcribed by the observer biologists and entered into a spreadsheet. Observations are combined with the track of the aircraft by interpolating the position according to the time of each observation. If required, the tape-recorded data can subsequently be used for more detailed analysis of animal and human distributions. Additional information can be obtained by taking photos and/or videos from the air; some guidelines for obtaining useful images can be found in Attachment B. Depending on the level and types of data required from aerial surveys, multiple flights/separate surveys may be required.

7.0 TECHNICAL WORKING GROUPS (TWGs)

TWGs are formed and staffed over the days, weeks and months following a spill. A TWG is a group responsible for assessing a specific technical aspect (such as a resource category) of the NRDA. Generally, TWGs are formed to evaluate a resource, habitat, or some combination of those. For example, a TWG may be dedicated to assessing injuries to birds, or a certain shoreline habitat, or human recreational use. The TWG is responsible for conducting the assessment for their assigned resources, addressing all NRDA requirements (release, pathway, exposure, injury). TWG subgroups can also form. These subgroups are a sub-category of a TWG, created when the activities of the TWG would be more efficiently managed by breaking the work into smaller tasks handled by a few members of the TWG. For large events, specialty TWGs may form to meet the needs of the resource TWGs. For example, TWGs could be created to focus on aerial imagery collection or performing toxicity tests across the case.

7.1 TWG Formation

The Case Management Team overseeing the NRDA will advise on TWG formation to comprehensively address impacts across the case. During Phase I of the NRDA, the Ephemeral Data Collection team will take the lead in collecting data in the early stages, where the TWGs may come on line later in Phase II or III. As every NRDA is different, the TWGs could form earlier in the process. The number of TWGs will depend on the complexity, the resources impacted by the incident, and the magnitude of the release. It is not unusual to begin with many TWGs during the early phases of an assessment and then merge and consolidate over time. Alternatively, a TWG may be split as needed. When developing the TWGs, the Case Management Team will also need to consider available staff and resources.

In a cooperative setting, the TWG is comprised of trustees and RP representatives. A TWG lead is designated for each group. The lead coordinates within and outside the TWG and provides overall direction for the group (See Section 5). The group should include scientists, agency resource managers and NRDA practitioners with sufficient subject matter and NRDA expertise to successfully conduct a NRDA injury assessment for the TWG resources. Resource specialists and other practitioners may also participate in the group to provide additional expertise. The TWG lead can coordinate with the case wide science advisor (if that person is in place) to assist in identifying experts and needs. A statistician is highly recommended to develop sampling plans and assist with data analysis. In some cases, a statistical advisor may work across all TWGs for consistency, which also can be coordinated with the science advisor.

7.2 TWG Responsibilities

TWGs are responsible for evaluating various resources. The following list summarizes key duties for each TWG, which are guided by the TWG lead:

- Identify/prioritize resources at risk;

- As soon as possible, develop a conceptual model for each resource that includes release, pathway, exposure and potential injuries. Conceptual models will be refined as more information is available;
- Aid in development of general ephemeral data plan and collection;
- Assemble and evaluate baseline data including historical, and traditional ecological knowledge for the resource;
- Develop work plans for Pre-Assessment;
- Develop assessment study plans for priority resources with clear and concise study objectives and ensure that studies address all NRDA requirements (release, pathway, exposure, injury);
- Identify how exposure will be documented and/or quantified for priority TWG resources;
- Identify appropriate assessment approaches for priority TWG resources;
- Identify and develop longer term assessment plan as appropriate;
- Identify/prioritize restoration options for priority TWG resources;
- For resource TWG's, identify how the proposed studies or tasks in the work plan will inform the scaling of the restoration project(s); and
- Develop or provide appropriate information to support restoration. Restoration may be part of the resource TWG. In some cases, a separate Restoration TWG may be formed case wide.

As mentioned, specialty TWGs may form during large incidents to address a technical need such as aerial imagery collection or toxicity testing for multiple groups. In this instance, these TWGs must coordinate closely with resource TWGs to ensure that appropriate information is collected. The resource TWG lead may designate a point of contact for coordination. The specialty TWG should understand how their data or information is informing the resource TWG assessment and be cognizant of timing for deliverables.

7.3 General Guidance

Coordination: If an Ephemeral Data Collection Team is in place, the TWG should coordinate to ensure that data collection needs are met. If not, the TWG may need to plan on supplemental data collection for any gaps early in the assessment process. Coordinate with other TWGs to collaborate on data collection when practicable and data sharing.

When developing assessment plans, following the data quality objective (DQO) process is recommended to ensure only the appropriate and relevant data are collected. This process will also shape plans where data collected are of sufficient quality to satisfy the injury assessment needs. This process provides for careful consideration of how data are to be used (in the context of injury assessment) prior to collection.

In some cases, contract support may be required to fill certain niches. It’s important to identify those needs and initiate the sometimes lengthy contracting process as soon as possible. For example, a resource specialist from academia or the private sector may assist with assessment plan development and analysis. Contract staff may be required to implement various sampling plans and perform field sampling.

8.0 DATA MANAGEMENT

In the days, weeks, and months after an oil spill, NRDA scientists collect a broad range of data. Whether collected in the form of samples, measurements, counts, interviews, photographs, written observations, or other inputs, these records are eventually compiled, analyzed, and interpreted as part of the NRDA. It is therefore important that thoughtful consideration of the ultimate organization and management of the data be integrated into the planning and collection efforts at the outset. This section discusses data and metadata compiling and organizing that lead to robust, comprehensive, and accessible data which reliably characterize the ambient and spill-affected conditions of the natural resources as envisioned through study plan. While parties may differ over the interpretation of the data, it should be the goal of the scientists conducting cooperative NRDAs to minimize disagreements about the integrity and usability of the data themselves.

8.1 Types of Data

Many different types of data are typically collected for the purposes of a NRDA. For example, photographs, field measurements, samples, species identification and counts, analytical chemistry, written observations, and instrument readings may all be recorded or collected. Depending on the specific needs of the NRDA scientists and the size and complexity of the case, data may be managed centrally (i.e. most or all data combined across the different TWGs into a data warehouse)[4] or organized and maintained separately by each TWG. Even if data are not to be managed centrally, the TWGs should coordinate across the case to ensure basic consistency of approaches and expectations.

Information management for NRDAs should consider how best to handle both structured data (e.g. quantitative measurements, analytical results, etc.) and unstructured data (text entries, images, and other things not readily amenable to searching and sorting with a computer). Even for smaller NRDAs, systems should be considered to securely organize and facilitate retrieval of these diverse types of information and form appropriate linkages between them.

In the early stages of a cooperative NRDA, the trustees and RP, under the guidance of the Lead Administrative trustee, should discuss and initiate development of a data management system or systems suitable to these tasks and appropriate to the scale of data collection.

8.2 Data Sharing

The data management system should provide for levels of accessibility of data suitable for the data sharing and dissemination agreement(s) reached by the trustees and RP. Broad access to most data brought into the system is conducive to mutual trust and

[4] For example, see NOAA's DIVER data warehouse website, https://www.diver.orr.noaa.gov/

cooperation. Reasons for limiting access to some data and metadata may include (1) the provisional nature of certain data sets or a temporary need for review and correction prior to dissemination; (2) beta-testing of custom software development for new data management schemes; (3) confidentiality; (4) other potential needs for data separation, [e.g., should records be subject to public release under a state Public Records Act (PRA) or the federal Freedom of Information Act (FOIA)]. Consideration should be given to whether or what data will be made available to the public with or without a PRA or FOIA request, and how that will be accomplished. The scale and public visibility of the case may dictate whether to grant and manage public access to portions of the data warehouse, versus restricting warehouse access to trustees and RP(s), and public dissemination of data takes place through other means such as a public web site.

8.3 Essential Elements in All Field Data Records

See also Section 6.3 above. In general, data collection records should include when (date), where (location including latitude and longitude), and who (sampler/team) obtained the sample or recorded the observation, measurement, or photograph. This information may be recorded on a form by hand, or recorded by electronic equipment taken into the field (e.g., a waypoint recorded on a GPS associated with a photograph or sampling event). All original files, whether hard copy or electronic, should be preserved as potential evidence and for transcription verification. Technical Work Groups preparing to conduct field studies should ensure that they have the most current guides and templates for recording field data entries (field sampling and field measurement information, imagery, field observations, and other field assessment activities). These materials are frequently updated; requests may be directed to one or more of the West Coast natural resource trustees (e.g., NOAA's Assessment and Restoration Division, or California Office of Spill Prevention and Response). At the outset of early stage data collection, it should be made a priority for participants in the cooperative assessment to discuss and agree upon preferred templates and minimum information requirements for recording ephemeral field assessment activities. While it may be inevitable that early in the assessment multiple recording formats are used by the many parties participating, care should be taken to record all essential information and maintain the integrity of the samples and records. It will always be possible to subsequently ingest and organize records into a unified data warehouse as long as information is complete and legible.

Ideally information entry into forms should be structured such that each individual parameter has a separate field (cell) within the form, so that data managers are not later required to separate and interpret multiple types of information from a single cell in a form. For instance, if a field team considers it important to record the date and the time, these should be entered into separate cells. Collection of superfluous field parameters should be discouraged, since all entries typically undergo transcription and verification, and performing such steps on unnecessary entries can add to the time and cost of assessment and expand the size of output files (reports) making it harder for users to sort through and find essential entries. For instance, recording air temperature and

other weather conditions onto a field sampling form during beach sampling increases the number of parameters required to be transcribed, quality checked (e.g., is the temperature recorded in ^{0}C or ^{0}F?), and entered into the database. Before recording such information consider what it will be used for when the data are ultimately queried.

It is paramount that each sample receives unique identification. The specific system for sample identification should be discussed and agreed upon across the parties conducting field work as early as possible. Since comprehensive information about each sample is recorded on associated field records (Chain-of-Custody and FSF, see 8.4 below), it is not necessary that a field sample ID include a lengthy string of numbers and letters that elucidate a broad array of information about the sample. The only strict requirement for a sample ID is that it be unique to each sample. Highly recommended is the inclusion of information or codes denoting identity of the sampling team, the date, and a sample number that distinguishes the sample from others collected by that team on that date. Encoding of the sample ID with additional characters denoting matrix, species, or other sample characteristics are optional, as they should already be recorded on associated field forms. The more complex the sample ID scheme, the greater the likelihood of transcription or other inconsistencies needing to be addressed later.

As of the date of preparation of this Cooperative Assessment Guidance, electronic data collection (EDC) techniques are still under development and testing and have been used in only limited field applications. As such techniques become more widely available they should be given serious consideration as means to improve data collection and entry.

8.4 Data Management Organization/Structure

Field data should be recorded in an organized and systematic manner that facilitates integration with other data and entry into data management and presentation systems such as ERMA, other summary reports to the UC and management chains, and ultimately for use in data interpretation and injury assessment.

This document does not provide a specific recommendation for a database application or organization/structure for any and all NRDAs; several offices have developed and continue to refine data management systems tailored to NRDA data management. Lessons learned from past cases familiar to the parties should be reviewed. A meeting or conference call of data managers from the various parties should be called by the LAT at the outset of an incident to exchange information and reach agreements on the principles and specific means for the handling of data, metadata, and archiving of files and forms.

Some important considerations in establishing data management systems for an NRDA:

- **Security**. All data and associated information should be preserved in original form and backed up. Previous versions of processed data should not be discarded, but archived.

- **Adaptability.** Data management systems should be flexible and capable of bringing in diverse types and formats of information, integrating information (e.g., associating laboratory results with field collection information), and growing/adapting to new needs.
- **Scale**. Data management systems should be suited to the size of the spill; for small spills, there may be only limited resources available for dedicated data management services. However, the system should be capable of growing should the assessment expand.
- **Ease of retrieval**. The data system should serve not only as a secure and complete archive but also as a practical means of retrieving data for use by the TWGs.

To reduce duplication and potential for inconsistencies, the trustees and RP should seek to reach agreement on a database or data warehouse that will be considered the definitive source into which and from which all parties load and extract data, and from which data are made ready for publicly dissemination if needed. If it isn't possible to have all parties obtain data from the same database(s) or warehouse, then parties should discuss how to optimize consistency among databases managed by the different parties (e.g. running checks between databases to identify and address any inconsistencies).

8.5 Data Collection and Intake

All sample collection, field measurements, and other information should be entered on field sample forms (FSF) or field entry forms created for the particular data gathering task; the FSF is a means for recording more complete and essential information about the collection than the Chain-of-Custody allows for. Field forms are available from several West Coast NRDA offices; the LAT should facilitate a common system for recording field data to the extent practical.

The intake of field data for transmission to laboratories and data managers is a sizable task that is greatly aided by a dedicated field intake team stationed at a location where field teams may reunite after field work each day. Intake teams may perform completeness and reasonableness checks, identify and resolve potential transcription or other ambiguities (e.g. inconsistency between sample jar and Chain-of-Custody), and support secure transmission including accession recording. Field teams are often fatigued at the end of a day of field work and in addition may not be entirely familiar with data intake conventions. These issues making the role of a dedicated field intake crew all the more important, if it is possible to staff. Ideally there are two data intake individuals available to handle the processing of samples from multiple field teams each day.

8.6 QA/QC and Validation/Verification

Quality reviews are performed at several stages in data collection, processing, and management. The nature and extent of quality reviews should be discussed early in the

assessment among all parties, and expectations established among those having designated roles for QA/QC (see Section 5.4).

Database management quality systems should consider not only reviews of data entries and structure up to the point of making data available to users, but should include a comment or notification process that subsequently provides data users a means to call attention to suspected errors in the published data which may be discovered even after thorough and careful quality reviewing.

8.7 Data Management Planning and Training

The goal of producing reliable and accessible data for NRDAs is fostered by efforts aimed at continuous improvements and communication among all parties, even prior to initiation of new incidents. It is advisable to identify and address data management system developments and common challenges in in periodic JAT meetings and even during drills. Periodic discussion, dissemination of information, and training in existing and new developments in key data management practices (e.g., the importance of drilling on sample intake tasks, and the critical importance of specified and unique field team, trip, and sample IDs) are best worked on before a new response.

9.0 COMMUNICATION AND OUTREACH

During an oil spill incident outreach focuses on active response operations as a priority. It is important, however, to inform the public not only on the response but also the NRDA. These are considerations that should be addressed during NRDA:

- How to manage the public's expectations around NRDA and restoration;
- What resources you are making available to the public for current and credible information;
- What organizations are the go-to for this type of information; and
- Which tools (social media, websites, other media sources) can be used to engage the public?

This section of the document provides several examples of outreach strategies employed during incidents as well as other tools and resources available to effectively inform and engage the public. These include studies and reports from recent incidents, examples of newsletters and fact sheets, plus suggestions for confirming guidance language is consistent with the messages from the Joint Information Center (JIC) during an incident.

9.1 NRDA Outreach Overview

During the response, communications are coordinated with the Joint Incident Command (discussed in Sections 4 and 5). NRDA communication and outreach with the public typically last longer than spill response because the process of damage assessment and restoration planning has a longer timeline. Examples of communication types that have been used to provide ongoing communication of progress to the public; e.g., newsletters, presentations, etc. are listed below (Section 9.2). The trustees are the lead for soliciting public comment on restoration plans, but the RP can provide key support for communication.

The Case Management Team should decide how transparent does the NRDA need to be considering the incident specific context and how to share data and other information. The costs for data sharing and making information available should be factored into planning.

The team should consider establishing a listserv or other mechanism for sharing information with the interested public.

<u>Best practices:</u>

- Get educational material into the public's hands quickly;
- Be as transparent as possible from the beginning, including acknowledging uncertainty;

- Provide multiple opportunities for the public to learn the basics of NRDA (i.e.; via webinars); and
- Work with your offices' communications teams early and often.

Examples of platforms for communication with the public:

- Print Media based: handouts, factsheets, infographics; and
- Web based: trustees websites, incident specific websites, social media (Facebook, Twitter), YouTube video, Webex, blogs, electronic newsletters, listerve, blogs.

It is important for each agency to consider establishing a list of NRDA experts skilled and prepared to speak with the public/reporters.

NRDA 101-Overview Products

- NOAA NRDA basics 1-pager - https://darrp.noaa.gov/sites/default/files/node-attachments/NRDA_Fact_Sheet_12_01_2015_508_0.pdf
- NOAA blogs on Tar Sands
  - **What Are the Increased Risks From Transporting Tar Sands Oil?** https://usresponserestoration.wordpress.com/2012/12/13/what-are-the-increased-risks-from-transporting-tar-sands-oil/
  - **As Oil Sands Production Rises, What Should We Expect at Diluted Bitumen (Dilbit) Spills?** https://usresponserestoration.wordpress.com/2014/06/20/as-oil-sands-production-rises-what-should-we-expect-at-diluted-bitumen-dilbit-spills/
- Other examples of documents, including work plans, DARP (Damage Assessment and Restoration Plan), public meeting presentations, etc. can be found:
  - https://casedocuments.darrp.noaa.gov/
  - http://www.cerc.usgs.gov/orda_docs/

Volunteers

- Information gathered by NOAA regarding the use of volunteers for NRDA – https://www.estuaries.org/pdf/2012conference/room19/session2/Brosnan_RAE_2012_pres.pdf

Social media

The following are examples of existing social media for agencies:

- **NOAA**
  - Follow OR&R on Facebook: https://www.facebook.com/noaaresponserestoration
  - Follow OR&R on Twitter: https://twitter.com/noaacleancoasts
  - Follow OR&R on Flickr: https://www.flickr.com/photos/noaa_response_restoration/
- **CDFW- OSPR**
  - Facebook - https://www.facebook.com/CalSpillWatch
  - Twitter - https://twitter.com/CalSpillWatch

The following resources provide overview of the use of social media:

- U.S. Digital Services Playbook https://playbook.cio.gov/
- U.S. Public Participation Playbook https://participation.usa.gov/
- The U.S. Public Participation Playbook is a resource for government managers to effectively evaluate and build better services through public participation using best practices and performance metrics.
- Federal Social Media Accessibility Toolkit http://www.digitalgov.gov/resources/federal-social-media-accessibility-toolkit-hackpad/
- Federal Social Media Analytics Toolkit http://www.digitalgov.gov/resources/federal-social-media-analytics-toolkit-hackpad/

9.2 Outreach tools and strategies used in Deepwater Horizon (DWH)

Outreach products from DWH:

- NOAA's ERMA Deepwater Response: http://gomex.erma.noaa.gov/erma.html#/x=-89.37870&y=29.14486&z=7&layers=16+6770+15879+19872+19897
- Videos - http://www.gulfspillrestoration.noaa.gov/media-center/videos/
- DIVER – publishing science results, work plans and more: https://dwhdiver.orr.noaa.gov/explore-the-data

Community outreach and communications regarding the use of dispersants:

- The **Coastal Response Resource Center/Center for Spills in the Environment** is located at the University of New Hampshire and has coordinated numerous forums, studies and reports on state of the science of dispersants including lessons learned from DWH and other past spills.
- The Pacific States/British Columbia Oil Spill Task Force provides a clearinghouse of issues related to dispersants including communications. Visit their resource page at: http://oilspilltaskforce.org/resources/dispersants/

Reports and documents addressing communication and outreach tools and strategies utilized during DWH:

- **Communications Challenges**: Response Risk Communication Tools for Dispersants and Oil Spills
- **Fact Sheets:** http://www.oilspillprevention.org/oil-spill-cleanup/oil-spill-cleanup-toolkit/dispersants
- **Social Media:** Social Media, Public Participation, and the 2010 BP Deepwater Horizon Oil Spill

9.3 Newsletter and presentation examples

Newsletters providing updates on the NRDA progress are a way to provide ongoing communications as information becomes available. Depending on the incident the timing may be regular (i.e., monthly or quarterly) or as key milestones are achieved. Typically newsletters are available on websites which allow easy access to previous versions for the public.

Public Meeting best practices:

- Before the meeting begins, have an open poster session so the public can ask questions to experts one on one; and
- To ensure public meetings are well run, hire a facilitator.

Refugio Spill examples:

- https://www.wildlife.ca.gov/OSPR/NRDA/Refugio
- July 2015 NRDA newsletter (1 month post spill) https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=102624&inline
- November 2015 NRDA newsletter (5 months after spill) https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=111070&inline.

Cosco Busan examples:

- The first Cosco Busan newsletter (1 month after spill, December 2007): https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=17522&inline=true
- Here is the second newsletter (2 months after spill, January 2008): https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=17519&inline=true
- The press release for the public meetings (2 months after spill): https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=16847&inline=true
- PDF of the presentation given at the public meetings (2 months after spill): https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=17521&inline=true.

10.0 RECOMMENDATIONS FOR INCLUDING NRDA IN RESPONSE DRILLS AND EXERCISES

Because of the multiple benefits associated with coordination between NRDA and response activities (natural resource protection, personnel safety, data quality, and cost efficiencies), it is important that this working relationship function smoothly during a spill response. With that in mind, the West Coast JAT has two recommendations:

- **Training.** Response and NRDA personnel training should include concise modules describing NRDA and its effective coordination with the ICS or IMT [e.g., ICS and Federal On-Scene Coordinator Representative (FOSCR)] trainings; and
- **Drills and Exercises.** NRDA activities and coordination with the IMT should be included in drill/exercise scenarios as often as necessary to build smooth working relationship between the two groups and to develop effective response skills through the NRDA community. This is particularly true for larger exercises.

Recommendations for including various degrees of NRDA scenario complexity within spill drills and exercises are provided below.

10.1 One-Day Exercise (NRDA Representative Position Only)

The primary goal of including NRDA in a one-day spill exercise would be to test and train interactions of an NRDA Representative with response personnel. Example objectives of such a drill would include:

- Establish an appropriate and constructive relationship with the Unified Command and response, i.e., initially through the IMT Liaison Officer, and then through NRDA Representative interactions with Command, Wildlife Branch, Planning, and Logistics staff; through documentation (ICS Forms) and personal meetings;
- Educate UC/IMT on the NRDA process and common field activities;
- Attend the initial 201 Brief;
- Request office or conference room space for establishing an NRDA Command Post;
- Acquire up to date spill source, amount, type, trajectory, resources-at-risk, and shoreline information;
- Review and discuss wildlife reconnaissance objectives and initial observations with the Wildlife Branch;
- Request spill source samples be collected via Enforcement or Wildlife Investigations;
- Discuss and identify potential environmental sampling needs for NRDA with the Environmental Unit; and
- Meet with the IMT Safety Officer and discuss potential NRDA field team deployment areas and sampling objectives.

10.2 One to Two Day Exercise (NRDA Representative, NRDA Key Personnel, and NRDA Command Post)

The primary goal of including NRDA in a one to two day spill exercise would be to test and train interactions of an NRDA Representative and key NRDA personnel with response personnel. In addition, NRDA personnel would drill their own investigation, independent of the response effort, to test and train performing NRDA activities following a spill. Example objectives of such a drill would include:

- Fulfilling objectives listed above for a one-day spill exercise;
- Establishing an NRDA Command Post adjacent to the response Incident Command Post;
- Identifying resources at risk of injury;
- Identifying relevant trustees;
- Identifying NRDA TWGs, leaders, and staff;
- Identifying logistical needs and requesting through the IMT Logistics Section;
- Identifying ephemeral data collection needs for NRDA and environmental sampling plans and objectives;
- Coordinating sample/data collection activities with IMT Operations Section;
- Adopting a data management plan; and
- Identifying possible emergency restoration options.

An additional objective would be to establish a Cooperative NRDA Agreement (Section 3), depending upon whether trustee and responsible party attorneys can participate in the drill.

10.3 Two to Three Day Exercise (NRDA Representative, NRDA Key Personnel, NRDA Command Post, NRDA Contractors, and NRDA Field Teams)

The primary goal of including NRDA in a two to three day spill exercise would be as described above for a one to two day spill exercise; however, under this scenario, the exercise would be expanded to include actual deployments of NRDA field team(s) following initial TWG workplans and sampling objectives. The more involved two to three day exercise would likely test NRDA field deployment capabilities, resource requests, data collection protocols, and response times. Such a scenario would likely include trustee, RP, contractor, and field participants. Because of the size and complexity of this exercise, such a drill would require significant preplanning and coordination and would likely be linked to a trustee internal drill effort or with a drill involving a Spill of National Significance (i.e., SONS) or U.S. Coast Guard National Preparedness For Response Exercise Program (NPREP).

10.4 Other Considerations

Regardless of the scope of the drill/exercise, the NRDA activities should be documented including the retention of all sampling or data collection plans, organization charts, mapping of environmentally sensitive areas, lessons learned summary, etc. In the event of an actual spill in the general vicinity of the exercise incident, this documentation would be invaluable in informing the development of similar plans, organization charts, sensitive area maps, and other NRDA related documents.

Experience has shown that for many drills or exercises the company and/or jurisdictional regulatory agency may be reluctant to include NRDA as an official component in an effort to minimize complexity and better ensure a successful event. In these situations it may be acceptable to incorporate NRDA but just not as an official drill component. Company personnel, trustees, contractors and others can work off to the side in the Incident Command Post to develop sampling plans, organization charts, processes, etc. and still interface with the appropriate IMT personnel to obtain status updates, request resources and coordinate field activities with the understanding they are not to interfere with or burden the drill efforts.

ATTACHMENT A.

EXAMPLE (HYPOTHETICAL)

TRUSTEE FUNDING COMMITMENT LETTER

KEYDET ENERGY CORPORATION
123 Petroleum Road
Los Angeles, CA

April 22, 2004

Charles McKinley
Field Solicitor
Office of the Solicitor
U.S. Dept. of Interior
1111 Jackson St., Ste. 735
Oakland, CA 94607

LCDR Reismer, JACG, USN Assistant
Office of the Staff of Judge Advocate
Commander Navy Region Southwest
937 North Harbor Drive
San Diego, CA 92131-0058

Wendy Johnson
Office of Spill Prevention and Response
California Dept. of Fish and Game
1700 K St., Ste 250
Sacramento, CA 95814

Katherine Pease
Office of General Counsel
NOAA
501 W. Ocean Blvd., Ste. 4470
Long Beach, CA 90802

Re: Funding Commitment for Joint Pre-assessment/Assessment Activities

This is to confirm that Keydet Energy Corporation (Keydet) wishes to participate with the Natural Resource trustees (trustees) who are in receipt of this letter in their pre-assessment and assessment of injuries to natural resources related to the oil spill which occurred on or about April 20, 2004 in the waters approximately 10 miles northwest of San Diego, California. In consideration of the trustees' agreement to allow Keydet to participate cooperatively in these activities, Keydet hereby agrees to pay the reasonable costs previously incurred or to be incurred by the Department of the Interior (including the U.S. Fish and Wildlife Service, Bureau of Land Management, National Park Service, Office of Environmental Policy and Compliance, and Office of the Solicitor), the State of California (including the Department of Fish and Wildlife and Office of Oil Spill Prevention and Response), the Department of Commerce (including the National Oceanic and Atmospheric Administration), and the Department of Defense (including the U.S. Navy), or their designees, (collectively known as the "agencies"), for such activities.

So as to avoid any potential for violation of the Anti-Deficiency Act, Keydet agrees to provide within fifteen (15) days an initial payment of $100,000 to the Department of the Interior for its costs, via electronic funds transfer, pursuant to instructions to be provided by the Department of the Interior. Additionally, Keydet agrees to provide within fifteen (15) days an initial payment of $400,000 to the Department of Defense for its costs via electronic funds transfer, pursuant to instructions to be provided by the Department of Defense. Expenses incurred by the Department of Commerce will be reimbursed within 15 days of receipt of invoices. All requests for reimbursement for these activities should

be provided, along with supporting documentation, to Jay Jones, Keydet Energy, at the above address.

The trustees and Keydet expect to negotiate and enter into a Cooperative Agreement for further specific cooperative assessment activities.

The costs of the cooperative assessment covered under this Agreement will be limited to the reasonable costs to implement the activities outlined in the attached “Exhibit A”. The commitment contained in this letter will also cover all other costs incurred by the Agencies until five (5) days after Keydet provides the Agencies with written notice terminating the Funding Commitment, provided that Keydet’s liability for such costs under this commitment shall not exceed $1,000,000 without prior written agreement between Keydet and the Agencies.

Jay Jones
Incident Commander
Keydet Energy Corporation

ATTACHMENT B.

AERIAL SURVEILLANCE,

VIDEO TAPING AND REMOTE SENSING

AERIAL SURVEILLANCE, VIDEO TAPING AND REMOTE SENSING

B.1 GENERAL

The primary objectives of aerial surveillance, videotaping and/or remote sensing is to document the location of floating and stranded oil but can also be used to document the presence or absence and types of wildlife and human uses in the spill area. The latter is described in greater detail in Section 4.10 Aerial Surveys. Remote sensing can also be used to identify areas of environmental impacts such as stressed vegetation and other indicators. These activities are generally conducted as part of the spill response by the ICS Planning or Operations Sections but if not should be considered for implementation as part of the NRDA activities.

Specifically the goals include:

- Provide accurate and up-to-date information on offshore spill distribution;
- Provide accurate information on onshore spill distribution;
- Support identification and mapping of sensitive resources;
- Identify human and wildlife uses of the general spill area;
- Support development of oil spill mass balance; and
- Support Communications and Public Affairs needs.

The tasks typically involved in these activities are:

- Conduct aerial overflights to visually assess onshore and offshore oil distribution and the absence or presence and general abundance of human and wildlife uses by taking notes and annotating maps to record information;
- While conducting aerial surveys, use handheld cameras to acquire photographs and/or video images;
- If possible, acquire imagery (not from handheld cameras) that was collected by aircraft operated by governmental agencies, companies and response organizations; and
- Acquire satellite data as required and as available.

When conducting aerial surveillance or remote sensing there are various considerations or reminders that should be taken into account including:

- There are two basic categories of remote sensing data for incident response which are complementary but not interchangeable:
    - Downward-looking images from special instruments in airplanes or satellites that can be used as base maps and to map impacts; and

- Oblique images from hand-held still and video cameras for recording impacts and response activities;

- Agency/trustee personnel can assist with these activities and should be included whenever possible;
- USCG, NOAA, and other agencies have access to Remote Sensing aircraft and satellite information and NOAA maintains a specialized team for offshore oil mapping and modeling and can be contacted via the USCG or Scientific Support Coordinator. Images and other data should be obtained from these sources whenever possible;
- Satellite operators can provide information directly. As of May 2000, the best source for all-weather, day/night satellite images is Radarsat International, http:/www.rsi.ca/home.htm.;
- For detecting oil on water using remote sensing instruments, radar, ultraviolet, and thermal spectral bands are best; and
- For detecting oil and oil impacts on land or vegetation using remote sensing instruments, visible and near-infrared spectral bands are usually the best.

Specific guidelines that should be followed when conducting still photography or videotaping are provided below:

- Conduct a reconnaissance at 1000–1500 ft altitude followed by a detailed survey at 250-500 ft.;
- Record continuously to include the oiled and non-oiled areas to document where the oil was and was not. If the latter becomes oiled later, you will have some documentation to estimate the duration of the oil present at that location;
- Conduct surveys twice per day, particularly reconnaissance level, preferably as early as practical in the morning and in mid-afternoon;
- Use a helicopter with the door or window removed to allow recording without reflection and/or distortion;
- Use a high quality video camera with time and date imprinting capabilities and preferably connected to a GPS unit that will also imprint the coordinates on the video image. A good digital or 35mm SLR camera should also be used to supplement or as a back up to, the video;
- Angle the video or still camera forward (i.e., more or less in the direction of the aircraft flight line) to minimize vibration effects and/or rapid movement of the scene through the recording field, and to provide location;
- Keep the shoreline or other geographic reference locations in frame as much as possible; identify distinctive geographic locations, especially if there is an audio track; pan the whole area occasionally for location reference, as many shorelines look the same for long stretches;

- Plan a flight path that minimizes the amount of time that reflection of the sun off the water (and oil) occurs as glare will reduce the value of the video or photographs;
- Document every video or photograph with the date, time, location, sequence number, and photographer; include a map or sketch of the flight path and record the time and aircraft location on the flight path every few minutes. The times on the flight path can be compared to the time stamp on the video tape to more accurately locate each section of shoreline that was filmed;
- Document in writing or on the audio track, the weather, sea conditions, general oil characteristics, cleanup activities, equipment or logistical problems, or other conditions that may affect the quality of the recordings or the interpretation of the images;
- Use a video camera that allows for audio recording directly on the tape via remote microphones (preferably the aircraft headsets as they often have noise canceling microphones) and include the pilot if possible; and
- Aerial videotaping typically involves three people; the camera operator and narrator who generally sits in the back of the helicopter and films out the side and provides a verbal description of what is being videotaped, the navigator who sits in the front and provides commentary on the location of the area being filmed, and the pilot.

Additional guidelines to better ensure successful aerial surveillance/videotaping or photography includes things not to do such as:

- Do not zoom for close-ups unless the helicopter is hovering or you are facing forward, and then only sparingly;
- Do not record with camera perpendicular to the aircraft flight line unless the helicopter is hovering or the altitude is > 1,000 ft.;
- Do not move the video camera around a lot and/or quickly; pan slowly and smoothly; and
- Do not forget that many people may use the recording for a wide variety of purposes; therefore be objective and appropriate in photo and audio documentation.