

Encouraging robust oil spill planning, preparedness, and response
in Chesterfield Inlet, Nunavut, Canada.

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Abstract

Area-based oil spill plans such as community oil spill plans are essential for Arctic regions. The outcome of this project is the creation of a series of policy briefing notes based on consideration of Canadian policy and programs alongside those in Arctic jurisdictions outside of Canada. The project's objective was aimed at "creating a policy brief on oil spill planning, preparedness, and response for Canadian Arctic communities". Given the results of the document and literature review, the briefing notes focused on the following areas: Background Area Information, Monitoring Regimes, Training Regimes, Local Involvement Requirements, and Framework for a Community Oil Spill Response Company. Recommendations in each of these areas are applicable to the Canadian Eastern Arctic community context. Some of the project's main findings include the use of background information as a reference point/resource to inform area-based monitoring and training regimes. Regarding local involvement, it is suggested that a community advisory council/board would promote community-led oil spill planning, preparedness, and response tasks, such as risk assessments and knowledge exchange (oil spill response experience). A regional oil spill response company should be established that emphasizes community to community agreements (based on a hub structure). This would require ship/vessel owners to enter into response agreements with the company. The detailed briefing notes and recommendations are focused on local involvement and will help to inform Arctic communities, such as Chesterfield Inlet, and all levels of government about actions that are essential to improve the oil spill planning, preparedness, and response capabilities.

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CHAPTER 1: INTRODUCTION

1.1 Background Context

1.1.1 Increased Shipping in a Changing Arctic

As transportation through Arctic regions becomes increasingly prevalent with tourism, mining, community re-supply shipping and oil exploration, the surrounding communities have been and will continue to be exposed to an increased risk of ship-sourced oil spill incidents (Covert, 2016). The threat of a major oil spill in the Arctic and the potential impacts on the marine environment in the region is an area of concern for communities and state authorities. As a result of anthropogenic climate change, there has been increased warming, retreat and thinning of sea ice and greater ship traffic. Thinner and less ice has increased shipping accessibility and the risk potential of oil spills from resource extraction and other shipping activities (Chen et al., 2019; Covert, 2016; Frisso, 2022; Perkins and Loring, 2014; Webler and Lord, 2010). The search for a shorter shipping route from the Atlantic to Asia has been the quest for maritime powers and explorers for centuries (Inslee, 2013). The possibility of saving several days of sailing between trading blocs is a significant appeal for northern shipping routes and reduces shipping costs (Inslee, 2013). Most of the cargo ship traffic in the region consists of transporting natural resources from the Arctic and delivering supplies to natural resource facilities and communities (O'Rourke, 2011).

1.1.2 Oil Spill Response in the Arctic

Increased shipping and mining activities contribute to an increasing risk of hazardous pollution releases in the Arctic, particularly through oil spills (Inslee, 2013; Bi et al., 2025). Currently, because of the limitations of spill response capabilities in the Arctic, the likelihood of oil persisting in the environment after a spill is high (Inslee, 2013). The great distance between where spills could occur, and the locations of response equipment is a fundamental challenge (Inslee, 2013; Marchenko et al., 2018). It is also clear that communities in the Arctic are greatly concerned about the risk of spills and their lack of preparedness to respond to them (Covert, 2016). These oil spills can be caused by fuel barges, passing ships, tank farms and oil discharges, mining ore ships, etc. (Covert, 2016). One recent incident was the gasoline fuel leak in 2016 near Rankin Inlet. As reported by Environment and Climate Change Canada (2022b) and Jonassen (2022), approximately 18,400 litres of fuel (gasoline) spilt into Hudson Bay near Rankin Inlet. The spill occurred after a small boat collided with a resupply hose, resulting in a rupture (Van Dusen, 2016).

1.1.3 Example of the Impacts of Oil Spills on Communities

On 24 March 1989, the supertanker Exxon Valdez grounded on Bligh Reef and spilt approximately 11 million gallons of crude oil into Alaska's Prince William Sound (Holderied and Aderhold, 2018; Picou et al., 1992; Rodin et al., 1992; Skinner and Reilly, 1989; Parker, 1990). The spill not only caused unprecedented damage to the natural environment but also had several negative social consequences for the people within the affected region (Rodin et al., 1992).

Research has highlighted that oil spill disasters, such as the Exxon Valdez, can have significant mental health impacts on communities (Devens, 200; Rodin et al., 1992). One of the social impacts derived from the natural environment from studies such as Rodin et al., (1992:3) was the "feeling of uncertainty about the availability of local resources in the future". This was expressed by people with close relationships

with the natural environment such as those who rely on the environment for subsistence, (outdoor enthusiasts) recreational fishermen and commercial fishermen (Rodin et al., 1992). The effects of oil production and oil spills affect the environment, by causing water and soil pollution, which in turn affects almost all spheres of everyday life (Fedina, 2017). Major issues can include limited access to drinking water, decreased quality of such water, associated health problems, contamination of forests and pasture lands, and consequently, contamination of berries, mushrooms, and herbs (Fedina, 2017).

1.1.4 Arctic Oil Spill Response

Arctic conditions restrict the effectiveness of response equipment and often prevent response (Nuka Research and Planning Group, 2010; World Wildlife Fund, 2017). The climate and remoteness of these communities magnify the threat posed to human and animal life in arctic regions. It is often stipulated by oil spill response cleanup legislation that the polluter is primarily responsible for oil spill cleanup. However, surrounding communities are often left with the downstream effects of these spills. Community oil spill preparedness and the capacity to conduct monitoring and initiate response must be improved, should an oil spill occur. The main outcome of this project is a series of policy briefs that synthesize the approaches of oil spill planning, preparedness and response plans from arctic jurisdictions. Efforts to recover oil from Arctic waters will encounter environmental conditions that are very different from standard response efforts that occur in ice-free water where the oil is easier to locate and encounter with boats and equipment, thus careful planning is needed (Inslee, 2013).

There have been mixed results with the use of boats and booms as part of the response; however, this approach has not been effective in broken ice conditions (Nuka Research and Planning Group, 2010; Inslee, 2013; World Wildlife Fund, 2017). Standard oil spill response tactics also include the use of in situ burning and the use of chemical countermeasures such as dispersants, which are currently not allowed in the Canadian Arctic (Inslee, 2013).

1.1.4.1 Community Oil Spill Response Plans

A community oil spill response plan is an area-specific reference document that informs the actions required before, during and after a spill event. History shows that disasters often precipitate major policy and regulatory changes (Ivanova, 2011). The combination of remote location and lack of infrastructure can significantly complicate response efforts (Pankratova, 2022) and ‘may make oil spill measures extremely difficult over long periods in Arctic and sub-Arctic regions’ (Matveev, 2017).

Community-based oil spill response consists of a citizen-led response to oil spills in areas of economic, cultural, and recreational significance and for the subsistence of the community (Nuka Research and Planning Group, 2005). This concept relies on the community-based response of citizens trained as first responders in their communities who may be subject to a large oil spill or a spill by an unidentified source (Nuka Research and Planning Group, 2005). The success of this concept requires that small groups of trained citizens are capable of local oil spill response and are part of a network of community-based oil spill response teams throughout the region (Nuka Research and Planning Group, 2005). In the United States of America, there are currently approximately three community oil spill response teams in the Alaska region, for example, which include Cordova (Eyak), Chenega, and Seldovia located within the Prince William Sound/Cook Inlet area as shown in Figure 1.



Figure 1: Community Oil Spill Response Teams in Cook Inlet and Prince William Sound (Nuka Research and Planning Group, 2005:8).

Local communities can play an important role in minimizing the impacts of a hazardous release on the environment and the natural resources the communities rely on (Inslee, 2013). The 1989 Exxon Valdez oil spill pushed the need to integrate local community involvement to the forefront of spill response planning and response activities in Alaska (Inslee, 2013). The need for creating local community response became apparent early in the spill response (Inslee, 2013). This new role of the local community was advocated for in the 1990 Alaska Oil Spill Commission Report titled ‘Spill: Wreck of the Exxon Valdez’ which stated, “A substantive role should be given to the affected communities in any response system” (Alaska Oil Spill Commission, 1990:163). Communities near the spill and in the shadow of the oil were not given a proportionate role in the response system after the Exxon Valdez accident (Parker, 1990). Frequently, they were ignored (Parker, 1990). Often, they devised response strategies, for instance acquiring or manufacturing boom by themselves (Parker, 1990). Nevertheless, local interests, local knowledge and experience with the ocean often made the community-based workforce the most efficient available (Parker, 1990).

There are a variety of reasons for communities to increase their response capacity. According to (Inslee, 2013) these rationales can be grouped into two main themes:

1. The protection of the environment and subsistence resources.
2. The creation of an employment source for community members (Inslee, 2013).

1.1.4.2 Community Response Organizations

Communities that are interested in improving their response may be motivated to develop their own response organization (Inslee, 2013). Various communities have developed their organizations with varying levels of success. Based on research by Inslee et al., (2013) in Southern Alaska and other states, the following was suggested: that there are high transaction costs and the ability to maintain interest and financial support are two important constraints for community response organizations (Inslee, 2013). Community Oil Spill Response teams should have local community response agreements with the State, insurance to cover workers and operations, and reliable funding (Nuka Research and Planning Group, 2005). One such example is the Seldovia Oil Spill Response Team, which is explained in the Document Review Appendix 2 in the United States of America Section (Note – Appendix 2 is consists of my background information working notes).

The Alaska Department of Environmental Conservation (Nuka Research and Planning Group, 2005) proposed a model of oil spill response where the response is delegated to one organization and integrated under a unified joint agency-approved Subarea Contingency Plan, regardless of the responsible party (spiller) (Nuka Research and Planning Group, 2004). Mandated contingency plan holders would then request response services only from the delegated organization within the sub-area Contingency Plan holder's area of operation (reducing the risk of the duplication of responders and equipment) (Nuka Research and Planning Group, 2004).

1.1.5 Community/Local Involvement Initiatives

Regional Citizens Advisory Councils provide communities with an informed voice on the evaluation of emergency spill response and reclamation in the United States of America (Alaska Oil Spill Commission, 1990; Cook Inlet Regional Citizens Advisory Council, n.d.; Inslee, 2013). A Regional Citizens Advisory Council can transfer local knowledge and concerns of communities to incident commanders that are valuable to operational decisions (Alaska Oil Spill Commission, 1990; Cook Inlet Regional Citizens Advisory Council, n.d.; Inslee, 2013). Councils typically operate as an auxiliary resource within a Unified Command and include the participation of Stakeholder Committees when these are established (Alaska Oil Spill Commission, 1990; Cook Inlet Regional Citizens Advisory Council, n.d.; Inslee, 2013). The main responsibilities of the Regional Citizens Advisory Councils in the United States are illustrated in Figure 2.



Figure 2 : Main responsibilities of the Regional Citizens Advisory Council adapted from (Inslee, 2013).

A Vessel of Opportunity is a local, commercial or recreational vessel that has volunteered their vessel to assist in responding to oil spills (State of Washington Department of Ecology, 2014). These vessels may consist of fishing, charter, deck barges or other classes of smaller work boats (State of Washington Department of Ecology, 2014). One of the main arguments in favour of this initiative is centered upon the notion that fishermen and other marine workers possess substantial knowledge about area phenomena such as water currents, weather influence and local geography (Knol and Arbo, 2014). Additionally, the potential benefit of shorter mobilization times supplements this argument.

For example, in Norway, there was a case where private operators (such as Eni Norway, Statoil and Norwegian Clean Seas Association for Operating Companies) integrated fishermen into the oil spill emergency response system (via formal contracts) along the coast of Hammerfest (Knol and Arbo, 2014). These fishermen maintain their fishing activities and are obligated to maintain their vessels as mandated in the Regulations on Vessels Used in Oil Recovery Operations (2011) and must be properly equipped (Knol and Arbo, 2014). The specific tasks of the fishermen under this system include the deployment of oil booms, spill monitoring and, barricading coastal regions (Knol and Arbo, 2014). The fishermen receive financial compensation for training and for response operation time (Knol and Arbo, 2014).

Major oil spill incidents can cause significant economic disruptions to an area for many weeks or months during oil recovery efforts (State of Washington Department of Ecology, 2014). The use of vessels of opportunity and boat crews as part of response efforts can help communities economically recover during this period (State of Washington Department of Ecology, 2014). Vessels of opportunity can provide the following response support services such as:

1. Water-based oil removal by enhancing the effectiveness of oil skimming operations.
2. Deploy and maintain containment booms, drones and provide guidance on impact reduction measures on natural, cultural and economic resources.
3. Provide logistical support such as transporting food, equipment and personnel.
4. Provide communication equipment and command post accommodation on board vessels.

1.1.6 Community Oil Spill Involvement in The Canadian Arctic

Many Canadian Arctic communities exist in relative isolation, where naval and aerial routes of transport are often the only means of goods and services exchange. As a result, these communities are often the first responders to oil spill incidents. In these communities, municipal resources are limited and are rarely allocated to oil spill or emergency response planning (Robertson et al., 2003). As a result, planning projects are often formed, funded and led by external agencies such as government programs or grant-funded projects (DeCola et al., 2001; Robertson et al., 2003). This situation often results in the development of area or regional oil spill and emergency response plans with minimal local involvement (communities) (Roberston et al., 2003).

Community involvement in spill response in the Canadian Arctic region is limited despite the distribution of Arctic community packs of response equipment. The Keewatin Region Response Plan 2005 outlines the response strategies for oil spills near communities within the Kivalliq Region (Canadian Coast Guard Environmental Response Department, 2005). This Regional Response Plan is an example of what area-based planning can look like; however, there are areas of the plan that are outdated and should be further expanded and developed. The general oil spill response objectives include Coastal Area Cleanup, Area Protection, Recovery, Containment and Wildlife Rescue and Rehabilitation. The problem is the absence of an organized platform for grassroots involvement in the form of a community advisory council based on the principle that “people take care of what they love” (Parker, 1990:146). Community participation in planning and preparedness benefits communities and can also enhance local response capability (Walker, 2017). This project serves to provide a knowledge resource in the form of a series of recommendation policy briefing notes that inform communities such as Chesterfield Inlet and relevant territorial and federal government agencies on the key components of oil spill response planning at the community level.

1.2 Project Aim and Approach

This project aimed to understand the sorts of actions that communities in the Canadian Arctic might take to address the threat of marine oil spills regarding planning, preparedness, and response. In doing so, the various roles, responsibilities and approaches towards oil spill planning, preparedness and response in the local context (community, municipality and region) in arctic regions were investigated. Within this context, the project has produced the following deliverables:

1. A document review and content analysis of documents on the topic of community oil spill planning, preparedness and response from the eight countries within the Arctic Council plus Greenland. This served as a background information report and helped direct the briefing notes.
2. A series of briefing notes on marine oil spill planning, preparedness and response for Canadian Arctic communities, using Chesterfield inlet as a case example.

In actioning these deliverables, I focused on the eight-member countries of the Arctic Council including, Canada, the Kingdom of Denmark (including Greenland), Finland, Iceland, Norway, Russia, Sweden and the United States of America (each country studied represented a single case). The roles, responsibilities, and local emergency/response plans from each case study were used to identify feasible recommendation areas towards the improvement of the response and preparedness capacity of Chesterfield Inlet.

The document review of oil spill specific regulations and plans from the selected arctic countries served as the primary source of information in this project. They identified provisions for oil spill preparedness and, land-and marine-based response in existing government legislations, strategies, best practices, and plans arranged by the countries studied. The documents that were reviewed and the information that was extracted contributed to a knowledge base on the approaches to oil spill planning, preparedness and response at a community level. The review process is summarized in the flowchart in Figure 3.

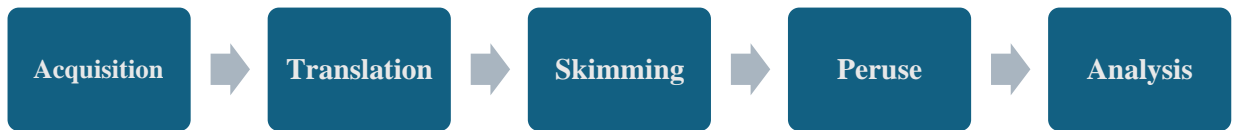


Figure 3: Document review process.

The following actions were initiated to undertake the review.

1. Oil Spill-related documents that suited the topical inclusion criteria (must mention oil/petroleum product spill) and that were from the specified Arctic countries) were downloaded electronically and organized by specific countries. These documents included but were not restricted to oil spill prevention plans, oil spill response plans, strategies, action plans and emergency plans. Local jurisdictions for more specific study were also selected so that capitals/major towns were not solely focused on.
2. These documents were initially skimmed, perused and the approach regarding oil spill planning, preparedness and response summarized.
3. They were analyzed for the presence of sections dedicated to community/local/regional aspects of oil spill preparedness and land and marine-based response plans using the gap analysis checklist.

The objective of the gap analysis was to identify various legislative approaches regarding the role of communities in oil spill planning, preparedness and response. In those plans, the checklist was adapted from the International Guide for the Assessment of Oil Spill Response Planning and Preparedness (2023) to identify key elements that should be present in an oil spill preparedness plan based on best practices. This checklist focused on planning, preparedness and response aspects of oil spills. This checklist was then utilized to identify initial gaps in spill response planning. The checklist consists of thematic areas to identify key elements of national and local plans regarding oil spill planning, preparedness and response.

Based on the findings from the document review, the local involvement approaches varied significantly among the countries studied due to different administrative divisions. A comparison was made thereafter of the local involvement approaches in oil spill planning, preparedness and response measures, to establish the areas (recommendation themes) for developing subsequent policy briefing notes. Each briefing note was developed based on each theme that will improve the existing ship source oil spill response regime for Canadian Arctic communities. Each briefing note was developed based on the integrated system identified in the document review from the countries studied. Due to the significant variation of administrative divisions in these countries, only the best examples that included high levels of involvement were highlighted.

1.2.1.1 Genice II Research Project (2017-Present).

Tankers that travel through Canadian waters are obligated to have an agreement with a certified Oil Spill Response Organization; however, these organizations are absent in the Arctic regions in Canada. This usually results in long delays for oil spill response assistance to arrive (days or weeks) (Genome Canada, 2022). Natural attenuation is often the presumed mechanism for the mitigation of major Arctic oil spills (Genome Canada, 2022). Natural attenuation is the removal or transformation of oil by naturally occurring microbial biodegradation, photo-oxidation, and evaporation, which have been shown to play a major role in the cleanup of oil spills at lower latitudes (Genome Canada, 2022). The GENICE II research project (team) aims to use metagenomics, metatranscriptomics, mass spectrometry, and high-sensitivity remote sensing techniques to develop a mechanistic understanding of the fate of oil in the Arctic, and social, policy, and economic research to further our knowledge of Monitored Natural Attenuation (MNA) as a rational response strategy for oil spills (Genome Canada, 2022).

This research project consists of three inter-linked Activities:

- Activity (1) focused on experimental incubations at the Ocean Sea Ice Mesocosm (OSIM) facility to observe geophysical, petrochemical, and microbial genomic responses to oil spills.
- Activity 2 will co-develop with four Kivalliq communities, a sustainable genomics-informed Community Based Monitoring (CBM) program that combines social and natural sciences with *Inuit Qaujimagatuqangit* while building a baseline understanding of seasonal cycling in Arctic marine microbial communities and serving as a sentinel in the case of an actual spill.
- Activity 3 will ensure policy uptake of our research findings by translating the results using a regionally specific economic model (the Oil Spill Decision Support System (OSDSS); and implementable policy recommendations based on genomics informed Monitored Natural Attenuation. (This activity is the main emphasis for this practicum product).

1.2.1.2 Project Partner

The project's partner was GENICE II led by Gary Stern and Eric Collins (University of Manitoba). GENICE II is a multidisciplinary research project, based out of the Centre for Earth Observation Science at the University of Manitoba and made possible with the help of many collaborators and partners (GENICE II, n.d). During a meeting with those partners, the Mayor of Chesterfield Inlet indicated the community's interest in community oil spill plans and response due to community concerns about the potential of a marine based spill. This then solidified the basis of my research focus and the final products.

CHAPTER 2: CONSIDERING CURRENT COMMUNITY-BASED MARINE SPILL PLANNING AND RESPONSE

2.1 Introduction

A detailed review of the community-based marine spill planning and response documents responding to deliverable 1 noted above is established in Appendix 1. It consists of information that was drawn from various sources to outline the role of local authorities and communities in oil spill planning and response as part of a systems approach. Data from the review is provided on the 8 Arctic Council countries and Greenland. This review was the primary data source for subsequent consideration regarding the described deliverable set. The following provides a summary of the key themes that were essential to the development of the briefing notes in Chapter 3.

Based on the document review, the scope of local involvement varied among Arctic Council states mainly due to the different administrative divisions (hierarchy) and the roles of local authorities in oil spill management. An alternating comparative analysis was conducted, comparing local involvement approaches in oil spill planning, preparedness and response. In the following, different countries that take similar actions were highlighted, indicating some agreement in their importance and that they were either novel or highly recommended (See Appendix 2 – (Note – Appendix 2 is consists of my background information working notes)). The themes that emerged from the document review included:

- Local Environmental Monitoring.
- Regional Spill Preparedness Monitoring.
- Sensitivity Mapping; Risk Assessment.
- Inter-regional Oil Spill Planning, Response and Preparedness
- Designated Coordination Agency.
- Local Oil Spill Emergency Planning.
- Local Involvement in Spill Planning and Response.
- Spill Response Training.
- Spill Response Organizational Structure.
- Dedicated Equipment Stockpiles.

2.1.1 Local Environmental Monitoring

Local monitoring is vital to oil spill management due to the knowledge and experience of local knowledge holders about the environmental conditions before petroleum activities or incidents have occurred (i.e., baselines). These may be formal or informal environmental monitoring initiatives where the outputs and durations vary. These monitoring programs may be conducted voluntarily by community members where the focus is based on generational knowledge transmission of the perceived environmental conditions before oil spills/development. One example was the Nenets Autonomous Okrug's Union of Herders, (Indigenous Peoples in Russia) who were mainly reindeer herders, and the locals who conducted

monitoring of the environment based on pre-spill experience and early identification skills (Fedina, 2017). This approach was substantiated by the successful transmission of knowledge to subsequent generations, however, as highlighted by Fedina (2017:60), “only the residents of the districts mostly affected by oil production are concerned about oil spills”. This restricts effectiveness and creates challenges for the maintenance of these initiatives.

Formal local monitoring programmes either supplement or contribute to an established congregated monitoring system or part of an area-based alert system. It was found that oil spill monitoring programmes can be based on the incidence frequency, risk surveillance (especially increased risk) and legal mandates. The scope of local monitoring revealed in the documents varied in terms of the monitoring area, parameters measured, and phase of monitoring (pre-spill, spill response and post-spill). Some of the key identified outcomes of local monitoring were:

- Monitoring reports
- Basic information for developing advanced monitoring tools such as an environmental/oil spill sensitivity atlas.
- Area-based monitoring spill management strategies, and area information-based scenario training
- Basic information supplemented existing congregated monitoring regimes and later regulation changes.
- Promote awareness and support readiness.
- Traditional experiential knowledge exchange

The document review highlighted geographical delineation methods that define the area of responsibility that serves as a management basis for spill planning, preparedness and response monitoring. This approach significantly informs the scope and requirements for management activities such as monitoring, training scope, sampling and surveillance among other activities. These established areas of responsibility/operations are outlined by Exclusive Economic Zones (based on national mandates), Regional planning requirements (federal to regional mandates such as the subdivision of Alaska) and Geographic boundary requirements (administrative region maps/subdivisions). The geographic delineation of a defined area of responsibility can inform federal and local Environmental Management authorities.

From the document review, the delineation of areas of responsibility has been legislatively mandated. A good example of this is The Health Control Areas in Iceland, which divides the country into nine health control areas with varying areas of operations as illustrated in Figure 4. These areas are led by respective area committees that are focused on pollution and hygiene control according to the Act on Hygiene and Pollution Prevention (1998).



Figure 4 : Nine current health control areas in Iceland from (Environment Agency Iceland, 2022:9). The Reykjavik control area is shown on the map.

The Municipal health committee supervises operations and ascertains the quality of clean-up efforts within their area of operations (Ministry of the Environment, 2012). It is responsible for local monitoring, enforcement of polluting laws and regulations and managing the overall environmental quality within the health control areas (Regulation on Response to Acute Pollution of Sea and Beaches, 2012). The monitoring and environmental units are responsible for inspections of polluted areas where the role of monitoring promotes environmental awareness of the regulations. These committees report to the Icelandic Environmental Agency, and it should be noted that the Icelandic Coast Guard is the monitoring coordinator within Iceland.

There are also cases where local area monitoring is conducted through a local branch of a federal/governmental agency. One such example was the Murmansk office of the State Service for Hydrometeorology and Environmental Monitoring agency in Russia. The Murmansk office of the State Service for Hydrometeorology and Environmental Monitoring agency is a federal authority that operates in the Murmansk region and is responsible for hydrometeorology, Environmental Monitoring and Environmental Pollution Monitoring (Ivanova, 2011). In contrast, the State Service for Hydrometeorology and Environmental Monitoring is responsible for monitoring environmental pollution in the region, including tracking oil spills (Ivanova, 2011).

2.1.2 Regional Spill Preparedness Monitoring

Another activity noted in the document review was Regional Spill Preparedness Monitoring. These are studies that are conducted as part of a national risk assessment/picture (that outlines the regional risk picture also) which provides a conceptual/projected overview of the extent of readiness/preparedness in the event of a spill. These studies mainly identify vulnerabilities and propose recommendations towards maintaining synergy within a nationally integrated system. It should be noted that these studies facilitate

information symmetry between agencies through shared expectations and fostering an understanding of their mandated roles and capabilities.

Monitoring systems were set up to provide an overview of the extent of readiness in the event of a spill and to identify and resolve vulnerabilities in a nationally integrated system. One example was Sweden's work on Mapping the Capability and their Oil Spill Preparedness Survey 2021.

In 2021 the Swedish Agency for Community Protection and Preparedness surveyed the country to map the distribution of oil spill preparedness efforts across the counties and municipalities that border states waters (The Swedish Agency for Community Protection and Preparedness, 2021). The results of the mapping served as an initial basis for Sweden's national action plan for oil damage prevention 2021. The results were integrated as part of the Swedish Civil Contingencies Agency's supervision of the municipalities' mandates according to the Act (2003:778) on protection against accidents (The Swedish Agency for Community Protection and Preparedness, 2021). The survey included the county and municipality perspective regarding risk and vulnerability, planning, organization and the utilization of Digital Environmental Atlas to inform federal authorities on the local protection measures regarding oil spills (The Swedish Agency for Community Protection and Preparedness, 2021). This tool serves to delineate high priority areas specified by local authorities. However, buy in from local areas is key to ensuring a clear picture is painted of their capabilities. As Figure 5 illustrates, more than 50% of municipalities have not participated in the survey, while only approximately 10% of the counties have not participated in the survey (The Swedish Agency for Community Protection and Preparedness, 2021).

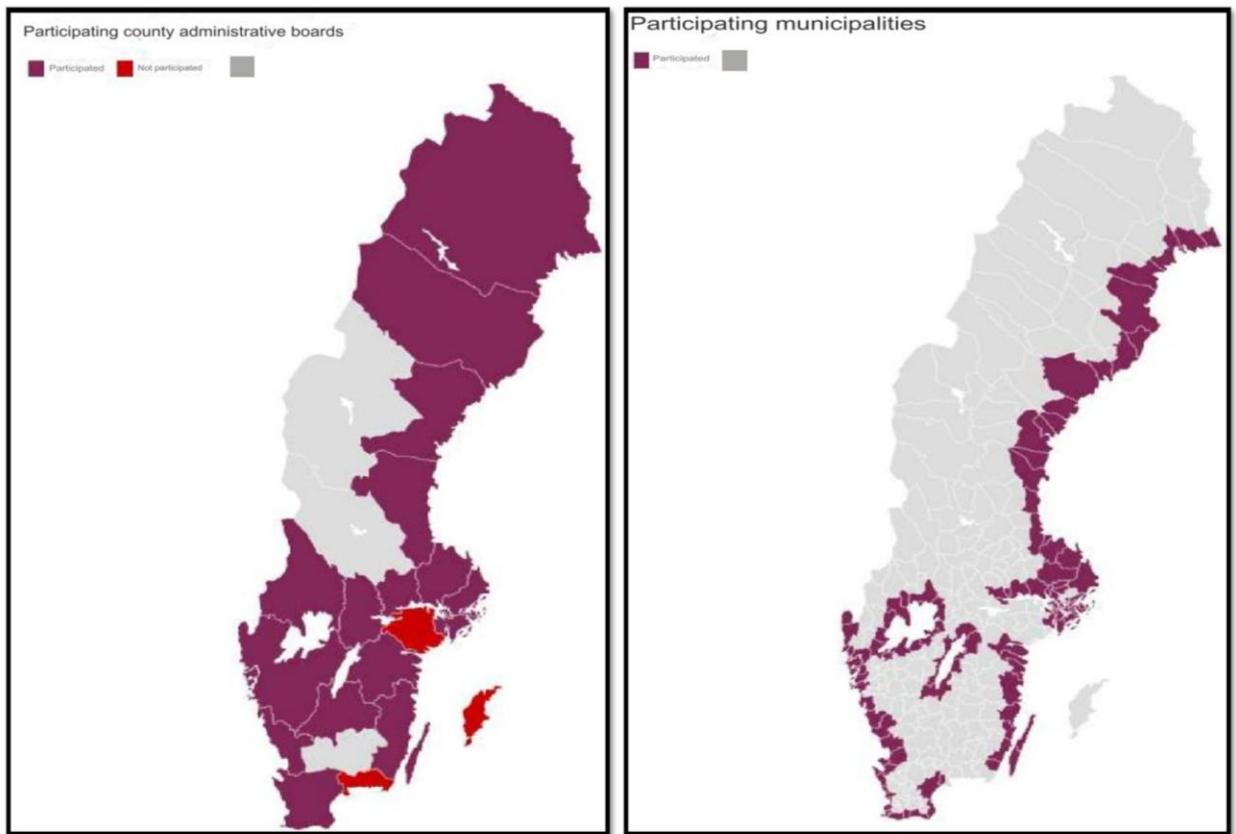


Figure 5: County administrative boards (left) and the municipalities that participated in the 2021 Survey (The Swedish Agency for Community Protection and Preparedness, 2021:7/8).

Based on environmental data and information collected from comprehensive oil monitoring programmes and research studies, this has led to the development of advanced monitoring tools such as Environmental Oil Spill Sensitivity Atlases. This tool facilitates guided oil spill response and preparedness measures with an emphasis on environmental protection (Kingdom of Denmark, 2011). Tools like this provide an opportunity for local involvement through knowledge exchange on sensitive biomes and habitats that can be outlined as established protection priority areas. One such example was the Environmental Oil Spill Sensitivity Atlas's development in Greenland.

Regional Monitoring in the context of Sweden produced online environmental monitoring tools which outlined the preparedness capability of various counties and municipalities towards the enhancement of the national monitoring system.

As part of regional monitoring by counties and municipalities, the Digital Environmental Atlas was developed (The Authority for Social Protection and Preparedness, 2011). This is an online map service that provides information on sensitive areas and objects around Sweden's Coast (Swedish Civil Contingencies Agency, 2011). This tool can be used both during emergency operations and cleanup (Swedish Civil Contingencies Agency, 2011). Further, this tool can serve as a basis for locating, assessing and prioritization of sensitive areas (County Administrative Board in Västra Götaland County, 2023). The Digital Environmental Atlas is administered by the County Administrative Board and consists of information about beach types, nesting times and areas for birds in addition to various spill beach cleaning methods (County Administrative Board in Västra Götaland County, 2023).

During oil spill response actions an operator can input information on the scope and location of the oil spill that is available to all users of the tool following publication (The Authority for Social Protection and Preparedness, 2011). The priority areas from the coastal areas were integrated as part of the National Priority of the Digital Environmental Atlas (Jonas Henriksson et al., 2018).

2.1.3 Sensitivity Mapping

One approach noted in the document review for compiling environmental information was the use of sensitivity mapping. In Greenland, an Environmental Oil Spill Sensitivity Atlas covering all of Greenland's offshore waters and coastal areas particularly sensitive to oil spills has been developed collaboratively by several Greenlandic and Danish institutions and headed by the Danish Centre for Environment and Energy (International Tanker Owners Pollution Federation Limited, 2018). The Atlas was prepared to provide oil spill response planners and responders with tools to identify resources at risk, establish protection priorities and identify appropriate response and clean-up strategies (International Tanker Owners Pollution Federation Limited, 2018). This tool contains location information collected from local communities about the local wildlife, the local fishing sector, local hunting interests and archaeological sites that may be especially susceptible to potential oil spills.

The Swedish Digital Environmental Atlas facilitates the management of established protection priority areas by mandating updates on the status of these areas and protective measures (National Collaboration Group for Oil Damage Prevention, 2022). Local, regional and national protected areas are documented in the Digital Environmental Atlas and inform the basis for the actors' prevention, preparedness and response efforts (National Collaboration Group for Oil Damage Prevention, 2022). Following an incident a report on Sweden's oil security preparedness (mapping the capability) was developed as a follow-up and evaluation of each municipality and county (National Collaboration Group for Oil Damage

Prevention, 2022). This tool can be used in the preparedness, response and planning phase of oil spill incident management as illustrated in Figure 6.

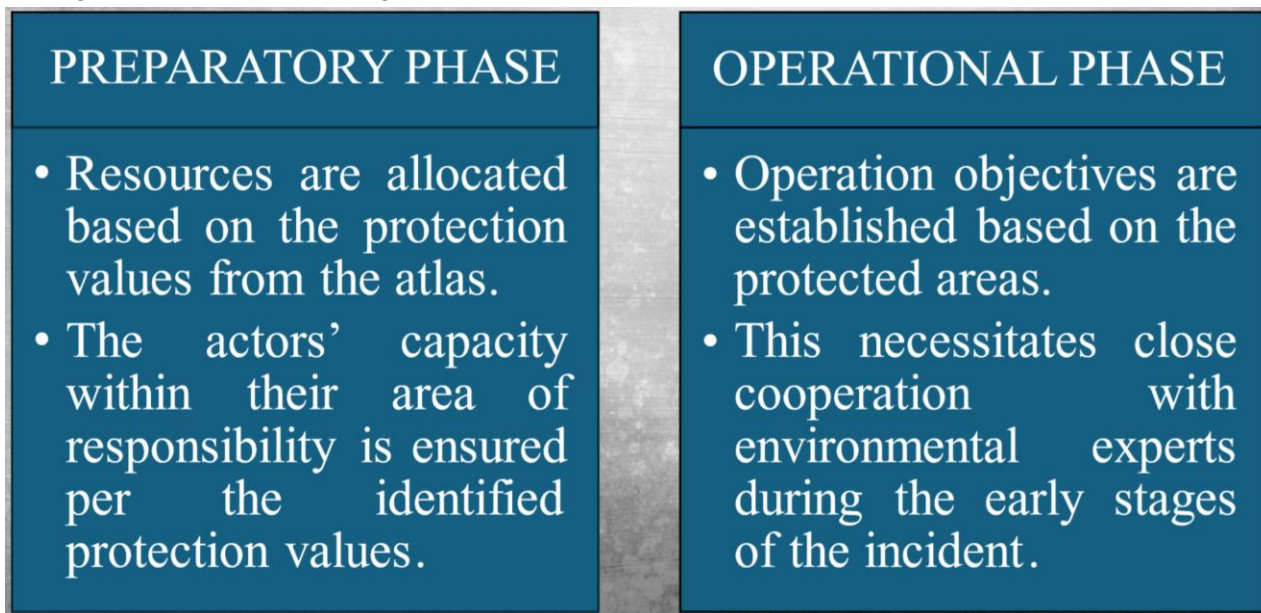


Figure 6: Use and importance of the Digital Environmental Atlas before and after an oil spill incident (National Collaboration Group for Oil Damage Prevention, 2022:22).

2.1.4 Risk Assessments

The document review also revealed that risk assessments are done to aid spill preparedness and serve to identify probable areas and risks where an incident may occur. The rationale, basis and outcomes of the risks assessments from the countries studied varied significantly. There have been cases where local risk assessment has been mandated as a standard service by the rescue service to ensure that local capacity meets the potential of the accident. The Finnish Rescue Act is an example of this. Risk assessments have been used to delegate resources (equipment, personnel, training need and operational capacity), and to determine the capacity of the response agency to respond to incidents based on the incident frequency and probability of incidents against existing resources.

There have been cases where a risk picture is developed, which serves as an overview of the risk of sea-based accidents in major waterways. Sweden has developed a regional risk picture that consists of a comprehensive overview of the risks of sea-based accidents in coastal areas which contributes to the main basis for the spill response strategy (National Collaboration Group for Oil Damage Prevention, 2022). This can be used as a basis for risk and vulnerability analyses (National Collaboration Group for Oil Damage Prevention, 2022).

One such example was Iceland's Fire Department risk assessment and counterbalance assessment, where municipal preparedness is based on risk assessments of activities in the municipalities and coastal oil pollution (Figenschau, 2015). For example, the Akureyri Fire Department risk assessment determines the size and organization of the department based on the existing risks present in the Municipality (Akureyri Fire Department, 2024). The risk assessment is based on the following priority areas:



Figure 7: Risk assessment priority areas adapted from (Akureyri Fire Department, 2024:23).

The Risk Assessment is conducted based on the formula illustrated below.



Figure 8: Formula used to calculate risk by the Akureyri Fire Department (Akureyri Fire Department, 2024).

Since municipal rescue services are responsible for oil spills in coastal areas this formula serves as a vital self-assessment for these agencies and encourages cooperation/joint emergency plans.

There has also been a collaborative approach to risk assessment. An example is the Western Uusimaa Joint Accident Prevention Plan (Finland) and the West Finnmark Intermunicipal Cooperation Agreement (Norway). The accident prevention plan provided a comprehensive account of the supervisory activities and communications related to safety associated with the rescue departments. These supervisory activities are based on a comprehensive risk assessment.

In the Western Uusimaa Joint Accident Prevention Plan, the current service level decision (policy) outlined the actions/policy in response to identified risks and threats, that require the rescue departments in the Uusimaa region to implement adaptations in response to the potential risks (Western Uusimaa Rescue Department, 2023). Measures to prevent accidents are planned and targeted more robustly in response to the potential risk. The use and development of the joint risk analysis for the Uusimaa region can be used to provide better coverage in accident prevention.

The risk analyses highlight the operating environment that workers would be in responding to a spill in addition to the changes and dynamics (based on the existing capabilities and accident frequency) that have been predicted. Under this West Finnmark Intermunicipal Cooperation Agreement, participating municipalities must maintain the necessary preparedness for response to minor cases of acute pollution that may occur within the municipality to ensure operational readiness (Intermunicipal Committee against acute

pollution in Western Finnmark, 2023). Participating municipalities must map current sources, or minor cases of acute pollution and have an overview map of prioritized environmental values and vulnerable natural areas in the municipality (Intermunicipal Committee against acute pollution in Western Finnmark, 2023). Environmental risk analysis and preparedness analysis must be updated under current regulations and submitted to Hammerfest municipality at Hammerfest Fire and Rescue, which administers the collaboration (Intermunicipal Committee against acute pollution in Western Finnmark, 2023).

2.1.5 Inter-regional Oil Spill Planning, Response and Preparedness

The documents also identified that an inter-regional (agreement among multiple municipalities/regions) and area-based approach have been taken towards oil spill response and preparedness, including monitoring. An example of an area-based cooperative approach to oil spill management was the creation of Inter-Municipal preparedness areas against acute pollution in Norway. These areas were developed due to municipal mandates regarding oil spill planning, preparedness and response. As a result, the Norwegian authorities divided the countries' four hundred and thirty municipalities into thirty-four inter-municipal preparedness areas against acute pollution (IUA). These regions engage in oil spill response should it be determined that the scale of the spill response operation is beyond the capabilities of an individual municipality (Wergeland, 2012; Det-Norske-Veritas, 2010). The planning, preparedness and response capabilities are further safeguarded and facilitate compliance with municipal preparedness mandates in the form of agreements. Figure 9 shows the organization of the thirty-four Inter-Municipal Preparedness Regions from Wergeland (2012). This strategy also served as a good alternative for addressing oil spill management of many communities within an area by creating sub-regions. This is like the sub-area framework that has been developed in the United States.



Figure 9: Intermunicipal Preparedness Areas in Norway from (Wergeland, 2012:115).

2.1.6 Designated Coordination Agency

Based on the countries studied, Fire Departments or rescue services have been given responsibility for the operational aspects of local oil spill response, except in Greenland and Canada. This may be due to the already integrated emergency management skills and training to handle a variety of incidents – in the other countries studied. The delegation of a single designated response agency exemplifies the one model of community oil spill response where one agency leads the operational and overall aspects of the local oil spill. The firehouse model proposes designating a single local agency to manage oil spill responses in the region through a unified command system or an approved Subarea Contingency Plan. This would reduce redundant response efforts and eliminate unnecessary overlap in personnel and equipment resources. In Canadian communities, the responsibility lies with the Canadian Coast Guard, although there is often confusion as the Coast Guard does have response equipment storage containers in many communities, but only some have people that have been trained to use them (Andre Legare, n.d).

2.1.7 Local Oil Spill Emergency Planning Requirements

All the studies apart from Greenland and Canada, had enforceable local emergency/pollution/oil spill planning mandates within their legislation, in the form of acts or government policy. However, the intricacies of these plans varied across authorities around issues such as their scope, related preparedness activities, monitoring and training regimes, and command structures, among others. The local plans were either created by a local administrative authority or the mandated response agency. The form of the plans focused solely on hazardous material spill (oil) such as an acute pollution/oil spill prevention plan. There were cases where there was a section of the plans dedicated to oil/hazardous substances spills/discharges as part of an emergency operations/emergency action plan. It should be noted that all plans were to be submitted to a federal agency to be reviewed and accepted for implementation.

It should be noted also that while these mandates required the development of these plans, the evaluation of the use (testing) of these plans were done on a case-by-case basis or as part of a post- spill investigation or part of a background study for the revision of a national plan for instance in Sweden.

2.1.8 Local Involvement in Spill Planning and Response

Local involvement in oil spill planning, preparedness and response activities was identified as being important in all countries and could be by way of either formal or informal activities. Formal local involvement consisted of institutionally mandated activities led by a federally mandated agency or an actor/interested party as part of an established command structure. Informal local involvement consisted of voluntary initiatives such as knowledge-holder-based programs. In Greenland local hunter and fishing knowledge (animal habitat) was used as an information source for the oil spill sensitivity atlas to serve as a tool to inform response personnel on key protection areas.

There have been cases where there were private-community oil spill involvement programs such as a ‘Vessel of Opportunity Program’ where fishermen and vessels were incorporated into the mechanical oil spill recovery efforts such as the deployment of booms. Two examples among the studied countries were during the Deepwater Horizon Oil Spill in the United States and the fishing vessel response program with ENI oil and fishermen in Hammerfest, Norway.

2.1.9 Community Response Organizations

There have been a few cases of community-led voluntary spill response involvement in the United States where communities have organized oil spill response to protect the resources they rely on. This then led to the development of community oil spill response teams such as the Seldovia Oil Spill Response Team. This response team is based in Seldovia, Alaska. During the Exxon Valdez spill, the community organized a response team led by fishermen to protect their resources. These federally certified and trained response organizations offer response operation packages to operating companies as an auxiliary resource.

2.1.9.1 United States of America.

2.1.9.1.1 Seldovia Oil Spill Response Team.

An example of a community-led oil spill response organization is the Seldovia Oil Spill Response Team (Inslee, 2013). This team is a community-based response team that focuses on spill education, prevention, preparedness and response all aimed at environmental protection and health and safety (Seldovia Oil Spill Response Team, 2015). This team was formed during the Exxon Valdez spill based on volunteers who deployed a 40,000 ft boom and developed a skimming task force (Seldovia Oil Spill Response Team, 2015). It was formed by workers and supported by the State of Alaska. This response team utilizes a generic agreement with the City of Seldovia (Inslee, 2013).

The Regional Citizen's Advisory Council in the United States seemed to be the best example of local involvement in oil spill planning, preparedness and response. These Regional Citizens Advisory Councils are comprised of citizen representatives who then inform residents, communities, and interested parties on the evaluation and verification of emergency spill response and clean-up efforts (Alaska Regional Response Team, 2022). The Regional Citizens Advisory Councils monitor and advise oil industry programs that focus on spill planning, prevention, response, tanker safety, and environmental impact assessments (Alaska Regional Response Team, 2022). As part of the Alaska Unified Command Structure this agency contributes as part of a Stakeholder Committee when established to represent citizens in oil spill response operations (Alaska Regional Response Team, 2022).

The Regional Citizens Advisory Council can transfer valuable local knowledge and the concerns of communities to incident commanders that are important to operational decisions (Alaska Regional Response Team, 2022; Inslee, 2013). The main responsibilities of the Regional Citizens Advisory Councils are illustrated in Figure 10.

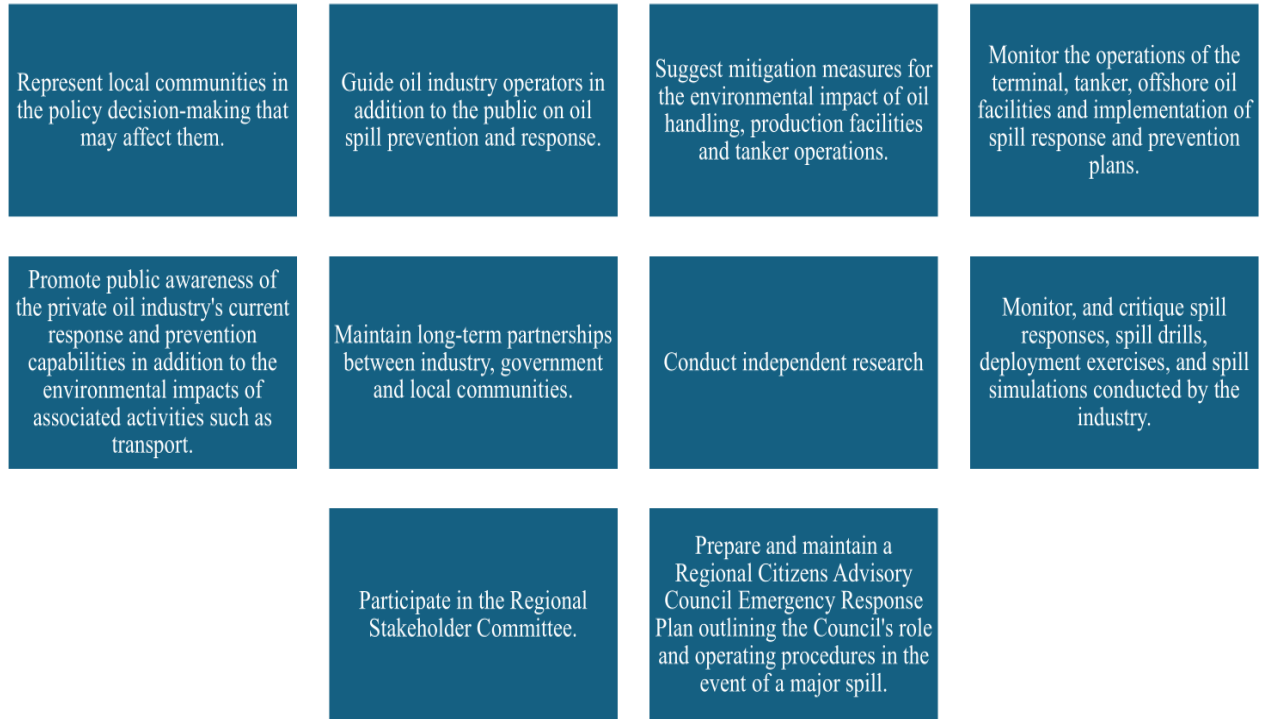


Figure 10: Main responsibilities of the Regional Citizens Advisory Council adapted from (Inslee, 2013).

These advisory councils conduct community outreaches that serve to increase public awareness of the oil spill planning, prevention, response, and environmental protection capabilities, within their region (Prince William Sound Regional Citizens Advisory Council, 2024a). This council funds projects, recruits local volunteers and research efforts, sponsors students, and hosts panels with communities to exchange oil spill experiences such as the Exxon Valdez spill (Prince William Sound Regional Citizens Advisory Council, 2024a). For instance, in 2023 the Prince William Sound Regional Citizens Advisory Council held a tour where Valdez residents observed fishing vessel-based oil spill response (Prince William Sound Regional Citizens Advisory Council, 2024b).

2.1.10 Spill Response Training

All the countries considered also established the importance of training to local spill response activities and that such training needs to be planned into an overall regime. Designated response agencies, such as the Canadian Coast Guard, can either train people in-house or outsource this training based on the expertise requirements of the department to achieve its operational mandate. There have been national training programs for actors that have been incorporated into an established national incident command/management system such as Norway. Training methods identified varied significantly and included a range from desktop theory to practical training methods. The training programs have been conducted at various scales. From the countries studied the best theory-based training resources were from the United States of America, Sweden, and Norway. Sweden’s training consisted of theory-based material such as the “Oil is Loose Handbook” as an introductory learning resource and evaluation of the training practices based on preparedness surveys. On the other hand, the integrated training system from the

Regional Citizens Advisory Council (Prince William Sound and Cook Inlet respectively) provided training for all education levels and in conjunction with outreach programs increased the overall awareness of oil spills. One example of this is the Alaska Oil Spill Curriculum which outlines the requirements that should be taught to all ages and education levels in communities from K12 to high school level. The Prince William Sound website has a variety of learning/course materials for students and teachers.

The Alaska Oil Spill Curriculum was established in 1990 to provide effective, usable lessons and information to schools in Alaska and around the nation about the hazards of oil spills (Mickelson et al, 1990). The lessons provided to students of various educational levels have been very successful in building overall awareness. Some of the key achievements included:

- Increased awareness of their surrounding environment.
- An understanding of the technical aspects of oil spills and hazardous waste management.
- The potential impacts of oil spills and informed decision-making were explored.
- Lessons focused on topics ranging from habitats to energy conservation(exercises).
- Aiding students in grasping the fundamental aspects of oil spills, challenges faced in clean operations and technological advances.
- Exploring the potential impact of oil spills on wildlife.

Sweden developed an oil spill management municipal handbook designed to provide a synopsis of community oil spill response issues, with a major emphasis on municipal responsibilities (Forsman, 1997). The manual provides management approaches for oil spills that have reached waterways and shorelines. The handbook was mainly intended to be utilized as course material at the Swedish Rescue Services Agency's schools during training programs and exercises on municipal oil protection (Forsman, 1997). The three main parts of the handbook covered the characteristics of oil and its behaviour in various environments, oil spill response planning, and coordination in addition to the legal basis for oil spill management at the municipal level, lastly the manual focused on theoretical knowledge of various oil spill responses. The content in the handbook is structured to be used as a direct operational guidance tool during and before oil spills (Forsman, 1997- updated in 2006 by Swedish Rescue Agency, 2006). Since then, the Swedish Civic Contingencies Agency has developed various guides and manuals that focused on relevant topics namely:

- Manual oil protection plan guide to establishing an oil protection plan for the municipality (Swedish Authority for Social Protection and Preparedness, 2010)
- Remediation manual for oil on Swedish beaches (Swedish Authority for Community Protection and Preparedness, 2010).
- Manual in municipal crisis preparedness 4. Risk catalog (Oil spills and pollution accidents at sea (The Swedish Agency for Community Protection and Preparedness, 2022)
- The Rescue Services Working Environment in connection with cleanup after oil spills on beaches- (Gyllenhammar and Arvidsson, 2007).
- Handbook on the content and structure of the municipalities' action programs according to the Accident Protection Act (The Swedish Agency for Community Protection and Preparedness, 2021).

2.1.11 Spill Response Organizational Structure

Except for Canada and Greenland, all the other countries studied have outlined all the related oil spill response actors in an organized management system. The lack of such a management system presents many vulnerabilities in organizing national oil spill response due to the absence of shared priorities and established roles for small communities that may have to respond. It was found that Denmark, the United States, Sweden, Russia, Finland, and Iceland all have a unified response command that integrates local authorities into spill response. However, there have been cases where the roles and responsibilities of these response systems are too rigid and may not apply to sparsely populated areas that may not have the required personnel and operational specifications due to their small size. Notably, the United States and Denmark have integrated simplified scenario-based guidance documents that coordinate the local response efforts for smaller, remote communities. Highlights of the Emergency Action Cards in Denmark and the Small Community Emergency Response Cards in the United States are noted below. These plans and action cards can be used to foster flexibility in the roles and responsibilities during oil spill response operations towards increased local involvement.

Denmark's Action Cards are exemplified by the Tårnby Fire Service (see Table 1). The environment-related operational aspects of emergency response are described in the form of action cards for various environmental accident scenarios (Tårnby Municipal Board, 2012). To describe the environmental side of the emergency response for the Tårnby Fire Department, 6 action cards have been prepared for the following scenarios: Oil spill on land, Oil spill in freshwater, Chemical spills on land, Chemical spills in fresh water, Oil and chemical spills at the company, Extinguishing water at the company. Saltwater has not been specified.

2.1.11.1 Coordination of the response effort.

During an incident, the Nature and Environment Department is responsible for:

- Contacting the task leader, reviewing situation reports, and agreeing on the next action.
- Providing technical environmental advice to the project manager.
- Identifying and monitoring the pollution source to the extent necessary if a responsible party has not been identified.
- Retrieving documentation that allocates roles and responsibilities during accidents to determine the scope.
- Serving as a liaison to the municipality's other security arrangements.
- Requesting assistance from private and public contractors at the task manager's request.
- Notifying other authorities at the request of the incident leader.

When the response manager assesses that the immediate danger has been removed, the contamination has been contained, the rescue team's efforts have been completed, then further responsibility is handed over to Nature and Environment (Tårnby Municipal Board, 2012). An accident report is drawn up according to the guidelines and handed over to the relevant case manager in Nature and Environment or another authority (Tårnby Municipal Board, 2012). A decision is then taken on the further administrative course of the case (Tårnby Municipal Board, 2012).

2.1.11.2 Action Cards For Scenario-Based Training and Response.

Table 1: Action Card for Freshwater Oil Spill Response (Tarnby Municipal Board, 2012:13).

Action card 2: Oil spill in freshwater	
Environmental efforts	<ol style="list-style-type: none"> 1. Locate the pollution source and stop the spill. 2. Preventive measures <ul style="list-style-type: none"> ● Emptying any defective container ● Unclogging of any oily discharge ● Containment of pollution in still flowing streams (establishment of spade barrier, earth dam, straw barrier, net barrier, floating barrier) ● Containment of oil in stagnant water (Establishment of float restriction possibly combined with blocking at the lake's outlet, see, if necessary, delay basin with submerged drain) ● Collection of free oil (absorption material, oil skimmer, oil separator, suction head, mud suction)
Assistance	<ul style="list-style-type: none"> ● Contractor/hauler ● Nature and Environment Department ● Waste recipient ● Police (Investigation) ● Photo ● Map sketch/notes/course of events
Documentation	<ul style="list-style-type: none"> ● Sampling (oily discharge) ● Quantitative assessment of spillage ● Document the connection between the source and contamination in the receiver ● Flushing pipelines and streams can be considered.
Restoration	<ul style="list-style-type: none"> ● If necessary, the flow barrier is maintained for a suitable period after the spill in agreement with Nature and the Environment.
Follow- up	<ul style="list-style-type: none"> ● Submission of documentation to Nature and Environment. ● Copy of emergency report sent to Nature and Environment.

Table 2: Action Cards for Company/Private Facilities (Tarnby Municipal Board, 2012:17).

Action Card - Oil and Chemical Spills	
Environmental efforts	<ol style="list-style-type: none"> 1. Stop spills. 2. Preventive measures <ul style="list-style-type: none"> • Emptying any defective container • Containment of pollution by still flowing liquid (establishment of an embankment, collection in artificial swamp). • Covering drain grates with water-filled plastic bags. • Suction of spillage with suction material or mud suction, if applicable. In plugged drainage wells.
Assistance	<ul style="list-style-type: none"> • Driver • Nature and Environment • Police (Investigation) • Photo • Map sketch/notes
Documentation	<ul style="list-style-type: none"> • Sequence of events • Sampling/documentation of spills • Quantitative assessment of spills • Cleaning of hard surfaces by rinsing with (hot) water
Restoration	<ul style="list-style-type: none"> • Contaminated water must be collected.
Follow-up	<ul style="list-style-type: none"> • Submission of documentation to Nature and Environment • Copy of emergency report sent to Nature and Environment

2.1.11.3 Small Community Emergency Response Plan.

In the United States of America, the Small Community Emergency Response Plan is a guidance document which contains essential, community-specific, information that can aid the community’s response approach to a disaster (Alaska Regional Response Team, 2022). The Small Community Emergency Response Plan supports an Emergency Operations Plan as a quick response reference tool to assist communities with limited response capabilities within the first seventy-two hours of an event (Alaska Division of Homeland Security and Emergency Management Planning Section, n.d.; Alaska Regional Response Team, 2022). This plan also stressed the importance of the integration of the knowledge of

community members and interested parties in the development of these plans (Alaska Division of Homeland Security and Emergency Management Planning Section, n.d.; Alaska Regional Response Team, 2022). These plans also include a proposed community incident command system under the National Incident command structure requirements as illustrated in Figure 11. It should be noted that each incident determines the required positions in the Incident Command Structure.

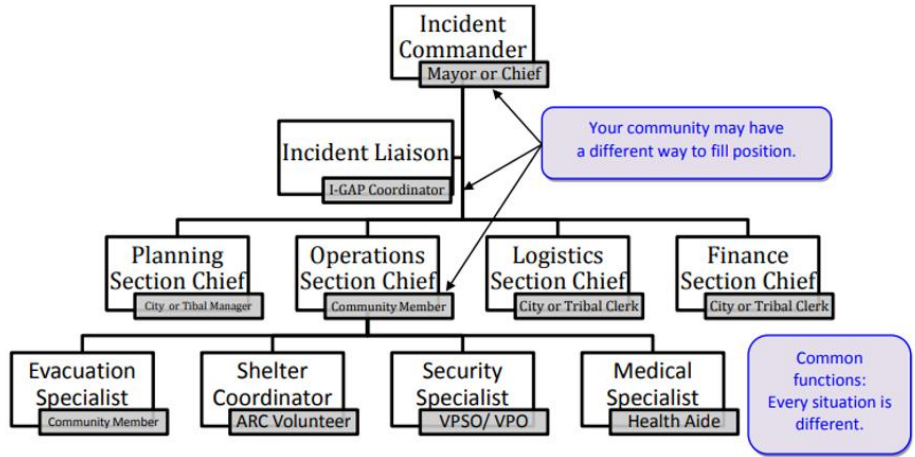


Figure 11: Sample Incident Command System from the Alaska Division of Homeland Security and Emergency Management Planning Section (Alaska Division of Homeland Security and Emergency Management Planning Section, n.d.).

2.1.11.4 Dedicated Area Specific Oil Spill Response Equipment Stockpiles.

All the countries studied utilized dedicated area equipment stockpiles regionally for spill response. Greenland has recently changed in this regard, however. Around 2016 Greenland established a national oil spill response company; Greenland Oil Spill Response Inc (GOSR) with legislation stipulating that contracting companies enter response agreements with the firm. This company was responsible for the national management of oil spills in the country and for providing equipment. However, the company entered liquidation in 2022, and a new company was formed namely Sikuki Nuuk Harbour. According to an annual report, this company had absorbed all the response equipment, moved it to Nuuk and retained the lead oil spill response staff. The following highlights how dedicated stockpiles are a part of Community Spill Response Agreements in the United States.

The Alaska Department of Environmental Conservation has established approximately forty-five formal Community Spill Response Agreements with boroughs and municipalities across Alaska (State of Alaska Department of Environmental Conservation, 2024). As illustrated in Figure 12, there are 57 locations that are response equipment sites, most associated with communities that have spill response agreements. These agreements stipulate that communities are required to take initial response actions for oil spills within their area of responsibility (State of Alaska Department of Environmental Conservation,

2024).

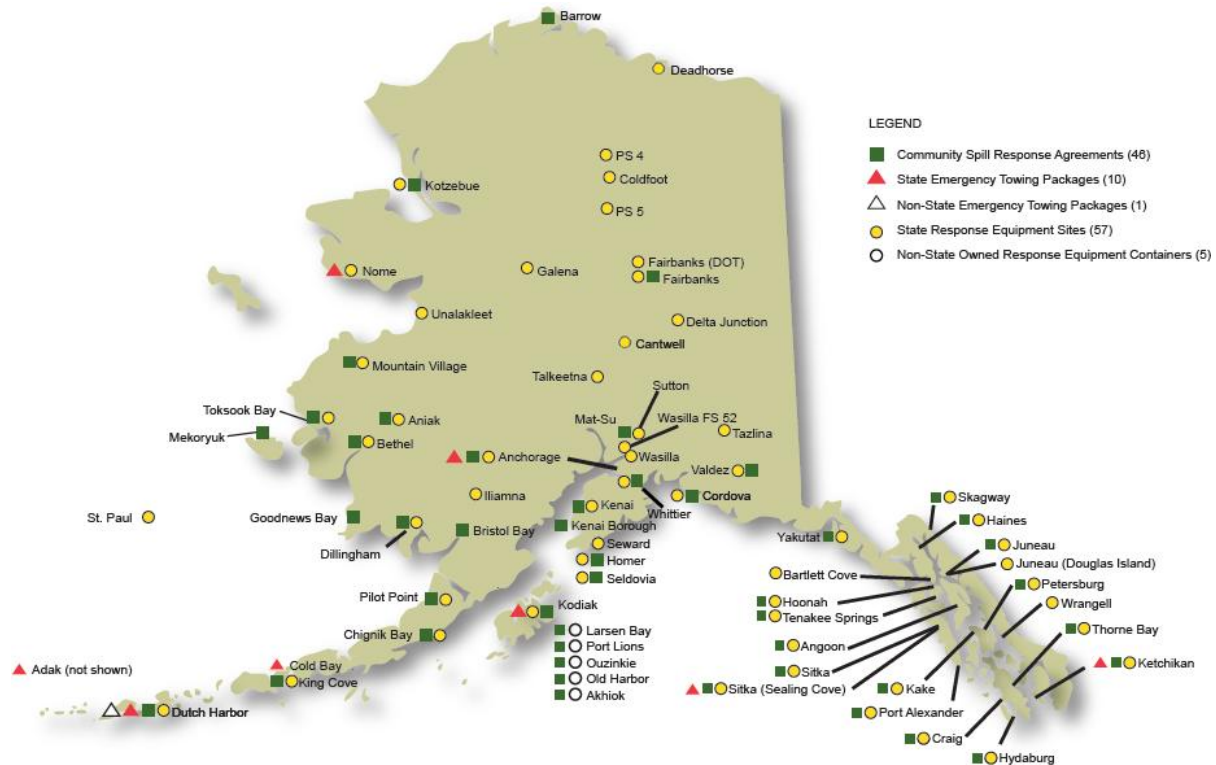


Figure 12: Map of Community Response Agreement signatories, and Oil Spill Response resources across the state of Alaska from (State of Alaska Department of Environmental Conservation, 2024).

These agreements facilitate the Alaska Department of Environmental Conservation to reimburse local governments for spill response activities undertaken at the request of the State On-Scene Commander (State of Alaska Department of Environmental Conservation, 2024). The Alaska Department of Environmental Conservation may reimburse the community for costs incurred in spill response, containment and recovery operations (State of Alaska Department of Environmental Conservation, 2024). These agreements serve as a means of providing state equipment to communities. Some of the equipment in these community stockpiles consists of:

- Initial Rapid Response Equipment
- Security /Lighting Equipment
- Containment Equipment-Booms, tow bridles with floats, fast water booms, buoys
- Recovery Equipment-Sorbent booms, sorbent pads, oil snares, skimmers
- Storage Equipment
- Treatment/Disposal Equipment
- Small Tools - hammers, saws and other tools

2.1.12 Chapter Summary

Based on the topics focused on this chapter and the document review, the following table and summary were developed. The Gap analysis chart in Table 3 was created based on the document review

and the analysis of the local plans reviewed. There were five common themes identified based on the common properties of the plans reviewed and the subsequent deliverables, including:

1. Background Area Information-From the nine countries studied, there was an emphasis on environmental characteristics such as priority areas and protection areas. This was present as part of the Geographic Response Strategies from the United States. The information in these strategies includes response strategy, implementation, response resources and protected resources. They included tools such as atlases (Sweden and Greenland) that have integrated area information to inform training, response and monitoring measures. In addition to environmental information, there was information on the existing response capabilities in response to oil/chemical characteristics. They were background information that was used to create training, monitoring and response measures.
2. Monitoring Regimes-This was a common component in oil spill response and emergency plans where the emphasis was on three areas: early detection, surveillance and post spill monitoring. This was shown to be an essential component in oil spill planning, preparedness and response at the local level.
3. Training Regimes- These regimes were either nationally mandated competency requirements or staff-based competency requirements (to sharpen individual skills). The spill response training approaches varied through the plans reviewed.
4. Local Involvement Requirements-This was based on the various ways in which citizens were involved in oil spill preparedness, planning and response. Local involvement was either agency based(formal), resident based(informal) or government funded local programs(semi-formal). Local involvement initiatives consisted of community knowledge exchange(input) to make tools and plans such as animal nesting areas in Greenland's oil spill sensitivity atlas. The Regional Citizens Advisory Councils (Prince William Sound and Cook Inlet) of the Alaska region of the United States conduct community outreach, funds project, recruits local volunteers and research efforts, sponsors students, and host panels with communities to exchange oil spill experiences such as the Exxon Valdez spill (Prince William Sound Regional Citizens Advisory Council, 2024a).
5. Community Oil Spill Response Company - There were cases where there was active response involvement such as Vessel of Opportunity programs where fishing vessels and communities have been integrated into local oil spill response structure. This brought about the idea of a Kivalliq regional oil spill response company based on the model of the Seldovia Oil Spill Response team. This company would be based on a hub structure that would integrate multiple surrounding communities and is funded through spill response contracts from shipping companies and offshore facilities. The following areas identified from the previous deliverables served as key

recommendation areas. These terms outline the key components of what a community oil spill response plan for Chesterfield Inlet should have.

Of the nine countries studied sixty-seven percent had local oil spill/emergency response plans as illustrated in Figure 13.

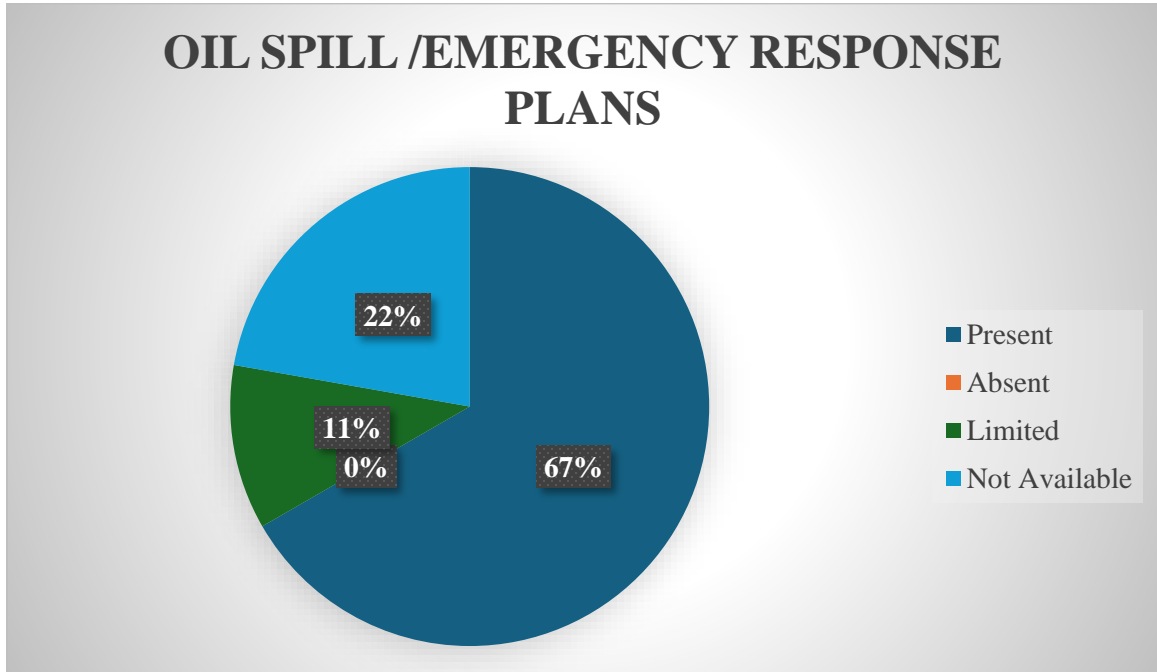


Figure 13: Distribution of oil spill/emergency response plans among the countries studied.

Eighty-nine per cent of the nine countries studied had dedicated local spill response equipment as illustrated in Figure 14.

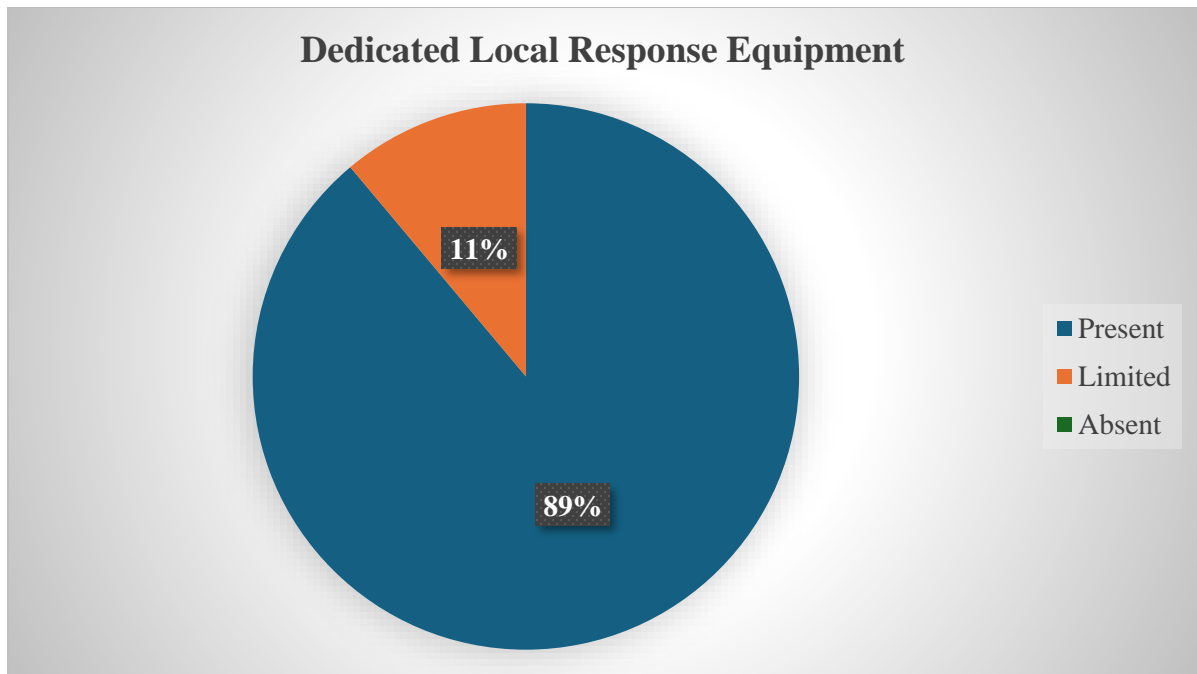


Figure 14: Dedicated Local Response Equipment among the countries studied.

Table 3 establishes the gap analysis chart that I developed based on consideration of the outcomes of the document review regarding both preparedness and response. It reveals that on a broad scale, many of the case countries have taken some form of action underscoring further the importance of action on each of these.

Table 3: Gap Analysis Checklist of Countries studied in the project.

Country	Canada	Denmark	Finland	Greenland	Iceland	Norway	Russia	Sweden	USA
PREPAREDNESS									
Local Area Planning Requirements	NA	P	P	NA	P	P	L	P	P
Based on Background Information/Scenarios	NA	P	P	P	P	P	A	P	P
Training Policy	L	P	P	P	P	P	P	P	P
Sensitivity Mapping	L	P	P	P	P	P	P	P	P
Risk Assessment	P	P	P	P	P	P	P	P	P
Preparedness Assessment	A	P	P	P	P	P	P	P	P
Exercises	P	P	P	P	P	P	P	P	P
Local Oil Spill /Emergency Plans	L	P	P	P	P	P	P	P	P
Community Plans for Canada, Russia, Greenland, USA	L	NA	NA	P	NA	NA	A	NA	P
Local Emergency Response Systems	P	P	P	P	P	P	P	P	P

RESPONSE									
Local Response Equipment	L	P	P	L	P	P	P	P	P
Response Management Agency/Unit	L	P	P	P	P	P	P	P	P
Incident Command System/Structure	L	P	P	P	P	P	A	P	P
Post Spill Monitoring	P	P	P	P	P	P	P	P	P
Response Framework/Document	P	P	P	P	P	P	A	P	P

Presence	Code
Present	P
Absent	A
Limited	L
Not Available	NA

CHAPTER 3: BRIEFING NOTES ON IMPROVING LOCAL MARINE SPILL RESPONSE CAPACITY

3.1 Introduction

This chapter establishes the main community deliverable from this project, a series of briefing notes for the community of Chesterfield Inlet. It is aimed at presenting the key activities that the community may consider in trying to take action to improve their marine oil spill response capacity. The first briefing note in the series outlines what I have identified through my research as the five key areas that need to be actioned for community-based marine spill planning, preparedness, and response. Subsequent briefing notes are provided for each of these five areas.

Underscoring these, WWF Canada's report on Oil Spill Response Capacity in Nunavut and the Beaufort Sea (2017) recommends the improvement of local capacity to respond to oil spills. As noted by Covert (2016:29) many documents regulate oil spill prevention, preparedness, and response efforts in the Arctic region yet little has been done to prepare small communities for oil spills. In accordance with these comments, these briefing notes have been developed to outline a framework that serves to enhance the local capacity of Canadian Eastern Arctic communities for marine spills using Chesterfield Inlet as an example. It is also worth noting that the Arctic Chapter of the Marine Spills Contingency Plan (2022) had defined terms such as area response plans and community plans. However, this plan does not include specific guidelines that can be implemented at the community level. In June 2010, Transport Canada released a plan and a policy for preparedness and response in relation to Canada's Marine Oil Spill Preparedness and Response Regime. This plan also does not contain information on the state and expected levels of preparedness relative to risks or on mechanisms to ensure an adequate response, and therefore the plan does not fulfil its own purpose, which is to establish Canada's national preparedness capacity (Vaughan, 2010).

As highlighted by Chen et al., (2012) the Canadian Coast Guard's Plan (1998) defined the scope and framework within which it will operate to ensure a response to marine pollution incidents. However, it does not contain an up-to-date response model and related procedures that would be used to manage the Coast Guard's response to a major incident. In addition, Chen et al., (2012) pointed out that this plan had not included Public Safety Canada and other agencies that could have played an important role in the event of a significant incident.

Even though area plans were updated for Central and Arctic regions in 2008, the remaining plans date back to as early as 2004. These plans are based on the Canadian Coast Guard's 1998 plan, but because they have been updated at different times, they are not consistent across other regions and do not address local response activities (Fisheries and Oceans Canada, 2010).

Given the Canadian Coast Guard's role as the lead responder to ship-source oil spills, the absence of an updated, ship source oil spill response framework restricts the Coast Guard's ability to fill their role as the leading responder to ship source oil spills in the Arctic. The absence of any formal integration of local authorities in such planning is a serious gap that needs to be filled.

BRIEFING NOTE#1

PROMOTING ROBUST MARINE SPILL PLANNING, PREPAREDNESS AND RESPONSE IN CHESTERFIELD INLET IN CANADA’S EASTERN ARCTIC

To: Government of Nunavut (the Department of Environment and Wildlife and the Petroleum Products Division), and Chesterfield Inlet (Guardians, Fire Department, Community Office, Hunters and Trappers Organization)

Re: Promoting robust marine spill planning, preparedness, and response in Chesterfield Inlet in Canada’s Eastern Arctic

Prepared by: Ashley Adams

Summary

As transportation through Arctic regions becomes increasingly prevalent due to tourism, mining, community re-supply and the potential for future oil exploration, the threat posed to surrounding communities by ship-sourced oil spills increases. The remoteness and climate often result in local Arctic communities being the first responders to these incidents. Community-led area-specific planning, preparedness, and response based on local interests, and knowledge significantly increases the effectiveness of response efforts. This policy brief recommends various tools and initiatives that should be considered in the development of a robust community oil spill planning, preparedness, and response plan for Chesterfield Inlet and the existing local strategies to facilitate robust oil spill planning. While addressed to Chesterfield Inlet, these recommendations also apply to other communities and regions in the Canadian Arctic. As such, this brief provides a list of recommendations for a comprehensive oil spill response and preparedness plan.

Context

Canada’s level of preparedness to respond to oil spills in the Arctic region is very minimal (Covert, 2016:21). “Preparedness in the context of Arctic communities in Canada is often more robust on paper than it is on the ground” (Funston, as interviewed by Covert (2016:22). According to the outdated Keewatin Region Response Plan (2005), the existing oil spill response and preparedness strategy is limited. The objectives of Wildlife Rescue and Coastal Cleanup restrict response tactics and represent the entirety of Chesterfield Inlet’s plan. Integrating instruments such as area-based response strategies and risk and vulnerability assessments helps communities establish priority areas towards a risk-informed oil spill preparedness and response approach. As part of the GENICE II project the leaders of Chesterfield Inlet have expressed interest in oil spill plans. The policy brief’s recommendations are tailored towards

Chesterfield Inlet but are applicable in the small Canadian Arctic community context. It is important to note that community-based planning should be coordinated under national plans.

Policy Options

Canada's current approach towards responding to an Arctic oil spill is primarily based on the enforcement of the obligations of the responsible party during the incidents. The Marine Spills Contingency Plan-Arctic Charter (2022) defines area plans and communities (local stakeholders) and highlighted their importance in oil spill planning. However, specific planning requirements, and community-specific information have not been integrated. This results in inefficient spill response operations due to the absence of shared expectations. Currently, the Keewatin Region Response Plan (2005) outlines a regional community's approach in responding to oil spill incidents. These community response strategies are outdated, basic, do not facilitate local involvement, and are inadequate for addressing current oil spill response and preparedness concerns due to the increased risk associated with growing Arctic shipping traffic. For example, Chesterfield Inlet's Response Plan was created as part of the Keewatin Regional Response Plan in 2005 and has only two action items. The following series of policy briefing notes aims to outline a few recommendations that will be essential for community ship source oil spill preparedness response requirements, and that could be applied under the 2022 Canadian Coast Guard's Marine Spills Contingency Plan-Arctic Chapter with a focus on Chesterfield Inlet as an example.

Recommendations

This policy briefing note introduces the five key areas that need to be actioned for community based marine spill planning, preparedness and response, including background area information, monitoring regimes, training regimes, local involvement requirements, and framework for a community branch of a Kivalliq Regional Oil Spill Response Company.

Background Area Information

Robust oil spill planning, preparedness and response planning at a community level must be based on comprehensive background information to inform area-based measures and response scenarios. Priority should be placed on delineating a geographic boundary outlining the area of responsibility of a community (or communities), identifying mandated agencies for response, and outlining protection priorities (assets such as tourism assets, historical sites, cultural values community subsistence areas, and hunting areas). The background information should consist of three categories: i. Environmental (geography, climate, ecological, wildlife oceanography, general oil spill frequency and volume), social (population, cultural), and economic (subsistence, tourism, fishing and hunting areas); ii. Relevant assessments (risk and vulnerability) used to help establish Geographic Response Strategies towards protecting subsistence resource areas, human health, culturally significant areas, and the surrounding environment; iii. Operational information such as mandated spill response capacity (required response volume capability), resources (temporary storage sites, equipment, vessels, approaches, etc.) and personnel (specialists) should be kept updated and readily available.

Monitoring Regimes

Long-term and short-term monitoring regimes will increase the capacity of local communities as they will be able to identify signs of pollution earlier and then identify and track spill impacts, the

effectiveness of responses, and ecosystem recovery. Monitoring regimes should consist of risk assessments, environmental status reporting, identification of environmental indicators to track and regular collection of data about those indicators, and opportunities for the public to contribute observations and see monitoring results (for instance using apps like SIKU and other online platforms). The findings from the monitoring program can be used to develop an area-specific environmental status report which documents the extent (number and volume) of any spills and impacts), based on ecosystem and wildlife data before, during, and after an incident. This should inform the planning, preparedness, and response monitoring of facilities and local staff, including inspection of facilities and evaluation of competence. Environmental status as defined in the 2019 Marine Strategy Act-Promulgation (see also Appendix 2) is the overall state of the environment in marine waters that accounts for the structure, functions, and process of marine ecosystems and natural physio-graphic, geographic, biological, and climatic factors, as well as physical, acoustic, and chemical conditions including those resulting from human activities within or beyond the area concerned. Programs that facilitate joint community environmental monitoring initiatives should be developed to increase the competence and cooperation among communities that share a regional area. Subsequent analyses of the findings from the environmental status reports and integrated training regimes can be used to develop pollution response actions based on community-based spill scenarios. This can significantly improve the effectiveness of response operations and overall community preparedness since they would be based on a combination of community specific information and regionally shared priorities.

Training For Spill Response

Training should be led and evaluated by an appointed on-scene commander (e.g. local fire chief) who would serve as the emergency manager representing the community, coordinating marine oil spill response operations, and reporting to the Canadian Coast Guard. The emergency manager may be supported by the local oil handling facility managers who should have expanded training, logistical and technical expertise. These persons would inform governing bodies of the training requirements in a community context. The planning and response capacity of the community would be expanded through specialized annual training programs. Specialized oil spill management training programs based on the existing roles will enable better execution of assigned tasks will improve overall community preparedness. A model for citizen oversight should be developed to facilitate an organized approach to oil spill management. The use of manuals, handbooks, and courses will facilitate the synchronization of management efforts, increase overall awareness of oil spills, promote increased local participation, and reduce the risk of harm to human health, the environment, and socio-economic and cultural values. The key aspects of the training regimes should consist of:

- incident management,
- scenario-based Geographic Information Systems training (for priority and values mapping) (e.g. SIKU),
- overview mapping,
- response scenario mapping,
- environmental status reporting,
- delineation of area of responsibility,
- risk identification and assessment,
- contingency planning,
- source detection,

- wildlife protection, and
- hazmat handling.
- Specialized equipment training agreements with private companies and/or non-profits should be established to develop localized oil spill response specialists in addition to improving the overall competencies of associated agencies (e.g. Community based monitoring; Training on use of scientific equipment such portable DNA sequencers, meteorological stations etc.)

Local Involvement Requirements

Local involvement is essential for the management of oil spills. As stated in the United States Oil Pollution Act (1990:9) “Only when local citizens are involved in the process will the trust develop that is necessary to change the present system from confrontation to consensus.” To promote involvement in oil spill prevention, policy should facilitate mechanisms for formal and informal involvement, such as knowledge exchange platforms. A model for citizen oversight should be developed to facilitate an organized hierarchical approach to oil spill management. An oversight committee should be developed for Chesterfield Inlet which could include the fire chief, police chief, leader of the Indigenous Guardians, the Mayor, a representative from the Hunter and Trapper Organization, Elders, the local emergency manager, and the on-scene commander. This committee would help to promote environmentally sound marine transport and ensure community-engaged monitoring and spill response. This oversight committee would conduct, or oversee, the following risk assessments: evaluation of planning; preparedness and response measures; oversight of remediation efforts; monitoring; identification of risk reduction measures; hosting outreach events; and designating priority areas in addition to initiating independent research as needed. Standards for the involvement of local vessels should be outlined based on class and capacity to promote more prompt offshore containment. The vessel operators should be trained and licensed by regulatory agencies.

Framework For a Community Branch of a Kivalliq Regional Oil Spill Response Company.

Given the remoteness of the Kivalliq Region, the development of response agreement framework with a regional company (e.g., community-based, private, or public-private partnership) that responds to marine and land-based oil spills on a regional basis and facilitates communities' active participation in local preparedness, planning, and response is recommended. Shipping and offshore facilities would be required to enter agreements with the spill response company to fund its activities, much like what happens on the east and west coasts of Canada. The framework should, therefore, consist of payment structure (compensation), assessment of local capacity (equipment and personnel), outline of roles and responsibilities, and identification of priority response areas.

References

- Canadian Coast Guard. (2022). Marine Spills Contingency Plan-Arctic Chapter.
- Canadian Coast Guard Environmental Response Department. (2005). Keewatin Region, Nunavut Area Plan.
- Chistopher Covert. (2016). Small Community Oil Spill Preparedness Research Project Item Type Report. <http://hdl.handle.net/11122/7795>

Marine Strategy Act-Promulgation, Pub. L. No. 1161, Promulgation of the Marine Strategy Act (2019).
Oil Pollution Act (OPA) of 1990, Pub. L. No. 2701, 2701 (1990). <https://www.epa.gov/laws-regulations/summary-oil-pollution-act>
Funston, B. (2016, March). EPPR in Alaska. (C. Covert, Interviewer)

BRIEFING NOTE #2

NECESSARY BACKGROUND AREA INFORMATION FOR COMMUNITY-BASED MARINE SPILL PREPAREDNESS AND RESPONSE

To: Chesterfield Inlet (Guardians, Fire Department, Community Office, Hunters and Trappers Organization), Government of Canada - Environment and Climate Change Canada and Canadian Coast Guard, Government of Nunavut - Environment and Climate Change.

Re: Necessary Background Area Information for Community-Based Marine Spill Planning, Preparedness and Response

Prepared by: Ashley Adams

Summary

Robust oil spill planning, preparedness, and response planning at a community level must be developed based on comprehensive background information that can be used to inform area-specific measures and response scenarios. Access to such information greatly increases the effectiveness and efficiency of planning, preparedness and response measures, especially the prevention of damage to the environment, economy, and cultural values during an oil spill event. To achieve this outcome the community of Chesterfield Inlet, the Government of Nunavut (Environment and Climate Change), Environment and Climate Change Canada, and the Canadian Coast Guard need to work together to compile the necessary information. Environment and Climate Change Canada can also provide and confirm the validity of the information retrieved. Since the Canadian Coast is the coordinating agency for oil spill response in Canada, they can serve as a conduit for this initiative. The background information should include three categories: i. Environmental, social, and economic data; ii. Relevant assessments (risk, vulnerability, sensitivity) used to help establish Geographic Response Strategies towards protecting human health, private property, and the surrounding environment; and iii. Operational information, such as mandated spill response capacity, resources and personnel.

Context

Area-based oil spill response and preparedness plans significantly increase the efficacy of response and reclamation operations. There have been various reports that provide background information on Communities by not-for-profit organizations such as World Wildlife Fund Canada. The report, titled *Background Information for Community Oil Spill Response Planning in Pod Inlet, Resolute, Grise Fiord, and Arctic Bay (2017)*, outlined key components of community specific background information that may be required for local oil spill response planning. This included topics such as physical environment, infrastructure and population, climate change, regulatory framework, oil spill response equipment

(operational information such as logistics, trained personnel), and oil spill response limiting factors. The Government of Nunavut has developed a report for Chesterfield Inlet as part of their Nunavut Coastal Resource Inventory (2010) which provided insight on the geographic distribution (through maps) of Chesterfield Inlet-specific information on archaeological sites, mammals, birds, invertebrates, marine plants, areas of high diversity, among others. This is an example of valuable background information that can be used in the creation of community oil spill preparedness and response plans. This report was informed through interviews of community members and was supported (and verified) by scientific methods. The objectives outlined in the Keewatin Regional Response Plan (2005) focused on wildlife rescue and coastal cleanup. According to the Plan, the priority for Chesterfield Inlet is Chesterfield Narrows, but this key area has not been clearly delineated in the form of a map or boundary in this response plan, nor has background information been collected about it. This plan also does not specify environmental priority areas, culturally significant areas, and operational information which would increase the efficacy of response efforts if available. The existing plan also further increases the communities' reliance on the Canadian Coast Guard and thereby restricts the local capacity, resilience, and independence during response to spill incidents. As part of the GENICE II project, the leaders of Chesterfield Inlet expressed interest in developing oil spill plans. This policy brief (as part of a series of briefs) serves to inform the relevant stakeholders on the importance of compiling background information as part of marine spill response planning. Similar efforts have been undertaken in many other countries within the Arctic Council to encourage robust local oil spill management efforts.

Currently, the Coastal Environmental Baseline Program of the Department of Fisheries and Oceans Canada collects ecological data to better understand the status of coastal ecosystems (Fisheries and Oceans Canada, 2022). In the Arctic region, monitoring is focused on Frobisher Bay (Iqaluit) and Qikiqtarjuaq (Andre Legare, 2004; St Lawrence Global Observatory, n.d.). Residents are employed to help in the collection of the data, which is later examined in the Department of Fisheries and Oceans laboratories (André Légaré, n.d.; St Lawrence Global Observatory, n.d.). It should be noted that many other communities within the Arctic such as Chesterfield Inlet have not been included in the scope of this program, but it provides an example of how this key element could be actioned in part by the community. However, the integration of other existing baseline study and monitoring programs can significantly enhance the capacity of local data collection framework within the Canadian Arctic.

Policy Options

Canada's current approach to marine oil spill response in the Arctic is primarily based on the enforcement of the obligations of the responsible party during the incidents. The Marine Spills Contingency Plan-Arctic Charter (2022) highlights the role of area plans and community stakeholders in oil spill planning; however, planning requirements and community-specific information are still not present. This results in inefficient spill response operations due to the absence of shared expectations. Currently, the Keewatin Region Response Plan outlines a community's approach in responding to oil spill incidents, though these are outdated and very basic. For example, Chesterfield Inlet's Response strategy was outlined in the Keewatin Plan (2005:10/11). and consists of only two action items. WWF Canada and the Government of Nunavut have developed reports that served to address various background information gaps that may be essential for the development of community oil spill preparedness and response. The following recommendation section outlines the general steps for retrieving or collecting background area

information which can be supplemented by existing information such as the Nunavut Resource Inventory Report for Chesterfield Inlet (2010).

Recommendations

Collecting Background Area Information

It is suggested that experience from other jurisdictions be drawn on to action the collection of background information. The Alaska Department of Environmental Conservation Prevention, (2022) states that as an initial step, priority should be placed on delineating a geographic planning boundary for baseline data collection. The Alaska Department of Environmental Conservation Prevention (2022) outlined that background information needs to be collected so that it can be used to inform the area of responsibility of a community (or communities) and mandated agencies that need to be involved in any response. The document also recommended that area-specific information can be used to create reference documents for mandated agencies in oil spill incidents within a defined geographic area. These documents and instruments can then be incorporated into reference documents to inform future oil spill response regulations. For example, Sweden's strategy for oil damage protection was supplemented by a comprehensive background report (National Collaboration Group for Oil Damage Prevention, 2022). The reference documents can then be integrated into a monitoring tool that can be used by decision-makers to forecast oil spill events for contingency management and facility-effective source detection. The World Wildlife Fund Canada report (Hughes, 2017) outlined various components essential to enhance the oil spill response capacity for communities, such as the location, physical environment, infrastructure, community population, and associated constraints that should be considered.

As outlined above, background information should consist of three main categories: Environmental, Socio-economic and Operational. For the environmental category, information on geography, climate, ecological, and wildlife oceanography is typically documented. Environmental information should provide an understanding of the land-based features of the area of operation such as shoreline type, and topography, which will inform local planning and response measures, (Alaska Regional Response Team, 2022; Björn Forsman, 1997, 2012). Social and cultural information should inform the relationship between the local population and the environment, including livelihoods, culturally sensitive areas, and subsistence areas that responders need to be aware of should an oil spill occur (Alaska Regional Response Team, 2022; National Cooperative Group for Oil Damage Prevention, 2014). Economic information is used to establish the local economic activities, risks, and potential impacts of oil spills on the local economy. Operational information should outline the existing infrastructure and resources such as trained personnel, response equipment (quantity and condition), response procedures, roles and responsibilities, ramp-up procedures, response and logistical concerns, potential response constraints, response organizational structure, administrative guidelines, and administrative task descriptions (associated reporting guidelines). The integration of these can then be used to inform local monitoring plans and generate materials to inform decision-making before, during, and after an incident. This could include response capacity assessment that also looks at operational constraints, status report frameworks, training programs, monitoring regimes, and overall management. The background information collected from the creation of the oil spill preparedness and response plan should be incorporated into an online database to

be updated, analyzed, and verified by Government agencies with highlights of the plan being shared through platforms such as SIKU.

The United States of America National Oil Spill Contingency Plan outlined area-planning requirements that necessitated the use of area-specific information such as maps, agency/personnel contacts, resources, sensitive areas, hazard analysis, response strategies and worst-case discharge, oil spill frequency, expected type of oil spill, response management roles and responsibilities as a reference tool in environmental emergencies.

A community will benefit from the completion of an area risk assessment to ascertain the likelihood and consequences of a marine oil spill based on the local activities related to oil and gas, such as transportation, extraction, processing, and handling. Risk and vulnerability assessments are used to help establish Geographic Response Strategies towards protecting human health, private property, and the surrounding environment. In Sweden, for example, an oil spill management approach at the local level (County Administrative Board) has been adopted based on local risk analyses, vulnerability analyses, and estimated risk for the county. Risk Assessments can also be integrated into the operations of responsible agencies, such as Fire Departments, to inform agency-based adaptations and resource management. The identification and assessment of risks within the area of operation should be centered upon three areas:

- People (population and condition),
- Environment (likelihood of contamination), and
- Assets (at large, including socio-cultural, ecological and economic assets).

The use of operational, environmental, social, and cultural information based on Chesterfield Inlet can be used to form an oil spill community profile for informing local and private marine oil spill management. It should be noted that the information retrieved from the assessments can be used as a framework to inform scenario-based oil spill management using instruments such as reference material (emergency response cards, wildlife protection guidelines, community profiles, status report frameworks, situation reports), training regimes, and monitoring regimes in the geographic context of Chesterfield Inlet.

References

- Alaska Department of Environmental Conservation. (2022). Arctic And Western Alaska Area Contingency Plan. <https://dec.alaska.gov/spar/ppr/contingency-plans/response-plans/arctic-western-area/>
- Alaska Regional Response Team. (2022). Alaska Regional Contingency Plan. <http://www.alaskarrt.org>
- Andre Legare. (2024). Marine Ecosystem Monitoring and Emergency Response Chart_Draft2_.
- Björn Forsman. (1997). The oil is loose. Handbook on municipal oil protection. Statens räddningsverk.
- Björn Forsman. (2012). ENSACO - Environmental Atlas. www.sspa.se
- Canadian Coast Guard. (2022). Marine Spills Contingency Plan-Arctic Chapter (0001).
- Canadian Coast Guard Environmental Response Department. (2005). Keewatin Region, Nunavut Area Plan.
- Fisheries and Oceans Canada. (2022). Northern Low-Impact Shipping Corridors.
- National Collaboration Group for Oil Damage Prevention. (2022). Sweden's strategy for oil damage prevention-Action plan until the year 2026.

National Cooperative Group for Oil Damage Prevention. (2014). Sweden's strategy for oil damage prevention– Background report.

St Lawrence Global Observatory. (n.d.). Coastal Environmental Baseline Program. Retrieved October 25, 2024, from <https://ogsl.ca/en/coastal-environment-baseline-program/>

BRIEFING NOTE #3

TRAINING FOR SPILL RESPONSE

To: Chesterfield Inlet (Guardians, Chesterfield Fire Department, Community Office, Hunters and Trappers Organization), Nuka Research, WWF Canada, the Government of Nunavut, Environment and Climate Change Department, and the Canadian Coast Guard.

Re: Training in Marine Oil Spill Planning, Preparedness and Response.

Prepared by: Ashley Adams

Summary

As stated in the United States of America's Oil Pollution Act (1990:9) "Only when local citizens are involved in the process will the trust develop that is necessary to change the present system from confrontation to consensus". Therefore, training regimes based on area-based information should involve local people and be integrated into community planning, preparedness, and response plans to increase readiness and local capacity during spill events. Training should consist of modern theory and practical training, in a concise manner based on internal capacity building. Key training areas should include emergency operations management (communication, supervision, conducting risk assessments, drafting risk reduction action plans), geographic information systems (mapping for monitoring and supervision), personnel-based training for tasks (safety, monitoring, response), local area awareness, and chemical awareness (oil hazards and behaviour). The effect of integrating training regimes will increase community resilience and flexibility in responding to oil spill incidents.

Context

The lack of trained personnel within small communities is a commonly identified shortfall within the Arctic (Covert, 2016:12). Covert (2016:21) found a lack of trained personnel to effectively respond to oil spills and an insufficient capacity of Canadian communities in regard to trained personnel and response equipment. There is an absence of an organized training framework that integrates training programs from the various learning institutions in the Canadian Arctic towards community oil spill planning, preparedness, and response capacity building. Training regimes can significantly increase the efficacy of response and reclamation operations through area-specific, personnel, and equipment-based training measures.

A training regime plan outlines the general responsibilities of agencies and stakeholders that should be involved in oil spill incidents based on the population size and risk. According to the Keewatin Regional Response Plan (2005:11), the key priority is Baker Lake, while Chesterfield Inlet's priority areas have not been clearly outlined. There is an absence of defined priority areas for Chesterfield Inlet in the form of a map or boundary in this response plan. The objectives outlined within the Keewatin Regional Response Plan (2005:10/11) focus on wildlife rescue and coastal cleanup. These objectives provide an opportunity for the development of training within these areas based on the existing equipment provided by the Canadian Coast Guard, such as the Arctic Community Packs of response equipment shipping containers in many communities. Oil spill response and preparedness training can be conducted in various mediums and scales; however, the content should follow national and international standards. Training can be overseen

by governmental institutions such as the Canadian Coast Guard, the Government of Nunavut, private firms such as Nuka Research and Planning Group, and non-profit organizations such as World Wildlife Fund Canada. In addition, there are specialized learning institutions such as the Nunavut Municipal Training Organization, Nunavut Arctic College (Environmental Technology Diploma, Spill Response and Hazardous Materials) and opportunities to study the region at various Canadian universities. As outlined in Briefing Note #2, training regimes should be informed based on community specific background information as an operational basis for community-based training programs. This policy brief (as the third part of a series of briefs) serves to inform the relevant stakeholders (Chesterfield Inlet community and the Government of Nunavut's Environment and Climate Change Department), a private firm (Nuka Research and Planning Group), with the assistance of the Canadian Coast Guard, WWF Canada and other organizations on the local training approaches of various Arctic countries working towards robust local oil spill management efforts.

Policy Options

Canada's current Arctic oil spill response is primarily based on the enforcement of the obligations of the responsible party during the incidents. The Marine Spills Contingency Plan-Arctic Charter (2022) highlighted the role of area plans and stakeholders in local communities in oil spill planning, however local area planning requirements and community-specific information are not present. This will result in inefficient spill response operations due to the absence of shared expectations. The Keewatin Region Response Plan outlines a community's approach in responding to oil spill incidents; however, these are outdated and very basic. The Canadian Coast Guard Central and Arctic Region Regional Response Plan (2008) states that communities that have received Arctic community packs of oil spill response equipment are provided with initial response training to members of the community to promote effective deployment in spill incidents. Chesterfield Inlet's Response strategy was outlined in the Keewatin Region Response Plan 2005 which consists of two action items - Wildlife Rescue and Coastal Cleanup. This regional response plan also mentioned that communities such as Chesterfield Inlet that have received oil spill response equipment storage containers are provided with training to operate the equipment provided; however, this training has not been delivered in communities.

Recommendations

Training

Chesterfield Inlet voiced its interest in developing a community oil spill plan as part of the GENICE II project. The Keewatin Regional Response Plan 2005 outlined two oil spill response action items for Chesterfield Inlet which consists of Coastal Cleanup and Wildlife Rescue. The identification of these two areas serves as an opportunity for the development of area-specific training regimes that can be integrated as part of a robust community oil spill management plan. These training regimes should be designed according to the community's personnel capacity and based on Inuit culture. For example, the Inuit Guardians training program "provides youth with careers such that all skills are essential aspects of being Innu-the language, area knowledge are recognized and valued" (Anastasia Qupee from Innu Nation). Training should consist of modern theory, as well as simulated and practical training for long/short-term internal capacity building, such as:

- Emergency operations management, geographic information systems, and chemical awareness (oil hazards and behaviour).

- Personnel-based training for tasks and responsibilities, agency-based competency training (Fire Department), and simulation training.

Training should be informed by a combination of modern theory, and practical approaches to strengthen critical thinking and adaptive management decision-making. Training must be based on national and international standards. Area-specific handbooks, manuals, and workshops must be developed to supplement local training efforts.

Roles

The Canadian Coast Guard should develop a framework that organizes the existing training programs from the respective training institutions and establish a training standard that synchronizes the training programs. Training regimes need to be localized so that they are suitable for the established roles in a community such as Incident Commander/Task Manager that delegates and manages tasks for existing stakeholders.

For example, Chesterfield Inlet’s Fire Chief could take on this role for marine oil spill incidents. The Fire Chief would then be responsible for overseeing community response operations and liaising with private (facility manager/owner) and governmental officials during oil spill incidents, supervising training exercises, and carrying out risk assessments. The Incident Commander would also participate as part of an Emergency Working Group consisting of the Canadian Coast Guard, the Guardians, the Fire and Police Departments, the Community Office, and the Hunters and Trappers Organization for overall guidance and transparency. Private consultancy firms such as the Nuka Research Group alongside WWF Canada with the Government of Nunavut (Environment and Climate Change Department) with the direct involvement of the Canadian Coast Guard will provide training area requirements and preparedness evaluation for Chesterfield Inlet (See Briefing Note #6). The World Wildlife Fund of Canada, with its guidelines for oil spill contingency management, could be responsible for proposing a small-scale community oil spill management framework.

Steps to Implementing Training Regimes.

Establish Areas of Competency.

This section is based on establishing areas of competence that should be integrated into the curriculum for community-based training regimes. These training programs should consist of the following competency areas:

1. Emergency Operations Management (risk assessments, communication, adaptive decision making, coordination, situation analysis/picture),
2. Chemical Awareness and Handling (pollutant behaviour and impacts),
3. Ecological Management (plants, animals, microbes),
4. Socio-economic Assessments (citizen management, damage evaluation, compensation management),
5. Application of Geographic Information Systems (GIS) for pollutant management.

These general competency areas should provide spill response decision-makers with the tools required to effectively manage local oil response operations. Incident-specific personnel training has been developed to focus on higher level tasks in oil spill incident management, for example in Tarnby Municipality, Denmark.

Incident Specific Personnel Roles Training Requirement

According to the Beach Cleaning Plan (2023) developed by the Municipality of Tårnby in Denmark, during an oil spill incident a task leader is stationed in a mobile command post with means of communication. The command post is situated in a pre-determined location and staffed by employees with training in radio and telephone monitoring as well as Geographic Information Systems. Situation-based personnel training requirements help establish an organization alongside the required skills for the specialized roles. This can then be used to inform the skill competence requirements for the agency and personnel-based training according to legal requirements.

Personnel and agency-based capacity building.

These programs should consist of personnel-based training for tasks and responsibilities, agency-based competency training, and simulation training. Operational background information should be consulted to inform these measures in order to more effectively integrate the programs.

Agency-based training should consist of multi-service training for a mandated agency such as a Fire Department/Rescue Services in areas such as carrying out risk assessments (Helsinki's Fire Department, for instance), environmental assessments, economic assessments, and operational readiness assessments. The training should be tailored towards developing general skills and increasing on-scene adaptive management. It should also include operational instructions where the trainees are able to develop the background knowledge needed to participate in and manage various spill-related operations such as spill containment.

In Finland, for example, the Helsinki City Rescue Department outlined tasks required for marine oil spill response such as the use of vessels of different sizes, and having staff with required competencies during marine oil spill response, firefighting, and rescue operations (Helsinki City Rescue Department, n.d.).

Personnel Training should consist of specialized training for key personnel in emergency management such as coordinators, environmental specialists, chemical specialists, media relations and stakeholder communication, technologists, equipment experts, health and safety, logistics, etc. This form of training is more focused on providing responders and mandated personnel with the required skills and knowledge to efficiently conduct their duties and functions during a particular phase of an oil spill incident such as remediating an oil slick recovery from beaches or containment by capping further outflow. Personnel-based training aims to integrate and improve existing skills following federal requirements, especially regarding safety.

Training can also be provided in relation to the background policy and legal context that at least some responders will have to be aware of. For example, the 'Planning and Operation Instruction' sections of Sweden's municipal oil protection handbook are specifically for officials and decision-makers involved in the planning process of municipal oil spill response. It provides an overview of the legal basis for oil spill management and related legal instruments and the contextual cases where they may be applicable.

Awareness training has also been established as being important to local spill response. For example, the Regional Citizens Advisory Council (Prince William Sound and Cook Inlet) provides training for citizens of all education levels and in conjunction with outreach and volunteer programs increased the overall awareness of oil spills. The Advisory Council has a variety of training resources such as online lesson banks that contain a variety of lessons from grade ranges from K-2 to 6-8, focusing on the following subjects: Engineering, Environmental Science, Chemistry, Social Science, History, Art, Conservation, Stewardship, Mathematics, and Writing. They also host oil spill response training tours and on-water oil

spill response training for communities. Alaska has an Oil Spill Curriculum that outlines the requirements that should be taught to all ages and education levels in communities from pre-school to Grade 12. The Prince William Sound website has a variety of learning materials for students and teachers.

Training programs based on the use of updated resources and learning formats.

This section outlines how training could be conducted. Training should be informed by a combination of modern theory and practical approaches to strengthen critical thinking and adaptive management decision-making. It should be noted that these training programs must be executed through online and in-person mediums. Sweden's approach towards oil spill preparedness and response training consists of the use of various resources. This includes the Handbook on Municipal Oil Protection entitled *Oil is Loose* (1997) later updated in 2011, which was designed to provide a synopsis of community oil spill response issues with a major emphasis on municipal responsibilities (Björn Forsman, 1997). Civil oil spill management consists of organizational approaches, preparatory actions, preventive measures, and containment measures that serve to eliminate oil spill damage to property, human life, and the environment that is under threat (Björn Forsman, 1997). The Swedish Municipal Manual covers oil spills that have reached waterways, and shorelines. The Swedish handbook and Swedish Civil Contingencies Agency's resource manuals were mainly intended to be utilized as course material at the Swedish Rescue Services Agency's schools during training programs and exercises on municipal oil protection. Simulated exercises should be conducted based on various oil spill incident scenarios to develop skills in various tasks, everything from communication to full-scale deployment of equipment and personnel. According to the Nunavut Working Group (Canada), there are various formal and informal courses offered through the Canadian Coast Guard College that include simulated exercises.

These exercises are simulated events based on various realistic marine pollution incidents, ranging from a simple notification exercise to a full-scale deployment of personnel and equipment. One example of training regimes in Canada was the Arctic Region's Environmental Response Program that aims to maintain the minimum exercise frequency, where feasible, based on the operational priority areas: Annual Equipment Deployment exercise, Annual Internal Incident Command System exercise, Bi-annual On-water exercise with partners, and international exercise. This should be tailored to a community or local perspective to be integrated into Chesterfield Inlet.

The training regimes outlined in steps 1 to 3 serve as a framework for the development of community-led, area-based training regimes in oil spill management. Training consists of specialized tasks, required personnel, and agency functions. The integration of background area information and training regimes into the development of community-centred oil spill management action cards, as found in other jurisdictions, is recommended. Such action cards will provide decision-makers, such as in Chesterfield Inlet and surrounding communities, with the framework for efficient oil spill incident management. The cards include information on the local oil spill response procedures in various environments as a simplified checklist version of an emergency plan/spill response plan to promote organized and prompt response measures. In Denmark, for instance, the Tarnby Municipality's Emergency Environmental Preparedness Plan (2012) and Beach Cleaning Plan (2023) have included oil spill response action cards on land, freshwater, and private facilities. These cards outline the required activities, including: local oil spill response such as environmental efforts (focuses on spill containment and oil recovery); assistance (outlines the agencies that can support the overall response effort for instance the police department and outline the tasks such as photo investigations); document (activities that catalogue the overall efforts such as sampling, analytical assessment of the spill, identification of the polluter, and containment measures); restoration

(repairs to infrastructure and ecological restoration); and follow up (submission of reports to the relevant agency). An example of these actions is illustrated in Table 4. They can be updated annually based on existing requirements for oil spill management. These cards should be provided in English, French and Inuktitut to expand the participation of all residents. Formal and informal training opportunities will significantly increase the response capacity of Chesterfield Inlet decision-makers.

Table 4: An Action Card Example for Freshwater Oil Spil Response (Tarnby Municipal Board,2012:13).

Action card 2: Oil spill in freshwater	
Environmental efforts	<ol style="list-style-type: none"> 3. Locate the pollution source and stop the spill. 4. Preventive measures <ul style="list-style-type: none"> • Emptying any defective container • Unclogging of any oily discharge • Containment of pollution in still-flowing streams (establishment of spade barrier, earth dam, straw barrier, net barrier, floating barrier). • Containment of oil in stagnant water (establishment of float restriction possibly combined with blocking at the lake's outlet, see, if necessary, delay basin with submerged drain). • Collection of free oil (absorption material, oil skimmer, oil separator, suction head, mud suction).
Assistance	<ul style="list-style-type: none"> • Contractor/hauler • Nature and Environment Department • Waste recipient • Police (Investigation) • Photo • Map sketch/notes/course of events
Documentation	<ul style="list-style-type: none"> • Sampling (oily discharge) • Quantitative assessment of spillage • Document the connection between the source and contamination in the receiver. • Flushing pipelines and streams can be considered.
Restoration	<ul style="list-style-type: none"> • If necessary, the flow barrier is maintained for a suitable period after pollution in

	agreement with Nature and the Environment.
Follow- up	<ul style="list-style-type: none"> • Submission of documentation to Nature and Environment. • Copy of emergency report sent to Nature and Environment.

References

Anastasia Qupee. (n.d.). What Guardians Do — Land Needs Guardians. Retrieved November 9, 2024, from <https://landneedsguardians.ca/what-guardians-do>

Björn Forsman. (1997). The oil is loose. Handbook on municipal oil protection. Statens räddningsverk.

Canadian Coast Guard. (2022). Marine Spills Contingency Plan-Arctic Chapter (0001).

Canadian Coast Guard Environmental Response Department. (2005). Keewatin Region, Nunavut Area Plan.

Chistopher Covert. (2016). Small Community Oil Spill Preparedness Research Project Item Type Report. <http://hdl.handle.net/11122/7795>

Environment and Climate Department Tarnby City Center. (2023). Tarnby Municipality Beach cleaning plan 2023.

Helsinki City Rescue Department. (n.d.). Expertise at sea | Helsinki City Rescue Department. Retrieved November 21, 2024, from <https://pelastustoimi.fi/en/helsinki/services/rescue-operations/special-situations-and-expertise/expertise-at-sea>

BRIEFING NOTE #4

COMMUNITY MARINE OIL SPILL MONITORING REGIME

To: Canadian Coast Guard, World Wildlife Fund Canada, Nuka Research, and the Government of Nunavut - Environment and Climate Change

Re: Community Marine Oil Spill Monitoring Regime

Prepared by: Ashley Adams

Summary

The Canadian Coast Guard, the Government of Nunavut, and the Government of Northwest Territories are primarily responsible for monitoring petroleum-related spills within the Arctic. Establishing long-term area-specific monitoring regimes will increase the management capacity of Arctic communities such as Chesterfield Inlet. Monitoring and evaluation requirements that facilitate area-based monitoring studies strengthen the overall preparedness and effectiveness of oil spill containment operations due to early detection and a greater understanding of the extent of the oil spill and its potential implications. Community-based monitoring regimes should include equipment requirements, area planning requirements, staff/personnel competency requirements, and sampling and logistics requirements. Additional activities could consist of an operational readiness assessment, socio-economic assessment, and reclamation compliance monitoring. This policy brief outlines the general requirements for a comprehensive oil spill monitoring regime to establish a viable monitoring program and outlines implementation approaches.

Context

The Canadian Coast Guard in collaboration with Environment and Climate Change Canada, the Government of Nunavut, and the Government of Northwest Territories are mainly responsible for monitoring petroleum-related activities within the Arctic. As mentioned by Knapp (2023) the Canadian Coast Guard does not engage in ongoing monitoring unless in the acute phase (if they are required to respond).

According to the Keewatin Region Response Plan, the existing oil spill response and preparedness strategy is limited. The objectives of Wildlife Rescue and Coastal Cleanup restrict response tactics and represent the entirety of the community's plan, although the integration of components such as area-based response strategies and risk and vulnerability assessments as outlined in Briefing Note #2 helps communities establish priority areas towards a system-based oil spill response approach. As part of the GENICE II project the leaders of Chesterfield Inlet have expressed interest in oil spill monitoring. This policy brief's recommendations are tailored towards Chesterfield Inlet but are applicable in the small Canadian Arctic community context. It should be noted that community-based monitoring should be organized under national monitoring plans. While there are many monitoring programs within Canada, the objectives and areas of operation are scattered and lack coordination. One example is the Coastal Environmental Baseline Program (part of the Oceans Protection Plan) which sees ecological data collected

to determine the status of coastal ecosystems (Fisheries and Oceans Canada, 2022). In the Arctic region, monitoring under this plan is focused on Frobisher Bay (Iqaluit) and Qikiqtarjuaq (Andre Legare, 2024; St Lawrence Global Observatory, n.d.). Residents are employed to help in the collection of the data under these plans, which is later examined in the Department of Fisheries and Oceans laboratories (André Légaré, n.d.; St Lawrence Global Observatory, n.d.). It should be noted that many other communities within the Arctic such as Chesterfield Inlet have not been included in this overall system. However, the integration of the existing monitoring programs under one umbrella can significantly improve oil spill monitoring in the Canadian Arctic Region.

Policy Options

The Canadian Coast Guard is responsible for monitoring petroleum activities within the Arctic. The Government of Nunavut and the Government of Northwest territories have tasked the primary responsibility for the monitoring of spills to private facilities such as those operating on-land fuel tanks. In 2018, the Government of Northwest Territories developed an online reporting and tracking tool for spill events that illustrates information such as date of occurrence, location, product type, area of contamination, lead agency, and estimated quantity of spill (Government of Northwest Territories, 2018). However, some key information such as the source, responsible party, the status of the spill containment, and reclamation efforts is often not clearly specified. Even though this reporting provides an overview of oil spill incidents, the absence of essential components could restrict the effectiveness of community oil spill monitoring. In the Keewatin Regional Response Plan (2005), during a spill incident, Baker Lake has been mandated to protect the Chesterfield Narrows area at the headwaters of Chesterfield Inlet, and the hamlet of Chesterfield Inlet has been mandated to protect Chesterfield Anchorage as the mouth of the inlet. This will result in inefficient spill response operations in the event of a spill flowing from Baker Lake into the inlet, due to the absence of shared expectations. There is no response plan for spills happening or flowing into Chesterfield Inlet, despite ships, including tankers, travelling upstream to Baker Lake. Currently, the Keewatin Plan outlines a community's approach in responding to oil spill incidents, though as previously mentioned, these are outdated and very basic, and the plan makes no mention of monitoring.

Recommendation

An integrated long-term area-based monitoring regime will boost the management capacity of Arctic communities. Oil spill monitoring requirements that encourage area-based monitoring programs strengthen the overall readiness and provide responders with a greater overview of the extent of the spill. There should be monitoring requirements focused on the following: area equipment, area plan development, staff/personnel competency (including skills in Geographic Information System, aerial surveillance, sampling studies), and management requirements (logistics). Community oil spill monitoring should consist of the following activities: environmental monitoring, operational readiness assessment, socio-economic assessment, and reclamation compliance monitoring. Oil spill monitoring programs should be informed by background information as outlined in Briefing Note #2). They can be based on the following approaches: comparison of post-spill against pre-spill data, comparison of data from contaminated and uncontaminated areas, and long-term monitoring. This policy brief outlines some of the general requirements for a comprehensive oil spill monitoring framework to inform monitoring and provide some of the steps to design and implement a prospective monitoring regime for communities. This policy brief is aimed at the Canadian Coast Guard, World Wildlife Fund Canada, Nuka Research, and the Government of

Nunavut - Environment and Climate Change, to develop a framework for community oil spill monitoring regimes.

Monitoring Regime

A practical approach to monitoring should include the involvement of all parties in cooperative monitoring activities (International Tanker Owners Pollution Federation Limited, 2014). This can be achieved through joint sampling, analysis, and sharing of the results (International Tanker Owners Pollution Federation Limited, 2014). Even though differences in opinion may arise in the interpretation of the results, each of these approaches reduces the duplication of effort and costs and maximizes the opportunity for agreement on the basic facts (International Tanker Owners Pollution Federation Limited, 2014).

Monitoring Regime Requirements

Monitoring requirements should complement the existing equipment, area plan development processes, staff/personnel competency, and management mandates. Community oil spill monitoring should be based on a long-term approach and consist of area-based environmental status, socio-economic status, and operational readiness of both (staff and equipment through the acquisition and evaluation of pre-spill data, spill incident data, and post-spill data. This should be followed by the analysis of trends (frequency), probability (likelihood to cause harm to humans and the environment), and consequences (harm to environment, property and the economy). The objectives should consist of the protection of the environment, property assets, economy, subsistence areas, and the cultural areas of the communities.

Designing a monitoring regime

Community monitoring regimes should be based on the understanding of the chemical aspects (fate, behaviour) of oil, and potential impacts on the local environment (pathways by which resources may be exposed to hydrocarbons) which will help determine whether monitoring programs are needed and, if so, will assist with their design. Oil spill monitoring should be based on a defined area of responsibility, monitoring objectives, and monitoring activities. For instance, you might need boat or shore-based surveys, as these will enable communities to document the extent of oil contamination. Pre-spill and post-spill monitoring studies should be carried out based on the parameters outlined in Table 5.

Table 5: Proposed Pre-Spill and Post Spill Monitoring Study Parameters

Designing a Regime	
Pre-Spill Monitoring Study Parameters	Post Spill Monitoring Study Parameters
<ul style="list-style-type: none"> • The geographical extent of the area of responsibility to inform the monitoring regime. • Potential types of oil spills are informed by the incident reports. • Potential exposure pathways enable appreciation of spatial and temporal parameters to be applied when designing a monitoring regime. 	<ul style="list-style-type: none"> • Quantity and type of oil spill. • Weathering behaviour of the oil • Physical characteristics of the area affected. • Nature and location of sensitive resources. • Means available for sampling and analysis. • Sampling constraints.

Establishing monitoring objectives

The objectives of a monitoring program should be established that outline the information, field data, and approach required to achieve those objectives (International Tanker Owners Pollution Federation Limited, 2014). The distribution of sampling areas, type, number, and volume of samples taken from each sampling area should be outlined as part of developing the objectives (International Tanker Owners Pollution Federation Limited, 2014). The objectives will also provide direction into the sample collection frequency, analysis approach, and overall duration of the monitoring studies. The monitoring objectives for Chesterfield Inlet should be related to environmental baseline monitoring, oil spill detection, spill source identification, area of contamination, delineation/scoping, estimated environmental quantity monitoring both during and after the containment of a spill, operational monitoring including reclamation efforts of the responsible party, and community oil spill impact assessment and damage assessment.

Pre-Spill Sampling and Monitoring Regime

Prior to an oil spill, surveys of the marine environment should be carried out to determine baseline conditions and can be actioned through land and water-based visual assessments, collection of water, sediment, and/or biological samples, or surveys by divers or remotely operated vehicles, acoustic sensors. Methods in the form of sorbent materials anchored in fixed positions or towed across the seabed have been used to establish base-line conditions and monitor spills in past cases. During the early oil spill incident oil samples should be retrieved from the area of contamination to verify the type and properties of the contaminant.

Following the containment of the oil slick, oil and the environmental quality of both soil and water should be recorded throughout the reclamation phase of oil spill response. Pre-spill monitoring and sampling focuses mainly on surveillance and early detection of spills based on identified probable risk and likelihood of incidents with a structured approach.

Establishing monitoring sites and data needs.

Reference sites are essential for oil spill monitoring because they can provide responders with insight into the potential risk areas, and the impacts and consequences of contaminants in the environment. Reference sites provide responders with a baseline for comparing the environment before, during, and after oil spill incidents. It is important to ensure that the reference sites selected are representative of the habitat types within a region so they can be compared to the area affected in terms of biota, topography, and physical nature, for example, exposure to currents or wave action (International Tanker Owners Pollution Federation Limited, 2014). The use of GIS to record data facilitates direct referencing of data and information.

Establish the location and number of monitoring sites.

The retrieval of high-quality quantitative data through various methods such as field surveys, underwater surveys, satellite image analysis, and wildlife examination must account for the natural variability that occurs in any ecosystem (International Tanker Owners Pollution Federation Limited, 2014). Comparison of a time series of measurements from reference sites and from within the area affected allows for the accounting of naturally occurring variability and seasonal changes (International Tanker Owners Pollution Federation Limited, 2014). Detailed shoreline studies and aerial surveillance aimed at rapidly documenting existing shoreline conditions that can be used for comparison provide crucial information to assist in determining appropriate clean-up techniques based on the overall geographical extent of the oil spill in coastal regions on the sea and shoreline. Underwater surveys can be used to identify properties of the oil and the environment that are not visible on the surface during the spill incident, in addition to further

delineating the scope of affected areas. Field surveys can be used to collect area-based and spatially referenced information and data on the location and geographical extent of oil spills. Surveys can be used for qualitatively monitoring the effectiveness of shoreline cleanup operations and natural recovery. In the case of Chesterfield Inlet, these parameters need to be taken into account in determining the number and location of sites as well as capacity to undertake such monitoring. This needs to be determined with the help of the agencies indicated as party to this briefing and could include the support of outside assistance from, for example, university and college researchers.

Spill Based Monitoring

This consists of incident-based monitoring and surveillance from the date of occurrence of the spill to the completion of cleanup efforts. They are usually coordinated by a technical officer or an Incident Commander who provides technical guidance on the intricacies of spill response such as modelling spill behaviour. In the case of Tarnby Municipality in Denmark, for example, spill-based monitoring consists of the use of a Geographic Information System to map, model and monitor the spill and all information through radio and telephone on the extent of the spill during response operations.

Post oil spill monitoring regime

Post spill monitoring consists of surveys conducted after the containment of the source of the spill. Post spill monitoring serves to provide an understanding of the conditions of a healthy ecosystem and monitoring of recovery following the containment of a spill.

Post spill monitoring is conducted based on the following: the assessment of the potential environmental and economic impacts; the identification of effective approaches to investigate the impacts; the utilization of the most appropriate methods to evaluate the immediate and future impacts; the evaluation of the effectiveness of spill response operations; and the determination of compensation (Brandt, n.d.). The types of post spill studies include ecological assessment, chemical, and ecotoxicity analysis (Brandt, n.d.).

Post spill monitoring regimes are essential to paint an accurate picture of the impact of the oil spill which consists of the socio-cultural, ecological and economic aspects of an area. Monitoring is dependent on the information and data retrieved from environmental conditions before and during the oil spill response phase. Studies produced by Odén et al., (2011) and the Swedish Authority for Community Protection and Preparedness (2010) have provided further examples of some of the components of a post spill monitoring regime. These include:

- General information parameters such as the date and location of the spill's occurrence, the type of oil, quantity of oil spilled, the party responsible for cleanup, and whether oil samples were retrieved and examined.
- Information about the area affected by the oil spill, such as the type of beach affected and its characteristics.
- Identification of particularly sensitive species, consisting of the documentation of the area's extent of sensitive species (species richness and distribution) to then investigate the impact and document the area's species recovery.
- Following cleanup efforts, focused on the operational aspect of oil spill response and considering remediation methods and timing, the techniques used, and the results achieved against the expectations are carried out. Photo documentation of the area is recommended.
- Post-oil spill cleanup oil presence documentation, consisting of the documentation of the presence of oil following cleanup efforts. This section records the potential extent of the oil that may have

penetrated the beach material based on the behaviour (interaction) of the spilled oil and the beach material. If there are further changes in the impacts on ecological values that are still noticeable following the post-spill cleanup monitoring study, a further follow-up study should be carried out over a long period.

Table 6: Graduated scale to determine the estimated remaining quantity of oil post clean up adapted from (Michel and Benggio,1999) as cited by (Hanna Odén et al., 2011:5).

Criterion	Estimated Oil Quantity
A	<ul style="list-style-type: none"> No visible oil (cleanup effort may have been too intensive) No detectable oil via smell
B	<ul style="list-style-type: none"> No more than background frequency
C	<ul style="list-style-type: none"> No longer any emitting oil sheen to the surrounding water (which can affect sensitive species or human health)
D	
E	<ul style="list-style-type: none"> Oil is present but is not expected to cause damage.
F	<ul style="list-style-type: none"> More oil than is appropriate to leave behind. Beach cleanup needs to be reinstated.

Long-Term Monitoring Regime

Extended follow-up studies should become part of the longer-term monitoring program once it is established. This will provide representative and comparable data to evaluate the damage and separate it from other emission sources (Hanna Odén et al., 2011). The criteria listed below from Odén et al., (2011) outline the appropriate situations for a focused follow-up study as part of longer-term monitoring:

- If the area has been exposed to a sufficiently high level of oil that has caused negative impacts.
- If the effects are not well known and understood
- If the effects appear to be persistent and require restorative measures for the environment

There have been many cases of agency led or supported long-term monitoring studies such as the monitoring programs of Cook Inlet and Prince William Sound Regional Citizens’ Advisory Councils. Prince William Sound Regional Citizens Advisory Council’s Long-term Environmental Monitoring have been ongoing since 1993 (Prince William Sound Regional Citizens’ Advisory Council, 2024). The Council’s main environmental activities are conducted through the long-term environmental monitoring project that has collected data on the presence of hydrocarbons in sediments and mussels in the region since 1993 (Prince William Sound Regional Citizens’ Advisory Council, 2024). Mussels were selected as an indicator species because they are an important subsistence food to communities and commonly found throughout downstream habitats in the Prince William Sound area (Prince William Sound Regional Citizens’ Advisory Council, 2024). The findings of the Council’s studies identified a variety of hydrocarbon sources within the monitoring area such as traces from the Exxon Valdez oil spill (1989), terminal

operations, vessel activities and natural processes such as oil seepages (Prince William Sound Regional Citizens’ Advisory Council, 2024). The outputs of the monitoring program consist of technical reports and summary reports (Prince William Sound Regional Citizens’ Advisory Council, 2024).

Proposed General Requirements for Community Marine Oil Spill Monitoring Regime for Chesterfield Inlet.

There is much that could be done in terms of establishing a monitoring regime for Chesterfield Inlet and it will require the support of outside agencies. Figure 15 illustrates the general actions required for the implementation of a community marine oil spill monitoring regime for Chesterfield Inlet in relation to short, medium, and long-term actions based on activities in other Arctic communities.

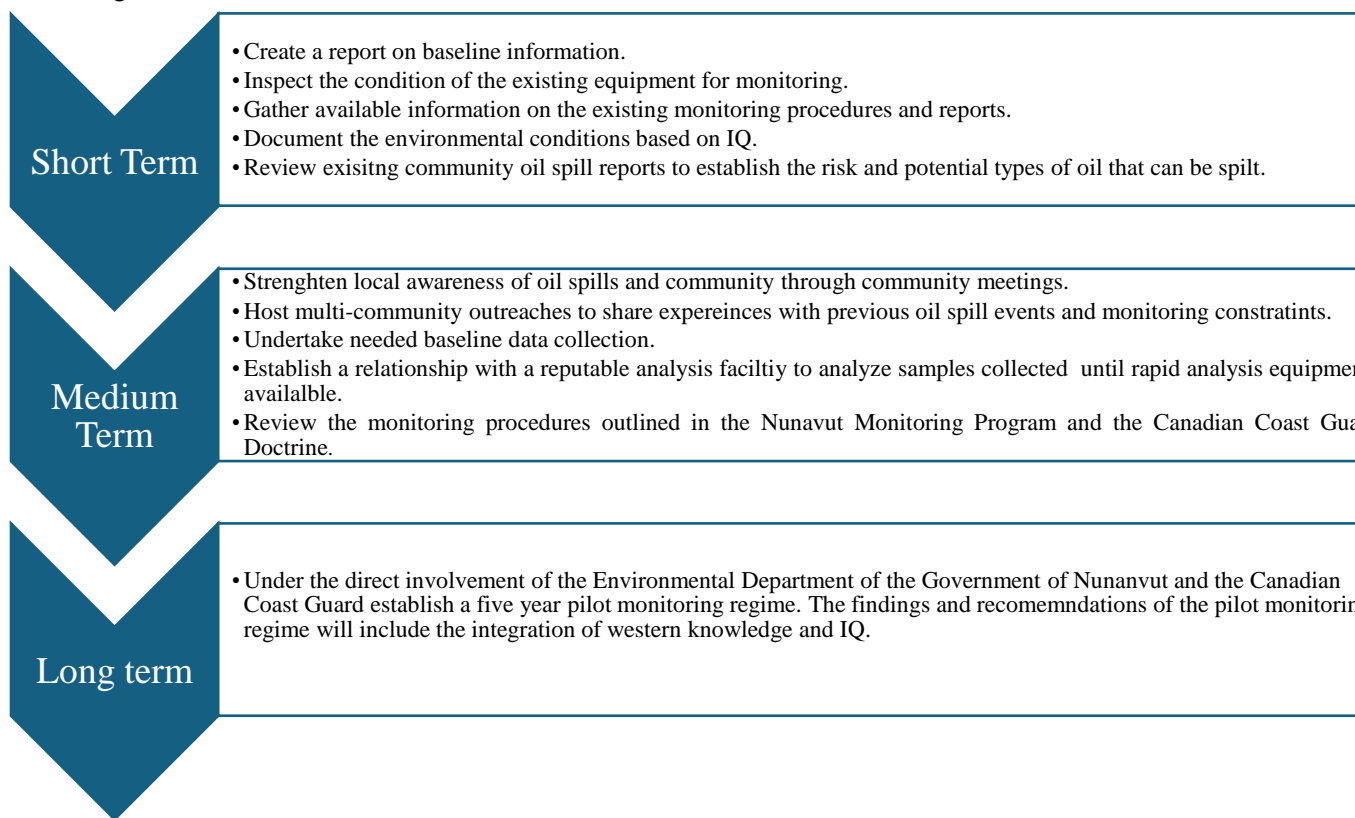


Figure 15: General actions required for the implementation of a community marine oil spill monitoring regime for Chesterfield Inlet and further explained in Table 7

Table 7: Summary of the key requirements for the implementation of a community marine oil spill monitoring regime for Chesterfield Inlet.

	Short Term	Medium Term	Long Term
Requirements	Baseline Information about the community environmental	Traditional knowledge exchange synthesis report.	Sustained Community (volunteers and

	<p>information, monitoring reports, and procedures.</p> <p>Monitoring Equipment Report on monitoring constraints and existing monitoring programs to prevent effort duplication.</p> <p>Based on the Baseline Report, it establishes monitoring indicators, for example Arctic cod, mussels, sediments, and biodegradation microbe proliferation.</p> <p>Beach surveys, absorbent boom study, Stratified beach sampling where appropriate.</p>	<p>Knowledge exchange report between private facility owners on monitoring.</p> <p>Geographic Information System Training.</p>	<p>capsule research sponsoring).</p> <p>Funds from Ocean Protection Plan Direct involvement of the Government of Nunavut, Canadian Coast Guard and the Inuit Guardians.</p>
<p>ons</p> <p>Acti</p>	<p>Create a community baseline report on background information as proposed in Briefing Note #2.</p> <p>Host dialogue-based inspections with private facility owners to strengthen the existing capacity and ascertain the conditions of the facility management, including the condition of the equipment</p> <p>Gather information on the</p>	<p>Strengthen local awareness of oil spills and community through community outreach.</p> <p>Review existing community oil spill reports to establish the risk and potential types of oil that can be spilt.</p> <p>Host multi-community outreaches to share experiences on previous oil spill events and monitoring constraints.</p> <p>Review the monitoring procedures outlined in the Nunavut</p>	<p>Under the direct involvement of the Environmental Department of the Government of Nunavut and the Canadian Coast Guard, establish a pilot monitoring regime.</p> <p>The final monitoring regime should consist of the integration of analytical and traditional knowledge reporting methods.</p> <p>The findings from the established</p>

	<p>existing monitoring procedures and reports.</p> <p>Document the environmental conditions based on traditional knowledge of the Elders to solidify the baseline report.</p> <p>Document the condition of equipment in the area.</p>	<p>Monitoring Program and the Coast Guard's Doctrine.</p>	<p>monitoring program can be used to create area-specific oil spill response tools such as the oil spill sensitivity atlas and Geographic Response Strategies (based on environmental characteristics).</p>
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References

Andre Legare. (2024). Marine Ecosystem Monitoring and Emergency Response Chart_Draft2_.

Canadian Coast Guard Environmental Response Department. (2005). Keewatin Region, Nunavut Area Plan.

Fisheries and Oceans Canada. (2022). Northern Low-Impact Shipping Corridors.

Government of Northwest Territories. (2018, May 25). GNWT launches new online spill reporting and tracking tool | Government of Northwest Territories. Government of Northwest Territories. <https://www.gov.nt.ca/en/newsroom/news/gnwt-launches-new-online-spill-reporting-and-tracking-tool>

Hanna Odén, Annika Tegeback, & Jonas Fejes. (2011). Follow-up after oil cleanup for Swedish Civil Contingencies Agency. www.ivl.se

International Tanker Owners Pollution Federation Limited. (2014). Sampling And Monitoring of Marine Oil Spills.

Julke Brandt. (n.d.). Post Spill Monitoring-Case Study and Lessons Learned.

Prince William Sound Regional Citizens' Advisory Council. (2024). Long-Term Environmental Monitoring. Prince William Sound Regional Citizens' Advisory Council. <https://www.pwsrccac.org/programs/environmental-monitoring/lttemp/>

St Lawrence Global Observatory. (n.d.). COASTAL ENVIRONMENTAL BASELINE PROGRAM. Retrieved October 25, 2024, from <https://ogsl.ca/en/coastal-environment-baseline-program/>

The Swedish Authority for Community Protection and Preparedness. (2010). Remediation manual for oil on Swedish beaches.

Kevin Knapp. (2023). 'Ongoing monitoring'. In Discussion Notes with staff of the Canadian Coast Guard meeting 15 December 2023.

BRIEFING NOTE #5

LOCAL MARINE SPILL RESPONSE INVOLVEMENT FRAMEWORK

To: Nunavut Marine Council, Inuit-Crown Partnership Committee, Arctic and Northern Policy Framework, Inuit Guardians Committee, Canadian Coast Guard Auxiliary Program, Shoreline Cleanup and Assessment Teams, Used Oil and Waste Fuel Protection Program, WWF Canada, Hunter Trapper Organization.

Re: Local involvement in marine spill planning, preparedness, and response

Prepared by: Ashley Adams

Summary

Oil spills cause extensive damage to marine ecosystems and inflict enormous losses on local communities by affecting cultural norms, interrupting fishing operations, and being detrimental to tourism (Chang, 2014). Coastal communities are especially vulnerable and affected communities have borne the social, economic, and environmental impacts. Spills such as the ones from the Exxon Valdez and Deepwater Horizon have significantly damaged affected communities (Marika Schulhof and Phyllis Grifman, 2019). To facilitate local involvement in marine oil spill planning, preparedness, and response it is suggested that a Community Oil Spill Advisory Committee, consisting of representatives from various sectors, local, regional, and federal authorities should be developed and implemented in Canadian Arctic communities.

This policy brief outlines the requirements needed for this action and recommends the implementation of local involvement within a community-led oil spill planning, preparedness, and response framework. The multifaceted nature of this recommendation necessitates the collaboration of the target audience of the policy brief consisting of the following agencies: Nunavut Marine Council, Inuit-Crown Partnership Committee, Arctic and Northern Policy Framework, Inuit Guardians Committee, Canadian Coast Guard Auxiliary Program, Shoreline Cleanup and Assessment Team, Hunter and Trappers Organization and World Wildlife Fund Canada.

Context

Community involvement in spill planning, preparedness, and response in the Canadian Arctic region is limited even though local communities will be the first responders and that response equipment satchels have been distributed by the Canadian Coast Guard. The Keewatin Region Response Plan 2005 has outlined the response strategies for the oil spills in communities located within this region. This plan is an example of what area-based planning should look like; however, it is outdated and should be more detailed in terms of local involvement in planning, preparedness, and response. Another key problem with the current plan is the absence of an organized platform for grassroots involvement in the form of a community advisory council based on the principle that “people take care of what they love” (Parker, 1990:146). Community participation in planning and preparedness benefits communities, and can also enhance local response capability (Walker, 2017). Currently, many agencies within Nunavut serve as

advisory, enforcement, and policy development agencies regarding petroleum-related activities within the Arctic region. For instance, the Nunavut Marine Council provides advice to federal and government agencies on marine area management based on the principles of the Nunavut Land Claim Agreement. This policy brief outlines the key areas that should be considered when developing a Community Oil Spill Advisory Council as the lead local involvement mechanism for oil spill planning, preparedness, and response planning. Successful community involvement should be based on established trust, confidence, realistic expectations, prompt communication, community leadership, and engaged stakeholders.

Policy Options

Local involvement is essential for the management of oil spills. As stated in the United States Oil Pollution Act (1990:9) it is “Only when local citizens are involved in the process will they trust development that is necessary to change the present system from confrontation to consensus.” Authors such as Cheong (2012) and Lasse et al., (2005) highlight the importance of integrating government agencies, private, volunteers, and communities to compensate for disasters and for monitoring and restoration of affected areas during and after oil spill incidents. The restriction of the local participation capacity of communities during oil spill events, specifically the planning and response aspects of oil spill contingency plans is an area of concern (Guevarra, 2008). For the practical organization and implementation of pollution combat operations, regional knowledge, human resources and experience, local infrastructure, and highly specialized equipment and trained personnel are essential components of efficient and successful damage prevention and combat operations in case of major marine pollution events (Pettersson and Milutinovic, 2005). A citizen-led oversight framework should be developed to facilitate an organized approach to oil spill management. Regional authorities have a major interest in the best preparedness for pollution events and in limiting the damage and impact of acute events (Pettersson and Milutinovic, 2005).

Canada’s current approach towards the Arctic oil spill response is, however, primarily based on the enforcement of the obligations of the responsible party during the incidents. The Marine Spills Contingency Plan-Arctic Charter (2022) highlighted the role of area plans and local stakeholders in oil spill planning. However, planning requirements and other aspects that necessitate the formal involvement of the communities were not clearly stated.

This has resulted in inefficient spill response operations due to the absence of shared expectations. Currently, the Keewatin Region Response Plan outlines a community approach in responding to oil spill incidents, but these are outdated and limited. The community oil spill response strategy constitutes the entire plan for these Arctic communities. Chesterfield Inlet’s response objective consists of Coastal Cleanup and Wildlife Rescue, limiting the potential for increased local involvement. There are institutions such as the Inuit Guardians Committee and the Nunavut Marine Council that can be further integrated into community oil spill management in advisory, response, and monitoring capacities. The potential outcome would be the increased local capacity of Arctic communities through the creation of an oil spill advisory committee under the leadership of an on-scene commander.

Recommendations

Local Involvement Framework

A Community Oil Spill Advisory Committee

A Community Oil Spill Advisory Committee in the Kivalliq region should involve the leadership of the various local oil spill-related emergency response agencies. In Chesterfield Inlet this could include

the fire chief, police chief, leader of the Guardians, Mayor, a representative from the Hunter and Trapper Organization, Elders and the on-scene commander. The Community Oil Spill Advisory Committee should be able to conduct risk assessments, evaluate planning, preparedness, and response measures, oversee remediation efforts, monitor the environmental status, suggest risk reduction measures, host outreach events, and designate priority areas in addition to independent research. Once struck, the Committee would be the main conduit in the community for initiating marine spill planning, preparedness and response activities to ensure these are coordinated. The Committee would need to meet more often, perhaps monthly as plans are developed and agreements reached as to how any response will be actioned. Once plans are in place, the Committee can meet less often, perhaps quarterly unless there is a spill event, in which case they would likely be in daily contact. It would also be expected that the Committee would communicate and coordinate with Committees struck in other communities.

The idea of striking Community Oil Spill Advisory Committees is rooted in the idea that those who live in a region permanently have the greatest interest in planning for and responding to events that intrude on their lives (Parker, 1990). The idea of having a local response corporation has its origins in Prince William Sound, because of the quick action taken by firefighters and others with no formal training in spill response to protect sensitive areas during a major spill event (Parker, 1990).

Proactive Volunteer Programs

Actioning proactive volunteer programs is another way to involve local community members in marine spill planning, preparedness, and response. There have been several proactive volunteer programs established with the aim of creating a group of locally trained personnel that can provide substantial assistance in oil spill response (Guevarra, 2008). These programs have been spearheaded by governments, private institutions, and nonprofit organizations (Guevarra, 2008). These programs allow concerned citizens to be trained so that they can be called on to assist in certain aspects of oil spill response and clean-up (Guevarra, 2008). The names and contact information of these people would be gathered by the Community Spill Response Advisory Committee and fire chief, so that they can be called on in the event of an emergency.

Aiming for success

This briefing has outlined two ways that community members could be actively engaged in marine spill planning, preparedness, and response. It is anticipated that the Community Oil Spill Advisory Committee would be the main vehicle for actioning broader community engagement. This could involve consultations during pre-spill planning, such as through workshops, as well as community meetings, for example, during a spill event. Walker et al. (2013) has outlined various indicators and implementation strategies for successful communication that can help guide the actions of Community Oil Spill Advisory Committees (see Table 8).

Table 8: Indicators of successful community engagement from (Walker et al.,2013:8).

Indicators of successful community engagement	
Success Indicator	Implementation Strategies
When to act: Pre-spill planning, modifications/updates during response. The response organization has the trust and confidence of the community.	<ul style="list-style-type: none"> • Leverage existing relationships. • Identify spill stakeholders in the community and define the nature and level of their concerns. • Commit to community engagement for specific, mutually agreed purposes related to spills. • Together, develop an engagement plan for spill planning, preparedness and response.
When to act: Pre-spill planning, then update, implement, and refine during response. Establishment and agreement of expectations in spill response between the community and other stakeholders.	<ul style="list-style-type: none"> • Prepare methods and tools that will help the community understand realistic options available to manage and mitigate the consequences of spills. • Apply risk communication principles to convey the limitations and opportunities of available response technologies. • Involve technical representatives with relevant expertise from the local level in planning, preparedness and response decisions.
When to act: Before, during, and after response. Community leadership, stakeholder engagement, and prompt communication that meets the needs of their region. This will support practical credible decision-making, facilitate appropriate compensation for damages, and promote recovery.	<ul style="list-style-type: none"> • Develop staff skills in the use of strategies, methods, and tools that the Community Liaison Officer and trusted individuals can use to engage the community and meet community needs. • Apply skills during pre-spill planning, training, exercises, and response. • Develop a pre-spill general plan for community engagement activities during response led by Liaison Officer(s), as a foundation to promote community resilience and recovery.

The document review revealed various advisory committees and local council examples across the jurisdictions studied. The USA’s Regional Citizens Advisory Council was one the best examples of local involvement and community representation. For example, Regional Citizens Advisory Councils serve to inform residents, communities, and interested parties by observing and verifying emergency spill response and clean-up efforts. A Council can transfer local knowledge and concerns of communities – which are valuable to operational decisions - to incident commanders. This Council serves as a resource within the Unified Command and participates in the Stakeholder Committee when it is established and functions for

oil spill response operations. The Prince William Sound Regional Citizens Advisory Council and the Cook Inlet Regional Citizens Advisory Council are Canadian examples. These advisory councils interact and exchange knowledge about oil spill response experiences, in addition to representing the communities and providing resources to the communities. Prince William Sound Regional Citizens' Advisory Council has created a website that includes class materials for all educational backgrounds about spills and spill response. These material resources are based on the Alaska Oil Spill Curriculum (1990). The Alaska Oil Spill Curriculum and the teaching resources (from the Prince William Sound Regional Citizens' Advisory Council) serve to foster increased awareness among students on oil spill planning, preparedness and response through various subject topics. The lessons provided by the curriculum served to enhance the general awareness of the surrounding environment, expand their understanding of the technical aspects of oil spills and hazardous waste use, and explore the potential impacts of oil on the environment and decision-making skills.

References

- Canadian Coast Guard. (2022). Marine Spills Contingency Plan-Arctic Chapter (0001).
- Canadian Coast Guard Environmental Response Department. (2005). Keewatin Region, Nunavut Area Plan.
- Chang, S. E., Stone, J., Demes, K., and Piscitelli, M. (2014). Consequences of oil spills: A review and framework for informing planning. *Ecology and Society*, 19(2). <https://doi.org/10.5751/ES-06406-190226>
- Cheong, S. M. (2012). Community adaptation to the Hebei-spirit oil spill. *Ecology and Society*, 17(3). <https://doi.org/10.5751/ES-05079-170326>
- Joselito Guevarra. (2008). Integrating Local Communities and Resources into Oil Spill Planning, Preparedness and Response.
- Lasse H. Pettersson, And Svetlana Milutinovic. (2005). The Congress of Local and Regional Authorities.
- Marika Schulhof, & Phyllis Grifman. (2019). Workshop report: Improving oil spill preparedness and response in Santa Barbara.
- Nunavut Land Claim Agreement, Pub. L. No. 1 (1993).
- Oil Pollution Act (OPA) of 1990, Pub. L. No. 2701, 2701 (1990). <https://www.epa.gov/laws-regulations/summary-oil-pollution-act>
- Walker, A. H. (2017, May). Strengthening Preparedness and Response Decision-Making at the Local Level: Adaptations to Manage Better and Suffer Less.
- Walker, A. H., Mcpeek, M., Scholz, D., & Associates, S. &. (2013). Community Engagement Guidance for Oil and HNS Spills. A report for Pembrokeshire County, Wales, UK. 179 pages. <https://doi.org/10.13140/RG.2.1.3613.7683>
- Walter B. Parker. (1990). *Spill: The Wreck of the Exxon Valdez*.

BRIEFING NOTE #6

REGIONAL OIL SPILL RESPONSE COMPANY

To: Nunavut Marine Council, Inuit-Crown Partnership Committee, Arctic and Northern Policy Framework, Inuit Guardians Committee, Canadian Coast Guard Auxiliary Program, Shoreline Cleanup and Assessment Teams, Used Oil and Waste Fuel Protection Program, WWF Canada, Hunter Trapper Organization, Fisheries and Oceans Canada, Government of Nunavut - Department of Community and Government Services, Department of Economic Development and Transportation, Department of Health.

Re: Establishing Regional Marine Oil Spill Response Company

Prepared by: Ashley Adams

Summary

Oil spills can cause extensive damage to marine ecosystems and inflict enormous losses on local communities by affecting cultural norms, interrupting fishing operations, and being detrimental to tourism (Chang, 2014). Coastal communities are especially vulnerable and affected communities have borne the social, economic, and environmental impacts. This policy brief proposes the development of a regional marine oil spill response agreement framework with a private or public-private company established to respond to marine and land-based oil spills. The framework should facilitate a communities' active participation. This policy brief advocates for a framework that facilitates the creation of a private or public (or a combination of both) community response company and community-initiated response equipment agreements supervised by a spill advisory council (See Briefing Note #5). Due to the multifaceted nature of this action area, this briefing note targets the following agencies: Nunavut Marine Council, Arctic and Northern Policy Framework, Inuit Guardians Committee, Canadian Coast Guard Auxiliary Program, Shoreline Cleanup and Assessment Team, World Wildlife Fund Canada, and Nuka Research and Planning Group.

Context

Canada's current approach towards the Arctic oil spill response is primarily based on the enforcement of the obligations of the responsible party during an incident. Community involvement in the Canadian Arctic region is somewhat limited despite the distribution of response equipment satchels to Arctic communities. The Keewatin Region Response Plan 2005 outlines the response strategies for oil spills in communities located within this region. A framework for temporary or long-term response agreements between facility owners, shippers, and a private or community marine and land-based oil spill response company should be integrated as part of a community oil spill response plan. Such agreements require the creation of a community spill response company, coordinated by the community spill advisory committee to address land and sea-based spills. Community spill response agreements primarily focus on equipment

procurement and active response between the community spill response company and mandated parties (such as private companies, Canadian Coast Guard and government agencies). These agreements facilitate the temporary formal integration of the community response agency into the overall oil spill response system.

The creation of a framework for such a company and its ratification should be led by the Canadian Coast Guard and the Government of Nunavut once initiated by an interested community's oil spill advisory committee or Council. The oil spill response company may be part of a Vessel of Opportunity program that establishes available private response vessels (see below) to address the need for prompt response or complement existing resource needs in a major spill.

Policy Options

The Marine Spills Contingency Plan-Arctic Charter (2022) outlined area and community plans and highlighted the responsible agencies for the development of these plans. The Keewatin Region Response Plan (2005) informs community priorities and an overall approach to oil spill response. This plan is outdated and limits the capacity for adaptive decision-making in oil spill response since it is very narrow in scope and represents the entire plan for these communities. For instance, Chesterfield Inlet's response objective consists of Coastal cleanup and Wildlife Rescue, limiting the potential for increased local involvement.

This policy brief outlines a framework facilitating the creation of a marine spill response company and community-initiated response equipment agreements supervised by the previously proposed spill advisory council. It should be noted that the initiative advocates for the creation of a community oil spill advisory council. In the context of Chesterfield Inlet and surrounding communities, it is proposed that a regional oil spill response company be established for the Kivalliq region.

This regional approach would include an inter-community-based company and will require cargo ships and petroleum-related facilities to enter response contracts with the company to cover the costs of its operations. The proposed structure is illustrated in Figure 17, with the major center of Rankin Inlet serving as the hub of a spill response wheel with the communities as spokes. The development of an expanded community-based Vessel of Opportunity program in each community that provides various support services such as monitoring, response, and inspections is also central to this initiative (see Figure 16). The initiative aims to foster a group of informed, certified, trained and equipped community-based personnel who will enact various roles under the guidance of the community advisory committee until further spill support as provided by the company arrives, if necessary. Finally, this briefing note builds on the foundations of Briefing Note #5 on Local Involvement.

Recommendations

A regional oil spill response company for the Kivalliq region would significantly boost the management and response capacity for communities like Chesterfield Inlet. The envisioned roles and responsibilities of the communities that would be involved in establishing the company and ensuring it is operational are outlined in Table 9. As illustrated in Figure 16 this company could begin following a pilot project in Chesterfield Inlet until a hub structure and subsequent expansion through community-to-community response agreements. The map in Figure 17 illustrates the overall structure of this company to provide response coverage throughout the Kivalliq region.

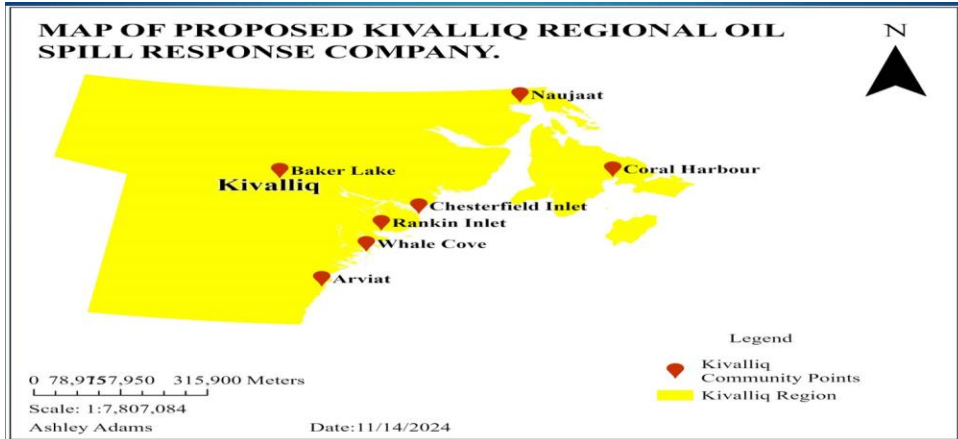


Figure 16: Overall structure of the proposed Kivalliq Regional Response Company.

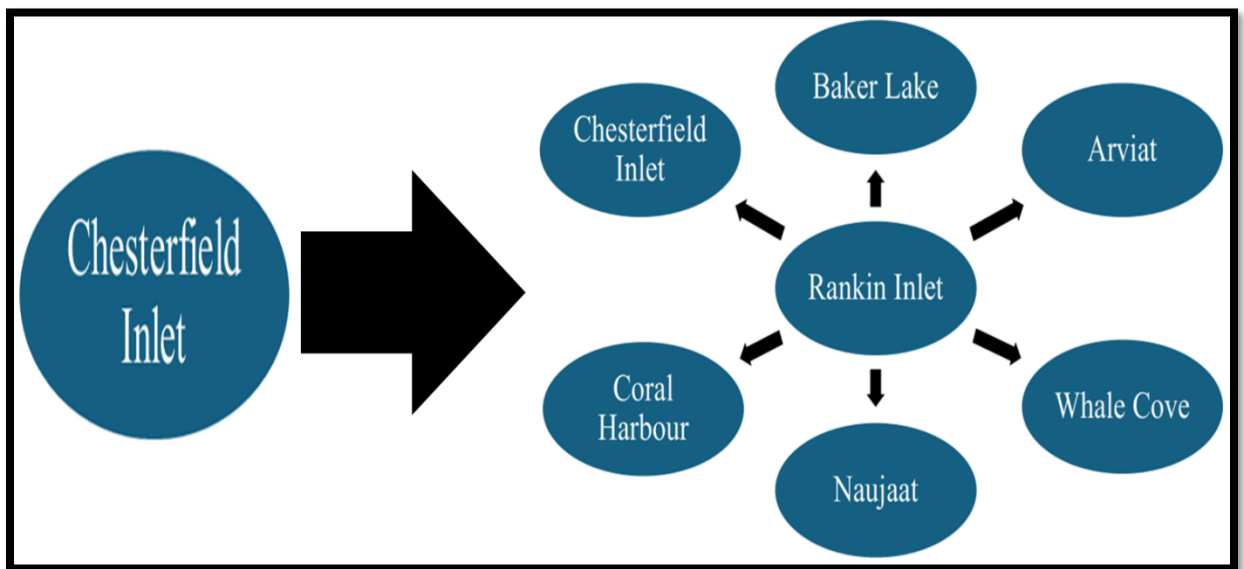


Figure 17: Hub framework for a proposed Kivalliq Regional Oil Spill Response Company.

Table 9: Roles and responsibility of the Communities as part of the Kivalliq Regional Oil Spill Response Company.

Community	Rankin Inlet	Arviat	Baker Lake	Chesterfield Inlet	Coral Harbour	Naujaat	Whale Cove
Community Specific Responsibility	Coordination Center, Monitoring and Response	Response and Monitoring	Response and Monitoring	Response and Monitoring	Response and Monitoring	Response and Monitoring	Response and Monitoring

The hub framework is based on the movement of materials and services among communities centered around a focal point. The focal point houses equipment that is too expensive to have in each community and circulates that equipment as needed to the surrounding communities. Rankin Inlet serves as the focal point of this framework because of the shipping and transport capabilities of the airport in terms of proximity to Manitoba. In addition, Rankin Inlet will host a representative from the Canadian Coast Guard and a bio-chemical testing facility. Rankin would also have equipment and trained staff available to deploy in the event of a larger spill. The other communities in the spokes of the hub focus will be on immediate spill response and monitoring (rapid analysis testing kits), with needed equipment housed in each community. Community volunteers will be trained through the initiative. The operations of the company would consist of the following activities:

- The company applies for certification from the Canadian Coast Guard based on operational viability and is required to recertify every five years.
- The company enters into response agreements with operators, such as mines and shipping companies, so that the financial support is there to purchase and maintain equipment.
- Should an oil spill be detected the company will respond within the Kivalliq area of responsibility.
- Each community would have trained response personnel and equipment to initiate a first response if possible and be able to make a list of vessels of opportunity. These people would be paid for any spill response activities, including training.
- Community emergency managers (for example, fire service representatives) would conduct inspections of vessels of opportunity and response equipment.

Vessels of Opportunity Programs for Small Communities.

Employing a Vessel of Opportunity program to assist in the response can help communities recover during a period of disruption (Department of Ecology-State of Washington, 2014). A Vessel of Opportunity program can support spill response efforts in the following ways:

1. The removal of oil from waterways through accelerating and enhancing oil skimming operations.
2. The deployment and maintenance of oil spill containment booms to assist in mitigating the immediate environmental, social, and economic impacts on resources.
3. The provision of logistical support such as transporting food, equipment, and deployment guidance, personnel, and local experience on local phenomena such as weather and currents.
4. The provision of communication equipment and command post space on board vessels.

The Seldovia Oil Spill response team is an example of a community-led non-profit Vessel of Opportunity program that assists in the containment of oil spill response through trained fishermen and their vessels. The motivation for these community-based response teams is that they would respond to and protect the waters upon which they rely for income, recreation, and subsistence. The following elements have been established as being essential to such a model:

- The integration of fishing vessels into the response arrangements. Fishing crews are trained annually by Alyeska's Ship Escort Response Vessel System in the deployment and operation of oil spill response equipment. Alyeska's Ship Escort Response Vessel System maintains and funds this training program with per vessel foot rate to contract the ships as responders and reimbursement for the fishing crew being trained.
- The core fleet receives money to keep vessels maintained throughout the winter (Prince William Sound Regional Citizens Advisory Council, 2016). The local fishing vessels form an important part of Alyeska's nearshore response strategy designed to protect fish hatcheries and sensitive areas prioritized for protection together with wildlife.
- As part of this strategy, the oil industry has stockpiled pre-staged equipment for spill response at fish hatcheries and five community response centres in Prince William Sound. Each of these centres provides manpower, equipment, and coordination of emergency responses (Prince William Sound Regional Citizens Advisory Council, 2016).

As such, Vessel of Opportunity programs are initiatives that integrate local, commercial, or recreational vessels that have volunteered to assist in responding to oil spills (Department of Ecology-State of Washington, 2014). This program would function on a non-profit basis. Standards for the involvement of fishing vessels should be outlined based on ship class and capacity to promote more prompt offshore containment (Department of Ecology-State of Washington, 2014). The fishers should be trained by private companies and licensed by regulatory agencies (Department of Ecology-State of Washington, 2014). The general structure of the proposed community oil spill response companies is outlined in Figure 18 and explained in Table 10.

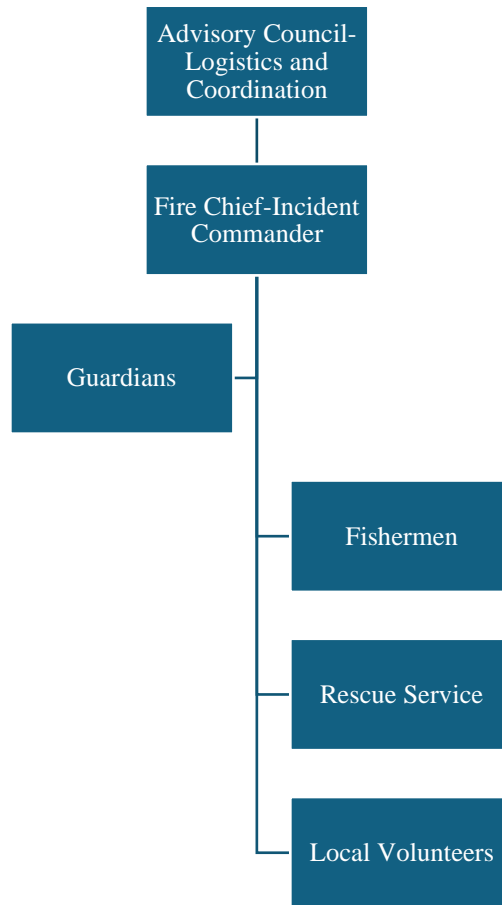


Figure 18: Proposed Framework for a Community Oil Spill Response team based on the Firehouse Model from Nuka Research and Planning Group (2004).

Table 10: Proposed Roles and Responsibilities of the proposed framework for a Community Oil Spill Response team from Figure 18.

Role	Responsibility
Advisory Council	Logistics and Advisory. Report to the Government of Nunavut and Northwest Territories Spills Working Group and the Canadian Coast Guard
Fire Chief	Reports to the Advisory Council and supervises active response.
Guardians	Monitors and oversees animal handling, post-spill monitoring, sampling and rescue operations.
Fishermen	Deploy boons and mechanical recovery.
Rescue Service-Police, Health Services.	Crowd Control, Public Communication, maintaining order during incidents, Health Services and overseeing sanitation

Volunteers	Fill gaps in staffing for tasks that they are trained for such as beach cleaning.
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References

Canadian Coast Guard. (2022). Marine Spills Contingency Plan-Arctic Chapter (0001).

Canadian Coast Guard Environmental Response Department. (2005). Keewatin Region, Nunavut Area Plan.

Chang, S.E.; S.J.; D.K.; P.M. (2014). Consequences of oil spills: A review and framework for informing planning. 19(26).

Department of Ecology-State of Washington. (2014). Focus on Vessels of Opportunity-Spill Prevention, Preparedness, & Response Program. www.oilspills101.wa.gov

Nuka Research and Planning Group, L. and M. S.-L. & M. C. (2004). Combining the Firehouse Model and Community-based Response Teams for an Improved Regional Oil Spill Response System in Alaska Report to Cook Inlet Regional Citizen’s Advisory Council and Prince William Sound Regional Citizens’ Advisory Council.

Prince William Sound Regional Citizens Advisory Council. (2016). Fishing Vessel Training. Fact Sheet,

CHAPTER 4: CRITICAL REFLECTION

4.1 Introduction

Following two academic years in the Master of Natural Resource Management program which consisted of completing classes and gathering data following the project proposal's acceptance on the 11th of December 2023, it took approximately ten months to complete this project. This project has been a constant ebb and flow experience. From the beginning, I decided to enter the Practicum Stream because I had a bad experience with my undergraduate research project and significantly lost self-confidence in my ability to write. For my Masters project, Dr. Sinclair and I discussed my research areas such as oil spills and general waste management when I arrived at the Natural Resources Institute (NRI). I became interested in oil spills from the onset of oil and gas extraction in Guyana, my home country. I had indicated that I would like to enter the practicum stream since I was already enrolled into the Project Management Course taught by Dr Iain Davidson-Hunt and Professor Sheldon McLeod. I had then inquired about possible practicum projects regarding oil spills or waste management, Dr Sinclair spoke about the GENICE II project with communities and the need for a capacity-building document. I read the Genice project report article on Monitored Natural Attenuation as an environmental reclamation technique. We then agreed that the development of policy briefings was a suitable product for a practicum, I agreed to this approach. I saw this as a means of improving my self-confidence in my writing ability. I also undertook associated course work including Human Dimensions of Natural Resources and Environmental Management, Qualitative Field Methods for Community-based Resource and Environmental Management and in addition to the Natural Resource Institute's Project Management course.

I was introduced to the initial aspects of the Practicum Stream process in the Project Management Course. The Human Resources and Sustainability, Economics and Natural Resources courses served as preparation for writing policy briefs. The Qualitative methods course introduced areas that I missed from not being in the thesis stream such as epistemology, case study research methods and world view which were pertinent in developing the project plan and subsequent integrated project plan. The subsequent sections will explain the information and skills improved upon.

4.2 Project Execution

4.2.1 Project Plan Development

The initial drafted project plan was developed as the completion of the Project Management course. The project was focused on the creation of a policy brief that proposed the integration of Monitored Natural Attenuation in arctic communities (Chesterfield Inlet). I saw this project as an opportunity to work on oil spills, since it was one of my research interest areas. The initial integrated project focused on developing a policy brief on monitored natural attenuation for the Chesterfield Inlet oil spill response plan. The Project Management course was developed based on an accredited Project Management Professional curriculum and guidebooks. We addressed many topics through a biodiversity project scenario and group-based problem-solving activities. Some of the topics covered were tools such as risk management, quality management and resource need assessments. Due to constantly overthinking, I had issues with managing

the scope of the objectives which resulted in many explanation sections with the instructors of the project management course.

4.2.2 Project Plan Re-Development

In the summer of 2023, I had a brief meeting with Dr Sinclair about the project topic and was advised to change towards community oil spill plans since this topic was of direct interest to the community of Chesterfield Inlet. This interest also aligned with GENICE II's projects existing co-development approach with Chesterfield Inlet. So, the entirety of summer was spent developing the new project plan for proposal in the Fall of 2023. The topic of the project eventually progressed into "Developing a policy brief to encourage robust oil spill preparedness and response planning in Chesterfield Inlet in Canada's Eastern Arctic". The eight member countries of the Arctic Council were identified as the comparators for this project and Greenland was included since it was located within the Arctic region. The project was proposed on December 11th, 2023, in front of the committee members who were Dr Sinclair, Dr Stern, Dr Hostettler and Mr Agark. The deliverables were a document review, gap analysis and comparative analysis as part of the case study approach.

4.2.3 Initial Assumptions and Expectations

Initially I had assumed that I would complete the activities associated with the deliverables at the rate of completing a major assignment. This resulted in intense work for the first two weeks which resulted in mental burnout (thoughts were not flowing, I had difficulty maintaining focus on the work and difficulty remembering how to do basic tasks like cooking). To address this, I decided to focus more on the acquisition and filtering of electronic documents. I had initially found large amounts of academic literature and grey literature that outlined the national administrative structure of oil spill response of these countries. The country profile reports from the International Tanker Owners Pollution Federation Limited were good introductory overview documents that pointed out the relevant pollution coordination bodies. During the document acquisition phase, I lacked confidence about my ability to produce a comprehensive document that would satisfy the project objectives and partner's expectations given the volume of material available.

4.2.4 Project Changes and Decisions

Based on the initial stages of the document acquisition phase I had many changes to proactively solve challenges faced. One of the changes was to add private companies, wharfs, and harbours from the entry criteria in the document acquisition phase of the project. Since the polluter pays principle had been globally integrated into national pollution prevention systems, private entities were to have the best prevention measures and response equipment. The wharfs and harbours were removed because they tended to either be privately owned or managed as separate entities based on different standards. The next challenge was burnout, which was quite frequent, in response to this issue I looked at the associated activities and flow diagrams to identify other task that could have been completed on limited brain function (like simple yes/no questions in a questionnaire). During the creation of the background information report I was under the misconception of oil spill response systems in arctic communities judging from the Keewatin Regional Plan (2005), the Artic Regional Plan (2021) and the estimated population of Chesterfield Inlet that there was an established community system-based on the involvement of the Canadian Coast Guard. Based on this I assumed that I had to simply propose a hierarchal system centered around the local fire department and the community members can participate as volunteers since the equipment satchels were there.

During this time Dr Sinclair had suggested that I participate in a GENICE II workshop in Chesterfield Inlet. Upon arrival after the first leg of the trip at Baker Lake, I came to the realization that maybe this would not be as simple as assumed. Subsequently upon my arrival in Chesterfield Inlet, I met the Guardians at the hamlet office, and later presented my work on community oil spill plans and at the time most of my work was based on Alaskan Communities in the United States of America. Based on my observations during the trip further changes were required to make them more applicable to Chesterfield Inlet. The assistance of Dr Sinclair and Dr Hostettler were an asset in the problem-solving aspects of the project. The research expertise and experience of Dr Hostettler and Dr Sinclair also helped overall, throughout the project. Upon reading a few articles such as the Doctoral Dissertation article of Jonas Pålsson titled “Oil spill preparedness in Sweden: prevention, planning, and response for large accidents” (2016) was introduced to Organizational theory. The author stated that “the mainly top-led and politically derived framework and conditions in an organization interact with the mechanisms that govern human behaviour and interaction (Pålsson, 2016). I was then encouraged to expand the scope of the document review to look at the national oil spill management structure to highlight the role of local authorities/communities in oil spill preparedness and response. The next change happened near the end of the project following the completed draft policy briefing note. The previous deliverables had identified multiple recommendations based on a large knowledge source and Dr Sinclair had advised me to create a series of briefing notes that can focus on five key recommendations for Chesterfield Inlet. The comparative analysis served to further analyze the strengths in the form of best examples under various aspects of oil spill preparedness and response. The comparative analysis provided further highlights the results of the Document review where the Gap Analysis lacked.

Communication was essential throughout the project due to the opportunity for swift response and information exchange. Communication was mainly conducted through emails and zoom calls since it offered flexibility when face to face interactions were not feasible. I did not lead all communication efforts; it was primarily Dr Sinclair that led inter-committee communications. The products’ target audience was further improved under the guidance of Dr Hostettler and Dr Sinclair.

4.2.5 Project Completion

The completion of the project consisted of five phases: integrated project plan development, project proposal, progress committee meetings, deliverable completion, practicum document development and defense. The integrated project plan development was conducted based on the format of the Natural Resources Institute (University of Manitoba Faculty of Graduate Studies) Practicum framework and the teachings from the Project Management course. The project management course was very interactive where us students were placed in project problem solving scenarios as part of the practical aspect of project management. The course theory was based on a mixture of sources. This phase consisted of the peruse of various articles and reports on the topic of Community oil spill plans with an emphasis on developing the background information and project methodology section. I had believed that these two sections were the mechanisms that made the project actionable. The project proposal phase was slightly straightforward where I presented the key components of the project to the committee members.

- The first deliverable Document review completion process consisted of the acquisition (download) and review of electronic versions of the oil spill management documents (plans, acts, regulations, guidelines, annual reports, journal articles and other grey literature resources) to paint a picture of oil spill management in arctic jurisdictions. To address language translation, Google Translate (free

online tool) and the PDF Book Translator (free application) were used. In cases where there were scanned documents free online tools such as small pdf was used to convert adobe files into searchable documents. The retrieved documents were sorted based on the country. The sections of the document review were structured as follows (Regulations/Legislation) and then roles and responsibilities (National local). The national plans outlined all responsible actors in oil spill management, the roles and responsibilities were outlined in later sections for each Jurisdiction. The final sections looked at the existing local/municipal/community oil spill plans in addition to the roles and responsibilities in oil spill prevention, preparedness and response. Supporting documents such as action plans, annual reports, journal articles were used to provide clarity on the role of local authorities within the established oil spill incident command structure. The different approaches formed the basis for the potential recommendation areas for the subsequent policy briefing notes.

- The second deliverable was the Gap analysis, which was in the form of a checklist table, served as an initial comparison mechanism of the countries studied across various features such as dedicated response equipment and local response plans. This section was done based on the document review. This deliverable served to compare the countries studied across various areas based on the standard requirements from private entities since it's the local areas that are often the first responders to oil spill incidents in cases where the spill generator has not been identified.
- The final deliverable was the comparative analysis where the focus was a cumulative section based on the Document review and the Gap analysis. This deliverable focused on the strengths of the local response and preparedness systems of the countries mentioned. Further, this deliverable had also informed the scope of the recommendation areas for the policy briefing notes.
- The creation of the policy briefing notes required extra reading on the overall structure of oil spill preparedness and response in a Canadian Arctic perspective. The working paper from (André Légaré, n.d.) highlighted the poorly organized structure of oil spill preparedness and response in the Canadian Arctic. The author had identified many overlaps in plans, programs, institutional objectives, the absence of established training standards among other problems that were beyond the scope of the current project.
- The final stage of the project was the compilation of briefing notes (products) and other sections necessary for the preparation of the Practicum document such as the Critical Reflection which was a great way of explaining the decision and phases as a project manager.

4.2.5.1 Background Information Report.

The Background Information Report provided an insight into the various aspects of the Canadian Arctic such as the impacts of climate change, increased shipping in the arctic, Canada's approach to the Increased Shipping Traffic in the Arctic, Canada's approach to oil spills, among others. This report provided an overview into the project's topic of the approach to oil spill preparedness and response in Canadian Eastern Arctic Communities.

4.2.6 What did I learn after completing this project?

I learned many things through the project. Due to the differences in the administrative divisions in these countries, the best examples were highlighted based on the level of sophistication and the case study approach of this project. I learned that the scope of local involvement varied among Arctic Council states studied due to the overall geographic distribution and the governance hierarchy, where the lowest were communities, municipalities, or counties. The review revealed that local environmental monitoring either

supplements or contributes to an established congregated monitoring system or part of an area-based alert system. Another lesson learnt was there were many communities in Nunavut Canada and implementing oil spill preparedness and response systems would have been theoretically challenging. To address this issue, Norway has subdivided its four hundred and thirty municipalities into thirty-four inter-municipal preparedness areas against acute pollution. This was done to further safeguard municipalities. Further highlights of what was learned from the project include:

- The geographical delineation of areas as a basis for oil spill monitoring can serve as an effective information resource for federal Environmental Management authorities. This form of Area-based monitoring serves to contribute to quantifying the environmental and risk status within an established area of responsibility by producing later reports for a designated federal agency.
- Environmental data and information collected from comprehensive oil monitoring programmes and research studies led to the development of advanced monitoring tools such as Environmental Oil Spill Sensitivity Atlases. The Environmental Oil Spill Sensitivity Atlas facilitates guided oil spill response and preparedness measures with an emphasis on environmental protection (Kingdom of Denmark, 2011). Tools like this provide an opportunity for local involvement through knowledge exchange on sensitive biomes and habitats that can be outlined as established protection priority areas.
- The firehouse model was integrated into many of the countries studied regarding oil spill preparedness and response. In formal systems, the fire department was the agency responsible at the local level.
- Excluding Greenland and Canada all the countries studied had enforceable local emergency/pollution/oil spill planning mandates within their legislation in the form of acts or Government decisions. However, the intricacies of these requirements varied across authorities such as the scope of the plans, related preparedness activities, monitoring and training regimes, and command structures.
- Using Virtual Private Networks (VPNS), Google Chrome's webpage translator and Google translator tool have proven to be an impertinent addition to the document review. Google may show results based on your location for potential marketing and algorithm-based processes. This was a problem during the document review phase since it temporarily restricted my ability to acquire local oil spill response and emergency plans. Google Translate and Google Chrome's webpage translator proved to be very beneficial in the document review process. However, the Google Translate tool could only translate files of ten megabytes (within this there was an additional limit of 300 pages) and could only translate scanned documents. To account for this, I either translated the text of the first ten pages or utilized the PDF Book Translator Microsoft Windows application.

Lastly, reflecting on the completed report, I can say that it has been a great experience to learn about the roles and responsibilities of local authorities in marine oil spill response and how this varies across nations. I can also say that Canada is behind other Arctic nations in developing systems to help community respond to oil spills. Also, the experience gained has slowly improved my confidence in my writing ability through the Project Management Course, Qualitative Research Methods and Human Dimensions in Natural Resources Management. Since I have experienced the entirety of the process through ebbs and flows, I am now interested in progressing my career based on what I have learned. Working with the GENICE II project

and Chesterfield Inlet has been truly enlightening since I was able to meet some of the expectations of the project's interested parties.

5 REFERENCES

Act on Hygiene and Pollution Prevention, Pub. L. No. 7 (1998). <https://www.althingi.is/lagas/nuna/1998007.html>

Alaska Oil Spill Commission. (1990). *Spill: The Wreck of the Exxon Valdez Final Report*.

Alaska Division of Homeland Security and Emergency Management Planning Section. (n.d.). *Small Community Emergency Response Plan*. Retrieved October 16, 2024, from <https://ready.alaska.gov/Plans/SCERP>

Alaska Regional Response Team. (2022). *Alaska Regional Contingency Plan*. <http://www.alaskarrt.org>

Andre Legare. (n.d.). *Marine Ecosystem Monitoring and Emergency Response Chart_Draft2_*.

Akureyri Fire Department. (2024). *Akureyri Fire Department Fire Prevention Plan*.

Bi, H., Wang, Z., Yue, R., Sui, J., Mulligan, C. N., Lee, K., Pegau, S., Chen, Z., & An, C. (2025). Oil spills in coastal regions of the Arctic and Subarctic: Environmental impacts, response tactics, and preparedness. In *Science of the Total Environment* (Vol. 958). Elsevier B.V. <https://doi.org/10.1016/j.scitotenv.2024.178025>

Blake James Wergeland. (2012). *A High North Strategy? An assessment of Place-vulnerability in Finnmark Country and the Norwegian Government's Policies towards Mitigation Oil Spills in Barents Sea*.

Belle Mickelson, E. T. J. B. J. B. (1990). *ALASKA OIL SPILL CURRICULUM* (Elizabeth Trowbridge, Ed.). The Oil Spill Recovery Institute Prince William Sound Science Center.

Björn Forsman. (1997). *The oil is loose. Handbook on municipal oil protection*. Statens räddningsverk.

B., Zhang, B., Li, P., Cai, Q., Lin, W., & Liu, B. (2012). *From challenges to opportunities: towards future strategies and a decision support framework for oil spill preparedness and response in offshore Newfoundland and Labrador*.

Canadian Coast Guard Environmental Response Department. (2005). *Keewatin Region, Nunavut Area Plan*.

Canadian Coast Guard. (2008). *Canadian Coast Guard Central & Arctic Region Regional Response Plan*.

Canadian Coast Guard. (2022). *Marine Spills Contingency Plan-Arctic Chapter*.

Christopher Covert. (2016). Small Community Oil Spill Preparedness Research Project Item Type Report. <http://hdl.handle.net/11122/7795>

Chen, J., Zhang, W., Wan, Z., Li, S., Huang, T., and Fei, Y. (2019). Oil spills from global tankers: Status review and future governance. In *Journal of Cleaner Production* (Vol. 227, pp. 20–32). Elsevier Ltd. <https://doi.org/10.1016/j.jclepro.2019.04.020>

Cook Inlet Regional Citizens Advisory Council. (n.d.). Advisory Council Model.

County Administrative Board in Västra Götaland County, U. for C. P. and S. (2023). Regional Oil Protection Plan for Västra Götaland county.

Centre for Earth Observation Science (CEOS). (n.d.). About — GENICE II. Retrieved March 25, 2025, from <https://www.genice2.com/about>

DeCola, T.L. Robertson, K.M. Trimpert., and E.G. (2001, July). Fostering Community Support for Community Planning Projects in Rural Alaskan Communities. *Proceedings of the 12th Biennial Coastal Zone Conference*.

Det-Norske-Veritas. (2010). Report for OLF/Norwegian Clean Seas Association for Operating Companies- Summary of Differences between Offshore Drilling Regulations in Norway and U.S. Gulf of Mexico.

Devens, J. (2000). Community involvement versus big oil A Case Study of the Policy Process. www.pwsrccac.org

Environment Agency Iceland. (2022). National monitoring plan 2022. According to Article 51 and Article 54 Act no. 7/1998 on hygiene and pollution control. www.ust.is

Environment and Climate Change Canada. (2022b, April 25). The government of Nunavut ordered to pay a \$100,000 fine for the Rankin Inlet diesel fuel spill into Hudson Bay - Canada.ca. Environment and Climate Change Canada. <https://www.canada.ca/en/environment-climatechange/news/2022/04/government-of-nunavut-ordered-to-pay-100000-fine-for-rankin-inletdiesel-fuel-spill-into-hudson-bay.html>

Fedina, M. (2017). Oil Spills: A Public Organizations and Indigenous Peoples' Perspective The Cases Of The Komi Republic And Nenets Autonomous Okrug (Russia). University of Finland.

Figenschau, C. (2015). Emergency preparedness organization for offshore oil recovery operations in Norway EN310E: Master of Science in Energy Management.

Fisheries and Oceans Canada (2010), Audit of the Canadian Coast Guard -Environmental Response Services (6B091), Fisheries and Oceans Canada.

Frisso, G. M. (2022a). Vulnerability, Arctic Indigenous Groups and Oil Spills. *Yearbook of International Disaster Law Online*, 3(1), 352–373. https://doi.org/10.1163/26662531_00301_014

Genome Canada. (2022, July 26). GENICE II: Reimagining Monitored Natural Attenuation as an Oil

Gyllenhammar, C., & Arvidsson, L. (2007). The rescue service-Working Environment in Connection with Cleanup after Oil Spills on Beaches.

Holderied, K., and Aderhold, D. (2018). Exxon Valdez Oil Spill Long-term Monitoring Program (Gulf Watch Alaska) Final Report Science Coordination and Synthesis for the Long-term Monitoring Program Exxon Valdez Oil Spill Trustee Council Project 16120114-H Final Report.

Inslee, J. (2013). *A Changing Horizon: Building Community Oil Spill Response Capacity in the Arctic*.

Intermunicipal Committee against acute pollution in Western Finnmark. (2023). Cooperation agreement on the Municipal Task Community “Intermunicipal Committee against acute pollution in Western Finnmark”- between the municipalities of Alta, Hammerfest, Hasvik, Kautokeino, Loppa and Måsøy municipalities.

International Tanker Owners Pollution Federation Limited. (2014). *Sampling And Monitoring of Marine Oil Spills*.

International Tanker Owners Pollution Federation Limited. (2018a). *Country and Territory Profiles*. <http://www.itopf.org/knowledge-resources/countries-territories-regions/>

International Tanker Owners Pollution Federation Limited. (2018). *Greenland Country Profile-A summary of oil spill response resources and arrangement worldwide*.

International Guide for the Assessment of Oil Spill Response Planning and Preparedness. (2023). www.arpel.org

Ivanova, M. (2011). Oil spill emergency preparedness in the Russian Arctic: A study of the Murmansk region. *Polar Research*, 30(SUPPL.1). <https://doi.org/10.3402/polar.v30i0.7285>

John Van Dusen. (2016, July 14). 500 litres of fuel spilled into Hudson Bay near Rankin Inlet. *CBC News*.

Jonas Henriksson, Johanna Stadmark, & Sofie Hellsten. (2018). National priority layer in the Digital Environmental Atlas. To use in connection with an oil spill.

Kingdom of Denmark. (2011). Kingdom of Denmark Strategy for the Arctic 2011– 2020.

Maaik Knol, and Peter Arbo. (2014). Oil spill response in the Arctic: Norwegian experiences and future perspectives. *Marine Policy*, 50(PA), 171–177. <https://doi.org/10.1016/j.marpol.2014.06.003>

Marchenko, N., Andreassen, N., Borch, O. J., Kuznetsova, S., Ingimundarson, V., & Jakobsen, U. (2018). Arctic Shipping and Risks: Emergency Categories and Response Capacities. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation*, 12(1), 107–114. <https://doi.org/10.12716/1001.12.01.12>

Matveev A.V. (2017). Strategic planning of forces and means of the Russian Emergencies Ministry in the Arctic zone // *National Security and Strategic Planning*. 4(20), 32–42.

National Collaboration Group for Oil Damage Prevention. (2022). Sweden’s strategy for oil damage prevention-Action plan until the year 2026.

Nuka Research and Planning Group, L. and M. S.-L. and M. C. (2004). Combining the Firehouse Model and Community-based Response Teams for an Improved Regional Oil Spill Response System in Alaska Report to Cook Inlet Regional Citizen’s Advisory Council and Prince William Sound Regional Citizens’ Advisory Council.

Nuka Research and Planning Group. (2005). Community Oil Spill Response Forum Final Report to Prince William Sound Regional Citizens Advisory Council and Cook Inlet Regional Citizens Advisory Council.

Nuka Research and Planning Group, L. P. C. L. (2010). Oil Spill Prevention And Response In The U.S. Arctic Ocean.

O’Rourke, R. (2011). Changes in the Arctic: Background and Issues for Congress

Pankratova M.V. (2022). Functional model of control of forces and means of the Ministry of Emergency Situations. Russia in the elimination of oil and oil product spills in the Arctic zone of the Russian Federation. <http://vestnik.igps>.

Perkins, R., and Loring, P. (2014). =Environmental Impacts of Arctic Oil Spills and Arctic Spill Response Technologies Literature Review and Recommendations Arctic Oil Spill Response Technology Joint Industry Programme.

Picou, J. S., Gill, D. A., Dyer, C. L., Curry, E. W., and Picou, J. S. (1992). Disruption and stress in an Alaskan fishing community: initial and continuing impacts of the Exxon Valdez oil spill.

Prince William Sound Regional Citizens' Advisory Council. (2024). Long-Term Environmental Monitoring. Prince William Sound Regional Citizens' Advisory Council. <https://www.pwsrcac.org/programs/environmental-monitoring/lttemp/>

Prince William Sound Regional Citizens Advisory Council. (2024). Community Outreach. <https://www.pwsrcac.org/outreach/>

Regulations on Vessels Used in Oil Recovery Operations, Pub. L. No. 9 (2011).

Regulation on response to acute pollution of sea and beaches-, Pub. L. No. 1010 (2012).

Robertson, T. L., DeCola, E. G., Alcantra, R., and Wassilie, C. (2003). Fostering A Grassroots Approach to Oil Spill and Emergency Response Planning in The Yukon River Watershed's Native Villages. Protecting historical, cultural, and wildlife resources, 887–891. <Http://Meridian.Allenpress.Com/Iosc/Article-Pdf/2003/1/887/2350125/2169-3358-2003-1-887.Pdf>

Rodin, M., Downs, M., Petterson, J., and Russell, J. (1992). Community impacts resulting from the Exxon Valdez oil spill.

Seldovia Oil Spill Response Team. (2015). Seldovia Oil Spill Response Team A Local Emergency Response Team 1989-Present.

Skinner, S. K., and Reilly, W. K. (1989). The EXXON VALDEZ Oil Spill a Report to the President the National Response Team.

State of Washington Department of Ecology. (2014). Focus on Vessels of Opportunity. www.oilspills101.wa.gov

State of Alaska Department of Environmental Conservation. (2024). Community Spill Response Agreements and Local Response Equipment. <https://dec.alaska.gov/spar/ppr/response-resources/local-response/>

Swedish Civil Contingencies Agency. (2002). Act (2003:778)-Civil Protection Act-Government Bill 2002/03:119-Reformed rescue services legislation. Swedish Civil Contingencies Agency.

Swedish Rescue Agency. (2006). Updated supplement of the Oil is Loose Handbook.

Swedish authority for social protection and preparedness. (2010). A guide to establishing an oil protection plan for the municipality Manual oil protection plan.

Tarnby Municipal Board. (2012). Tarnby Municipality Emergency Preparedness Plan.

The authority for social protection and preparedness. (2011). Municipal Oil Protection, Environmental Atlas. http://www.gis.lst.se/ivl/faktablad/Manual_Digital_Miljoatlas.pdf

The Swedish Agency for Community Protection and Preparedness. (2021). Handbook - Content and structure of the municipalities' action programs according to the act on Protection Against Accidents.

The Swedish Agency for Community Protection and Preparedness. (2021). Mapping the ability Sweden's oil protection preparedness 2021 Mapping the ability.

The Swedish Agency for Community Protection and Preparedness. (2022). Manual in municipal crisis preparedness – 4. Risk catalog – Oil spills and pollution accidents at sea.

Trine Jonassen. (2022, April 26). Government of Nunavut Fined \$100,000 for Hudson Bay Fuel

Spill | High North News. High North News. <https://www.highnorthnews.com/en/government-nunavutfined-100000-hudson-bay-fuel-spill>

Vaughan, S. (2010), 2010 Fall Report of the Commissioner of the Environment and Sustainable Development, Environment and Sustainable Development, Canada.

Walker, A. H. (2017, May). Strengthening Preparedness and Response Decision-Making at the Local Level: Adaptations to Manage Better and Suffer Less

Walter B. Parker. (1990). Spill: The Wreck of the Exxon Valdez.

Webler, T., and Lord, F. (2010a). Planning for the human dimensions of oil spills and spill response. In Environmental Management (Vol. 45, Issue 4, pp. 723–738). <https://doi.org/10.1007/s00267-010-9447-9>

Western Uusimaa Rescue Department. (2023). HIKLU Accident prevention plan-Western Uusimaa (Google Translate).

World Wildlife Fund. (2017). Oil spill response capacity in Nunavut and the Beaufort Sea responding to arctic shipping oil spills: risks and challenges.

6 APPENDIX 1 AND 2

(Attached as PDF)

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1.1 PROJECT CHARTER

This project charter provided a detailed overview of the project, following the project's team agreement on a more refined scope. It provided introductory information on how the project should proceed and further explained the project deliverables. The requirements of the deliverables allowed for further development of the final project plan. The project charter was later updated during meetings as noted in the charter change history table. Subsequent documents such as the scope statement, quality management and change management were all grounded in the broad ideas laid out in this Project Charter.

1.1.1 Project Overview

The outcome of this project is a knowledge transfer tool in the form of a series of policy briefing notes that serves to inform various Interested Parties on the approaches of the different administrative levels, that can interact with communities in preparation and response to a ship-based oil spill. The researcher perused national oil spill preparedness and response plans of the eight-member states of the Arctic Council and Greenland. The researcher focused on the response and preparedness plans to identify examples of local involvement initiatives at the local/community level. It was envisioned that this supporting document would be developed while considering all stakeholders' needs.

1.1.2 Project Justification

As transportation through Arctic regions becomes increasingly prevalent with tourism, mining, community re-supply shipping and oil exploration, the surrounding communities are under an increased threat of ship-sourced oil spills. These oil spills can be caused by fuel barges, passing ships, tank farms and oil discharges. One recent incident was the gasoline fuel leak that occurred in 2016 near Rankin Inlet. As reported by (Van Dusen et al., 2016) approximately 500 litres of fuel (gasoline) spilled into Hudson Bay near Rankin Inlet. The spill occurred after a small boat collided with a resupply hose, resulting in a rupture near Rankin Inlet, Nunavut (Van Dusen et al., 2016). The Canadian Coast Guard and Environment Canada have assessed the impact on the surrounding area (Van Dusen et al., 2016). According to the Mayor, some of the fuel had drifted into a nearby cove where it was contained using absorbent booms (Van Dusen et al., 2016). Following the repair and testing of the fueling hose, refueling was recommended (Van Dusen et al., 2016).

The climate and remoteness of these communities exasperate the threat posed to human and animal life in Arctic regions. It is often stipulated by oil spill response cleanup legislation that the polluter is primarily responsible for oil spill cleanup events. However, surrounding communities are often left with the downstream effects of these spills. It is imperative to increase community preparedness, the capacity to conduct monitoring and initial response should an oil spill occur. The main outcome of this project was to develop a series of policy briefing notes that synthesize the approaches of oil spill preparedness and response plans from Arctic jurisdictions.

Findings of research should provide an in-depth understanding of the issues that policymakers seek to address to ensure scientific evidence-informed decision-making. In addition, research can provide insight into cost-effective and efficient approaches to address the needs of a community. This series of policy briefing notes seek to encourage the integration of these ideas into community oil spill response policy through several measures such as:

- It presented findings and translated them into opportunities for policymakers through high-quality methods to promote evidence-based decision-making.
- These policy briefing notes would provide resources to ensure that the policymakers have access to summarized information and data-driven findings regarding the interaction of various administrative levels and communities in the event of oil spills.

Table 1: Project Objectives and Deliverables.

Objective	Deliverables and Related Objectives
<ol style="list-style-type: none"> 1. To create a series of policy briefing notes on oil spill planning, preparedness, and response for Canadian Arctic communities. 	<ol style="list-style-type: none"> 1. A document review of documents (legislation) on the topic of community oil spill preparedness and response from the eight countries within the Arctic Council. 2. A gap analysis of the various plans/regulations regarding oil spill response and preparedness plans for Arctic communities. 3. A series of policy briefing notes that outline various recommendations based on the document review and gap analysis.

1.1.2.1 Requirements:

The proposed requirements are encapsulated in table 2.

Table 2: Project requirements.

Deliverables	Requirements
<ol style="list-style-type: none"> 1. A document review and content analysis of documents (legislation) on the topic of community oil spill preparedness and response from the eight countries within the Arctic council. 	<ul style="list-style-type: none"> • Specific requirements from the project advisor, and external interested parties. • Must be of high quality and meet the standard of the learning institution.
<ol style="list-style-type: none"> 2. A draft document illustrating the implementation of key recommendations using Chesterfield Inlet based on the policy briefing notes' findings. 	<ul style="list-style-type: none"> • An unbiased collection of the collected data based on high-quality analysis and methods. • The comprehensiveness of the literature review must be according to the guidance of the project advisor and within the capabilities of the project management. • It must highlight the areas in which other stakeholders can be involved, such as the community.
<ol style="list-style-type: none"> 3. Series of Policy briefing Notes. 	<ul style="list-style-type: none"> • The cooperation of the Chesterfield Inlet Hamlet office and other interested parties. • Must be a cumulative effort of all deliverables.

1.1.2.2 Roles and Responsibilities:

Table 3: Roles and responsibilities of this project.

Roles	Responsibilities
Knowledge Holder	<ul style="list-style-type: none">• Review and provide feedback on the final product.
Partner (GENICE II lead)	<ul style="list-style-type: none">• Review and provide feedback on the product.
Project Advisor(s)	<ul style="list-style-type: none">• Review drafted document submission and provide feedback on all submission.• Provide expert advice on the research area and project concerns.• Email and Zoom meetings to enable frequent communication.
Researcher	<ul style="list-style-type: none">• Complete the objectives and produce related deliverables.• Keep the project on schedule and within budget.• Resolve sources of conflict that may occur under the guidance of the project advisors.• Keep the sponsor updated and fully informed of the progress of the project.

Essential Contacts:

Barnie Aggark - Knowledge Holder

Dr Gary Stern - Partner (GENICE II Lead)

Dr John Sinclair - Project Advisor

Dr Glen Hostetter - Project Advisor

Attendance and Meeting Date - December 11th, 2023

Attendees

1.2 PROJECT SCOPE

Project Name: Developing a series of policy briefing notes to encourage robust spill preparedness and response planning in Chesterfield Inlet in Canada's Eastern Arctic.

Sponsor Name: Dr Gary Stern GENICE (II) Research Project Lead

Researcher Name: Ashley Adams

1.2.1 Scope Overview:

This project consisted of a document review of Arctic community oil spill preparedness and response plans. It also examined community oil spill response and preparedness literature to assess the planning approaches including the interactions among levels of government. The focus of this project was community preparedness and response towards oil spill management, since the current approaches are reactionary. The response plans for the Chesterfield Inlet community were used as a case from which to consider response plans and planning in other jurisdictions. It is envisioned that the completed policy briefing notes contribute to the enhancement of the role of communities in oil spill preparedness and response plans.

1.2.2 Exclusions From Scope:

The Exclusions from the Project Scope consisted of the following:

- **Project Product Exclusion:** The development of community oil spill response plans, therefore there was no consultation with community members or the public at large. The development of such a legislative instrument would have required stakeholders' consultations, which were beyond the budgetary limits and the scope of the project.
- **Project Approach Exclusion:** Policy Analysis was also excluded since it would have required an evaluation factor such as effectiveness, benefits, risks, and political and administrative feasibility. This project was desk-based hence there was a reliance on virtual communication between the sponsor, the researcher and other interested parties. Conducting in-person community consultations was beyond the current scope of creating a supporting document for community oil spill preparedness and response.
- **Project Outcome Exclusion:** The completed and reviewed series of policy briefing notes were submitted to the Project Partner and other Internal Interested Parties. It is impertinent to note that the project's product only served to promote the adaptation of the themes towards the enhancement of oil spill preparedness and response, however the researcher did not seek to influence political opinion towards the amendment of the existing oil spill response plans.

1.2.3 Assumptions:

There was an assumption that the researcher would be able to work under the GENICE II research team regarding the disclosure of information about the existing work that was pertinent to the successful completion of this project. It was presumed that the completion of the project's deliverables would have been successful following the complete acceptance of all the parties interested. It was assumed that agencies would have to be interviewed should the required documents for the document review be unavailable. In addition, an assumption was made that through the support of all parties, the project's objectives were completed according to schedule and budget.

1.3 CONSTRAINTS

1.3.1 Timeframe: 11 months 27 days

During the project cycle factors such as budget, time and scope are paramount. It should be noted that since this project was desk-based, there was a reliance on remote means of communication with stakeholders.

1.3.2 Acceptance Criteria:

The acceptance criteria of the sponsor regarding the product were considered. This project was deemed successful when the policy briefing notes were in sync with the requirements outlined in the project scope document. The researcher ensured that the project was carried out on time and managed relationships among the project's stakeholders, so that it was done effectively, according to schedule and budget requirements.

1.3.3 Scope Management:

The project consisted of a review of various documents (academic literature, grey literature, oil spill response plans and webpages). Scope creep was a potential factor that could have resulted in the late completion of the project and the increase in the final project cost. Instead of reviewing international oil preparedness and response plans, community oil spill response plans were identified due to potential financial, time and scope constraints. In the end, managing expectations was key towards completing the project on time and resisting the pressure of including other activities to satisfy the needs of external stakeholders. The expectations of the project advisor and the researcher of the project were outlined during the first meeting. The expectations of the complexity and comprehensiveness of the project activities were also outlined in this meeting. Following the initial meeting, a summary of the project's activities was communicated to the sponsor/project partner and other interested parties to identify their expectations. The expected outcomes that aligned with the expectations and capabilities of the project team were identified and pursued. Changes alongside the reasons were communicated to the interested parties. Effective and frequent communication between the interested parties and the project team were essential in avoiding scope creep.

1.4 PROJECT SCHEDULE

This project schedule was derived from a list of project activities, a Work Breakdown Structure, the Sequence Diagram, Milestones, and Critical Path calculations. The Project Schedule served as a task-tracking mechanism with task progress updated daily and was used by the researcher for daily planning.

1.4.1 Critical Path and Calculations:

The Critical Path consisted of the shortest possible timeline of the project and was calculated from the sum of all dependent project tasks with no float time. Project start/early finish dates and late finish dates were calculated at the end of the table. To evenly distribute the workload the tasks with no float time were scheduled at a convenient time within the date range. This enhanced the quality of the project's activities and outcome.

1.5 PROJECT RESOURCE NEEDS ASSESSMENT AND PLAN

1.5.1 Resource Needs Acquisition Plan (Skills and Knowledge):

This section outlines the resources that were required to complete the project. It required the acquisition of the available resources from the project members. The skills and knowledge resources that needed assessment described the required expertise that the researcher did not possess and how they were acquired. The researcher enrolled in qualitative methodology courses and academic writing courses to boost his current skill set, to enable the successful completion of this project.

1.5.1.1 Writing

The most crucial skill required for this project was written communication, whether that was through email exchanges, project proposals, review reports and draft policy briefing notes documents. One challenge for any writer of a project proposal is to convince the readers of the project's significance concisely. In this regard, individual academic guidance (tutors) was sought from the Academic Learning Centre at the University of Manitoba, to improve my writing skills towards the successful completion of the final practicum document. The experience gained through the completion of coursework as part of the Master of Natural Resources Management program had substantially improved.

1.5.1.2 Communication skills

This is an important skill before and after the completion of the final product, since interest had to be built among the interested parties. Through clear and concise communication, the value of the final product was translated towards the interested party. In addition, this skill was essential for the promotion plan of this project.

1.5.1.3 Research

Like writing, there were substantial research-related tasks required before and during the project. The researcher retrieved and perused large amounts of scientific and grey literature documents that were required to complete the project's deliverables. The researcher learnt various strategies for using sources productively while not deliberating on aspects of a source from the Qualitative Methods course as a core requirement of this master's program.

1.5.1.4 Analytical skills

Like writing, there were significant requirements for sound analysis skills before and during the project. The initial analysis was essential to create inclusion and exclusion based on the limited number of documents viewed from the scoping review. In addition, this skill area was used to analyze the findings from reviews and interviews. The Qualitative Methods Course was vital in the improvement of my analytical skills.

1.5.2 Resource Needs Assessment (Skills and Knowledge):

The project required various skills and knowledge for the completion of the objectives and deliverables towards the acknowledgement of the project sponsor/partner. As outlined in the skills and knowledge resource needs assessment, all skills and knowledge required are held by the project team; namely; Ashley Adams, Dr Gary Stern, Dr John Sinclair, Dr Glen Hostetter and Bernie Aggark, therefore no additional individuals/firms were required.

1.5.3 Resource Needs and Procurement Plan (Materials, Supplies and Equipment):

Due to the desk-based nature of the project activities, which included research and document review, the use of a computer was essential in the completion of the objectives. Based on resource material,

supplies and equipment resource needs assessment, most of the project was executed on a personal computer which was held by the researcher. Additional resources included internet connection and student access to the University of Manitoba's libraries for research, a personal laptop with key programs such as Microsoft Word, Microsoft Excel, Google Translate and PDF Book Translate internet connection, zoom meetings and cellular phone. These digital resources were owned by the researcher.

1.6 MANAGING RELATIONSHIPS

Concise and frequent communication were crucial to relationships between the researcher and the interested parties. The relationship between the researcher and the interested parties was essential to the completion of the project. The project advisor required that the quality of the final product was compatible with the standards of the Master's practicum.

The community of Chesterfield Inlet and the Project Partner hope that the potential opportunities of this product considered the existing financial and technical scope of Canadian Arctic Communities. This project may result in a possible change in perspectives regarding the role of the government in oil spill response since it may have to allocate more resources for overseeing this new approach. The interested parties who can improve the project's outcomes would be the project partner, project advisor, and the interested parties.

1.6.1 Managing Relationships - Planning Elements:

Table 4: Internal Interested Parties Register.

Interested Party	Purposes	Mechanism and Fitness	Timing	Responsibility
Dr Gary Stern (Project Partner)	<ul style="list-style-type: none"> Validation of the product in correlation to the work done by GENICE. Main lead of GENICE II project. 	<ul style="list-style-type: none"> Remote means of communication through Zoom meetings and emails before and after the project's implementation. Shared the revised final documents. 	<ul style="list-style-type: none"> Following the acknowledgement by the Research Committee the Researcher will submit the finalized project product. 	Project Partner
Dr John Sinclair (Project Advisor and Academic)	<ul style="list-style-type: none"> Expert guidance about research and analysis. 	<ul style="list-style-type: none"> Remote means of communication through Zoom meetings and emails. 	<ul style="list-style-type: none"> These were carried out weekly. This should provide constant updates throughout the project. Before and after the creation of the project plan. 	Project Advisor
Dr Glen Hostetler Project Advisor	<ul style="list-style-type: none"> Expert guidance about research and analysis. 	<ul style="list-style-type: none"> Remote means of communication through Zoom meetings and emails. 	<ul style="list-style-type: none"> These were carried out weekly. Before and after the creation of the project plan. 	Project Advisor

<p>Chesterfield Community Knowledge holder- Barnie Aggark</p>	<ul style="list-style-type: none"> • Joint sharing of information and potential conduit to the community members. • Potential sharing of the opinions of the community members since the responsibilities and approaches during an oil spill may be affected. • Knowledge transfer about Chesterfield Inlet. 	<ul style="list-style-type: none"> • Remote means of communication through Zoom meetings and emails before and after the project's implementation. 	<ul style="list-style-type: none"> • Providing the acceptance of the project product by GENICE, it will be shared with the community oil spill committee. • Review the copy of the product and provide suggestions/recommendations. 	<p>Communication of views of community members.</p>
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1.6.2 Product/Service Promotion Plan:

Table 5: The Product/Service Promotion Plan.

<p><u>What is the overall Goal of the Project?</u> The overall goal of this project was to create a series of policy briefing notes to inform policymakers on approaches that were implemented at the local level by various Arctic jurisdictions to enhance community involvement oil spill preparedness and response.</p>
<p><u>Why the Promotion Plan is Needed – What is it intended to achieve?</u></p> <ul style="list-style-type: none"> • The promotion plan was needed to generate awareness of various approaches to community engagement aspects of oil spill preparedness and response. • A promotion plan was needed for the project to reach the right audience and raise awareness of the existence of the policy briefing notes. • The promotion plan ensured that the project was able to reach the widest possible audience and ensure that its message had resonated with its intended audience.
<p><u>Intended Audience (s)</u> Partner (GENICE II lead)- Dr Gary Stern Chesterfield Inlet Community Knowledge Holder- Barnie Aggark</p>
<p><u>Key Messages</u> There has been an increase in traffic in Arctic regions, due to shipping routes and the pursuit of resource extraction, thereby increasing the likelihood of marine oil spill.</p> <ul style="list-style-type: none"> • Community involvement in spill response in the Canadian Arctic region is limited despite the distribution of Arctic community packs of response equipment.

- Approximately ten per cent of oil is recovered by beach cleanups due to the preference for beach-top mechanical oil spill cleanup techniques.
- Updated oil spill preparedness and response plans need to be developed for Arctic communities.

Communication Vehicles

1. University of Manitoba Research Committee-product, Scientific conference proceedings.
2. Chesterfield Inlet-Electronic versions of the Product
3. General Public
 - Social media platforms - This is quite easy to reach many people. It can also serve as a networking platform for stakeholders. In addition, posters and YouTube videos will also be utilized to promote key aspects of the project.
 - Scientific conference proceedings- This is quite useful to announce the findings and gain support from the scientific community and among academia and the public at large.
 - Publish journal articles based on research activities and referencing the project's project - reviewed journal submission on research and findings.

Timing concerning project stage or activities.

This will be done following the revision and completion of the final product.

Other?

1.7 RISK MANAGEMENT

This risk management plan consisted of a comprehensive list of potential risks associated with this project. These risks were identified through multiple brainstorming sessions and discussions between the project advisors and the researcher. The project activities, schedule and associated deliverables were assessed to identify risks.

The identified risks were listed in a ‘Probability and Impact Matrix’ where risk probability and impact were graded/scored according to the relevant scale to identify the most significant risks to the project. The risks were then arranged from highest to lowest probability to highlight the most significant risks in a Risk Register, which was used to monitor risks throughout the project cycle by the researcher. This risk management plan consisted of a risk response plan which was centered on response actions for the risks that may have a high probability score due to the potential adverse effect to the project.

In completing the objective, the following risks have been identified that may negatively impact the project.

- Access to reliable information: Due to the remote location of the Canadian Arctic Communities, there was minor difficulty in accessing reliable information (They were reports for Canada’s ship source oil spill regime that were released one to two years after they were developed for instance).
- Balancing brevity and completeness: The summarized nature of the product may overlook aspects of the individual case studies. One of the strengths of the policy briefing notes is the conciseness (brevity) of the content.

Table 6: Risk register for this project.

Risk	Response Strategy	Response Details
Balancing brevity and completeness	Avoid and mitigate.	Conducted an initial review of fifty articles to outline the key parameters of inclusion, rejection, and explanations. Based on the recommendations of the advisor, more robust inclusion criteria were created that were based on all sources of bias. Should there be biases such as language bias, resource and scope allocations done.
Access to reliable information	Mitigate and accept.	Before the initiation of the project, all aspects of the project and appropriate were discussed. The suggested changes were discussed and implemented so that the project was not significantly constrained.

1.8 QUALITY MANAGEMENT PLAN

Project Name: Developing a series of policy briefing notes to encourage robust spill preparedness and response planning in Chesterfield Inlet in Canada's Eastern Arctic.

1.8.1 Quality Standards, Regulations and Commitments

The following Quality Management Plan was the result of detailed discussions from several meetings with the advisor and the project sponsor. This was done to clearly outline the expectations and quality requirements so that the project procedure and product are of the highest quality. This was done towards the acknowledgement of the interested parties. The related activities and deliverables have been through comprehensive analysis to determine the activities with uncertainty in them towards identifying potential risks. There has been a relative scarcity of external (international) standards that are for projects of this nature. The researcher utilized a combination of the Food and Agriculture Organization of the United Nations (FAO) guidelines and the Canadian Government's guidelines for writing policy briefing notes.

Quality Planning: Quality standards have been defined for the deliverables of the project and quality assurance measures to guarantee those standards are met. These standards were based on the Food and Agriculture Organization of the United Nations (FAO) and the Canadian Government's guidelines for writing policy briefs.

Quality Control: The series of policy briefing notes were reviewed for accuracy, completeness, and consistency. These policy briefing notes were reviewed so that the core elements are organized correctly and have minimal errors.

1.8.2 Most Significant Risks to Quality:

The following key areas were sources of risk that could have hindered the successful completion of the project.

1. The quality of the first literature review informed the creation of the inclusion criteria.
2. The quality of the required material for the reviews.

1.8.3 Quality Management Procedures:

The researcher enrolled in the University of Manitoba's Research Integrity and Academic Integrity courses to maintain the quality of the project's activities.

1. **Research Quality-** Project activities that focused on the review and analysis of documents were carried out under the University of Manitoba's research and academic integrity guidelines. The following steps were taken to maintain research quality:
 - Followed the University of Manitoba's research and academic integrity guidelines to maintain quality throughout the individual aspects of the project such as the procedure and the structure of the deliverables. Researcher.
 - Translation software was identified to reduce the risk of language bias. Researcher and Academic advisor.
 - Ensured that the methodology is repeatable to maintain validity. Researcher and advisor
 - Ensured that the advisor simulated the procedure to further maintain internal validity. Researcher.
2. **Product Quality -** The researcher, with the recommendation of the project advisor, utilized guidelines that informed the structure and design of the product that is of the highest quality. The researcher utilized the guidelines for the practicum from the University of Manitoba so that the project's product and the procedure were developed in a manner that was likened to the rigour of a master's thesis.

1.8.4 Roles and Responsibilities:

- Researcher - The researcher ensured adherence to quality requirements from the key stakeholders, advisors, institution (University of Manitoba) and the Project Partner. The execution of quality management processes was led by the researcher.
- Project advisor (academic advisor) - The project advisor was integral for ensuring that the project and the product were done with the utmost quality by identifying areas where quality was maintained. In addition, the project advisor provided recommendations for addressing quality barriers. The project advisor evaluated the methodology and other key components of the project. The project advisor provided documents/guidelines that can be adopted to improve and evaluate the quality of the key components of the project.
- The Project Partner outlined their quality requirements and expectations for the project and deliverables.
- The role of the GENICE II research project (team) was to outline their quality expectations through verbal guidelines (publications on their website or articles). This clearly defined the extent of the rigour, transparency and accountability required in the procedure of the project to create the product.

Attendance and Meeting Date:

Attendees: _____

Date:

1.9 CHANGE MANAGEMENT PLAN

To ensure the completion of this project regardless of change, a change management plan was developed. This included an evaluation of various components that have been evaluated based on the risks identified. Calculations were done to predict the likelihood of the risk and the magnitude of these risks. Corrective actions and mitigating measures were identified through an assessment of the literature and brainstorming with the project advisor. The change management plan outlined the decision-making process around changes such as accepting or denying requests, mitigation, management, and monitoring. The most probable factors that have resulted in significant change in the project were as follows:

- Mental burnout had significantly affected the project activities which led to extensions and delays in project activities.

1.9.1 Change management procedures.

1. The most significant risks were identified in the Risk Management Plan.
 - a) The risk response plan was consulted to address the most significant risks that may occur. Risk acceptance was discussed to acknowledge and implement the required changes and the potential outcomes.
 - b) Progression with the project was determined by the researcher and the project advisor(s) and future timelines were evaluated to determine if any future changes will result from the current change.
2. Risks to the quality of the project as described in the Quality Management Plan.
 - a) Quality management was essential to the completion of this project and risks to quality were identified in the Quality Management plan. They have been thoroughly analyzed and addressed so quality was not compromised.
3. Project activities that resulted in changes to project objectives and deliverables were as follows.
 - b) The Change in emphasis in the Document Review from local to an expanded focus that consisted of national and local oil spill response plans had significantly changed the procedure and the outcome of this activity.
4. Project changes resulting in project ending way beyond the original end date.
 - a) The Change in emphasis in the Document Review from local to an expanded focus that consisted of national and local oil spill response plans resulted in the extension of the project's activities and later pushed back the completion of the project by approximately four months. This significantly changed the procedure and outcome of this activity.

1.9.1.1 If the change is accepted and proceeds:

1. All recommended changes to the project were reviewed by the researcher, project advisor and the sponsoring agency (Chesterfield Inlet) before the denial, acceptance or the integration of change.
2. Accepted changes were recorded in the dedicated section of the project charter.
3. Changes and the reasons for changes were communicated to the interested parties through emails.

1.9.1.2 Change Documentation and Meetings:

1. Significant changes to the project that affected the schedule, budget, and resource needs were documented in the Project Charter with the meeting date.
2. Any other documents included in this project plan that were affected by the change were updated to reflect approved changes.
3. Minor changes which did not affect the schedule, and the budget were communicated through emails to affected individuals once determined necessary.
4. A project Change Log was created specifically for this project for the documentation of all changes (significant and minor) and was accessible by the Researcher and sponsor agency.

1.9.1.3 Change History

Table 7: Change log.

Change made	Reason for change	Date change made and approved
Community engagement project to the amendment proposal	Advisor recommendation	October 10 th 2022
Amendment proposal to policy brief.	Advisor recommendation and research.	October 23 rd , 2022,
Change of emphasis towards the community engagement aspect of oil spill preparedness and response.	Advisor recommendation, substantial interest in the area and further research observations.	June 22 nd 2023
Change from creating one policy briefing note to a series of policy briefing notes.	Advisor and researcher agreement due to large amount of recommendation areas identified from the Document Review.	August 18 th 2024

1.10 PROJECT PROPOSAL APPENDICES

1.10.1 BACKGROUND INFORMATION REPORT

1.10.1.1 Introduction

This project consisted of the development of a series of policy briefing notes as a communication document to enhance community involvement in the development of oil spill preparedness and response plans, using Chesterfield Inlet as an example but can be applied across other communities. A document of the various approaches towards the development of oil spill preparedness and response plans for the countries in the Arctic Council was done. The deliverables of the project provided information and outlined specific recommendations for the community of Chesterfield Inlet in the Kivalliq Region, Nunavut.

1.10.2 The Changing Canadian Arctic Climate

The rate of anthropogenic climate change has increased exponentially due to the burning of fossil fuels and the removal of naturally occurring carbon sinks, and as a result, the global average temperature has been increasing. This increase exasperates the rate of warming in Arctic and Antarctic regions thereby leading to increased accessibility and greater potential for oil spills from shipping accidents (transport) and extraction. The potential impact of the changing Arctic conditions and the development of the shipping industry has garnered significant attention (e.g. Pizzolato et al., 2014). The source of this increased attention can be derived from the potential for resource exploitation and newer shipping routes (Dawson et al., 2018). As the rate of ice melt increases, the potential for shipping activities increases (Afenyo et al., 2022).

1.10.3 Increased Shipping in The Arctic

Shipping traffic in the Canadian Arctic has undergone significant changes over the last few decades. As highlighted by Dawson et al., (2018:24) the total shipping distance travelled had tripled between 1990 and 2015. As observed by (Cropland, 2019:51) there was a shift towards vessels that had strengthened lower hulls in addition to the categories of pleasure craft, bulk carriers, and passenger ships that traverse through Arctic waters. The importance of preparation for increased economic development in the Arctic has been proposed in the literature for example (Afenyo et al., 2019; Afenyo et al., 2022; Carter et al., 2019). Marine areas are of great significance to Indigenous peoples who live near these regions. As shipping traffic increases, more shipping traffic overlaps occur in marine areas Indigenous people rely on for subsistence. This was identified in the findings of a study conducted by (Carter et al., 2019:9) which stated that the “marine areas that were most significant to the livelihoods and subsistence of communities were either located near or had overlapped with areas of increased shipping traffic”. These overlaps increase the risks and probability of events occurring with approximately forty-six reported Arctic incidents in 2018 according to (Allianz Global Corporation and Specialty, 2019).

1.10.4 Canada’s Approach to Increased Shipping Traffic in The Arctic.

1.10.4.1 Monitoring

The Government of Canada has been actively monitoring ships in Canadian waters to help prevent pollution in coastal regions (and oceans) due to the potential long-term adverse economic and environmental impacts of oil spills. From 2010 to 2020, the total volume of marine pollution spills detected annually varied between 1014 and 9296 litres as illustrated in Figure 1 below by (Environment and Climate Change Canada, 2021). The spills are monitored by aerial surveillance.

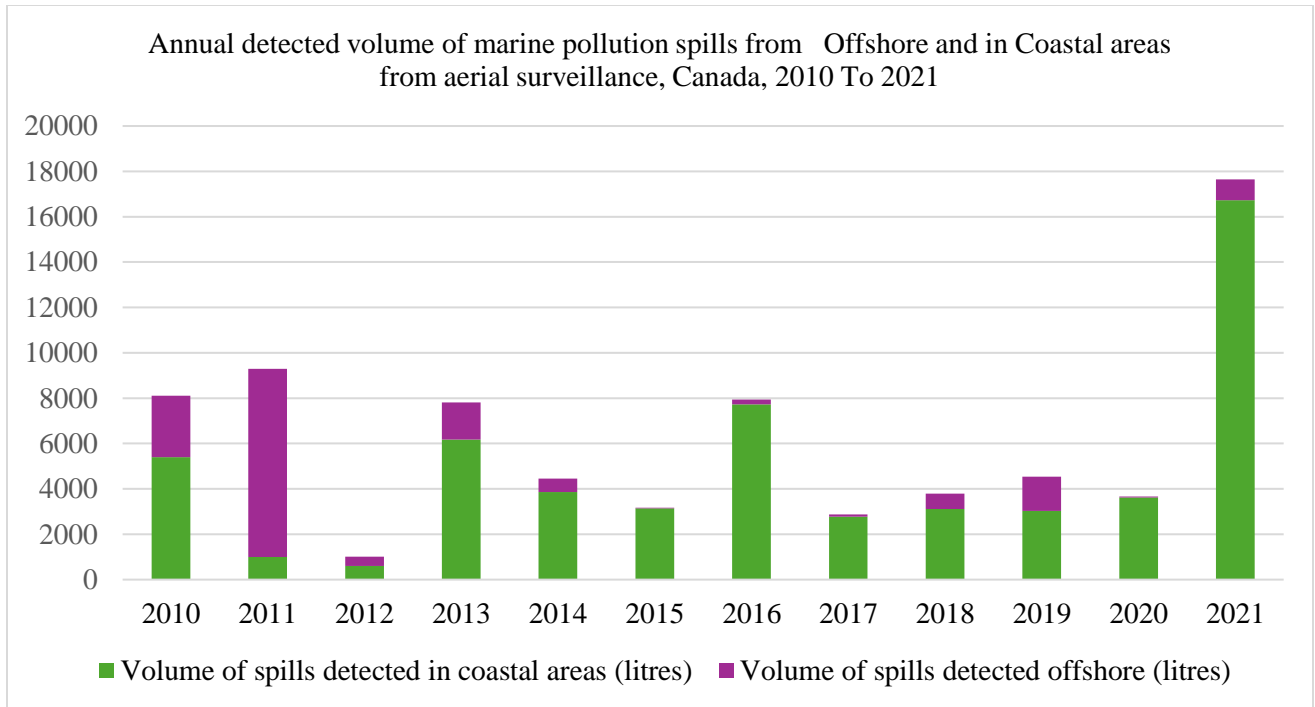


Figure 1: Annual detected volume of marine pollution spills from offshore and in coastal areas from Aerial surveillance (Environment and Climate Change Canada, 2021).

1.10.4.2 Low Impact Corridors

To help reduce spills and control their location the Government of Canada has been developing a network of low-impact marine transportation corridors in the Arctic as an approach to encourage marine transport to use routes that may pose less risk and reduce impact on the surrounding environment. Refer to

Figure 2 below for an illustrated example of a low-impact corridor from (Carter et al., 2019).

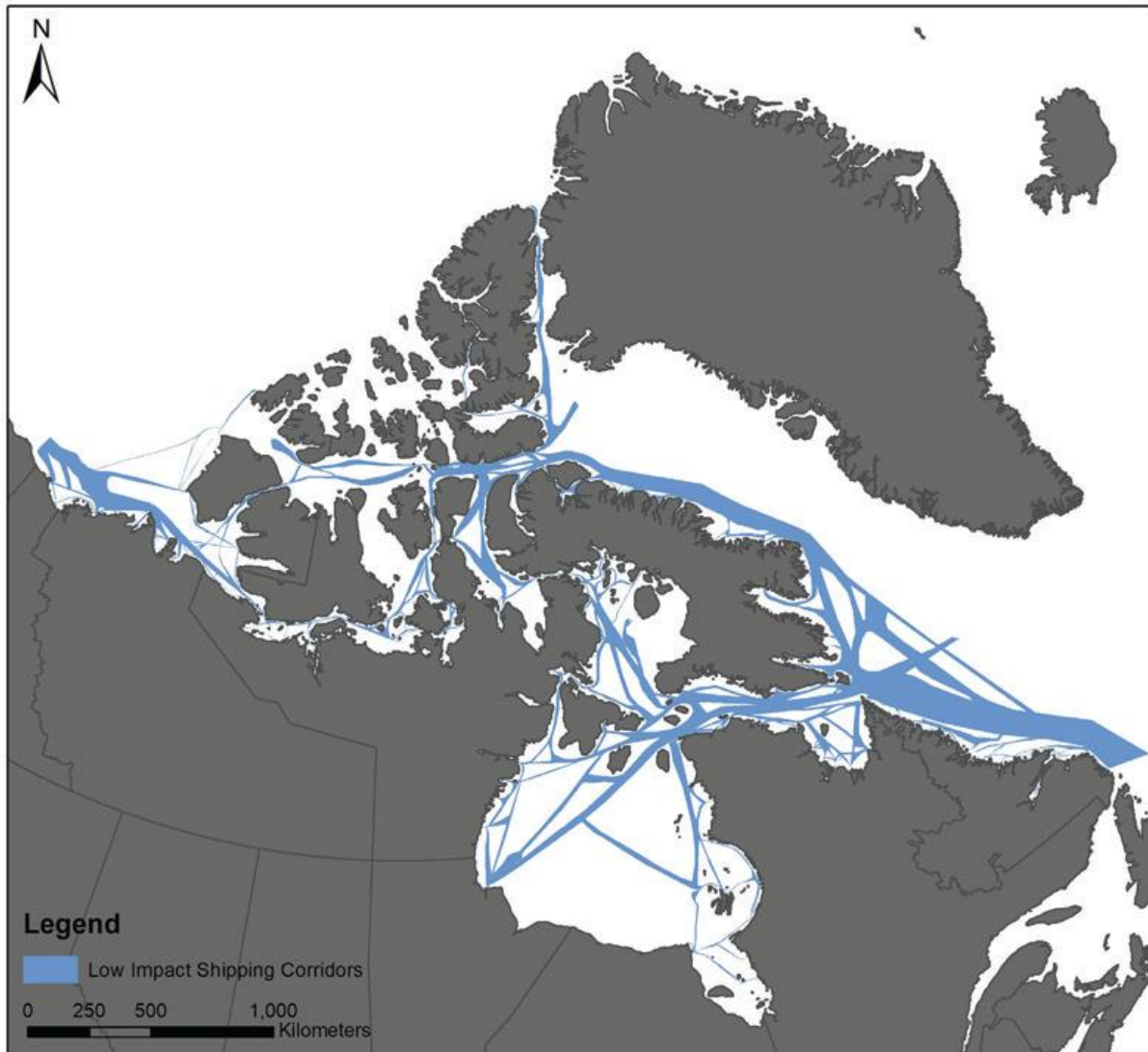


Figure 2: Low Impact Shipping Corridors (Carter et al., 2019:6).

The Low Impact Shipping Corridors served as a framework to inform later government investments that will support marine navigation safety in the North through enhanced charting and increased hydrography in collaboration with community members. The corridors initiative was co-led by the Canadian Coast Guard, Transport Canada and the Canadian Hydrographic Service.

1.10.5 Canada's Approach to Ship Source Oil Spills

The International Marine Organization conventions provided an international framework for ship-source oil spill preparedness and response regimes. Canada's approach to ship source oil spills comprises three key elements (based on various International Marine Organization) which are illustrated in Figure 3 below as established by (Transport Canada, 2013).

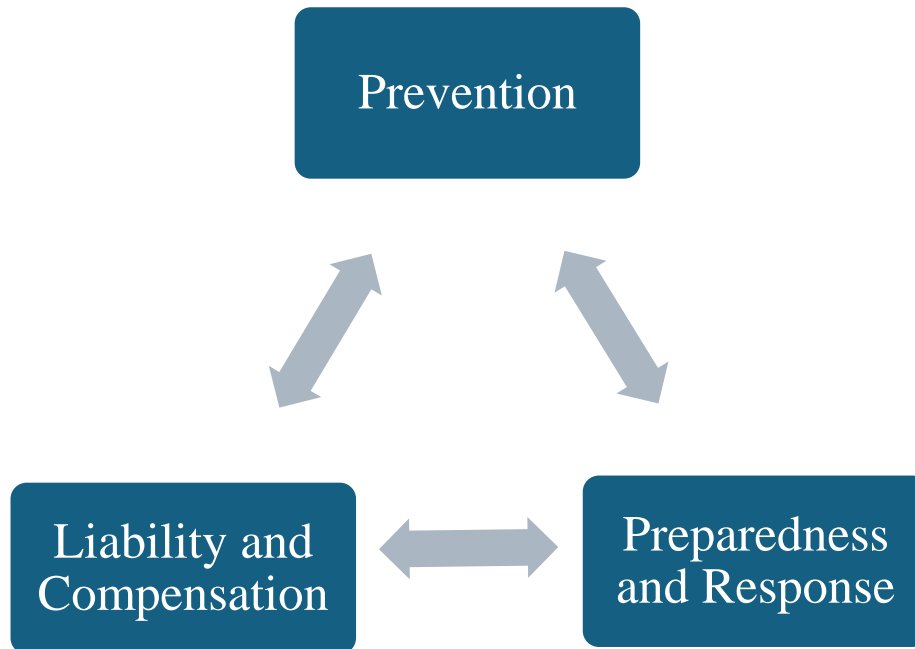


Figure 3: Core principles of Canada’s Approach to Oil Spills adapted from (Transport Canada, 2013).

- Prevention: consists of a collection of legislative and regulatory frameworks that govern tanker and vessel safety such as construction standards, crew certification, inspections, navigation, vessel traffic management, pilotage, as well as surveillance and monitoring.
- Preparedness and Response: consists of an array of regulatory instruments that have been established to maintain the preparedness and response capacity such as oversight of compliance monitoring, oil handling facilities’ regulations and federal agencies' obligations.
- Liability and Compensation: the multi-tiered international and domestic framework for liability and compensation should an oil spill occur.

Canada’s Ship-source Oil Spill Preparedness and Response Regime is the overarching framework for the preparedness to respond to ship-source oil spills in the Canadian marine environment south of the 60th parallel. Following international developments and sectoral collaborations, a regime was developed based on a public-industry partnership. The regime follows the polluter pays principle whereby the industry (firm transporting the product) was identified as the creator (source) of the risk, the liable and responsible party. They are deemed responsible for the first response to marine incidents in Canadian waters and are responsible for the operational elements of the Regime. The Canadian Coast Guard oversees the private sector’s (industry) response to spills. Response Organizations are required under the legislation to maintain their preparedness capacity to adequately respond to spills of approximately 10,000 tonnes within proposed time standards and operating environments. Response Organizations are mainly responsible for providing coverage to all Canadian environments located south of the 60th parallel (60° N latitude) (Transport Canada, 2019). Figure 4 below outlines a general framework of spill response in Canada. Figure 4 below illustrates a general framework of spill response in Canada.

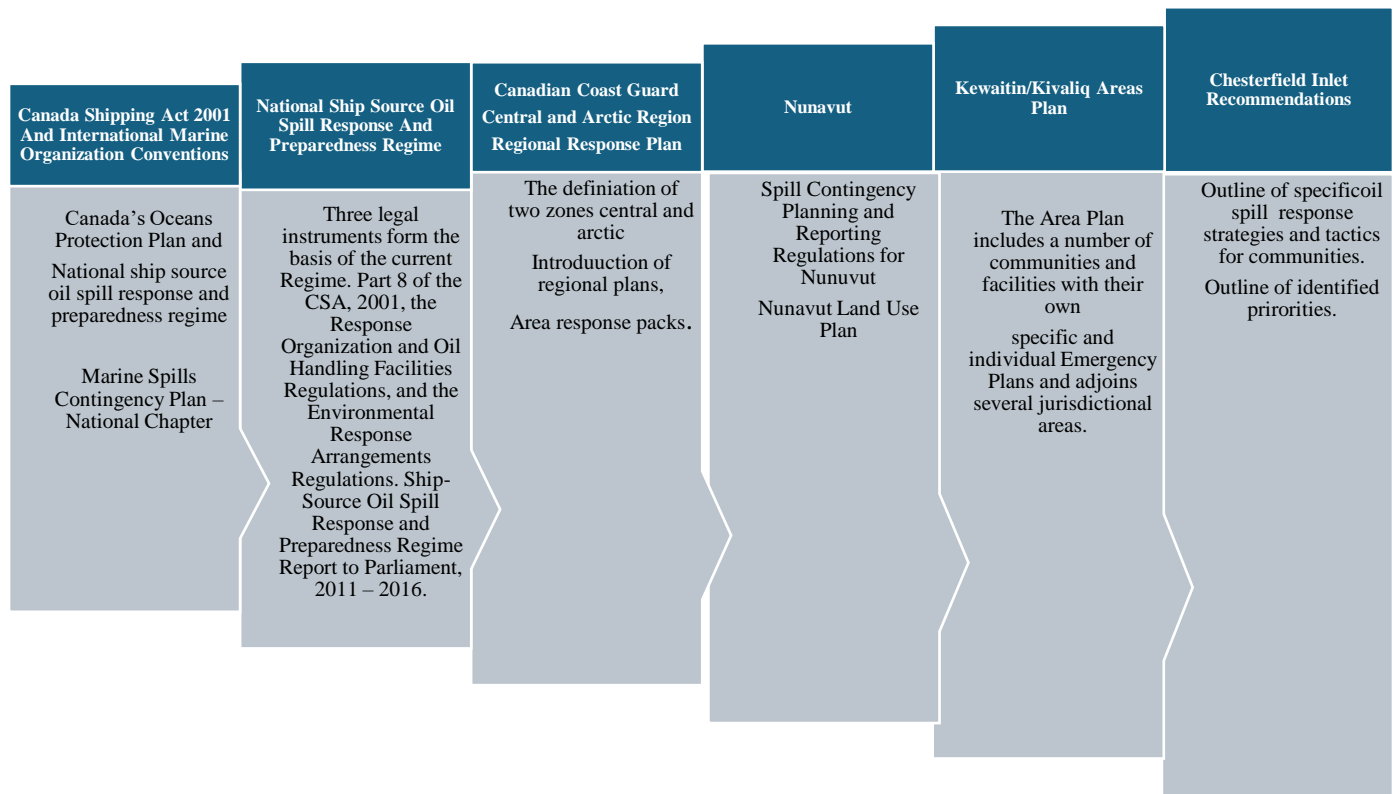


Figure 4: General framework of regulations regarding oil spill preparedness and response in the Canadian Arctic.

The Arctic is a complex environment regarding oil spill preparedness and response due to the climate, remoteness, and limited support infrastructure (Transport Canada, 2019). To operate in Canada, prescribed vessels and oil handling facilities are required to have an arrangement with a Response Organization as set out in the legislation, but this does not apply in Arctic waters.

1.10.5.1 Canadian Coast Guard's Role

The Canadian Coast Guard on behalf of the Minister of the Department of Fisheries and Oceans is the operational arm of the Government of Canada (Canadian Coast Guard, 2018). They ensure that there is an appropriate response to ship source and mystery source pollution incidents in Canadian waters (Canadian Coast Guard., 2018). As such, the Coast Guard fulfils a key component of Canada's marine pollution response capacity (Canadian Coast Guard., 2018).

According to the Canadian Coast Guard Marine Spills Contingency Plan (2018) the Response and Preparedness are managed by the following:

- National Strategies Directorate
- Operational Directorate
- National Environmental Response Program Office

The Canadian Coast Guard may apply the Incident Command System as the standard response methodology for all marine pollution incidents and respond as the Incident Commander for the Federal government (Canadian Coast Guard, 2018). A unified command or a single command structure may be

established based on the nature, scope, and complexity of the incident (Canadian Coast Guard, 2018). This incorporates the incident commanders of all mandated agencies to execute an effective response to incidents (Canadian Coast Guard, 2018).

1.10.5.2 Environment and Climate Change Canada

Environment and Climate Change Canada is the federal authority for technical advice during a marine oil spill incident (Canadian Coast Guard, 2018). Environment and Climate Change Canada normally chairs the Science Table which is responsible for providing consolidated environmental advice during response operations such as weather forecasts, information on the physical operating environment, spill movement and trajectory forecasts, appropriate response strategies, the location of sensitive areas, approving the use of spill treating agents and cleanup techniques (Canadian Coast Guard, 2018). Environment Canada’s main responsibility is to provide advice received from Regional Environmental Emergencies Teams and by providing expert advice on potential risks and ecologically sensitive areas as well as key physical, biological, and cultural resources (Chen et al., 2019).

1.10.5.2.1 Regional Environmental Emergency Response Team

The Regional Environmental Emergency Response Team is an arms-length organisation chaired by Environment and Climate Change Canada (Batten, 1990). The Regional Environmental Emergency Response Team’s primary role is to validate priorities and advise their respective Command representatives, such as the Provincial Incident Command or Federal Monitoring Officer (Blight, 2004).

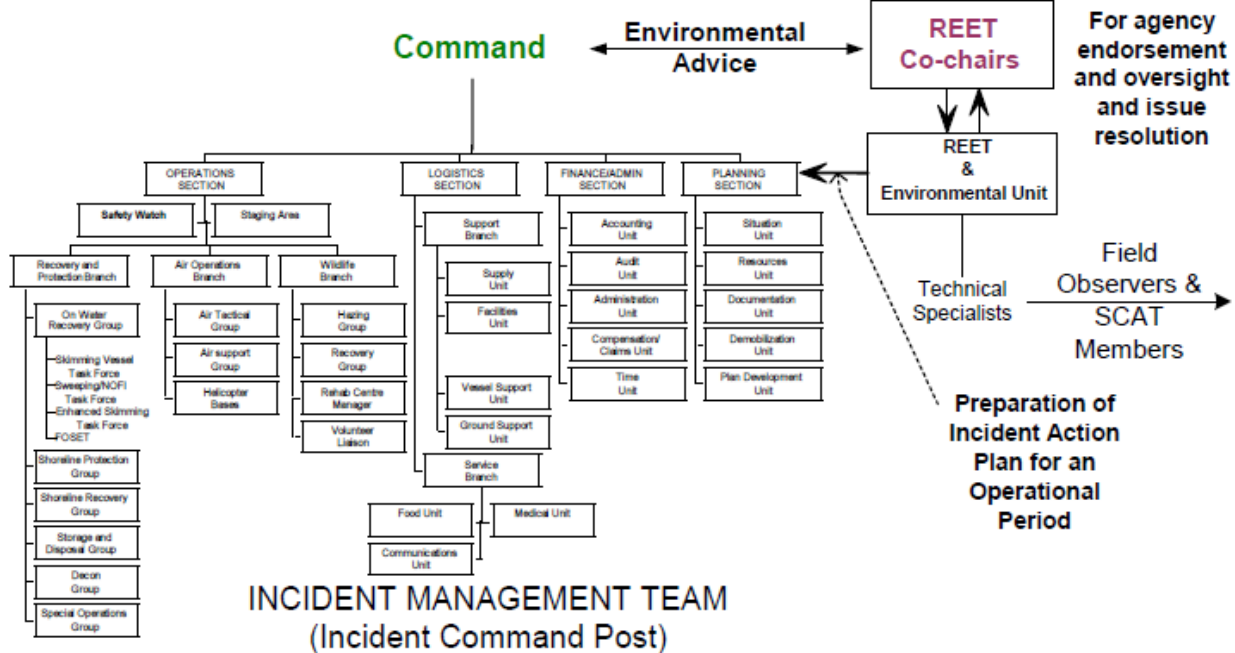


Figure 5: The Regional Environmental Emergency Response Team Organizational Relationship, including the role of field observers and Shoreline Cleanup and Assessment Team (SCAT) members (Blight, 2004:4).

The Regional Environmental Emergency Response Team, in both a governance and technical role, establishes performance standards and quality assurance regarding personnel selection, analyzing, gathering, and interpreting any ensuring that stakeholders with a legitimate interest in the spill impacts and response measures are included in the process (Blight, 2004). The members of the Regional Environmental Emergency Team, through the group’s co-chairs, provide environmental advice to spill response managers and identify issues that may need to be resolved (Blight, 2004).

1.10.5.2.2 Federal Roles of Regional Environmental Emergency Response Teams

The Regional Environmental Emergency Team is activated during moderate to major spills, and its regional and local experts provide advice on species, habitats, and shores at risk and environmental protection priorities directly to the Canadian Coast Guard's Federal Monitoring Officer (Blight, 2004). Although not formally part of an Incident Command System structure, REET works in conjunction with the Environmental Unit of an ICS Planning Section, with members of each team often being the same people.

1.11 CANADIAN COAST GUARD MARINE SPILLS CONTINGENCY PLAN 2018

The Marine Spills Contingency Plan outlines the framework of the operational scope of the Canadian Coast Guard during an incident (Canadian Coast Guard, 2018). It outlines the framework for how the agency operates while acting as the lead or an assisting agency during a spill incident. It also outlines the agency response management tactically, regionally, and nationally (Canadian Coast Guard, 2018).

1.11.1 Geographic Scope of The Canadian Coast Guard Regions

The Canadian Coast Guard Regions is responsible for the management of three areas which include:

- Western: consists of all Canadian waters on the West Coast of Canada out to the outer limit of the Executive Economic Zone and the internal waters of British Columbia, The Yukon Territory, The Northwest Territories, Alberta, Saskatchewan, and Manitoba (Canadian Coast Guard, 2018).
- Central and Arctic: consists of all Arctic waters from the Alaska-Yukon boundary east to the Nunavut-Greenland boundary out to the outer limit of the Exclusive Economic Zone, Hudson and James Bays, the Great Lakes, the St Lawrence River and the internal waters of Ontario and Quebec (Canadian Coast Guard, 2018).
- Atlantic: consists of all Canadian waters from the maritime border between Quebec and Newfoundland and Labrador, New Brunswick, Prince Edward Island and Nova Scotia to the United States of America Border (Canadian Coast Guard, 2018).

These three Canadian Coast Guard geographic areas are depicted in Figure 6 below.



Figure 6: Canadian Coast Guard geographic areas (Canadian Coast Guard Marine Spill Contingency Plan, 2018:5).

1.12 CANADIAN COAST GUARD'S CENTRAL AND ARCTIC REGIONAL RESPONSE PLAN 2008

The Canadian Coast Guard's Central and Arctic Regional Response Plan is authorized under the National Response Plan of the Canadian Coast Guard National Response Strategy. This plan serves to inform the Canadian Coast Guard and related stakeholders involved in marine spill response. It outlines the regional application of various roles of the scene Commander (responsible for active response), Federal Monitoring Officer (ensures that the responsible party/polluter fulfils their obligation) and Resource Agency (aids the lead agencies). The Canadian Coast Guard's Central & Arctic Region Response Plan (2008) describes the main base of operations with Environmental Response-dedicated personnel in Hay River, Northwest Territories. It also contains detailed information and tasks that are important to oil spill response in the Central and Arctic Regions). According to the plan the Central Arctic and Arctic Region in the case of marine pollution is defined geographically as:

- 'The contiguous waters of the Canadian Arctic (North of 60° Latitude) to the limits of the International Boundary, which includes the North Slope Area of the Yukon Territories, the internal waters of the Northwest Territories, the Territory of Nunavut; in addition to the waterways contained within the provinces of Alberta, Saskatchewan, Manitoba, Ontario and a western origin of Quebec beginning at the east wall of the Beauharnois Lock in the St Lawrence River'. (See Figure 7 below of a map of the Central and Arctic Region by Fisheries and Oceans) Canadian Coast Guard Central and Arctic Region Regional Response Plan.



Figure 7: Central and Arctic Region by Fisheries and Oceans (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008:1/2).

1.12.1 Linkages to the National Response Plan

The guiding principles and mandate (which includes interdepartmental, legislative, intergovernmental, and internal agreements) as well as the designation of Lead and Resource Agency roles are contained in the National Response Plan Sec 1 - Introduction. The mechanism for enacting the Environmental Response National Response Team is also defined in the National Response Plan. The Structure of the Regional Response Plan regarding preparedness and response indicates the following:

- Preparedness - The approach towards preparedness focuses on state readiness, personnel readiness, and technical preparedness under the guidance of site-specific response strategies. This consists of the regional application of Contingency Planning (which creates site-specific response strategies), Training, Material procurement and management.
- Response - approach for response operations consists of identifying mechanisms for initiating (through a resolute Duty Officer and Assessment process), Sustaining (Operational functions as Lead or Resource Agency), Controlling (using the Response Management System), Finalizing the response activity (decommissioning and reporting).

1.12.2 Linkages to the Other Response Plans in the Region.

In the event of a marine oil spill, the Canada Shipping Act is not the only legislation that applies. Recognizing that being designated Lead Agency for pollution response to mystery spills and spills from vessels does not preclude other agencies from competing for their mandate Canadian Coast Guard acknowledges that the internal and external partners listed in Sections 3.4 and 3.5 have plans that are active within the Central and Arctic Region.

1.12.2.1 International Joint Plans

- Canada-United States of America Joint Marine Pollution Contingency Plan
- Canada-Denmark Agreement for Co-operation Relating to the Marine Environment, Annex B (Joint Marine Contingency Plan concerning Incidents resulting from Shipping Activities)
- Great Lakes Water Quality Agreement, Annex 9
- International Boundary Waters Treaty Act

1.12.2.2 Preparedness

According to the Central and Arctic Regional Response Plan, preparedness is defined by the advanced planning used to create systems to tackle a range of likely spills effectively and efficiently. In the Central and Arctic Region, preparedness involves (See figure 8 below):

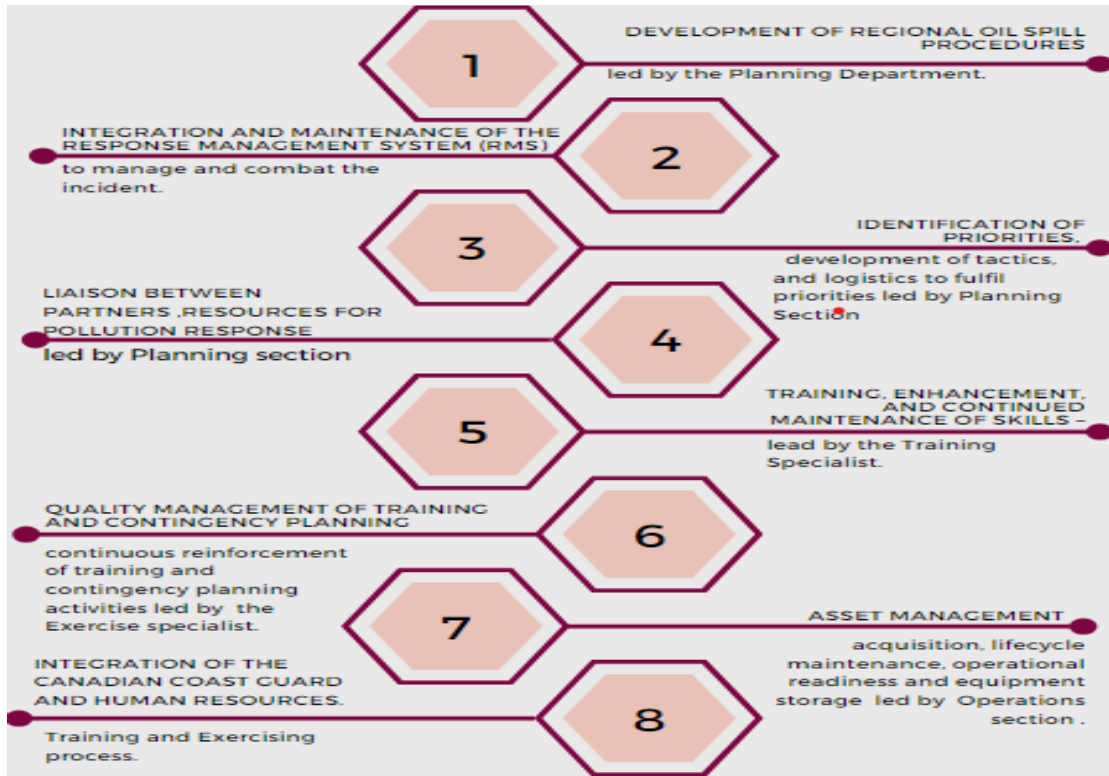


Figure 8: Phases of the Preparedness Section of the (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008:1/2).

1.12.2.3 Response Management System

The Canadian Coast Guard uses the Response Management System as its emergency management system (Canadian Coast Guard Central and Arctic Regional Response Plan, 2008). It operates under principles like the Incident Command System, which was developed in the United States of America to coordinate multi-agency responses to large-scale events (Canadian Coast Guard Central and Arctic Regional Response Plan, 2008). This system was adjusted to reflect the current marine oil spill response regime and Canadian law. The Integrated Technical Support system has not been integrated into a unified command by the Canadian Coast Guard, but it will be used as a command structure by the Polluter or Other Lead Agency.

The Response Management System utilizes an approach that outlines the roles and responsibilities of specific positions, identifies the reporting structure, establishes a common set of terminology, and uses standardized forms and paperwork. The Incident Action Plan documents the current conditions and outlines objectives, recovery, and response strategies in the Response Management Process. It is also the central document in the process. The system is designed to be flexible to fit the circumstances of the incident. Figure 9 highlights how the command structure is organized.

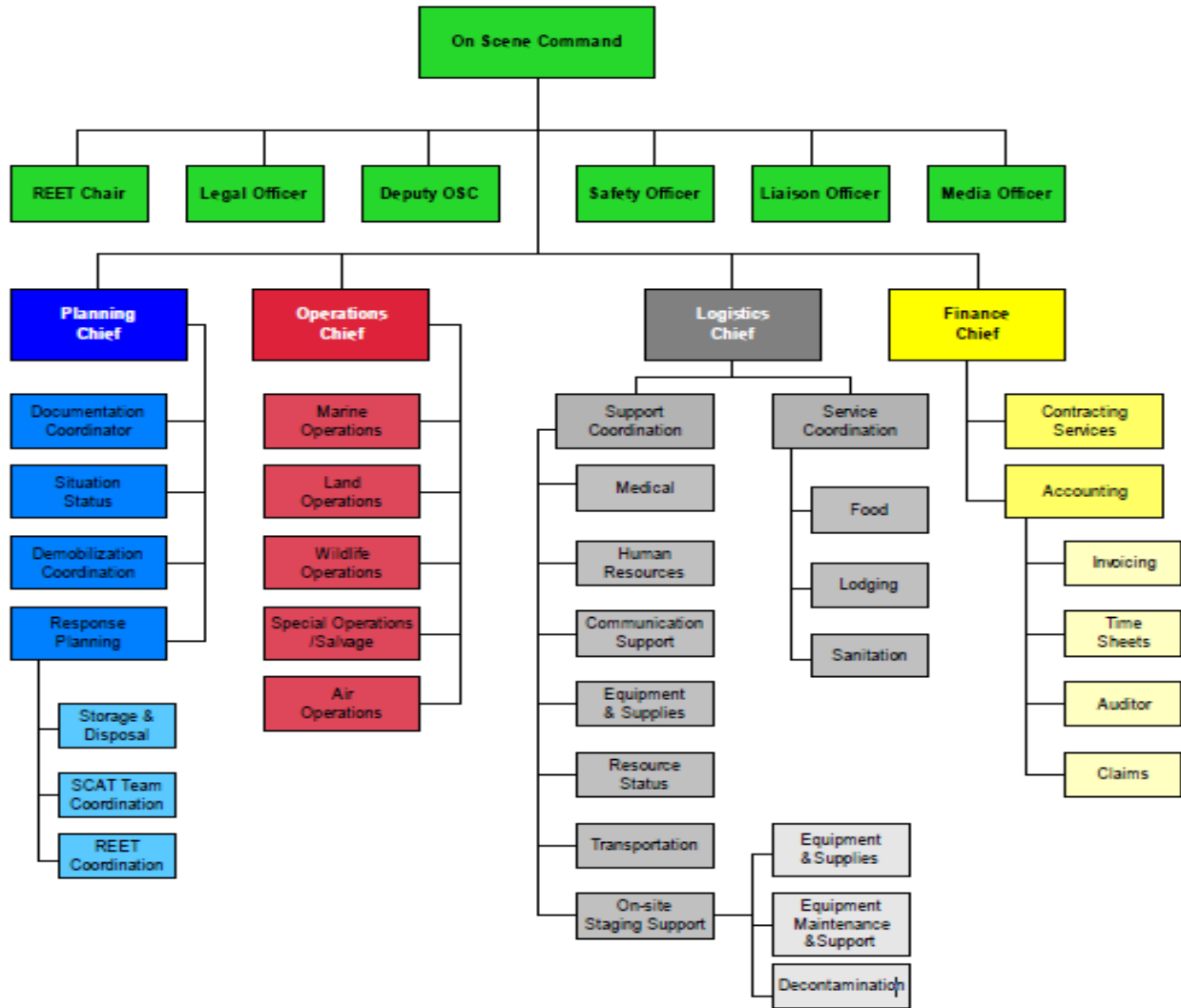


Figure 9: Canadian Coast Guard Response Management System Command Structure (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008:3/4).

The system also contains management tools that can be used by the On Scene Commander and response personnel to improve the management of the system and the spill event. These tools consist of a field operations guidebook, forms, reports, established meeting schedules and agendas. The Response Management System will also be used by the Federal Monitoring Officer and their Incident Monitoring Team while monitoring the Polluter’s response to an incident.

1.12.2.4 Planning

To facilitate an effective and efficient response. Canadian Coast Guard administers 16 area plans as an annex (addition) to the Central and Arctic Regional Response Plan. They are as follows: Keewatin, Baffin, Beaufort Sea and Amundsen Gulf, Great Slave Lake, Hudson Bay, James Bay, Kitikmeot, Mackenzie River and Delta, Inland Waters South of the 60°, Lake Erie, Lake Huron, Lake of the Woods, Lake Ontario, Lake Superior, St. Lawrence, St. Mary’s, and St. Clair and Detroit areas. These plans incorporate detailed response information for specific manageable geographic areas or response communities. The first 12-24 hours of a spill response is a general operating period for an area plan.

The development and maintenance of Area Plans are illustrated in Figure 10 below, adapted from the Canadian Coast Guard Central and Arctic Region Regional Response Plan (2008).

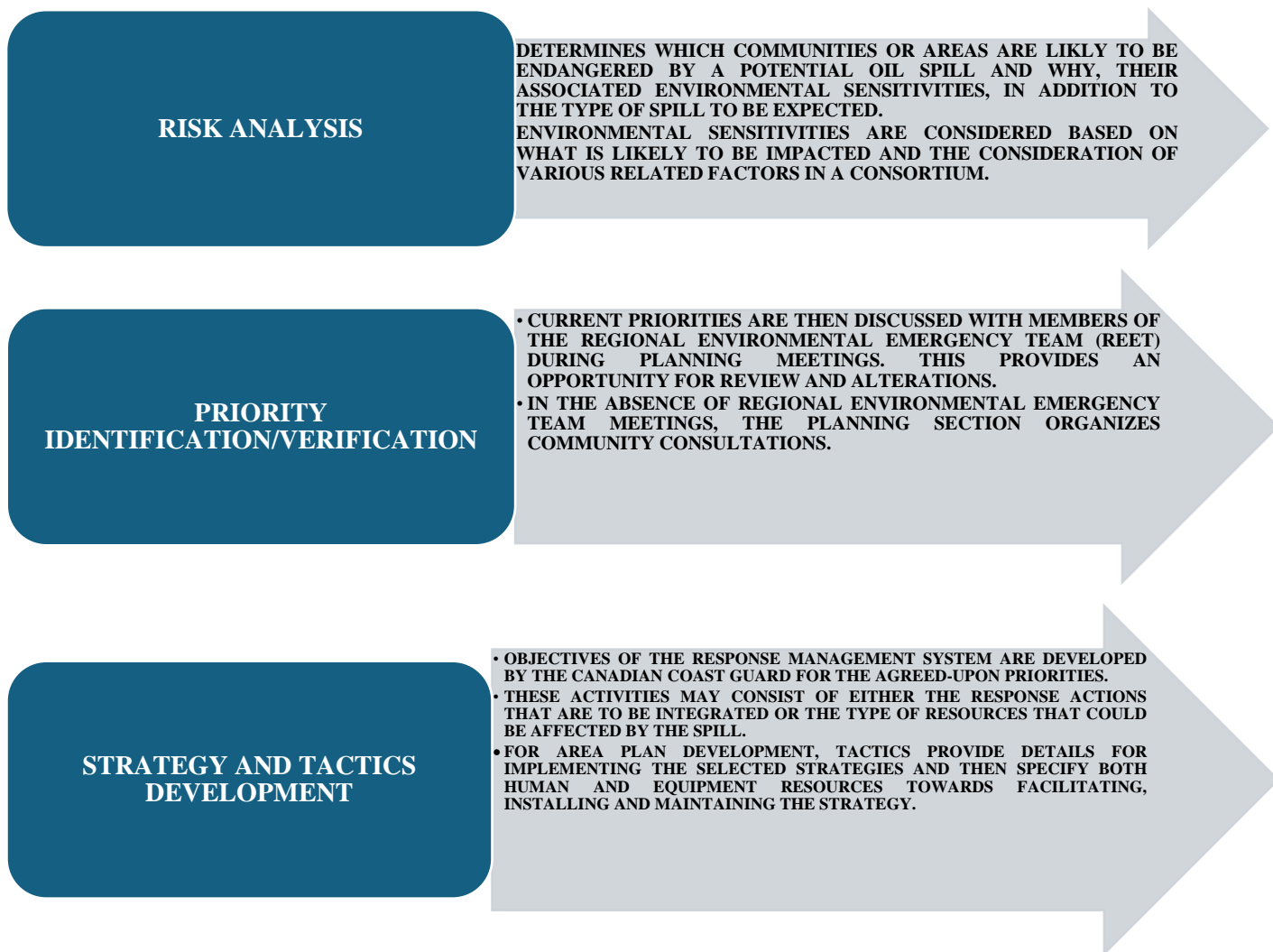


Figure 10: Process of developing and maintaining Area Plans adopted from the (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008).

1.12.2.5 Regional Procedure Development

The Central and Arctic Regional Response Plan of the Canadian Coast Guard National Response Plan provides a region-specific description of procedures such as notification, verification, activation, and cost recovery of a response. It should be noted that supporting information such as Standard Operating Procedures, Health Safety Plan and Media Relations Plan (supplementary plans) are not included in the Regional Response Plan but are referenced in Section 9 of the Canadian Coast Guard Central and Arctic Region Regional Response Plan (2008).

1.12.2.6 Arctic Community Emergency Plans

The Canadian Coast Guard is committed to assisting Arctic communities in the development of the marine pollution component of their Community Emergency Plans. This commitment was made in 1999 when the Canadian Coast Guard Arctic Response Strategy (ARS) was published. The Arctic Response Strategy has since been reassessed, and viable components have been incorporated into the text of this Plan.

1.12.2.7 *Inventory Management Maintenance and Infrastructure*

To ensure that a nationally consistent and effective state of preparedness is maintained, an Inventory Response Control and Management System (IRCMS) has been implemented which utilizes the Management Authority database as its main tool. Canadian Coast Guard administers this system in conjunction with regional Inventory Response Control and Management System Officials. In the Arctic region, the Logistics and Statistics Officer in the Operations Sections administers the program.

This system has been created to:

- Maintain an updated record of the quantity and location of resources.
- Maintain an appropriate state of readiness through an initiative-taking approach using work orders and preventative maintenance.
- Aid in keeping managers informed about Environmental Response's state of preparedness.
- Assist in the tracking of National Response Team personnel or equipment assigned to National or International incidents.

1.12.2.8 *Pre-positioned Equipment Caches and Depots*

The Central and Arctic Region covers an extremely large geographical and culturally diverse portion of Canada, therefore in essence they are different operating zones which are entrenched in the Canada Shipping Act. These are:

- The Arctic Zone or all areas of Canadian jurisdiction north of 60° North Latitude and
- The Central Zone is dominated in a marine transportation sense by the Great Lakes, but which include the southern portions of Hudson and James Bay along with the major waterways and watersheds of Lake Winnipeg, Winnipegosis, Lake of the Woods, and Lake Athabasca.
- The Environmental Response Branch has pre-positioned equipment to facilitate and maintain effective response operation. Response strategies in each of the two zones (Central or Arctic) are based upon the identification of local and regional responses. This means that the equipment required for such a spill size is contained within the region. The capacity is complemented by nationally available resources which would be distributed from/to other regions when required.

1.12.2.9 *Preparedness in the Arctic Zone*

Arctic Community Packs are placed in northern communities for rapid initial response, and these are meant to consist of booms, skimmers, boats, and open-top tank storage units (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). Figure 11 shows the community response storage containers at Chesterfield Inlet. The Canadian Coast Guard had provided initial response training to community members on the use of the response equipment should there be a spill (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008:15). Access keys are provided to a community official, and the holder listing is recorded by the Senior Response Officer (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008:15).



Figure 11: Community response packs at Chesterfield Inlet (courtesy of Glen Hostetter).

The equipment profiles at the existing Community Pack sites will be tailored by the Emergency Response planning group to reflect the characteristics and response strategies of the community. The main base of operations with Environmental Response resolute personnel is in Hay River Northwest Territories. This base is home to a Rapid Air Transportable (RAT) cache of equipment used in conjunction with planning standards for a 1000-tonne response. The selection of equipment must meet factors like pumping rates/capacities and be complementary to the equipment held in the depots. The response package, warehouse in Hay River, is maintained in full readiness during the shipping season. The equipment is broken down and packaged in containers so that it can be transported by air or ship

1.12.2.10 Response in the Arctic Zone

The Central and Arctic Region assesses, notifies relevant parties, and initiates the tasking/deployment of necessary resources (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). This is based upon the determination of the Canadian Coast Guard's role as the Lead or Resource Agency and the appropriate Canadian Coast Guard posture (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). The Duty Officer is tasked with this initial assessment, which is then verified by the superintendent, Environmental Response (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). The appropriate response is activated by the Superintendent who in turn assigns an On-scene Commander or Federal Monitoring Officer and notifies Canadian Coast Guard (CCG) Management (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). Following the termination of the incident cost recovery actions are undertaken. This process is illustrated in Figure 12, which establishes the typical Sequence of Events in the event of a spill.

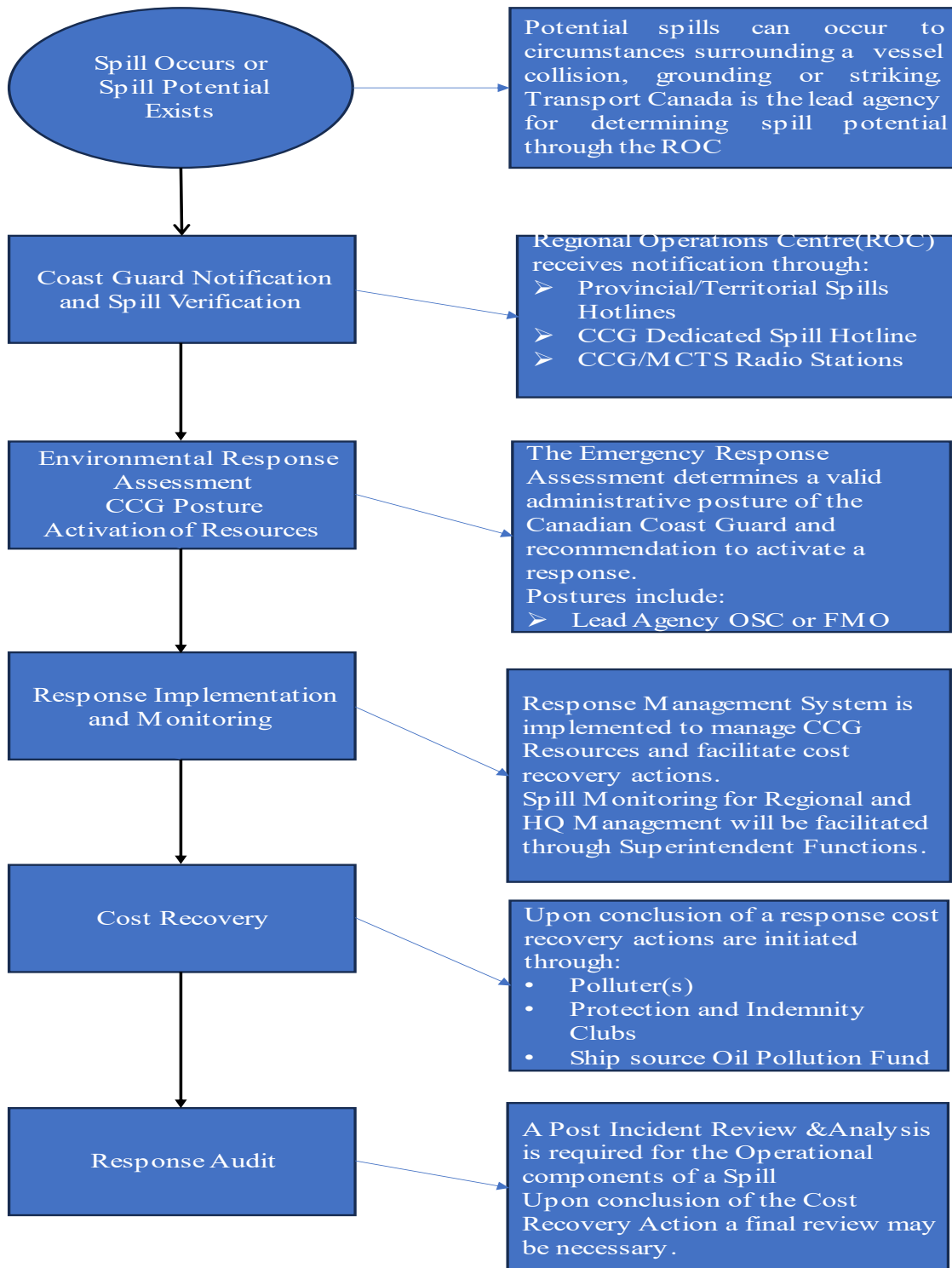


Figure 12: Typical Sequence of Events and a Description of the Functions at each step.

1.12.2.11 Arctic Zone First Response

The highest risk of pollution in the Arctic is during a ship fuel transfer to facilities in Canada's northern communities (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). Should pollution occur, the vessel and oil handling facility have a responsibility to implement their Oil Pollution Emergency Plan (OPEP) that deals with source control (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). The next step would be for the community to respond using its response plan, protecting the identified priority area(s) and employing the response equipment in an Arctic Community Pack, if so equipped (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008).

1.12.2.12 Arctic Zone Escalation

If the pollution is beyond the ship, facility, and community response then the Rapid Air Transportable will be the first line of Canadian Coast Guard emergency response (Arctic ice breakers or Special River Nav- aid tenders may have been on-scene first) (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). Upon activation, contractors will be called up. Nearby emergency personnel will be dispatched to the community to assess, plan, assemble (and train) responders while preparing to stage the incoming equipment (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008).

The personnel based at the Hay River facility will transport the pallets to the airport, where they will be loaded into the awaiting airframe (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). Upon arrival, the pallets will be unloaded, and a trailer tongue and wheels affixed to the pallet to facilitate movement to a forward staging area and ultimately to a beach site (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). The time frame for full forward staged capacity with personnel at any community with suitable runways is less than forty-eight hours (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008).

Standing arrangements with local contractors will be activated to move the containers to a location where they can be transferred to a ship (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). Should the need arise the closest Canadian Coast Guard base personnel will be dispatched to the depot to assist (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). The closest suitable marine transportation asset will also be contracted to move the equipment to the spill site (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008). The period from full forward staged capacity with personnel is estimated at one week (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008).

1.12.2.13 Alternative Countermeasures

Alternative countermeasures are non-mechanical techniques utilized in oil spill response operations such as in-situ burning, dispersant application and shoreline cleaner application (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008).

1.12.2.14 Arctic Zone

Given the difficulties associated with mounting an effective response in the Arctic and the fragility of Arctic systems, the Canadian Coast Guard had recommended that further research needs to be done regarding in situ burning, and the use of dispersants before they are used in the Arctic (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008).

Area Plans

The following Area Plans make up the Annexes to the Regional Chapter from (Canadian Coast Guard Central and Arctic Region Regional Response Plan, 2008).

1. St. Lawrence River and Lake Francis
2. Lake Ontario
3. Lake Erie
4. St Clair and Detroit River
5. Lake Huron, Georgian Bay and North Channel
6. St. Mary's River
7. Lake Superior
8. Lake of the Woods
9. Inland waters (South of 60°N latitude)
10. Hudson and James Bay
11. Baffin Region
12. Keewatin Region
13. Kitikmeot Region
14. Great Slave Lake Region
15. Mackenzie River and Delta
16. Beaufort Sea and Amundsen Gulf

1.12.2.15 Keewatin Region Plan 2005

This area plan served as a guide for responders for each given geographic area within this region, which includes Chesterfield Inlet (Canadian Coast Guard Environmental Response Department, 2005). The outlined approach and specific information are consistent with the existing guidelines of the Canadian Coast Guard (Canadian Coast Guard Environmental Response Department, 2005). This plan serves as a guidance document for various communities, facilities, and surrounding districts it also contains specific emergency plans (Canadian Coast Guard Environmental Response Department, 2005). Figure 13 establishes the different regions in the Arctic region including the Keewatin region.

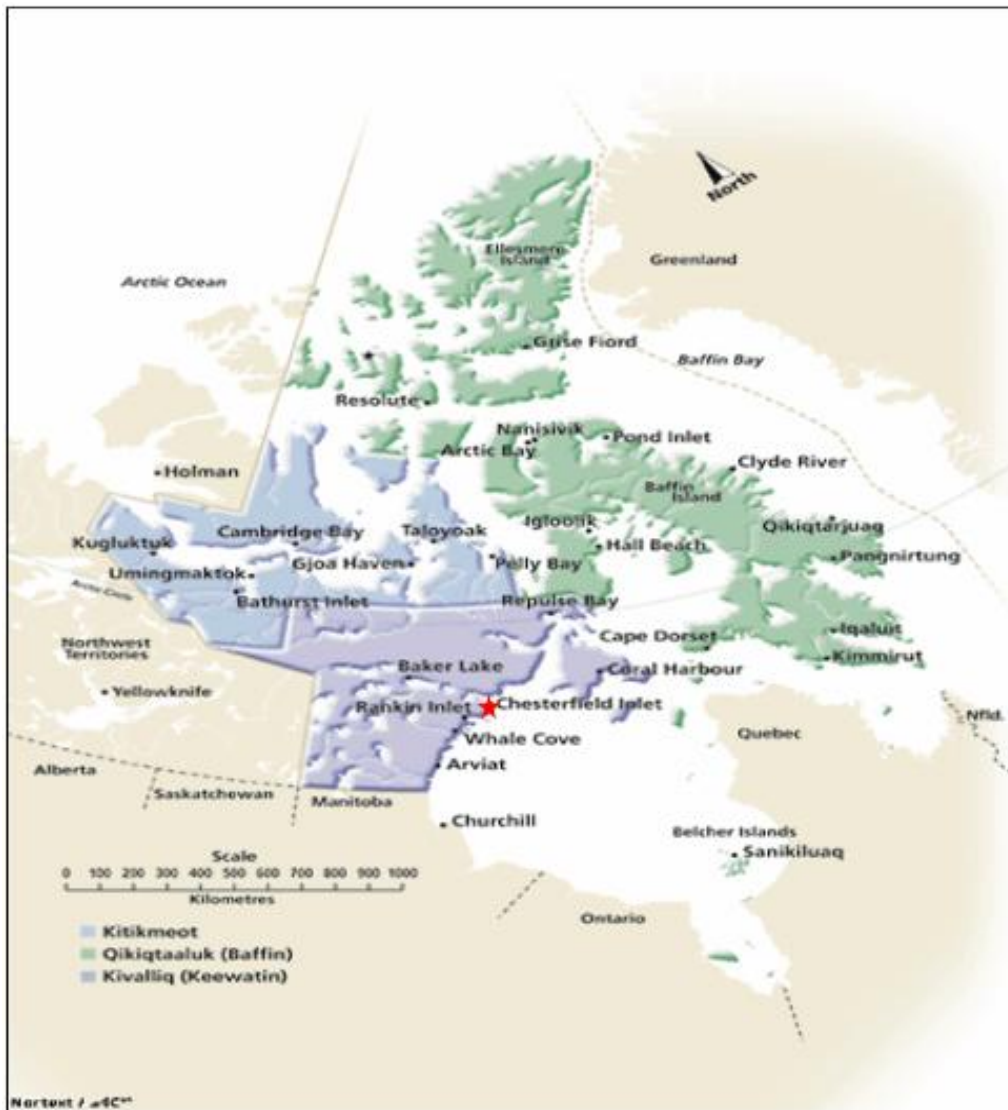


Figure 13: The Keewatin Region (Environmental Response, 2005:3).

A study conducted in the Canadian Arctic by (Dawson et al., 2018) and building on Environmental Response (2005) highlighted increasing ship traffic during the period from 1990-2015. The study also highlighted that the increased sightings of ships occurred in Nunavut waters. According to (Carter et al. 2019) community members are mainly concerned about the potential impact of these shipping activities on the wildlife, their livelihoods and migration routes.

The report by (Carter et al., 2019) highlighted many potential impacts of marine vessels in addition to recommendations. The study recommended the increased coverage of the Canadian Coast Guard’s presence to address the limited response capacity – it was noted that there was one Coast Guard ship to cover a vast area.

What do the plans state?

According to the Keewatin Region’s Area Plan under the guidance of the Arctic /National Response Strategy, several communities, and facilities in addition to their own specific and individual Emergency Plans adjoin several jurisdictional areas. Figure 14 below illustrates planning responsibilities in the Keewatin region. Specific plans for these areas and facilities must be referenced when a spill is likely to have an impact in any adjoining area.

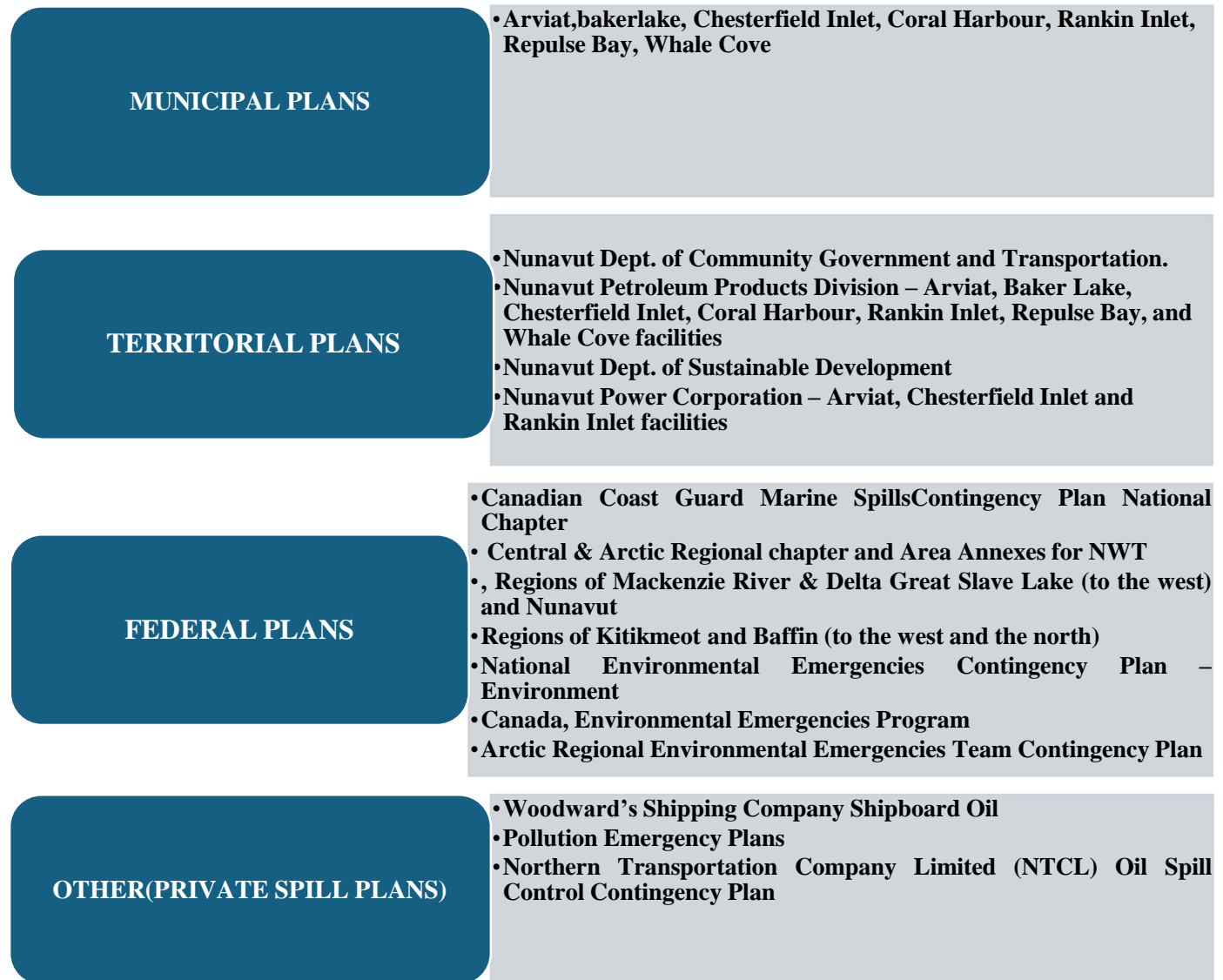


Figure 14: Various plans located in the Keewatin Regional Plan (Canadian Coast Guard Environmental Response Department, 2005:4/5).

1.13 CHESTERFIELD INLET

Chesterfield Inlet is a small settlement located on the Western Shore of Hudson Bay in the Kivalliq Region of Nunavut, Canada (Chesterfield Inlet New Power Plant Project Submission to Nunavut Planning Commission, n.d.). It is one of the oldest permanent settlements in the Canadian Arctic. Community access is limited to air and sea. The community fuel supply, which is overseen and administered by the Government of Nunavut, is replenished annually through a marine fuel supply tanker. According to Statistics Canada. (2023) the total population of Chesterfield Inlet was 397 (2021).

Economic development is gradually growing, which can be linked to jobs and increasing electricity demand. The need for transporting fuel and other goods that are efficient highlights the importance of marine shipping and is one of the reasons for the increased shipping traffic in Arctic waters (Dawson et al., 2018). This community is also an important fuel and goods transportation hub for Canadian Arctic communities. Chesterfield is located on Chesterfield Inlet, the main shipping route to mines at Baker Lake. Arctic Marine Shipping has various benefits and challenges. These benefits mainly include lowered shipping costs, and increased income from tourism in addition to greater cultural exchange (exposure). In contrast, the potential impact of shipping activities on wildlife (habitat and migratory behaviour) and livelihoods is a significant concern to communities.

1.13.1 Oil spills in Chesterfield Inlet

As noted above, fuel supply shipping occurs yearly. Stern and Collins note that "... the M/V Nanny resupply tanker was grounded on three occasions in the last twelve years, transporting thousands of tonnes of petroleum products such as diesel fuel" (Stern and Collins, 2020, p. 2). The tanker was grounded in three locations Deer Island, Chesterfield Inlet and Baker Lake; 2014 (Transportation Safety Board of Canada, 2014). Importantly, fuel spills regardless of the source, can significantly damage the environment, society, and economy of an area with repercussions beyond the affected location (Covert et al., 2016).

1.13.2 Chesterfield Inlet Response Strategy

According to the Keewatin Regions' Area Response Plan Chesterfield Inlet's response approach is based on two objectives, which consist of: Wildlife Rescue and Rehabilitation and Beach and tidal flat cleanup. As a result, the strategies and tactics are tailored to achieve the objectives. This is outlined in Table 7. It should be noted that this table represents the entirety of the plan.

Table 8: Key objectives, strategies, and tactics regarding oil spill response for Chesterfield Inlet (Canadian Coast Guard Environmental Response Department, 2005).

OBJECTIVE	STRATEGY	TACTICS
Wildlife Rescue and Rehabilitation	Animals are herded away from contaminated areas. (Emphasis on bears).	Local hunters and/or helicopters are deployed to conduct hazing.
Beach and Tidal Flat cleanup	There was no defined strategy under this objective. Environmental constraints to response activities such as exclusion booming (Environmental Response, 2005:11).	<ul style="list-style-type: none"> • Beach flushing • Shoreline cleanup • Collection of oil stranded on tidal flats. • Oil could remobilize with tides. • Sorbents are also used.

1.14 PROJECT CONCEPT

1.14.1 Project Description

The main outcome of the project was the creation of a series of policy briefing notes. This project was completed through a desk-based research approach to review and analyze Arctic community oil spill preparedness and response plans.

This project aimed to understand the sorts of actions that Arctic communities in the Canadian Arctic might take to address the threat of marine oil spills regarding planning, preparedness, and response. In doing so, the various roles, responsibilities and approaches towards oil spill planning, preparedness and response in the local context (community, municipality and county) in arctic regions were investigated. Within this context, the project has produced the following deliverables:

1. A document review and content analysis of documents on the topic of community oil spill planning, preparedness and response from the eight countries within the Arctic Council plus Greenland. This served as a background information report and helped direct the briefing notes.
2. A series of briefing notes on marine oil spill planning, preparedness and response for Canadian Arctic communities, using Chesterfield inlet as a case example.

In actioning these deliverables, the focus was on the eight-member countries of the Arctic Council including, Canada, the Kingdom of Denmark (including Greenland), Finland, Iceland, Norway, Russia, Sweden and the United States of America (each country studied represented a single case). The roles, responsibilities, and local emergency/response plans from each case study were used to identify feasible recommendation areas towards the improvement of the response and preparedness capacity of Chesterfield Inlet.

The document review of oil spill-specific regulations and plans from the selected arctic countries served as the primary source of information in this project. They identified provisions for oil spill preparedness and land-based response in existing government legislations, strategies, best practices, and plans arranged by the countries studied. The documents that were reviewed and the information that was extracted contributed to a knowledge base on the approaches to oil spill planning, preparedness and response at a community level.

This project focused on preparedness and response towards oil spills at a local/community level since the current approaches in the Canadian Arctic Region are reactionary. Chesterfield Inlet community was used as a case to illustrate the 5 key recommendations from the findings of the policy brief. It was envisioned that the completed policy brief will contribute to the enhancement of the role of communities in oil spill preparedness and response plans. In addition, this policy brief will contribute to the understanding of the various approaches towards land-based oil spill response and preparedness from a community perspective.

1.15 Justification

Ship traffic has more than doubled in the Canadian Arctic over the past three decades and additional growth is expected considering climate change-related decreases in sea ice and subsequent increases in maritime navigability Dawson et al., (2018). As the rate of anthropogenic climate change increases exponentially due to the burning of fossil fuels and the removal of naturally occurring carbon sinks, the global average temperature increases. This increase exacerbates the rate of warming in Arctic and Antarctic regions thereby leading to increased accessibility and greater potential for oil spills from shipping accidents and extraction.

As highlighted by (Covert, 2016:9) “The remoteness and size of these communities are some of the reasons why they become the first line of response before the intervention of the polluter to contain oil spills until further provisions are available”. Importantly, oil spills regardless of the source, significantly damage the environment, society, and economy of an area with repercussions beyond the affected location.

This approach can provide policymakers with a better understanding of the impact of the disruption on the economic, social, and environmental aspects of communities due to oil spill events (Covert, 2016). These approaches could also facilitate traditional knowledge transfer and improve relations and interactions between various administrative levels should an oil spill occur (Covert, 2016). Considering these points, this project served to create a series of policy briefing notes based on the various approaches regarding the oil spill preparedness and response at the local/community level. This project focused on the nine countries of the Arctic Council. There has been an increase in the utilization of policy briefs as a tool to inform or influence decision making (Tessier,2019).

Currently, the Chesterfield Inlet response strategy that is listed under the Keewatin Region, Nunavut Area Plan consists of beach and tidal flat cleanup, wildlife rescue, and rehabilitation. The findings of the policy briefs provide a concise detailed understanding of the issues that policymakers seek to address, to ensure that policy decisions are based on scientific evidence. In addition, the completion of this policy brief will contribute to the knowledge base of the various approaches employed by governments towards oil spill preparedness and response from a community perspective. It is imperative to note that the completion of this policy brief will also increase awareness of the constraints and developments of oil spill preparedness and response in Arctic environments.

1.16 SCHEDULE DETAILS

1.16.1 Activity List

Table 9: Activity list for the policy briefing note series project for Chesterfield Inlet.

WBS No.	Deliverable	Work Package	Estimated Duration	Date Initiated	Date Completed	Actual Duration	Comments
1	Qualitative Document review of existing community oil spill preparedness and response plans.	Obtain Arctic community oil spill preparedness and response plans.	3 days				It must be completed in 3 days.
		Conduct a Document Review plan to confirm whether Community responsibilities in preparedness and response have been integrated into these plans.	6 days.				Review required after the project commenced for the deliverable.
		Conduct a gap analysis of the various plans to identify the conceptual gaps in the plans regarding oil spill preparedness and response from a community perspective.	5 days				

2	Policy brief document.	Compile the results from other deliverables.	30 days				All activities under this section must be completed before February 20, 2023.
		Draft and print copies of the policy brief for the Chesterfield Inlet oil spill preparedness and response plans.	7 days				
		Review the document with the Project team and sponsor.	21 days				
	Revise the policy brief document and submit it to the Chesterfield Inlet Hamlet office.	7 days					
		Document Transfer to Sponsor	3 hours				Must be done before November 15 th 2023

1.16.2 Work Breakdown Structure in Outline Form.

1.16.2.1 Policy Brief Project

- Meet with internal and external interested parties.
- Acquire Oil Spill Preparedness and Response Plans.
- Document Review of existing oil spill preparedness and response plans.
- Content Analysis of the findings from the document review to identify gaps.
- Gap Analysis of existing oil spill preparedness and response plans.
- Compile and analyze findings from document review and gap analysis.

- Translate findings into the Policy Brief Document (Final product).
- Revise and share the final product with interested parties.

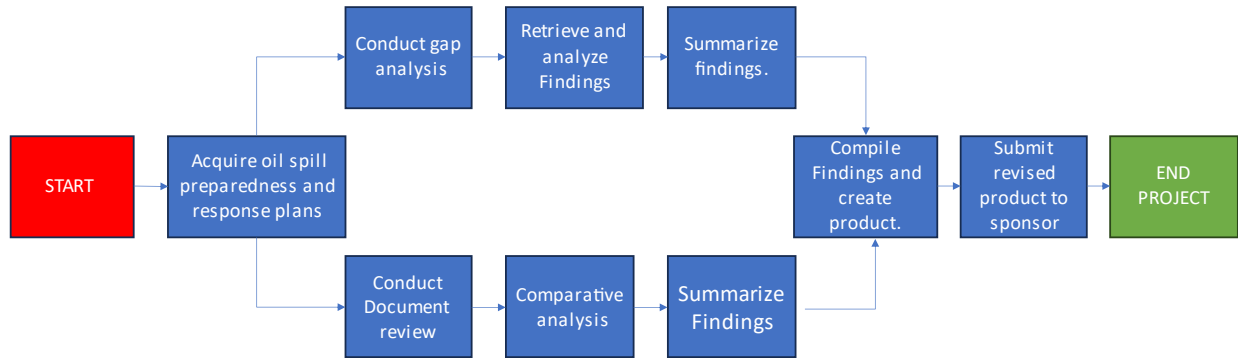


Figure 15: Summarized Work Break Down Structure in Flow Chart Form.

1.16.3 Project Milestones

Table 10: Key milestones for the project scope based on the sequence and dependencies diagram.

Reference	Milestone	Expected Completion	Actual Completion
1.	Obtain Arctic community oil response and preparedness plans.		
2.	Complete review and analysis of documents.		
3.	Compile results from reviews and summaries to draft policy brief document		
4.	Revise and submit the completed document to stakeholders		

Table 11: Critical Path Chart.

Activity	Activity	Dependency	Duration	Early Start	Early Finish	Late	Late	Float Time
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#	description					Start	Finish	
1	Obtain Arctic community oil spill preparedness and response plans.	N/A	3 days	October 27 th	October 29 th	October 28 th	October 31 st	0
2	Document Review plans to confirm whether Community responsibilities have been integrated into these plans.	1	20 days	October 30 th	November 19 th	October 31 st	November 20 th	0
3	Conduct a Comparative analysis.	2	14 days	November 20 th	December 3 rd	November 20 th	December 4 th	0
4	Conduct a Gap analysis of the plans.	3	18 days	December 4 th	December 20 th	December 4 th	December 22 nd	0
5	Compile and analyze results from the deliverables to draft a policy brief document.	4	30 days	December 21 st	January 20 th	December 22 nd	January 21 st	0
6	Draft and print copies of the amendment proposal for the	5 and 3 I will have to finish 5 first	8 days	January 21 st	January 28 th	January 21 st	January 29 th	0

	Chesterfield Inlet oil spill preparedness and response plans.							
7	Revise policy brief document transfer Chesterfield Inlet Hamlet.	6	20 days	January 29 th	February 18 th	January 29 th	February 18 th	0

1.16.4 Sequencing Diagram

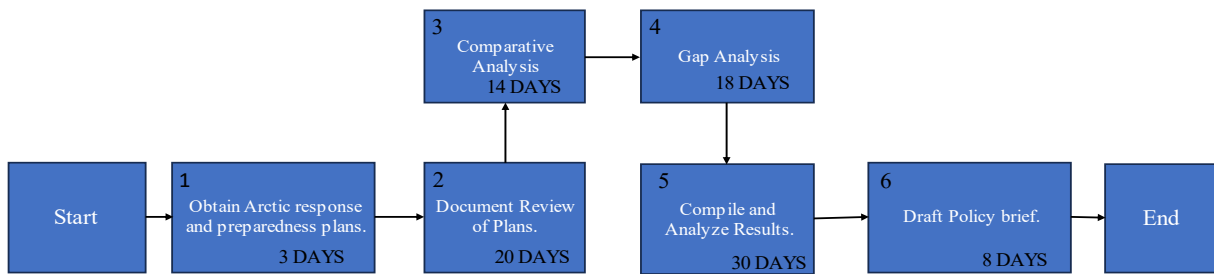


Figure 16: Sequencing and Dependencies Diagram for the Project.

1.17 RESOURCE NEEDS

Table 12: Resource needs.

Activity / Task	Quantity	Skill / Knowledge Requirement	Team Member (Name)	Contract (Name/ Company)	Approximate Cost (\$/Time) (COST)
Initial Research and analysis of documents		Research Analytical Writing	AA AA AA		30 days
Obtained Arctic community oil spill preparedness and response plans.	1	Analytical	Ashley Adams		30 days
Documented Review plans to confirm whether Community responsibilities have been integrated into these plans.	1	Writing and Analytical	Ashley Adams		30 hours
Conducted a content analysis.	1	Writing	Ashley Adams (draft), Dr Sinclair (Review) and SPONSOR		30 days
Conducted a Gap analysis of the plans.	1	Writing and Analysis	Ashley Adams (Researcher)		30 days
Compiled and analyzed results from	1				

the deliverables to draft a policy brief document.					
Drafted and printed copies of the amendment proposal for the Chesterfield Inlet oil spill preparedness and response plans.	1				
Revised policy brief document transfer Chesterfield Inlet Hamlet Office.	1				

1.17.1 Skills and Knowledge Inventory of The Team:

Table 13: Skills and Knowledge Inventory of Team.

Person	Job Title	Skills/Training	Years	Education
Ashley Adams	Researcher	Analytical skills, Research skills, novice remote sensing training and communication.	4	Bachelor of Science in Environmental Studies
Dr John Sinclair	Professor and Director Natural Resources Institute (Academic advisor)	Expert Researcher and research advisor.	31	B.A. (Hons) Law and Geography Concentration, Carleton University, 1984. M.A. (With distinction), Geography, Carleton University, 1986. PhD. Geography,

				University of Waterloo, 1991.
Dr Glen Hostetter	Researcher		11	

1.17.2 Resource Needs (Materials, Supplies and Equipment) Assessment:

Table 14: Resource needs assessment.

Activity / Task	Quantity	Materials/Supplies/ Equipment	Available/ Procure	Approximate Cost (\$/Time)
Obtained literature review documents and oil spill response plans.	Approximately 500 literature documents and nearly 50 community response plans.	Internet Connection, University of Manitoba's libraries and Personal Computer	Available	
Obtained Arctic community oil spill preparedness and response plans.	1 year Standard Pro Annual	Zoom Subscription, Internet Connection	Available	
Documented Review plans to confirm whether Community responsibilities have been integrated into these plans.	1 computer (laptop)	Personal Computer	Available	
Conducted a content analysis.	1 document	Personal Computer	Available	
Conducted a Gap analysis of the plans.	1 document	Personal Computer	Available	

Compiled and analyzed results from the deliverables to draft a policy brief document.	1 document	Personal Computer, Zoom Subscription, and Internet Connection	Available	
Drafted and printed copies of the series of Community Oil spill preparedness and response policy briefing notes.	1 document	Internet Connection	Available	
Revised policy brief document transfer Chesterfield Inlet Hamlet office.				

Table 15: Internal Interested Party Register.

Name or Office	Nature of Interest	Type of Engagement Needed
Dr John Sinclair	<p>Ensure that the Natural Resource Institute’s standards for graduation are met.</p> <p>Central responsibility for the quality of GENICE outcomes as the supervisor/advisor.</p>	<p>Emails (biweekly) and Zoom meetings.</p> <ul style="list-style-type: none"> • Provide documents to the advisor as completed. This is to maintain advisor’s confidence that the project documents are being created according to schedule and of high quality. • Email and Zoom meetings - Through bi-weekly emails and Zoom meetings, frequent communication can be maintained. This is required so that all queries and updates can be remotely addressed quickly since they would provide flexibility and convenience to the advisor. To ensure the success of this project, there is a need for constant updates on the project’s progression, draft deliverable documents and issues that may occur. As the advisor and potential conduit to GENICE, he

		must be kept up to date with all aspects of the project.
Dr Glen Hostetter		<p>Bi-monthly emails and Zoom meetings.</p> <ul style="list-style-type: none"> • Document sharing through bi-monthly emails- The project document will be checked to ensure that each component of the final document is cohesive and of the greatest quality. There will be constant updates on the project's progression, draft deliverable documents and issues that may occur. • Zoom meetings -Through bi-monthly Zoom meetings, frequent communication can be maintained. To ensure that the expectations are met, and trust is maintained.

1.17.3 External Interested Parties Register

Table 16: External Interested Parties Register.

Interested Party	Why should the interested be interested in the project and/or product?	What do the interested parties require from the project team?	What does the Project team seek from the interested party?	Implications for the Managing the Relationships
Partner (GENICE II lead)-Dr Gary Stern	<ul style="list-style-type: none"> • To review and provide feedback on the product. 	<ul style="list-style-type: none"> • Engagement throughout the process to develop a product that serves to aid in their goals and objectives. 	<ul style="list-style-type: none"> • Knowledge and expert opinion on remote sensing technology; continuous involvement throughout the project cycle. 	<ul style="list-style-type: none"> • It is important to seek initial contact with those who share the same research interests.

		<ul style="list-style-type: none"> • Final product and reports. 	<ul style="list-style-type: none"> • The acknowledgment of the final product and reports. 	<ul style="list-style-type: none"> • Emails and Zoom meetings will be organized every three months.
Community Oil Spill Committee- Barnie Aggark	<ul style="list-style-type: none"> • It could result in a change in their activities. 	<ul style="list-style-type: none"> • Remote means of communication through Zoom meetings and emails. • Sharing information on the scope of the project and the potential impacts on their activities. • Copies of the final product. 	<ul style="list-style-type: none"> • The acknowledgment of the project and the product. • Importantly, the Researcher requires documents related to oil spill response and recommendations on the final product. • The committee is required to serve as a potential conduit to the community since it may change the roles and responsibilities towards oil spill response. 	<ul style="list-style-type: none"> • It is important to identify a small number of persons who can speak about this project as a potential conduit to the community.

1.18 RISK MANAGEMENT

Table 17: Probability and impact matrix for the project.

Risk Description	Probability	Impact	Risk Score
Access to reliable information:	0.1 very low	0.3	0.3
Balancing briefness and completeness-	0.4 low	0.45	0.18

1.18.1 Risk Register

Table 18: Risk register for this project.

Risk	Response Plan Created?	Location of Response Plan	Risk Owner	Status
Access to reliable information:	Y	Risk Response Plan	Researcher	Pending
Balancing briefness and completeness-	Y	Risk Response Plan	Researcher	Pending

1.18.2 Budget Summary

This project did not require a detailed budget because the resources and skills required for the execution of the project, for example, zoom software, are either already available or are offered by the University of Manitoba for free. In addition, the desk-based nature of the project also limited the required resources for the project.

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1.19 CANADA

1.19.1 National Legislation

1.19.1.1 National Oil Spill Preparedness and Response Regime 1995- Present

The Canadian Government in collaboration with industry had established a regime based on a public-private partnership which proceeded with a review (international developments) in the early 1990's (Daisy et al., 2022). The regime provided a preparedness and response framework for ship-sourced oil spills in Canada's marine environment (Daisy et al., 2022). The responsible party and risk generator is liable to respond to marine oil spill incidents and, therefore, is responsible for the operational components of the regime (Daisy et al., 2022). The government leads the legislative and regulatory structure for the regime and oversees the industry's oil spill preparedness arrangements (Daisy et al., 2022). The development of the regime was formed by various legislative tools such as the Canada Shipping Act, 2001; the Response Organization and Oil Handling Facilities Regulations; and the Environmental Response Arrangement Regulations (Daisy et al., 2022). The Canadian Coast Guard manages the private sector's response to a spill (Daisy et al., 2022). The Canadian Coast Guard serves as the On-Scene Commander within the response system (Daisy et al., 2022).

1.19.2 Canadian Oil Spill Response Network

The functionality of the response network is dependent upon the members and their mandated actions during response operations (Daisy et al., 2022). Transport Canada (as the regulator) manages the regime while the Canadian Coast Guard serves as the operational leader, and the four response organizations provide the bulk of the response capacity (Daisy et al., 2022). The rest of the network is highly dependent on these three actors and serves under their leadership (Daisy et al., 2022). Figure 17 provides an overview of the network and its dependencies.

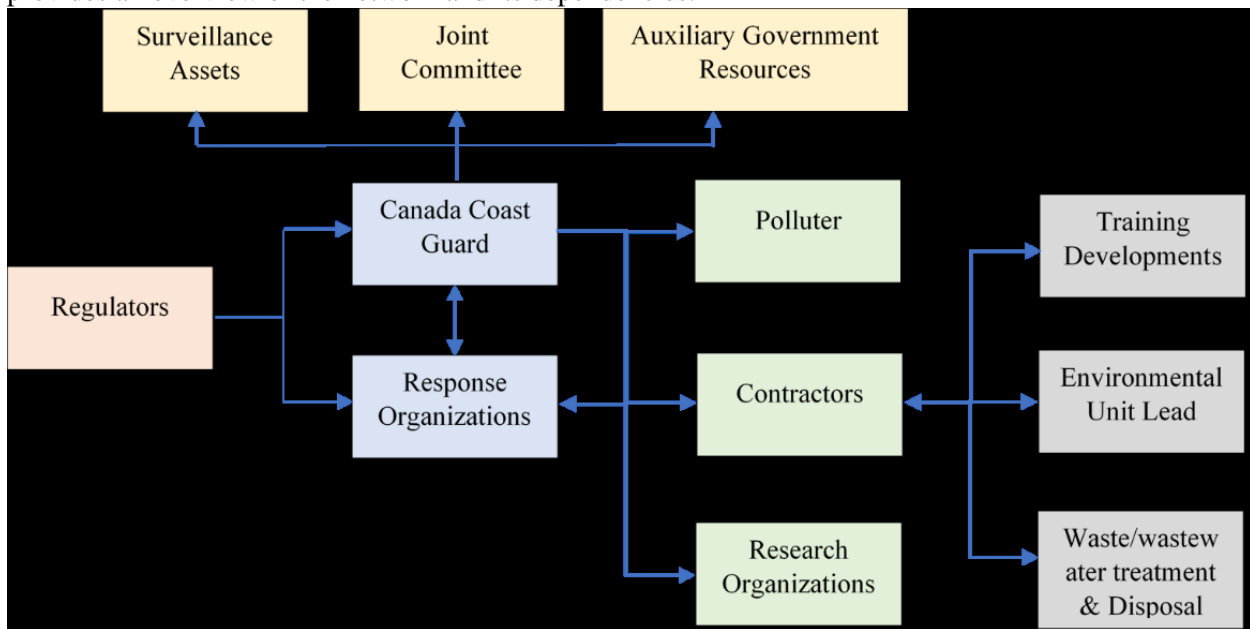


Figure 17: Members of the Canadian Oil Spill Response Network form (Daisy et al., 2022:8).

The International Maritime Organization's conventions have served as a framework for the development of Canada's preparedness and response regime (Daisy et al., 2022). According to (Daisy et al., 2022) the three major principles include:

- Prevention: These consist of regulatory frameworks that regulate tanker and vessel safety, through construction standards, pilotage, inspections, navigation, crew certification, and vessel traffic management and monitoring and surveillance.
- Preparedness and response: This consists of legislative instruments that establish and maintain oil preparedness and response capabilities within Canada such as mandates for vessels, oil handling facilities, and response organisations. This also consists of management and monitoring of the industry's compliance with these rules.
- Liability and Compensations: This is a multi-tiered structure based on international and national guidelines for liability and compensations, consisting of the ship owner and the cargo owner's financial contribution to the Ship Source Oil Pollution Fund.

1.19.2.1 Canada's Oceans Protection Plan-2016

Canada's Ocean Protection Plan serves as the national administrative plan that protects the health of oceans and coastal areas within the country's jurisdiction from the potential impacts associated with oil spills (Fisheries and Oceans Canada and Canadian Coast Guard, 2020). The Oceans Protection Plans will maintain the safety and environmental quality of Canadian waters for future generations (Department of Fisheries and Oceans Canada, 2020). The formal structure consists of the various federal departments with Transport Canada as the designated lead agency (Department of Fisheries and Oceans Canada, 2020). Partnership and collaboration are the foundation of the Government of Canada's actions to protect our oceans (Department of Fisheries and Oceans Canada, 2020). Collaboration with Provincial governments, Indigenous organizations, marine industries, environmental organizations, coastal communities and the public are the key areas of emphasis within this plan (Department of Fisheries and Oceans Canada, 2020).

There are four priority areas within this plan, namely:

- Strengthening partnerships and launching co-management practices with Indigenous communities, including building local emergency response capacity (Department of Fisheries and Oceans Canada, 2020).
- Creating a world-leading marine safety system that improves responsible shipping and protects Canada's waters, including new preventive and response measures (Department of Fisheries and Oceans Canada, 2020).
- Restoring and protecting marine ecosystems and habitats, using new tools and research.
- Investing in oil spill cleanup research and methods to ensure that decisions taken in emergencies are evidence-based.

1.19.2.2 Canadian Coast Guard Marine Spills Contingency Plan-National Chapter 2018

The Marine Spills Contingency Plan outlines the framework of the operational scope of the Canadian Coast Guard during an incident (Marine Spills Contingency Plan- National Chapter, 2018). It outlines the framework for how the agency operates while acting as the lead or an assisting agency during a spill incident. It also outlines the agency response management tactically, regionally, and nationally (Canadian Coast Guard, 2018).

1.19.2.2.1 Geographic Scope of The Canadian Coast Guard Regions

The Canadian Coast Guard Regions is responsible for the management of three areas which include:

- Western: consists of all Canadian waters on the west coast of Canada out to the outer limit of the Executive Economic Zone and the internal waters of British Columbia, The Yukon Territory, The Northwest Territories, Alberta, Saskatchewan, and Manitoba (Canadian Coast Guard, 2018).
- Central and Arctic consists of all Arctic waters from the Alaska-Yukon boundary east to the Nunavut-Greenland boundary out to the outer limit of the Exclusive Economic Zone, Hudson and James Bays, the Great Lakes, the St Lawrence River and the internal waters of Ontario and Quebec (Canadian Coast Guard, 2018).

- Atlantic: consists of all Canadian waters from the maritime border between Quebec and Newfoundland and Labrador, New Brunswick, Prince Edward Island and Nova Scotia to the United States of America Border (Canadian Coast Guard, 2018).

These three Canadian Coast Guard geographic areas are depicted in Figure 18 below.



Figure 18: Canadian Coast Guard geographic areas (Canadian Coast Guard Marine Spill Contingency Plan, 2018:5).

1.19.2.3 Marine Spills Contingency Plan-Arctic Chapter 2022

The National Chapter provided the scope, policy framework and guiding principles within which the Canadian Coast Guard functions as the lead agency in ensuring an appropriate response to marine pollution incidents occurring in Canadian waters (Canadian Coast Guard, 2022).

1.19.2.3.1 Geographic Area of Responsibility

This Plan applied to the Canadian Coast Guard Arctic Region (shown in Figure 19), which was defined to include all coastal Canadian waters from the Alaska Yukon boundary east to the Nunavut-Greenland boundary out to the outer limit of the Exclusive Economic Zone, Hudson and James Bays and the internal waters of the Northwest Territories, Nunavut and Nunatsiavut. The boundaries for this region were developed in partnership and collaboration with northerners. Specific to the Arctic Region, both the Canadian Coast Guard and the Department of Fisheries and Oceans Canada share the same boundaries.

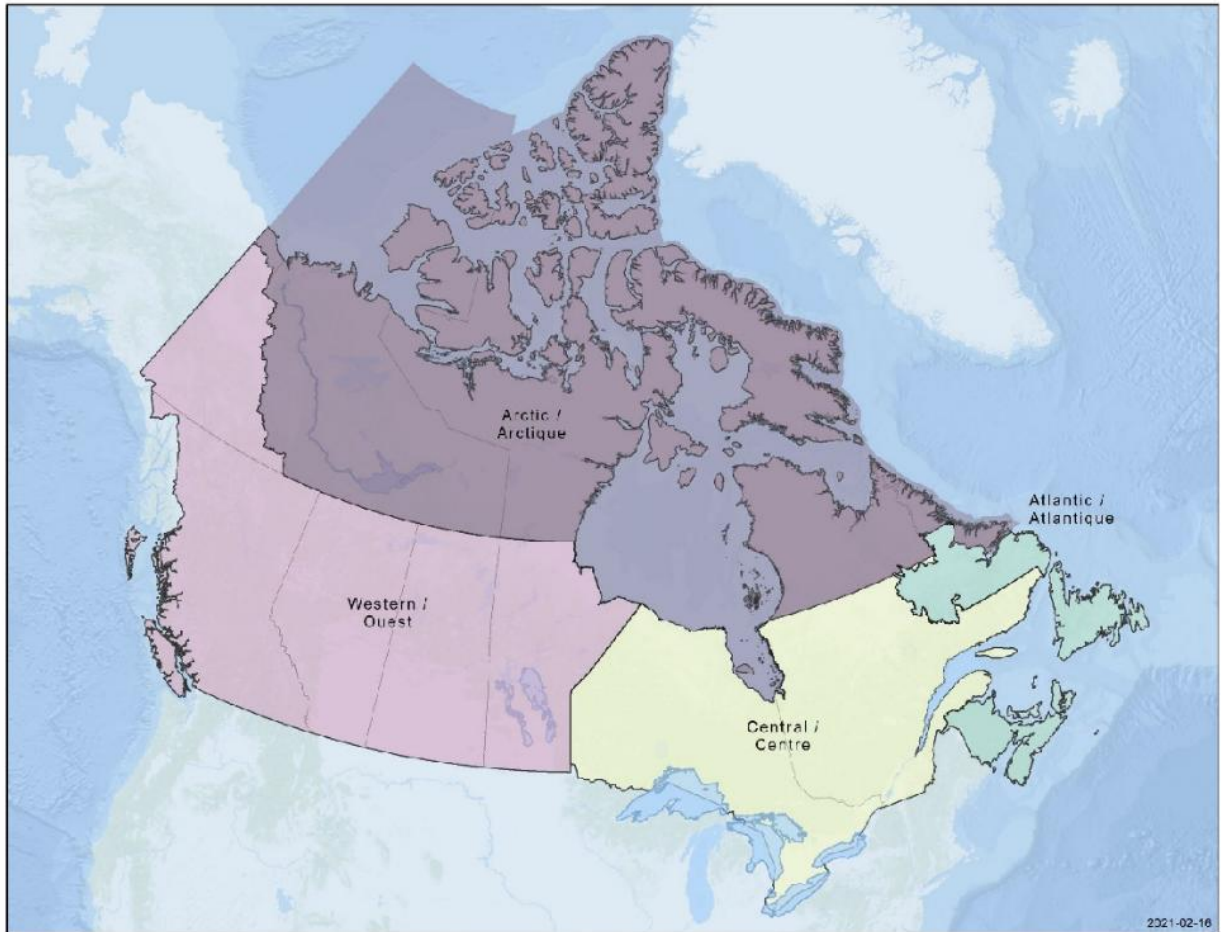


Figure 19: Canadian Coast Guard Regions Map (Canadian Coast Guard, 2022:5).

1.19.2.4 Roles And Responsibilities

Canada’s Marine Oil Spill Preparedness and Response Regime outlined the roles and responsibilities of key federally mandated agencies through preparedness guidelines and response measures to marine oil spill incidents as outlined in Table 19.

Table 19: General roles and responsibilities of the agencies within the Regime.

AGENCY	ROLES AND RESPONSIBILITIES
Canadian Coast Guard	Coordinates response operations between the responding parties and serves as the operational commander until the response activities can be handed off to the most appropriate party (Daisy et al., 2022). Trains environmental response personnel. Provides response officers to be appointed by the Minister of Fisheries and Oceans (Department of Fisheries and Oceans, 2019). The Federal Monitoring Officer assumes the role of the On-Scene Commander in cases where the polluter has not been identified/is unknown, unable or unwilling to execute a response operation (Daisy et al., 2022).
National Air Surveillance Program	Leads oil spill detection and verification efforts in Canadian waters (Daisy et al., 2022).

	N.B. This program also provides surveillance data to the Canadian Coast Guard (Daisy et al., 2022).
Canada Ice Service	In collaboration with the National Air Surveillance Program, this agency utilizes satellite imagery analysis techniques to inform response operations in terms of slick destinations (spill trajectory) and climate forecasts (Transport Canada, 2018).
Transport Canada	Transport Canada is mandated to develop transportation policies and programs that ensure a safe, secure, efficient and environmentally responsible transportation system for Canadians (Transport Canada, 2019). In the context of the Marine Oil Spill Preparedness and Response Regime (Transport Canada, 2019), they are the regulatory lead and are responsible for legislation, governance, policies, and guidelines that support it (Transport Canada, 2019). This agency also investigates spill events originating from Oil Handling Facilities and leads salvage operations (Daisy et al., 2022). Oversee legislative and regulatory oversight. This agency is also responsible for the Certification of Oil Spill Response Organizations (Daisy et al., 2022).
Environment And Climate Change Canada	Provides scientific, environmental and wildlife advice, with support from Fisheries and Ocean Canada (Daisy et al., 2022). Provides technical support during the “post-mortem” process of a spill response operation (Daisy et al., 2022). Chairs the Regional Environmental Emergency Team and facilitates technical information exchange during spill incidents (Daisy et al., 2022).
Regional Environmental Emergency Response Team	Provides synthesized environmental and technical advice to the Canadian Coast Guard in spill response operations.
Response Organizations	According to (Daisy et al., 2022) there are approximately four Transport Canada-certified response organizations that respond to oil spills in Canadian waters (Daisy et al., 2022). These include Western Canada Response Corporation, Eastern Canada Response Corporation, Point Tupper Marine Services Ltd and Atlantic Emergency Response Team (Daisy et al., 2022).
Polluters	Responsible for the immediate response to oil spills within or near the facility (Daisy et al., 2022).
Contractors	In large spills, contractors are employed by responders to elevate the overall response capabilities and accelerate response efforts (Daisy et al., 2022).
Research Organizations	Through technical seminars, discussions are held on the prevention, assessment and treatment of pollution events in various environments (Government of Canada, 2019, 2019a).
Arctic Environmental Response Program	The Arctic Environmental Response Program operates under the Canadian Coast Guard’s mandate for marine pollution response in Arctic regions. The Arctic Environmental Response Program ensures an appropriate response to marine pollution incidents within waters as defined in this plan (Transport Canada, 2019). Its objective is to

minimize the impacts on public safety, the environment, and the economy from marine pollution incidents (Transport Canada, 2019).

As the lead agency for marine pollution incidents, the Arctic Environmental Response Program:

Works with risk generators, polluters and partners, including Indigenous and coastal communities, provinces and territories, response organizations, and other government departments, to coordinate responses to marine pollution incidents.

1.19.2.4.1 Regional capabilities and capacities

1.19.2.4.1.1 Environmental Response Personnel and Equipment.

The Environmental Response Program in the Arctic Region is delivered by personnel distributed across the Canadian Arctic region (Canadian Coast Guard, 2022), as illustrated in Figure 20. In the Canadian Arctic, the Canadian Coast Guard has established supporting infrastructure to facilitate response operations (Canadian Coast Guard, 2022). This equipment includes staffed and unstaffed depots, equipment caches and rapid air-transportable equipment kit suites (Canadian Coast Guard, 2022). The regional response capacities have been augmented by the Canadian Coast Guard Fleet resources, which are also equipped with pollution response equipment and the provision of quick access to response equipment. (Canadian Coast Guard, 2022). Fleet resources can also be used as on-water command posts, accommodations and/or communication hubs to support response operations (Canadian Coast Guard, 2022).

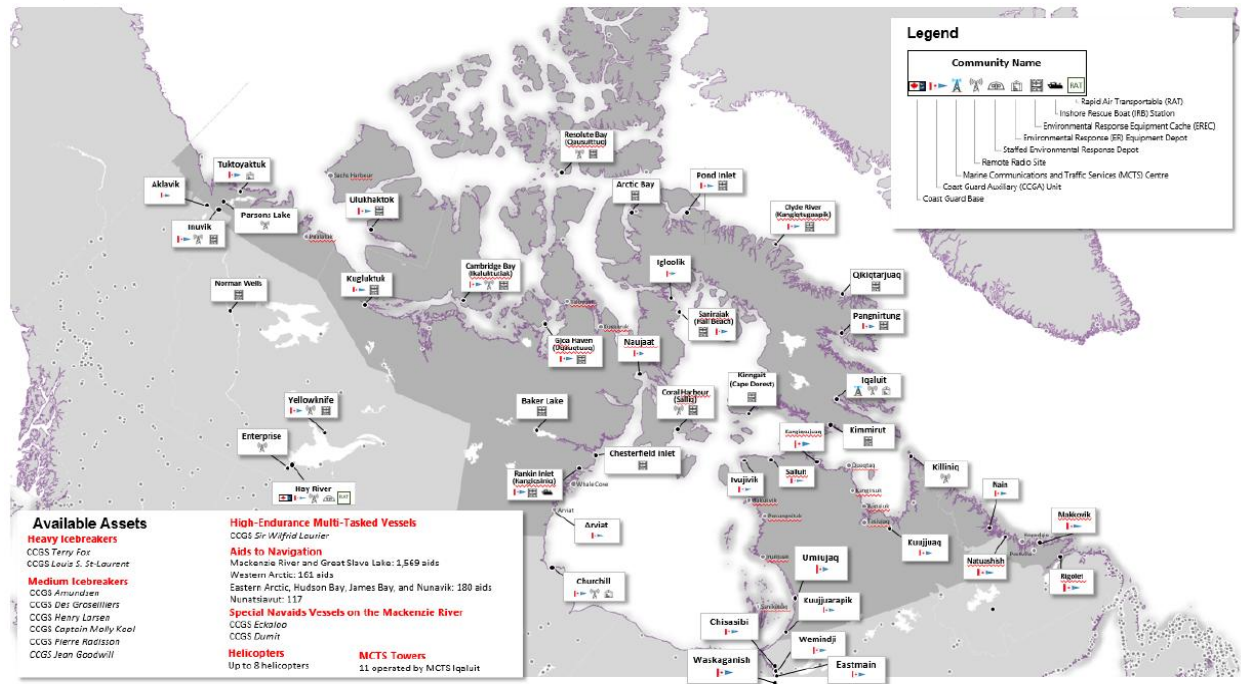


Figure 20: Distribution of the Canadian Coast Guard Environmental Response Assets (Canadian Coast Guard, 2022:40).

NB: The Arctic Charter 2022 provided theoretical definitions of the various plans within the charter. However, key specific information was not present in the charter. The specifications are all in future tense also, and many sections seem to be in development.

1.19.3 Nunavut And Northwest Territories

1.19.3.1 Nunavut Response Regulations

1.19.3.1.1 Nunavut Land Claim Agreement, 1993

The NLCA gives Inuit the rights “to participate in decision-making concerning the use, management and conservation of land, water and resources, including the offshore” through co-management boards (Nunavut Land Claim Agreement, 1993). These boards are legal entities and, through their protection under the Canadian Constitution (article 35) have quasi-constitutional status making them remarkably powerful.

1.19.3.1.2 Nunavut General Monitoring Plan

The Nunavut General Monitoring Plan was established through the implementation of Article 12.7.6 of the Nunavut Land Claims Agreement (Nunavut Land Claim Agreement, 1993:177). The Nunavut General Monitoring Plan collects data and synthesizes information on the health of the ecosystem and on the socio-economic environment, which includes the marine environment within the Nunavut region under Article 12.7.6(a)(b)(c) (Nunavut Land Claim Agreement, 1993). The Nunavut General Monitoring Plan is primarily an information provider and does not engage in monitoring (research-related) nor as an active policymaker (Légaré, n.d.). On the other hand, it contributes towards the establishment of baseline data and the continued collection of data required to monitor environmental changes over time (Nunavut General Monitoring Plan, 2022:4).

It has identified gaps where more monitoring needs to take place and has funded specific targeted monitoring projects that address key monitoring questions, existing gaps, and priorities established by the Nunavut General Monitoring Plan (Nunavut General Monitoring Plan, 2012:16). The Nunavut General Monitoring Plan is governed by a Steering Committee composed of a majority of Inuit members (Legare, n.d.).

It comprises of representatives from the Crown-Indigenous Relations and Northern Affairs Canada, the Government of Nunavut, Nunavut Tunngavik Inc. and the Nunavut Planning Commission (Légaré, n.d.). The Steering Committee provides direction to the Nunavut General Monitoring Plan in collaboration with the Nunavut Planning Commission (Nunavut General Monitoring Plan, 2022). A Secretariat, composed of five staff members located within Crown-Indigenous Relations and Northern Affairs Canada, 's regional headquarters in Iqaluit, supports the Steering Committee. It manages the data collection and reporting function (Légaré, n.d.).

1.19.3.1.3 Arctic and Northern Policy Framework

The Arctic and Northern Policy Framework was launched in September 2019 (Crown-Indigenous Relations and Northern Affairs Canada, 2019). The Framework was co-developed by the Government of Canada, Government of Northwest Territories, Government of Nunavut, Government of Yukon, Government of Québec, Government of Manitoba, Government of Newfoundland and Labrador, along with twenty-five Northern Indigenous organizations, including Inuit Tapiriit Kanatami (ITK). The Arctic and Northern Policy Framework reflects the policy and program priorities of Northern provincial and territorial governments and Northern Indigenous organizations (Inuit Tapiriit Kanatami, 2019). The objective of the Arctic and Northern Policy Framework is to guide the federal government's activities, investments, policies, programs, and services so that federal agencies can meet the objectives and expectations of Northerners (Crown-Indigenous Relations and Northern Affairs Canada, 2019). The Framework aims to address social and economic inequities in Canada's North. It focuses on the following issues: sovereignty and security, housing education, economic development (Department of Fisheries and Oceans Canada, 2018), and infrastructure (Crown-Indigenous Relations and Northern Affairs Canada, 2019). The Framework also aims to ensure safe and environmentally responsible shipping (Chircop, 2020).

1.19.3.2 Roles And Responsibilities of The Actors in Oil Spill Management in The Nunavut and Northwest Territories Region

1.19.3.3 The Nunavut Impact Review Board

The Nunavut Impact Review Board is a co-management public institution that is responsible for conducting Impact Assessments in the Nunavut Region (Dylan, 2017). It is established under Article 12 of the Nunavut Land Claim Act (Government of Canada and Tunngavik Federation of Nunavut, 1993). Nunavut Tunngavik Inc. nominates half of the members that sit on the board, while the other half is composed of individuals appointed by the Government of Canada and the Government of Nunavut (Andre Legare, n.d.; Légaré et al., 2009; MacNeill, 2021; Rodon, 2014; White, 2020).

The Nunavut Impact Review Board's process creates opportunities for the Inuit to participate in Impact Assessment's decision-making and to make sure that Inuit traditional knowledge, which encompasses Inuit experiences and values of the land, sea and ice, guides the decision of the proponent's project review (Gondar, 2016). The Nunavut Impact Review Board makes recommendations to the responsible federal minister on whether a project, or the expansion of an existing project, should proceed and, if so, the terms and conditions of the project's certification (Légaré, n.d.).

1.19.3.3.1 Arctic Marine Regional Advisory Council

The Arctic Marine Regional Advisory Council is one of five regional marine councils spread throughout Canada (Légaré, n.d.). The Arctic Marine Regional Advisory Council is composed of representatives from local communities, Inuit organizations, commercial shipping operators, non-governmental organizations such as Greenpeace, and Transport Canada officials. The Arctic Marine Regional Advisory Council makes recommendations to the Minister of Transport Canada on policies and regulations affecting oil spill preparedness and response in addition to search and rescue operations (Transport Canada, 2013).

1.19.3.3.2 Northwest Territories/Nunavut Spills Working Group

The Northwest Territories/ Nunavut Spills Working Group is an inter-agency group administered in Nunavut by Environment and Wildlife Protection providing coordination for spill monitoring, reporting, and response (Government of Canada, 2014). The Northwest Territories/Nunavut Spills Working Group's inter-agency also sometimes involves the participation of other governmental jurisdictions and agencies depending on the origin, nature and location of the spill (Hughes, 2017).

1.19.3.3.3 Inuit Guardians Committee

The Inuit Guardians Committee protect the land and marine wildlife habitats through data collection, tracking, and monitoring (Environment and Climate Change Canada, 2022a). The Inuit Guardians collect information on shipping activities in the region that is relevant and useful to communities and government agencies (Légaré, n.d.). Due to the potential impacts of shipping, there is a need for the monitoring of ships in Nunavut waters (Environment and Climate Change Canada, 2022). This is done through the Inuit Marine Monitoring Project co-funded by the Government of Canada and the Government of Nunavut and administered by Nunavut Tunngavik Inc. (Kikkert, 2023). The Guardians observe vessel activities and report on environmental conditions and wildlife (Taukie and Wilman, 2019). Inuit Guardians also gather information related to local concerns regarding the impact on harvesting activities from small vessels transiting in communities (Taukie, 2020). In the summer, guardians are often helped by the Inuit Marine Monitors who camp near the Nunavut Land Use Plan's designated sensitive marine sites where they monitor and protect the environment. They notify vessels that get too close to protected waters (Kikkert and Lackenbauer, 2019).

The information that the Inuit Guardians collect could help in the development of federal shipping management policies that would include greater input from Inuit communities (Kikkert and Lackenbauer, 2019). Guardians also offer an added emergency response capability to any accidents on land, water, or coastal areas. Besides monitoring activities, they are involved in search and rescue activities on land and at

sea and may also be called upon to help in oil spill response (Environment and Climate Change Canada, 2022).

N.B. The Canadian Coast Guard provides training to the Inuit Guardians and Inuit Marine Monitors community members. Courses include search and rescue techniques, basic oil spill response, the behaviour of oil in the water, and the deployment of the equipment (Transport Canada, 2017).

1.19.3.3.4 Coastal Environmental Baseline Program

The Coastal Environmental Baseline Program was established in 2017 as part of the Oceans Protection Plan (Fisheries and Oceans Canada, 2022). The Coastal Environmental Baseline Program provides funding for scientific activities to learn more about coastal ecosystems (Légaré, n.d.). In the Arctic, it is concentrated in the bay of Frobisher (Iqaluit) (Légaré, n.d.). The Coastal Environmental Baseline Program collects ecological data to better understand the current state of coastal ecosystems (Fisheries and Oceans Canada, 2022). Residents are employed to help with the collection of the data, which is later examined in the Department of Fisheries and Oceans laboratories.

1.19.3.3.5 Nunavut Emergency Management

The Nunavut Emergency Management develops emergency preparedness and rescue capability on land across Nunavut by providing community training on ground search and rescue and by providing land rescue equipment and communication systems (Community and Government Services, 2022). Volunteer local fire department, Inuit Rangers, Local Hunters and Trappers Organizations members, Canadian Coast Guard Auxiliaries and Inuit Guardians are trained and act as force multipliers on ground search and rescue efforts (Kikkert, 2023).

1.19.3.3.6 The Arctic Monitoring and Assessment Programme

The arctic Monitoring and assessment Programme focuses its activities on the circumpolar region located north of the 60th parallel including the marine areas of Hudson Bay and James Bay (Arctic Monitoring and Assessment Programme, 2023). The Arctic Monitoring and Assessment Programme is responsible for monitoring and assessing the status of the Arctic region concerning pollution and climate change issues and their effects on the ecosystem, including the marine ecosystem, and human health (Légaré, n.d.). This Programme compiles and assesses data from relevant scientific research institutions, which are engaged in Arctic monitoring activities and makes them available through scientific reports and articles to the Arctic Council's members and the public (Arctic Monitoring and Assessment Programme, 2023). Further, it provides policy-relevant recommendations addressing trends and gaps in pollution and climate change monitoring in the Arctic (Légaré, n.d.). It provides relevant targeted information to the international institution and to the Arctic Council's member States to help these institutions and governments to select effective decisions in their policymaking (Arctic Monitoring and Assessment Programme, 2019).

1.19.3.3.7 Nunavut Marine Council

The operations of the Nunavut Marine Council are based on Article 15.4.1 of the Nunavut Land Claim Agreement (Légaré, n.d.). The jurisdiction of the Nunavut Land Claims Agreement includes marine coastal waters. Based on Article 3 of the Agreement, the Nunavut Marine Council authority extends to the whole of the Nunavut Settlement Area, which includes all the lands, water marine areas, and the land fast ice zone described in the Agreement (Lalonde and Bankes, 2023). The Nunavut Marine Council makes recommendations to other federal agencies regarding marine areas of the Nunavut Settlement Area, and the Government shall consider such recommendations in making decisions which affect marine areas (Lalonde and Bankes, 2023).

1.19.3.4 Environmental Guideline: Spill Contingency Planning And Reporting Regulations, N.D.

This guide explains the requirements of the regulations from Spill Reporting to developing a plan that guides spill response operations known as a Spill Contingency Plan (Government of Nunavut, n.d.) This is a document that specifies the regulations that mandate approaches based on acts and other relevant

statutes, enacted by the Legislative Assembly of Nunavut (Government of Nunavut, n.d.). They serve to inform the required actions and measures based on the relevant acts in a concise manner (Government of Nunavut, n.d.).

1.19.3.4.1 Inventory Management Maintenance and Infrastructure.

To ensure that a nationally consistent and effective state of preparedness is maintained, an Inventory Response Control and Management System (IRCMS) has been implemented which utilizes the Management Authority database as its main tool. Canadian Coast Guard administers this system in conjunction with regional Inventory Response Control and Management System Officials. In the Arctic region, the Logistics and Statistics Officer in the Operations Sections administers the program.

This system has been created to:

- Maintain an updated record of the quantity and location of resources.
- Maintain an appropriate state of readiness through an initiative-taking approach using work orders and preventative maintenance.
- Aid in keeping managers in response informed about Environmental Response's state of preparedness.
- Assist in the tracking of National Response Team personnel or equipment assigned to National or International incidents.

1.19.3.4.2 Pre-positioned Equipment Caches and Depots

Central and Arctic Region covers an extremely large geographical and culturally diverse portion of Canada, therefore in essence they are different operating zones which are entrenched in the Canada Shipping Act. These are:

- The Arctic Zone or all areas of Canadian jurisdiction north of 60° North Latitude.
- The Central Zone is dominated in a marine transportation sense by the Great Lakes, but which include the southern portions of Hudson and James Bay along with the major waterways and watersheds of Lake Winnipeg, Winnipegosis, Lake of the Woods, and Lake Athabasca.
- The Environmental Response Branch has pre-positioned equipment to facilitate and maintain effective response operation. Response strategies in each of the two zones (Central or Arctic) are based upon the identification of local and regional responses. This means that the equipment required for such a spill size is contained within the region. The capacity is complemented by nationally available resources which would be distributed from/to other regions when required.

1.19.3.4.3 Local Level Chesterfield Inlet

It is important to note that Chesterfield Inlet has been explained extensively in the Background Information Report in Appendix 1, pages 36 to 37.

In addition, supplemental information about Canada's oil spill organizational structure and strategies are in the Background Information Report in Appendix 1, pages 17 to 34.

1.20 DENMARK

1.20.1 National Response Organization Overview

From the 1st of January 2000, the response responsibility to oil spills or other hazardous and noxious substances at sea and in coastal waters was moved from the Danish Ministry of the Environment and Energy to the Danish Ministry of Defence (International Tanker Owners Pollution Federation Limited, 2018a). The Ministry of Defence has subsequently delegated the authority to Defence Command Denmark, which delegated the contingency function to the Admiral Danish Fleet, also called the Royal Danish Navy (International Tanker Owners Pollution Federation Limited, 2018a).

1.20.2 National Legislation

1.20.2.1 Marine Strategy Act 2019 (Promulgated 19/12/2017)

The act established the framework for the implementation of measures that maintain good environmental status of marine ecosystems and enable the sustainable use of marine resources (Marine Strategy Act -Promulgation, 2019). According to the (Marine Strategy Act-Promulgation, 2019), the environment minister prepares marine strategies to:

- a) Ensure the protection, maintenance and prevent deterioration of the marine environment and restore marine ecosystems in areas where they have been adversely affected (where possible).
- b) Prevent and restrict inputs into the marine environment, phase out pollution, reduce significant impacts or risks to marine biodiversity, marine ecosystems, human health, and usage of the sea.
- c) Maintain the marine ecosystem's ability to cope with change.
- d) Ensure that the combined presence of human activities is compatible with the achievement of good environmental status.

Environmental status refers to the overall state of the environment in marine waters considering the structure, functions and processes of individual marine ecosystems and natural physiographic, geographic, biological and climatic factors, as well as physical, acoustic and chemical conditions, including those resulting from human activities inside or outside the are concerned (Marine Strategy Act-Promulgation, 2019).

1.20.2.2 Danish Marine Strategy II -Focus on A Clean and Healthy Marine Environment 2018 To 2024.

This strategy is a six-year strategy that serves to establish a healthy and improved marine environment for people, animals and plants for current and future generations (Ministry of Environment Denmark, 2019). This Marine Strategy Framework Directive is based on an ecosystem approach therefore, the total exploitation of the marine environment must be compatible with a good environmental status. In other words, the protection and use of the sea must be in balance (Ministry of Environment Denmark, 2019). The Marine Strategy consists of three sections: an initial analysis, a monitoring programme and a programme of measures (Ministry of Environment Denmark, 2019). The overall strategy covers the years 2018-2024. Each part of the Marine Strategy is revised every six years (Ministry of Environment Denmark, 2019).

Table 20: Key sections of Marine Strategy.

Section	Description
Initial analysis	An overview of the status of the sea and its impacts on it, and it sets targets aiming at a good environmental status.

Monitoring programme	Updates monitoring programme that considers new knowledge and new monitoring methods.
Programme of measures	Follows up with measures and efforts to be implemented for the sea to achieve or maintain a good environmental status.

This Strategy is based on the Marine Strategy Framework Directive and the Danish Marine Strategy Act, which establish the framework for achieving or maintaining good environmental status in marine ecosystems and enable sustainable exploitation of marine resources (Ministry of Environment Denmark, 2019). Good environmental status (acute pollution events)-This is when the adverse effects of significant acute pollution events on species' health and the status of habitats have been minimised and to the greatest extent eliminated (Ministry of Environment Denmark, 2019).

1.20.2.3 The Emergency Management Act Consolidation Act no. 660 of 10 June 2009.

According to the Emergency Response Act, it is the task of the rescue services to prevent, limit and remedy damage to persons, property and the environment in the event of accidents and disasters, including acts of terrorism and war, or in the event of imminent danger (The Emergency Management Act, 2009). The rescue service consists of the municipal rescue service (the fire brigade) and the state rescue service (The Emergency Management Act, 2009). The municipal rescue service initiates the immediate response to accidents and disasters and takes care of the technical management of the response at the scene of the accident during the entire course of action (The Emergency Management Act, 2009). In the event of major, long-lasting or manpower-intensive incidents or incidents that require special equipment, the National Emergency Management Agency assists at the request of the municipal rescue services and other authorities with emergency tasks or responsibility for important community functions (The Emergency Management Act, 2009).

1.20.3 The Municipal Emergency Response

The municipal rescue service must be able to provide responsible preventive, limiting and remedial efforts concerning local risks against damage to persons, property and the environment in the event of accidents and disasters, including acts of terrorism and war (The Emergency Management Act, 2009). The detailed rules for the tasks and organization dimensioning of the municipal rescue services appear in the order on risk-based municipal rescue services (The Emergency Management Act, 2009). The basic principle in the order is that the municipalities must seize the rescue services based on an assessment of the local risks (The Emergency Management Act, 2009). The tasks of the municipal rescue service can be carried out either by the municipality itself or by the municipal council entering into an agreement to this effect with another municipal council, the Emergency Management Agency, a private rescue service or others, e.g. a voluntary fire brigade (The Emergency Management Act, 2009). It is the municipal council's responsibility to ensure and check that the municipality's emergency response is properly organized and dimensioned (The Emergency Management Act, 2009). The municipal emergency preparedness is organized in nineteen municipal communities (coordinated emergency preparedness), and in thirteen municipalities, the emergency preparedness is handled by the individual municipal council (The Emergency Management Act, 2009).

1.20.3.1.1 The tasks of the municipal rescue service

As mentioned, the municipal rescue services must be able to provide appropriate action against damage to persons, property and the environment in the event of accidents and disasters, including acts of terrorism and war (The Emergency Management Act, 2009). Fires and explosion accidents, collision accidents, train accidents, plane accidents, ship accidents at quays, natural disasters and accidents may lead to the release and spread of dangerous substances on land, in lakes, in waterways and ports (The Emergency

Management Act, 2009). The municipal rescue service must also be able to be deployed in connection with the release of trapped persons in the event of a traffic accident (The Emergency Management Act, 2009).

Furthermore, the municipal rescue service must be able to receive, accommodate and care for evacuees and other people in need (The Emergency Management Act, 2009). Rescue tasks in lakes, marshes, streams and harbours are also part of the tasks of the municipal rescue services (The Emergency Management Act, 2009). The Emergency Services Act does not require that the municipal rescue service be able to solve rescue tasks that entail the establishment of a municipal diving service (The Emergency Management Act, 2009). However, the individual municipal council can decide to establish such a diving emergency service, which will then be covered by the requirements that apply to diving work (The Emergency Management Act, 2009).

1.20.3.2 Chemical, Biological, Radiological, Nuclear, And High Yield Explosives (CBRNE) Incidents Guidelines for Efforts -12/2022

Response to acute accidents involving dangerous substances on land, in lakes, streams and harbours is handled by the municipal rescue services (Danish Emergency Management Agency, 2022). All spills or releases of dangerous substances, where there has been personal injury or damage to the environment or valuables, or where there is an immediate danger of this, are considered acute accidents involving dangerous substances (Danish Emergency Management Agency, 2022). Acute accidents involving dangerous substances are thus a subset of the incidents that are collectively referred to as Chemical, Biological, Radiological, Nuclear, and Explosive Substance incidents (Danish Emergency Management Agency, 2022). Chemical, Biological, Radiological, Nuclear, and Explosive Substances incidents are understood to mean incidents with chemical (C), biological (B), radioactive (R), nuclear (N) or explosive substances (E) that in the specific situation constitute a danger (Danish Emergency Management Agency, 2022). The municipal rescue service is responsible for the emergency phase of the response to accidents involving dangerous substances, after which the municipality's or the state's road or environment department according to, among other things, road legislation or environmental legislation takes over the responsibility for the response to the resulting pollution (Danish Emergency Management Agency, 2022).

The acute phase is the stage immediately after the accident, where efforts are made to stop the accident and prevent the spread of pollution and other harmful effects (Danish Emergency Management Agency, 2022). If the accident causes or may cause a risk to the health and safety of directly or indirectly affected persons in or near the intervention area, the doctor from the Patient Safety Authority can advise the intervention management on precautions for these persons (Danish Emergency Management Agency, 2022). There is no authority in the Emergency Response Act to demand payment for the emergency response of the emergency services in the event of incidents involving dangerous substances (Danish Emergency Management Agency, 2022). In the specific case, it must be decided according to the rules in the environmental and road legislation, whether there is authority in these legislations to demand that the responsible person causing the damage reimburses the expenses of the emergency services (Danish Emergency Management Agency, 2022).

According to environmental legislation, in the event of imminent danger to health and in cases where immediate intervention is required to avert significant pollution or the spread of pollution, the environmental supervisory authority can take the necessary measures without order and at the expense of the person responsible (Danish Emergency Management Agency, 2022). According to road legislation, the road authority or the police can order the polluter to clean up and, in urgent cases, arrange for this to be done at the polluter's expense (Danish Emergency Management Agency, 2022). The road authority is the Road Directorate for state roads and the municipal board for municipal roads, private shared roads and usually also private roads (Danish Emergency Management Agency, 2022).

1.20.3.3 Preparedness Plan for The Government of Denmark- Preparedness to Combat Pollution of The Sea with Oil and Other Harmful Substances (Contingency Plan)- 07-03-2023

The contingency plan was developed based on applicable statutes and regulations to guide the Defence Command and other authorities (and response units) on sea-based oil spill response measures

(Danish Defence Command, 2023). The primary purpose of the emergency plan is to outline the framework for efficient and prompt response within the area of responsibility (Danish Defence Command, 2023). This plan also supports international response work as part of Denmark's international agreements (Danish Defence Command, 2023).

1.20.3.4 Roles and Responsibilities of the Actors in Oil Spill Response in Denmark

1.20.3.4.1 Danish State Emergency Department

The national objective of the Government of Denmark's Preparedness to combat pollution of the sea with oil and other harmful substances (Contingency Plan) consists of combatting sea-based oil and other harmful substance incidents.

1.20.3.4.2 Oil Spill Response

The entails development and maintenance of response equipment towards the required level of effectiveness, that enables emergency responders to deal with medium-sized spills (up to 5000 tonnes) in Danish (and adjacent) and Greenlandic waters (Danish Defence Command, 2023). The Containment or limitation of damage to the surrounding environment reduces the cost required to restore the environment to its original state (Danish Defence Command, 2023).

1.20.3.4.3 Monitoring oil

The entails monitoring of Danish and neighbouring waters through aerial surveillance and satellites-based monitoring, to facilitate the independent jurisdiction enforcement in addition to the establishment of an exclusive economic zone around Denmark (Danish Defence Command, 2023). This has informed the basis for the deployment response units and equipment in regional and international pollution incidents (Danish Defence Command, 2023).

1.20.3.4.4 National Legal Basis for Emergency Service.

The National Legal Basis for Emergency Service (environmental protection against pollution) is based on the Marine Environment Act under Legislative Decree No 1165 of 25 November 2019 on the protection of the marine environment with subsequent amendments, together with Legislative Decree No 1629 of 17 December 2018 on safety at sea with later amendments (Danish Defence Command, 2023).

1.20.3.4.5 Municipal council

The remediation of coastal areas and response to pollution in harbours are overseen by the Municipal Council (Danish Defence Command, 2023).

1.20.3.4.6 Ministry of Defence

The Ministry of Defence is responsible for the national Danish Preparedness to combat pollution of the sea with oil and other harmful substances (Danish Defence Command, 2023). As stipulated in the act the Minister of Defence may assume a lead role in the remediation of coastal areas and pollution response in harbours (Danish Defence Command, 2023). The distribution of tasks in connection to sea and coastal pollution response is illustrated in Figure 21.

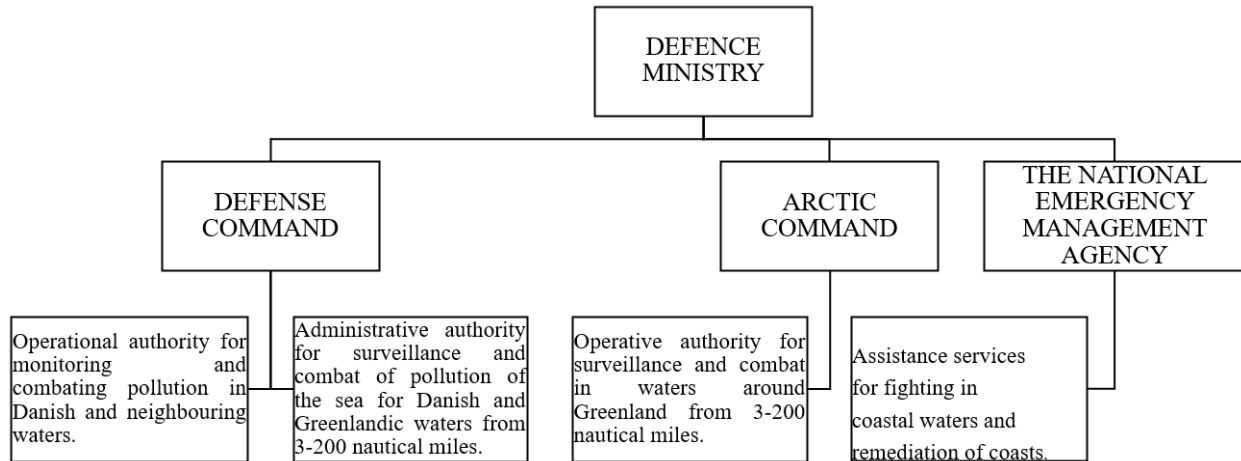


Figure 21: Roles and responsibilities in connection to sea and coastal pollution response translated from (Danish Defence Command, 2023:11).

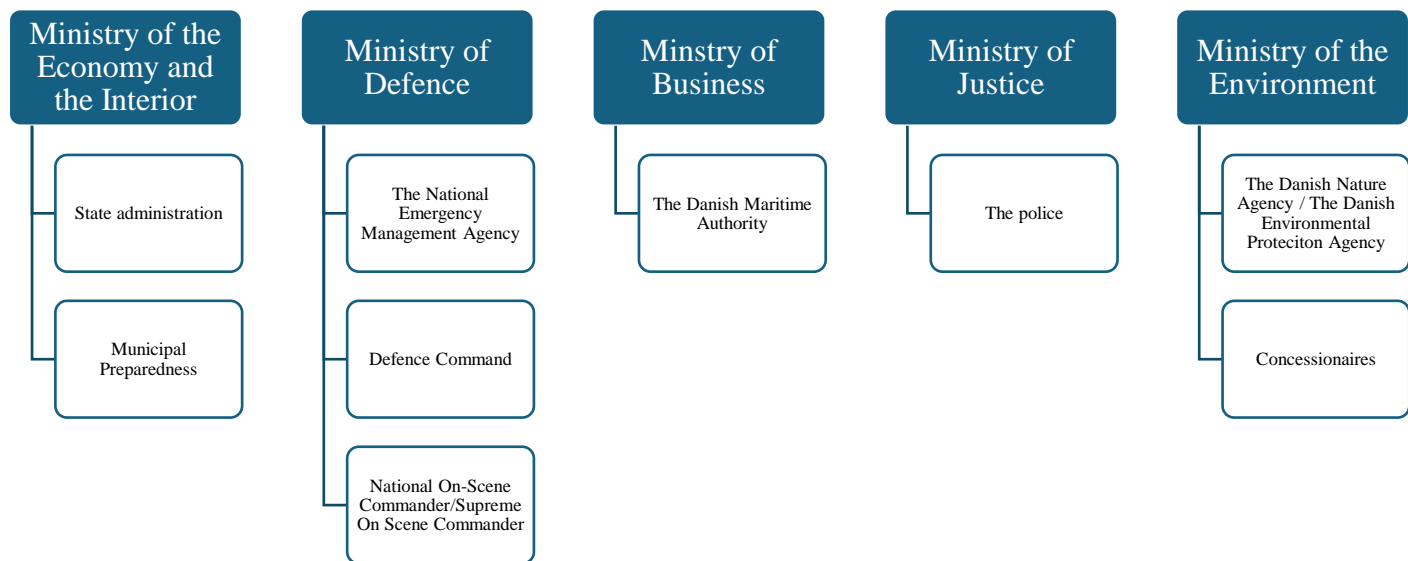


Figure 22: Command structures for marine pollution in Denmark translated from (Danish Defence Command, 2023:12)

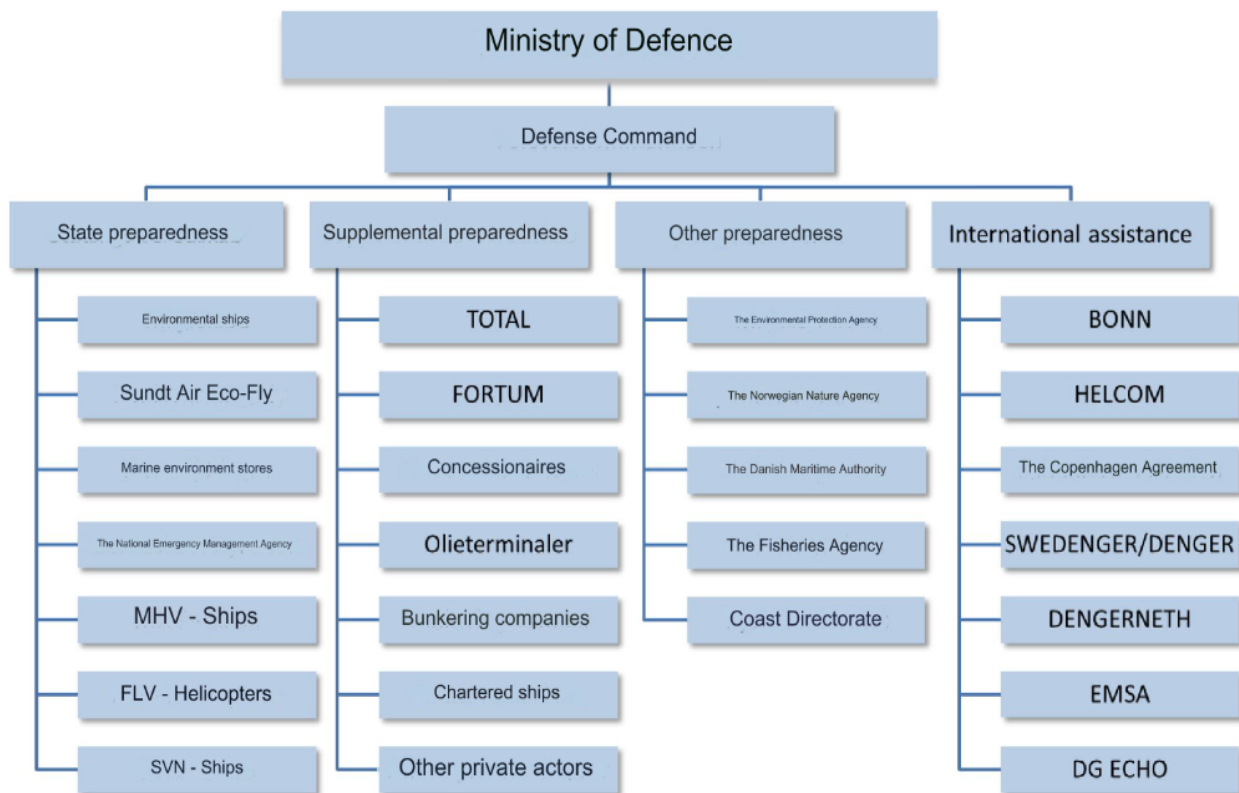


Figure 23: Organizational chart for marine environmental tasks translated from (Danish Defence Command, 2023:15).

1.20.3.4.7 Danish Defence Command

The Defence Minister has delegated the Danish Defence Command as the coordinator in oil and hazardous substances pollution preparedness and response (Danish Defence Command, 2023).

1.20.3.4.8 Danish Emergency Management Agency

The Danish Emergency Management Agency (DEMA) is a governmental agency under the Ministry of Defence. They work to prepare society for, prevent and respond to crises, accidents and disasters. According to an assessment from the National Risk Profile Report 2022, the Danish Emergency Management highlighted the significance of greater attention to the risk of maritime incidents. The agency also assesses and evaluates risk trends and promotes proactive planning (The National Audit Office, 2024).

1.20.3.4.9 The Chemical, Biological, Radioactive Nuclear, Explosive Substances Expert Response Teams

Several authorities have established expert emergency response teams that can be used as support and supplement to the daily emergency response (Danish Emergency Management Agency, 2022). The purpose of the expert emergency services is basically to be able to assist the municipal rescue services, the police or other relevant authorities with advice and response capacity to minimize a threat or the consequences of Chemical, Biological, Radioactive, Nuclear, Explosive substances incident (Danish Emergency Management Agency, 2022). The expert emergency services can advise and support the requesting authorities and contribute to a certain extent with analysis and intervention capacity (Danish Emergency Management Agency, 2022).

The Chemical Biological Radioactive Nuclear Explosive substances expert contingencies are the following:

- C: Chemical Preparedness, Emergency Management Agency

- B: Center for Biosecurity and Bio preparedness, Statens Serum Institute (SSI)
- R: The Danish Health Authority, Radiation Protection (SIS)
- N: Nuclear Preparedness, National Emergency Management Agency
- E: The Defence Ordnance Disposal Service

1.20.3.4.10 *The Ministry of Environment*

The Ministry of Environment coordinates the municipal emergency plans after negotiations with the affected municipalities on the overall preparedness (Danish Defence Command, 2023).

1.20.3.4.11 *Municipality*

According to the Marine Environment Act, the Danish municipalities must prepare a contingency plan for implementing the remediation of coastal stretches in the event of significant pollution of the coasts in the municipality and for combating pollution in ports within the municipal boundary (Danish Defence Command, 2023). Attached to the individual municipal plan is an overview map showing the nature-sensitive areas within the municipality (Danish Defence Command, 2023). It should be noted that the preparedness described in this contingency plan in principle only includes prevention and control measures for pollution if it is at sea, while the responsibility for cleaning/sanitizing beaches and other stretches of coast that have been polluted with oil-driven ashore or other harmful substances are the responsibility of the respective municipalities (Danish Defence Command, 2023).

1.20.3.4.12 *Municipal Board*

According to Section 35 of the (Marine Environment Protection Act, 1996), the municipal board is responsible for the remediation of coasts and beaches in addition to pollution management in port areas. This obligation also applies to private and municipal ports. The Municipal Board approves emergency plans (Marine Environment Protection Act, 1996).

1.20.4 Local Level Tårnby Municipality and Vesthimmerland Municipality

1.20.4.1 Tårnby Municipality Emergency Environmental Preparedness Plan 2012

This municipal emergency environmental preparedness plan was developed under the stipulations of the Emergency Management Act regarding acute environmental accidents (Tårnby Municipal Board, 2012). The plan serves to outline emergency response measures towards protecting the environment within the administration's area of competence from environmental accidents (Tårnby Municipal Board, 2012).

The Nature and Environment Department has drawn up the plan in collaboration with the Tårnby Fire Department and describes the tasks of the Nature and Environment Department in connection with environmental accidents involving the administration or an externally attached environmental advisor (Tårnby Municipal Board, 2012). The plan's primary target group is the Tårnby Fire Service, as the environmental side of the emergency response is described in the form of action cards for various environmental accident scenarios (Tårnby Municipal Board, 2012).

The municipality also prepares, by the Act on the Protection of the Marine Environment subsection 35, subsection 22, a contingency plan for implementing the remediation of coastal stretches and combating pollution of ports in the event of pollution (Tårnby Municipal Board, 2012).

If an urgent alarm is received by Nature and Environment during working hours by the Alarm Center or Tårnby Fire Department, the following guidelines are followed: The Environmental Protection Agency receives the notification and records the information on the "Telephone notification of pollution" form (Tårnby Municipal Board, 2012).

In the event of a major accident, the emergency center is contacted through telephone number 112 to ensure proper handling of the process (Tårnby Municipal Board, 2012). In the event of a minor accident, the incident leader at Tårnby Fire Brigade is contacted to clarify the situation (Tårnby Municipal Board, 2012).

In transboundary pollution situations, the environmental watchdog in the affected neighbouring municipality(s) is contacted immediately (Tårnby Municipal Board, 2012). To describe the environmental

side of the emergency response for the Tårnby Fire Department, 6 action cards have been prepared for the following scenarios:

- Oil spills on land, oil spills in freshwater, chemical spills on land, chemical spills in freshwater, oil and chemical spills at the company.

1.20.4.1.1 Coordination of the response effort

During an incident, the Nature and Environment Department is responsible for:

- Notification of the task leader, review of situation reports and agreement on the next action.
- Provision of technical environmental advice to the project manager.
- Identification and monitoring of the pollution source to the extent necessary, if a responsible party has not been identified.
- Retrieval of documentation that allocates roles and responsibilities during accidents to determine the scope.
- Operationalization as a liaison to the municipality's other security arrangements.
- Request for assistance from private and public contractors at the task manager's request.
- Notification of additional authorities at the request of the incident leader.

Following the response manager’s assessment that the immediate danger has been resolved, the contamination has been contained, and the rescue team’s efforts have been completed, then further responsibility is handed over to Nature and Environment (Tårnby Municipal Board, 2012). An accident report is drawn up according to the guidelines and handed over to the relevant case manager in Nature and Environment or another authority (Tårnby Municipal Board, 2012). A decision is then taken on the further administrative course of the case (Tårnby Municipal Board, 2012).

1.20.4.1.2 Action Cards For Scenario-Based Training and Response

Table 21: Oil spill response action card for land-based oil spills from (Tårnby Municipal Board, 2012).

Action Card 1 Oil Spill on Land	
Environmental Efforts	<ol style="list-style-type: none"> 1. The identification of the source of the oil spill and the containment of the spill. 2. Preventive measures consist of: <ul style="list-style-type: none"> • The drainage of defective storage containers. • The containment of the source of the contamination. 3. Restoration includes: <ul style="list-style-type: none"> • The establishment of an earthen embankment or a ditch for the collection of the pollutant (in an excavated swamp lined with a tarpaulin or with the introduction of water under the oil). • The establishment of a cut-off ditch (at a high ground water table less than 3 m depth). • The retrieval of spilt oil (suction material, mud cleaner)

	<ul style="list-style-type: none"> • Covering the contaminated area with tarpaulin.
Assistance	<ul style="list-style-type: none"> • Contractor • Nature and Environment Department • Investigator • Photo • Map
Documentation	<ul style="list-style-type: none"> • Sketch Notes/course of events • Sampling (soil) • Quantitative assessment of spills • Excavated soil • Aeration of the soil by ploughing
Restoration	<ul style="list-style-type: none"> • Harrowing • Use of NPK fertilizer • Fertilizer to promote microbiological decomposition. • Cleaning of hard surfaces by mixing with water. • Oil/water emulsion must be collected
Follow up	<ul style="list-style-type: none"> • Submission of documentation to Nature and Environment Department. • A copy of the emergency report was sent to the Nature and Environment Department.

Table 22: Oil Spill Response Action Card in freshwater environments from Tarnby Municipal Board, 2012.

Action card 2: Oil spill in freshwater	
Environmental efforts	<ol style="list-style-type: none"> 1. Locate the pollution source and stop the spill 2. Preventive measures <ul style="list-style-type: none"> • Emptying of any defective container • Unclogging of any oily discharge • Containment of pollution in still flowing streams (establishment of spade barrier, earth dam, straw barrier, net barrier, floating barrier) • Containment of oil in stagnant water (Establishment of float restriction possibly combined with blocking at the lake's

	<p>outlet, see, if necessary, delay basin with submerged drain)</p> <ul style="list-style-type: none"> Collection of free oil (absorption material, oil skimmer, oil separator, suction head, mud suction)
Assistance	<ul style="list-style-type: none"> Contractor/hauler, Nature and Environment Department, Waste recipient, Police (Investigation), Photo, Map
Documentation	<ul style="list-style-type: none"> Sketch/notes/course of events, Sampling (oily discharge), Quantitative assessment of spillage, Document connection between the source and contamination in the receiver, Flushing of pipelines and streams can be considered,
Restoration	<ul style="list-style-type: none"> If necessary, the flow barrier is maintained for a suitable period after pollution in agreement with Nature and the Environment
Follow up	<ul style="list-style-type: none"> Submission of documentation to Nature and Environment. Copy of emergency report sent to Nature and Environment

Table 23: On Oil Spill Response Action Card at Private Facilities From (Tarnby Municipal Board,2012)

Action card- oil and chemical spills at company	
Environmental efforts	<ol style="list-style-type: none"> Stop spills Preventive measures <ul style="list-style-type: none"> Emptying any defective container Containment of pollution by still flowing liquid (establishment of an embankment, collection in artificial swamp) Covering drain grates with water-filled plastic bags Suction of spillage with suction material or mud suction, if applicable. in plugged drainage wells
Assistance	<ul style="list-style-type: none"> Nature and Environment Police (Investigation) Photo

	<ul style="list-style-type: none"> • Map sketch/notes
Documentation	Sequence of events <ul style="list-style-type: none"> • Sampling/documentation of spills • Quantitative assessment of spills • Cleaning of hard surfaces by rinsing with (hot) water
Restoration	<ul style="list-style-type: none"> • Contaminated water must be collected.
Follow up	<ul style="list-style-type: none"> • Submission of documentation to Nature and Environment • Copy of emergency report sent to Nature and Environment

1.20.5 Tarnby Municipality-Beach Cleaning Plan 2023

This plan was developed based on the Act on the Protection of the Marine Environment.

1.20.5.1 Task Leader

During major pollution incidents, a mobile command post with means of communication is used. The command post is situated in a pre-determined location and staffed by employees with training in radio and telephone monitoring as well as Geographic Information Systems. The operations manager has direct contact with the command post. In the event of a significant pollution event, an emergency team is set up at Copenhagen Police Station. The emergency team usually consists of representatives of the emergency services, nature, environment and climate department, police, the Environmental Agency and neighbouring municipalities.

1.20.6 Environmental Monitoring Plan for Vesthimmerland Municipality-2022-2025

1.20.6.1 Supervisory effort

The municipality conducts dialogue-based inspections that serve to facilitate knowledge transfer and encourage compliance with regulations/legislation (Vesthimmerland Municipality, 2022).

1.20.6.2 Inspection types, risk assessment and inspection frequency.

The inspections are conducted as part of a drive/campaign (at least two major inspections annually). The campaigns are either industry-based or have an environmental theme. The municipality carries out emergency supervision in connection with pollution accidents and complaints.

1.20.6.3 International Environmental Organization of Municipalities (KIMO Denmark).

1.20.6.3.1 The Municipal Environmental Watch

Various municipalities have established an environmental watch system, which represents the municipality's environmental department outside normal working hours and which can either give advice by telephone or assist at an accident site and take care of the task of cleaning up after the accident (International Environmental Organization of Municipalities, 2022).

In municipalities with an environmental watch, this can guide the emergency services in the emergency phase when it comes to assessing the local environmental conditions, e.g. assessment of acute soil pollution or knowledge of companies with environmentally hazardous storage (International Environmental Organization of Municipalities, 2022).

1.21 GREENLAND

1.21.1 National Response Organization Overview

The responsibility for responding to a marine pollution event lies primarily with the polluter under the appropriate coastal state (Shipping and Aviation Rescue Council, 2020). Additionally, the provision of marine pollution response assistance may be in a participating agency's interest as a training opportunity to maintain or improve experience and response posture for major pollution incidents (Shipping and Aviation Rescue Council, 2020).

Greenland and Faroe Islands, which are both autonomous territories within the Kingdom of Denmark, have their oil spill response arrangements (Hänninen et al., 2020). These differ from those applied in Denmark, and the local governments coordinate Oil spill response actions (Hänninen et al., 2020). However, Danish assets can be utilized in an oil spill incident (Hänninen et al., 2020). This is if the scale of the incident requires this (Hänninen et al., 2020). Greenland's emergency prevention, preparedness and response system is co-managed between Greenlandic and Danish authorities as Greenland is a semi-autonomous constituent of the Kingdom of Denmark (Hänninen et al., 2020; Odd et al., 2019).

1.21.1.1 Government of Greenland and Internal Waters

The Department for Nature and Environment upholds maritime environment emergency preparedness based on personnel and equipment placed at the fire departments in the Greenlandic towns of Qeqertarsuaq, Ilulissat, Qasigianniguit, Aasiaat, Sisimiut, Maniitsoq, Nuuk, Paamiut, Narsaq, Qaqortoq, Nanortalik and Tasiilaq (Odd et al., 2018). This Greenlandic maritime preparedness organization can primarily respond to pollution in the harbour areas and coastal waters and:

- if the weather conditions allow
- in waters between the coastal line and the 3 nm line (Odd et al., 2018).

Responsibility for the marine environment and thus the oil spill response in Greenland is generally apportioned as outlined in table 24.

Table 24: Areas of Responsibility and Responsibility for Oil Spill Response Operations in Greenland (Government of Greenland, 2014).

Area of Responsibility	Responsible Party for Oil Spill Response
Within the three nautical mile zone	Government of Greenland- Ministry of Housing, Environment and Nature (Government of Greenland, 2014). The operational aspect of emergency response lies with the local municipal response units which have been stockpiled in most of the larger towns in Greenland (Government of Greenland, 2014).
Outside the three nautical mile zone	Denmark is responsible for the marine environment, excluding mineral resources activities (Government of Greenland, 2014). The operational aspect of emergency response lies with the Joint Arctic Command (Government of Greenland, 2014).

1.21.2 National Regulation

1.21.2.1 Contingency Plan for Greenland Command to Combat Pollution of the Sea with Oil and Other Harmful Substances in The Water Beyond Greenland Main Plan (Part I) And Emergency Plan for Greenland Command Ready to Combat Pollution of The Sea with Oil and Other Harmful Substance Emergency Manual (Part II) 2009

This contingency plan was drawn up within the framework of applicable laws and regulations, was approved for use in Greenland Command's area of responsibility, and served as guidance for units that are under Greenland Command's Operational Control (Greenland Command, 2009).

The emergency plan serves to establish the framework for initiating prompt and effective control efforts within one's area of responsibility and interest, in addition to supporting national and international cooperation with relevant authorities (Greenland Command, 2009). The emergency plan consists of a Master Plan (Part I) and an Emergency Manual (Part II) (Greenland Command, 2009). The primarily administrative master plan consists of several chapters that describe the emergency response's objectives, organization and areas of responsibility, all based on the applicable legal basis (Greenland Command, 2009). In addition, the established operational measures adopted combat strategies and emergency response capacity are described (Greenland Command, 2009). Finally, procedures and responsibilities for updating the emergency plan are determined (Greenland Command, 2009).

Part II of the emergency plan; the Emergency Manual, which is operational, consists of several annexes containing detailed regulations of an administrative, operational, technical and legal nature, which can serve as a practical reference book for everyone involved in an emergency combat operation of a larger or smaller scale (Greenland Command, 2009). Part II does not contain specific instructions for using the available equipment, and in this connection, reference is made to other relevant naval publications and regulations (Greenland Command, 2009).

The national objective for Greenland's preparedness to combat pollution of the sea with oil consists of:

1. The expansion and maintenance of combat equipment to a level of effectiveness where the emergency services will be able to deal with smaller spills of up to 20,000 litres without outside help in the event of a major spill, be able to handle, assist and operate equipment that is transported by plane and ship from Denmark (Greenland Command, 2009).
2. The monitoring of Greenlandic and adjacent waters primarily with the use of aircraft with a view to independent jurisdictional enforcement of the Marine Environment Act and for optimal utilization of the environmental jurisdiction for which the establishment of the Greenlandic exclusive zone has created the basis (Greenland Command, 2009).

Table 25: Roles and Responsibilities of the main agencies within Greenland's National Oil Spill Plan (Greenland Command, 2009).

Agency	Responsibility
Danish Defence Minister	Responsible for oil and chemical pollution in waters outside three square miles of the baseline (Greenland Command, 2009).

Greenland Command	Greenland Command is responsible for combating pollution or implementing measures in the event of a threat of pollution with oil or other harmful substances of the open sea (Greenland Command, 2009). In this connection, it is from outer territorial waters to the end of Greenland's Economic Exclusion Zone (Greenland Command, 2009).
Greenland Home Rule	Greenland's Home Rule is responsible for pollution control from the baselines and three-square miles from the baseline to the coast- including harbour areas and anchorages (Greenland Command, 2009).

The national preparedness for combating marine oil spill pollution of the sea consists of two main components:

- A combat and control strategy
- A combat tactic.

A combat strategy was developed based on basic attitudes of a political nature, also from various analyses while the tactics outline the actions for incident response (Greenland Command, 2009).

Control strategy- a national control strategy that was developed based on a risk assessment and damage analysis (Greenland Command, 2009).

Combat tactics-Based on the current combat strategy, it is the task of the tactics to achieve a maximum result in a specific combat action with the means available and under the conditions and circumstances particularly applicable to the specific effort, i.e. geographical, environmental, weather and material nature (Greenland Command, 2009).

DECISION DIAGRAM

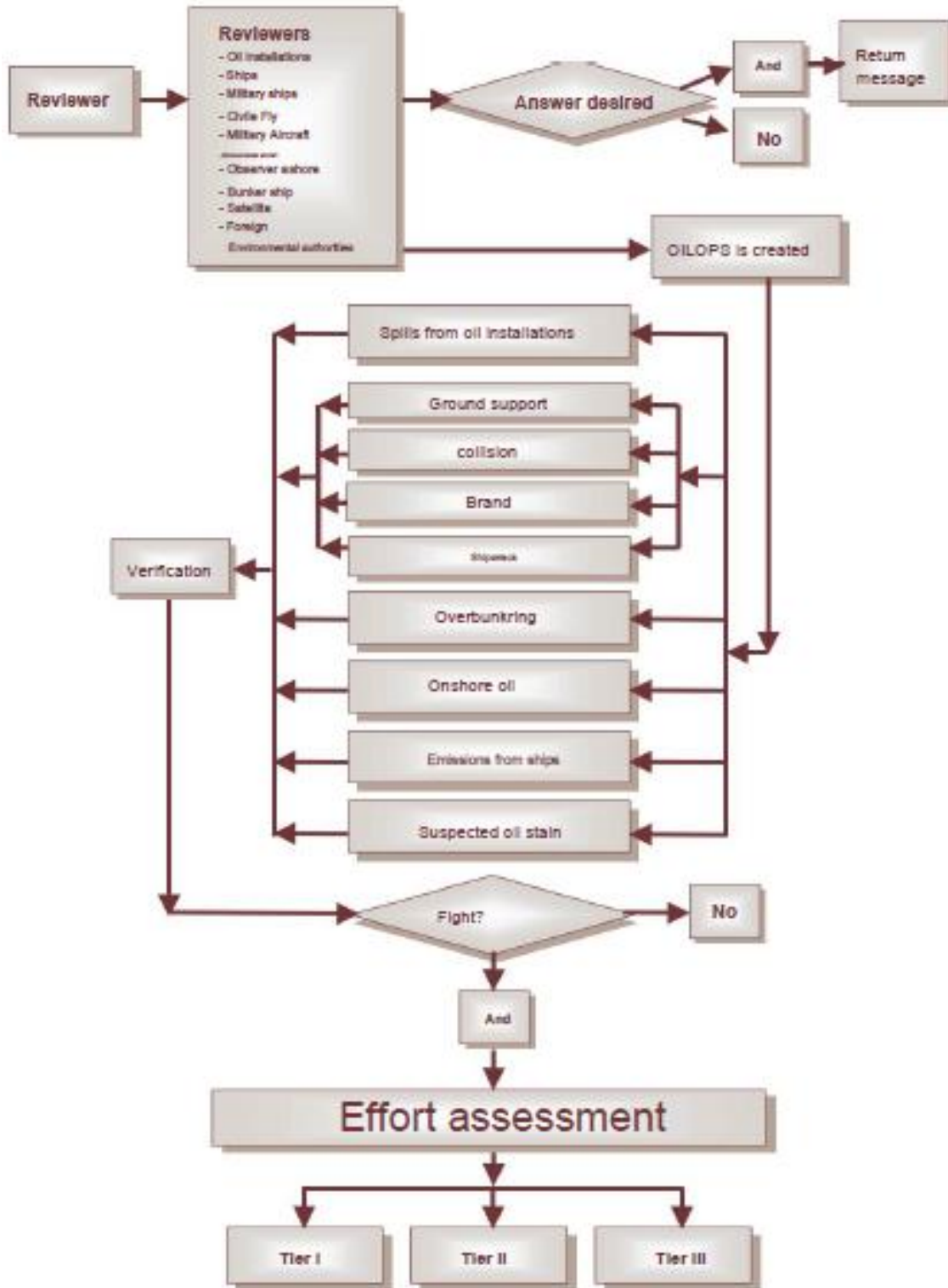


Figure 24: Decision diagram that outlines the decisions taken when dimensioning the level of tiered response during oil spill incidents (Greenland Command,2009:29).

If an extensive oil spill at sea has taken place or if there is a risk of an extensive oil spill, the following organization, or parts of it will be implemented (Greenland Command, 2009). Within the maritime territory, the County Council manages the efforts. Outside the sea territory, the management is carried out by Greenland Command (Greenland Command, 2009).

Tasks of a government operation manager in the sea territory include:

1. Ensure that the necessary personnel and materials are present in the right amount, at the right time and in the right place.
2. The coordination of the response, so that personnel and equipment are utilized efficiently.
3. The designation of an On Scene Commander.
4. The provision of vessels for the transport of oil control agents (dispersants etc) and collected oil.
5. The establishment of discharge points for retrieved oil and oil control agents (dispersants etc).
6. The protection of areas that are particularly vulnerable to oil pollution.
7. Implement preventative measures against the ignition of the oil during oil spills.
8. Procure specialized response equipment (sludge, vacuum, cleaners, special vessels, pumps).
9. The procurement of additional equipment and personnel.
10. Facilitates communication between the on-scene commander and the participating units engaged in pollution response/containment (ships/aircraft). If required, the communications between the on-scene commander and the incident leader on land are facilitated by the government operations manager.
11. If necessary, other countries and international authorities are informed/alerted about the oil spill, the extent of the spill and the response measures.

1.21.2.2 Response Levels I, II And III (Tiered Response)

The International Maritime Organization in collaboration with the oil industry had established a gradation of response services and levels for the use in classifying oil spill situations, tiered response system.

1.21.2.3 Classification of the Effort Levels

1.21.2.3.1 "Tier 1" or "Effort Level 1"

This action step deals with action services to minor spills that can be abated with limited national resources or with action solely from the preparedness of local authorities (e.g., ports) or companies (e.g. oil terminals). The circumstances surrounding the spill as well as the surrounding environment are contributing factors to classifying a spill in this category.

1.21.2.3.2 "Tier 2" or "Effort level 2".

This response step deals with response services for spills that require significant national resources and/or cooperation between the personnel and equipment of several emergency organizations. This action step may result in national resources and/or other resources outside the geographical area in question being deployed e.g., a port or an oil terminal. This step covers a wide range of spill sizes and potential scenarios.

1.21.2.3.3 "Tier 3" or "Effort level 3".

This action step deals with major oil spills, which require the mobilization of all national resources and, depending on the situation, international assistance, if necessary. provided based on bilateral, regional or global cooperation agreements. Detailed information on natural areas and other coastal areas that are particularly sensitive to the effects of oil pollution is significant as a background for action planning in connection with oil pollution accidents at sea.

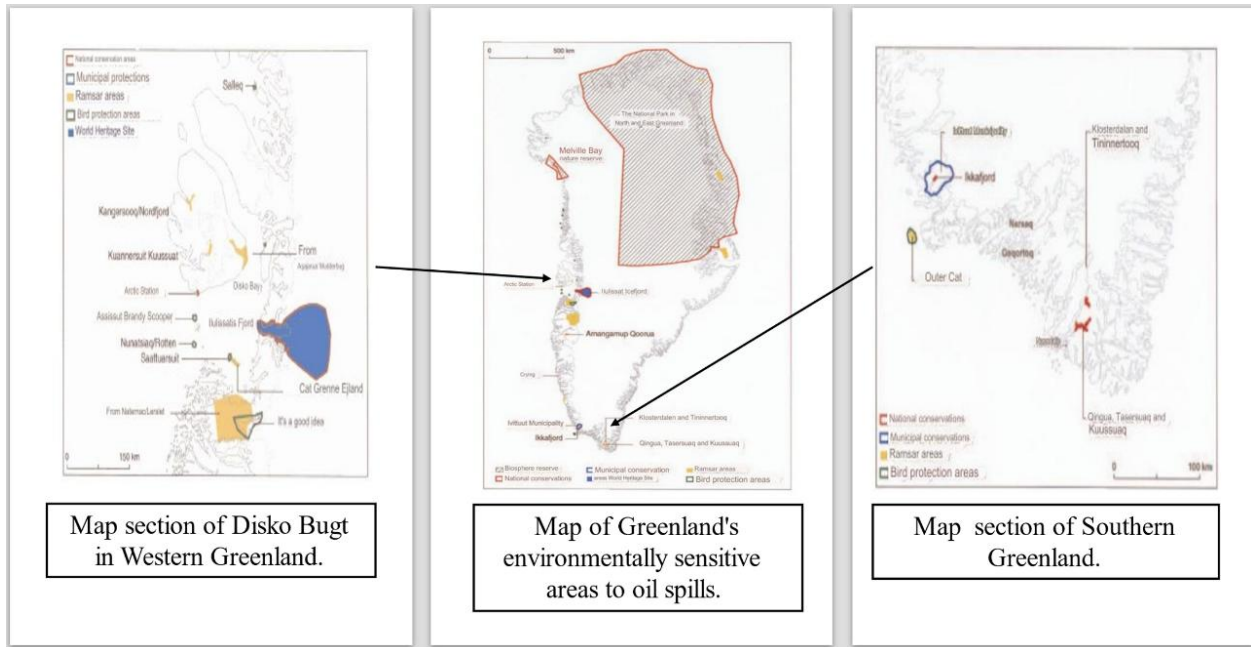


Figure 25: Left to Right Environmentally sensitive areas within Greenland (Greenland Command, 2009:48/49).

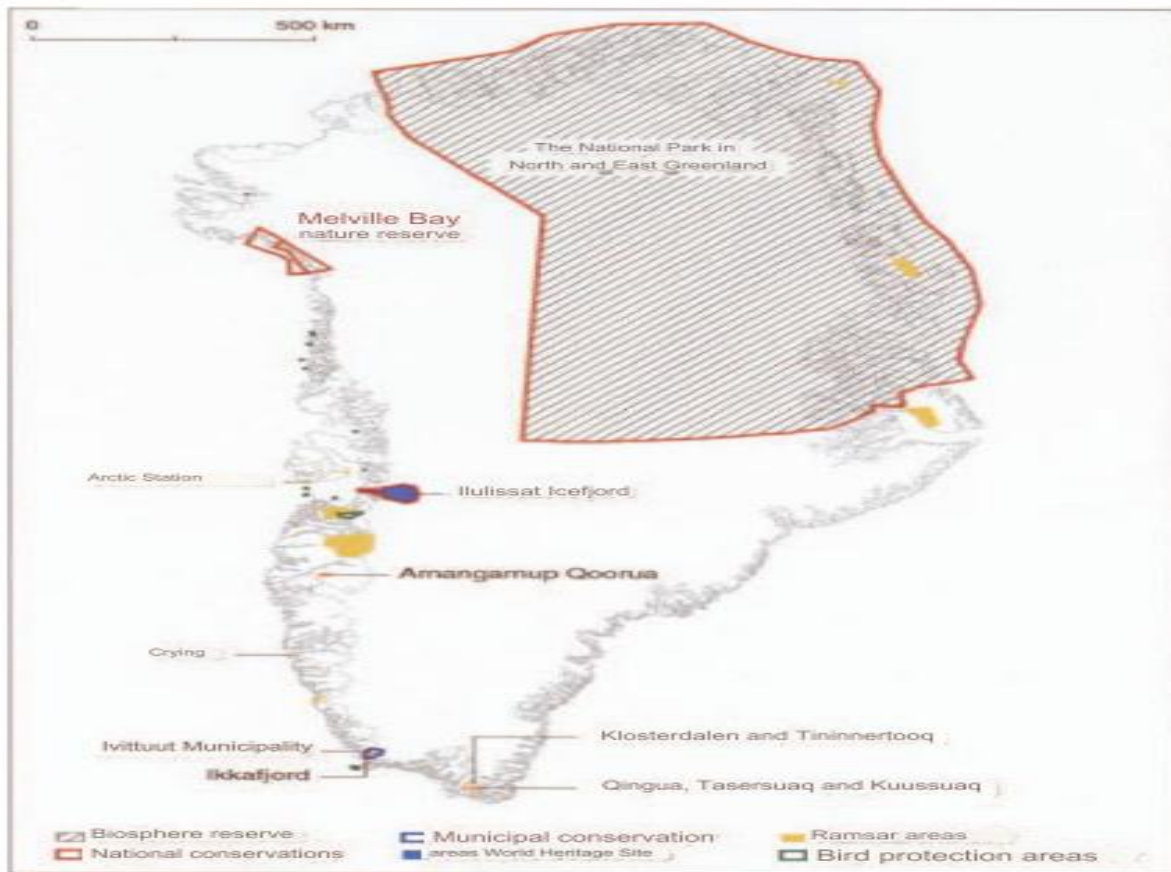


Figure 26: Environmentally sensitive areas of mainland Greenland (Greenland Command, 2009:48).

Table 26: Legend table of the natural areas requiring special attention and protection in this context from Figure 26.

AREA NAME	DESCRIPTION
Biosphere reserve	An area where human influence is tried to be minimised, as a result, tourists or raw material extractions are rare (Greenland Command, 2007).
Municipal conservation areas	Local areas that wish to be preserved via a municipal bylaw, such as the Ikkafjorden (Greenland Command, 2007).
Bird protection areas	Habitats for bird species that are under special protection and where the habitat is at risk of deterioration or is directly threatened (Greenland Command, 2007).
Ramsar sites	Ramsar areas are wetlands with so many waterfowl that they are of international importance and must be protected (Greenland Command, 2007). According to agreements in international conventions (Greenland Command, 2007)
World Heritage Area	These are areas that are protected internationally via UNESCO (Greenland Command, 2007).
National conservation areas	These areas are protected by national decrees (Greenland Command, 2007).

1.21.3 Local Level Avannaata Municipality

1.21.3.1 Avannaata Municipality-Emergency Plan 2018-2021 08 September 2019 (Avannaata Municipal Administration, 2019)

The contingency plan 2018- 2021 for Avannaata Municipality is a comprehensive contingency plan for the municipality's areas of responsibility and a plan that describes relationships and connections to other authorities and concessionaire companies (Avannaata Municipal Administration, 2019). Emergency plan 2018-2021 replaces the previous emergency plans for the areas (Avannaata Municipal Administration, 2019). The purpose of the plan is primarily to ensure a coordinated effort in extraordinary situations, e.g. in the event of major accidents or disasters which involve several of the municipality's specialist areas and which require the use of extra resources (Avannaata Municipal Administration, 2019).

1.21.3.1.1 Municipal Area of Responsibility

1.21.3.1.1.1 Main plan

According to the contingency plan for Greenland, the following points fall under the municipality's area of responsibility (Avannaata Municipal Administration, 2019):

- Rescue efforts, fire, traffic accident, a plane crash on land, etc (Avannaata Municipal Administration, 2019).
- Environmental preparedness within the 3 nautical mile limit. The Department of Internal Affairs, Nature and the Environment has drawn up a contingency plan for oil pollution within the 3-nautical mile limit (Avannaata Municipal Administration, 2019).
- Accommodation and catering to create a basis for a coordinated preparedness effort and a coordinated use of emergency resources, the police are the coordinating authority.

1.21.4 Roles and Responsibilities of The Actors in Oil Spill Management in Greenland

1.21.4.1 Government of Greenland

The Government of Greenland is responsible for environmental pollution connected to offshore oil/gas activity through the Greenland Oil Spill Response Company (Jakobsen, 2022). Greenland municipal fire brigades are responsible for environmental pollution in ports and coastal areas (Jakobsen, 2022). Greenland municipalities (fire brigades) are responsible for environmental operations within 3 nautical miles.

1.21.4.2 Emergency Preparedness Commission

The Emergency Preparedness Commission was established in 2010 under the Act of the Inatsisartut, the Greenland Parliament, on emergency preparedness (Inatsisartut, 2010). Strategically the commission is the highest formal authority and includes both Greenlandic and Danish realm authorities to provide a coordination platform between the different institutions involved in emergency prevention, preparedness and response in case of “greater catastrophes” (Inatsisartut, 2010). The commission advises the Government of Greenland, the mayors of the municipalities, and foreign authorities on emergency conditions (Odd et al., 2019). The commission initiates and coordinates the Greenlandic emergency management authorities to activate and coordinate contingent emergency management activities from foreign authorities (Odd et al., 2019). Other authorities in Denmark can be requested to support operations in Greenland.

The Emergency Management Commission’s tasks as outlined by (Jakobsen, 2022) include:

- The creation/maintenance of public awareness of the overall situation
- The clarification policy priorities and major financial decisions
- The coordination of external crisis communication to media etc.

The Emergency Management Commission consists of the following agencies:

- Greenland Ministry of Research and Environment
- Greenland Department of Environment and Contingency Management
- Greenland National Health Authority
- One representative from the five Greenland municipalities
- Office of the Chief Constable of Greenland Police
- Office of the Joint Arctic Command
- Office of the High Commissioner of Denmark in Greenland

CRISIS MANNAGEMENT IN GREENLAND

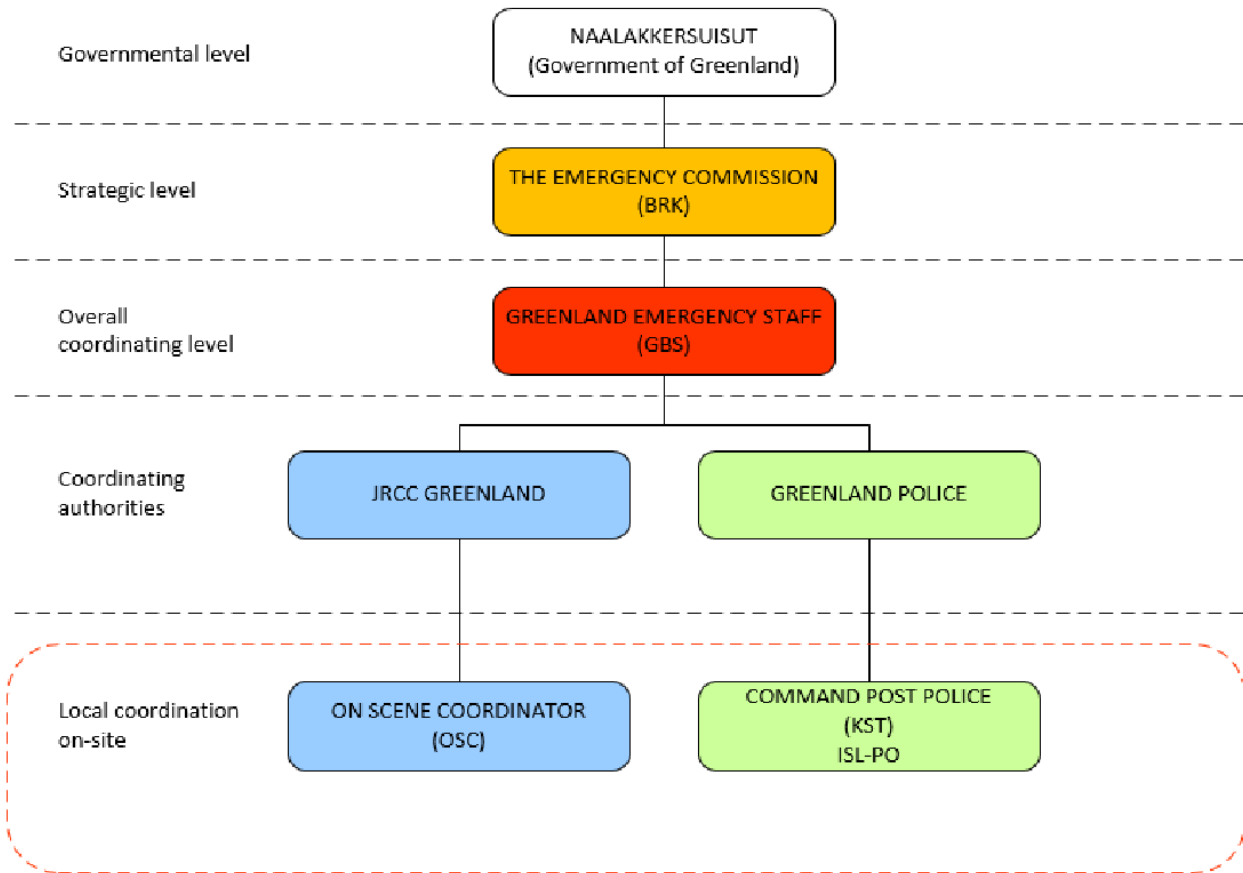


Figure 27: Crisis Management Structure (Shipping and Aviation Rescue Council, 2020:32).

The Greenland Ministry of Nature and Environment’s Department of Environment and Contingency Management functions as the secretariat of the Emergency Preparedness Commission (Odd et al., 2019). The Emergency Preparedness Commission consists of seven permanent members and three appointed officials who represent the Greenlandic and Danish authorities:

1.21.4.3 Government of Greenland

Ministry of Nature and Environment with the deputy minister functioning as the chair of the commissions and the Department of Environment and Contingency Management functions as secretary of the commission (Odd et al., 2019). There is also the National Health Authority, which has the same management responsibilities as a deputy minister and participates in the meetings (Odd et al., 2019).

1.21.4.4 Greenland Municipalities

The five municipalities of Greenland select one common representative as a member of the commission (Odd et al., 2019). Greenland municipal fire brigades have responsibility for environmental pollution in ports and coastal areas (Jakobsen, 2022).

1.21.4.5 The Greenland Police

The Greenland Police is a Danish realm institution and a section of the Danish national police organization that is the police authority of the whole of the Danish realm including Greenland, the Faroe Islands and continental Denmark (Odd et al., 2019). The police maintain order and ensure compliance with laws and regulations (Odd et al., 2019). Greenland Police has responsibility for emergency response for internal sea territory from the baseline to three nautical miles (nm) (Jakobsen, 2022).

1.21.4.6 The Danish Realm

The Danish realm authorities include the following:

- The office of the Chief Constable of Greenland Police
- The office of the Joint Arctic Command
- The office of the High Commissioner of Greenland

In addition to the seven members, three more institutions are authorized to participate in the commission's meetings:

- Ministry of Health
- Ministry of Nature and Environment, the office of oil emergency preparedness
- Ministry of Mineral Resources and Labour

At the operational level, the Greenland Emergency Preparedness Staff have recently been established as a common forum for authorities in charge of the actual emergency capacities:

The municipal-level agencies, such as Greenland Police, Joint Arctic Command, health authorities and emergency preparedness authorities, can supplement the search and response capacities in Greenland, especially at the local level, but the main search and response capacities are divided between the Greenland Police and the Joint Arctic Command (Jakobsen, 2022).

1.21.4.7 Joint Arctic Command

For the Joint Arctic Command, the Navy and Air Force have responsibility for all other activities in the sea territory from 3 Nautical Miles to 200 Nautical Miles (Exclusive Economic Zone) (Jakobsen, 2022).

1.21.4.8 Greenland Command

The Greenland Command is the Maritime Rescue Coordination Center for the Greenlandic Search and Rescue Region for the Greenlandic Search and Region (Kitka, 2018). The Greenland Command coordinates rescue operations with the available resources, such as naval ships and aircraft, commercial helicopters, or any civilian traffic in the area (Kitka, 2018).

The tasks and responsibilities of the Greenland Command consist of:

- Military Defence of Greenland
- Surveillance and maintenance of territorial sovereignty
- Search and Rescue
- Fishery Protection
- Anti-pollution and oil spill recovery in the open ocean
- Support to local Greenlandic communities such as icebreaking
- Hydrographic survey

MILITARY PRESENCE IN GREENLAND



Figure 28: Military presence in Greenland (Boegsted, n.d.: 8).

1.21.4.9 The Joint Arctic Command (Denmark and Greenland)

The Joint Arctic Command functions as the Coast Guard authority (equivalent) within Greenland (Odd et al., 2018). It is responsible for the supervision of the response to pollution incidents at sea unless the incident has been the result of a hydrocarbon license holder's activities (International Tanker Owners Pollution Federation Limited, 2018b). Should an oil spill occur outside the 3 nautical mile zone the Joint Arctic Command has the right to request suitable equipment and personnel from the Danish contingency equipment stockpile (Odd et al., 2018).

1.21.4.10 Bureau of Minerals and Petroleum (Under the Ministry of Mineral Resources)

The Bureau of Minerals and Petroleum is responsible for Local Spills from hydrocarbon-related activities and consists of spills from mineral and hydrocarbon-related exploration and exploitation irrespective of whether the spill is within or outside 3 nautical miles of the Greenland coast (Odd et al., 2018). The Bureau of Minerals and Petroleum reports directly to the government of Greenland through the Minister of Mineral Resources (Odd et al., 2018).

1.21.4.11 Danish Centre of Environment and Energy

The Danish Centre of Environment and Energy (DCE) formerly known as the Danish National Environmental Research Institute acts as an environmental adviser to the Bureau of Minerals and Petroleum. During large-scale offshore facility oil spill events, the operator's license spill response framework coordinates local response efforts (Odd et al., 2018).

1.21.4.12 Bureau of Minerals and Petroleum's Contingency Committee and Emergency Response Group

During large spills, the Bureau of Minerals and Petroleum's Contingency Committee and Emergency Response Group would be mobilized consisting of:

- Bureau of Minerals and Petroleum
- Joint Arctic Command
- Danish Centre for Environment and Energy
- Regional Police Departments
- Regional Fire Departments
- Representatives from local authorities, health authorities and media

N.B. Due to the CANDEM Agreement between the Government of Canada and the Government of the Kingdom of Denmark for Cooperation Relating to the Marine Environment, (1983) articles 3 and 4 respectively obligate that the Greenland Government is responsible for liaising with Canadian and Danish governments should an incident occur and ensuring collaboration in an escalated pollution response strategy. This serves as further legislation to ensure that the Greenland Government observes their obligations regarding pollution prevention, preparedness, and response.

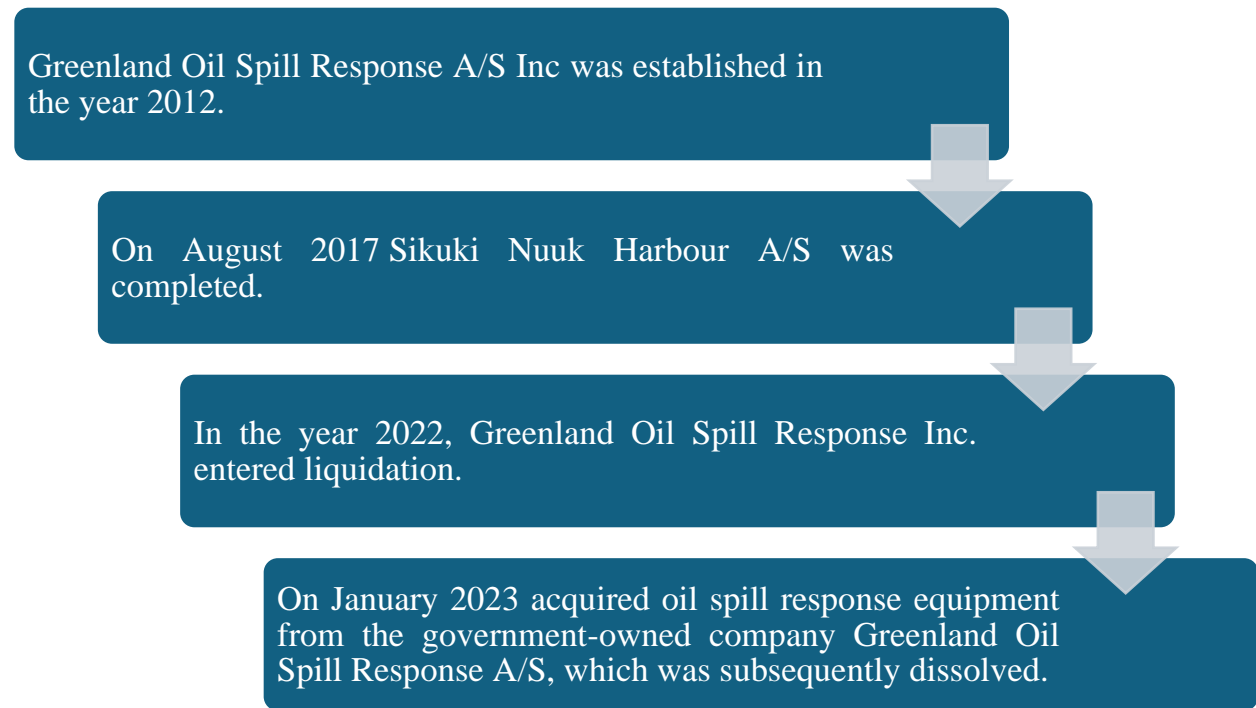


Figure 29: Evolution of Greenland's National Oil Spill Response Company from 2012 to the present created by the researcher.

1.21.4.13 Greenland's National Oil Spill Response Company to Sikuki Nuuk Harbour A/S

Greenland's oil spill response company known as Greenland Oil Spill Response A/S(GOSR) was established as the national oil response company in 2012 according to the Act on the Greenland Oil Spill Response, No. 4 of 2012, it is fully owned by the Greenland Government. The company aims to operate on a commercial basis on oil pollution preparedness, oil pollution control, environmental clean-up after oil spills, and particularly in the contingency area of oil spill response and the mineral resources sector in Greenland (Christiansen, 2021; Kitka, 2018).

Greenland Oil Spill Response A/S(GOSR) manages local stockpiles of offshore and onshore response equipment through the fire and rescue services (Christiansen, 2021; Hänninen et al., 2020). The fire and rescue services can handle smaller coastline oil spills (Hänninen et al., 2020; Spansvoll et al., 2016). This company manages the majority of oil spill response equipment, such as oil boomers for harbours, beaches and open waters, oil skimmers, temporary containment systems and chemical dispersants (Odd et al., 2018). Personnel and equipment can be supplemented by the local municipalities (Hänninen et al., 2020). These oil spill equipment stockpiles are in Qeqertorsuaq, Illulissat, Qasiqianguit, Aasiaat, Sisimint, Manitsoq, Nuuk, Paamint, Narsaq, Qaqortoq, Narotalik and Tasiilaq (Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic, 2013).

In 2014, Greenland Oil Spill Response Company's response equipment was relocated from the airport area in Kangerlussuaq to the harbour areas in the towns of Nuuk and Aasiaat to ensure better coverage of the whole country and faster mobilization (Odd et al., 2018). License holders of offshore prospecting and exploration licenses are required to contract with the company (Christiansen, 2021).

1.21.4.13.1 Training

Greenland Oil Spill Response A/S since 2016 recruited and trained groups of volunteer Oil Spill Responders in Nuuk and Aasiaat and organized several courses in Oil Spill Response and Arctic Shoreline Clean-up Assessment Techniques for various roles such as Supervisors, On-Scene Commanders, Administrators and Senior Managers (Odd et al., 2018).

1.21.4.14 Sikuki Nuuk Harbour A/S

In January 2023, Sikuki took over equipment for oil pollution response from the government-owned company Greenland Oil Spill Response A/S (Sikuki Nuuk Harbour A/S, 2023). Sikuki maintains, stores, and mobilizes equipment under a resource-sharing agreement with the Arctic Command and the Defence Staff and has consequently hired an emergency coordinator from the former. In connection with Greenland Oil Spill Response A/S being under solvent liquidation, Sikuki has taken over and retained an employee and various equipment for oil spill response as of January 1, 2023. In the future, Sikuki will be responsible for the maintenance, storage, and mobilization of equipment in cooperation with the Arctic Command (Sikuki Nuuk Harbour A/S, 2022).

1.21.4.14.1 Environmental Oil Spill Sensitivity Atlas.

The Environmental Oil Spill Sensitivity Atlas enables oil companies and the Greenland Self Government to ensure the best possible emergency preparedness in case of any oil spill to mitigate damage to nature and the environment (Kingdom of Denmark, 2011). The atlas became an essential segment of the overall preparedness in connection to oil exploration (Kingdom of Denmark, 2011). This tool contains information about the local wildlife, the local fishing sector, local hunting interests and archaeological sites that may be especially susceptible to potential oil spills (Kingdom of Denmark, 2011). In addition, this tool contains physical environmental data such as coastal types, oceanography with logistics and ways to manage/control oil spills (Kingdom of Denmark, 2011).

An Environmental Oil Spill Sensitivity Atlas covers Greenland's offshore waters and coastal areas that are particularly sensitive to oil spills. This has been developed collaboratively by several Greenlandic and Danish institutions headed by the National Environmental Research Institute (International Tanker Owners Pollution Federation Limited, 2018b). The Atlas has been prepared to provide oil spill response planners and responders with tools to identify resources at risk, establish protection priorities and identify appropriate response and clean-up strategies (International Tanker Owners Pollution Federation Limited, 2018b). The Atlas can be freely accessed from either the National Environmental Research Institute or Greenland Home Rule Bureau of Minerals and Petroleum's webpage (International Tanker Owners Pollution Federation Limited, 2018b).

1.22 ICELAND

1.22.1 National Response Organization Overview

Three agencies supervise Iceland's national oil spill management system in tandem consisting of the Environmental Agency Iceland, the Icelandic Coast Guard, and the Icelandic Maritime Administration under the direction of the National Contingency Plan (Hänninen et al., 2020). The overall strategy for oil spill preparedness outside harbour areas falls under the responsibility of the Environment Agency of Iceland, Harbour Masters within harbours, and Local fire departments for the area on land (Fredriksson et al., 2015). Subsidiary institutions such as the Local health authorities and Civil Protection Iceland provide support in cross-sectorial tasks, usually on an ad hoc basis or upon a request (Fredriksson et al., 2015).

Response measure coordination and implementation at sea and on shore falls under the responsibility of the Environment Agency of Iceland and the Harbour Masters within harbours (Fredriksson et al., 2015). The Environmental Agency Iceland collaborates with the Icelandic Coast Guard and the Icelandic Transport Authority regarding organizing response and task allocation between agencies (Odd et al., 2019).

1.22.2 National Regulations

1.22.2.1 Action Plan for Response to Acute Pollution Outside Port Areas and The Use of Ship Hangouts-2022

The Environmental Agency Iceland, the Icelandic Coast Guard and the Icelandic Transportation Authority collaborated to develop this action plan for acute offshore marine pollution (Environmental Agency et al., 2022; Odd et al., 2019). The directors of the three organizations are responsible for the action plan and its implementation (Environmental Agency et al., 2022).

Table 27: Responsibilities of the main agencies for Iceland's Action plan for response to acute pollution outside port areas and the use of ship hangouts 2022.

AGENCY	RESPONSIBILITY UNDER THE PLAN
Icelandic Coast Guard (Chief of Operations)	<ul style="list-style-type: none"> The Icelandic Coast Guard's Chief of Operations is responsible for complying with the plan and the Joint Rescue Coordination Centre -Iceland's Chief Watch officer is responsible for introducing the plan to the staff (Odd et al., 2019).
Environmental Agency Iceland (field director)	<ul style="list-style-type: none"> Receives alerts of acute pollution, decides the level of response, and upholds communications with off-location responders (Odd et al., 2019).
Iceland Transport Authority	<ul style="list-style-type: none"> Provides consultation on issues regarding sailing, navigation, port facilities, weather and sea conditions, technical issues and legal matters (Odd et al., 2019). Responsible for monitoring the quality of pollution prevention on board vessels and assisting in clean-up operations in offshore areas (Odd et al., 2019).

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Table 28: Administrative actions at various action levels within the National Plan.

ACTION LEVEL	ADMINISTRATIVE ACTION
1. In an event where pollution is not visible and there is no clear risk of pollution (Odd et al., 2019a). <ul style="list-style-type: none"> a. When a ship alerts the Joint Rescue Coordination Centre - Iceland of an accident but confirms no danger of pollution. 	The Icelandic Coast Guard oversees activating the action plan (Odd et al., 2019).
2. When there is a risk of pollution (Odd et al., 2019a). The state is alerted by the vessel calls for concern about pollution (Odd et al., 2019a).	The Icelandic Coast Guard oversees activating the action plan and notifying the EAI and Icelandic Transport Agency. Environmental Agency Iceland is responsible for pollution response preparation (Odd et al., 2019).
3. When pollution is visible	The Environmental Agency of Iceland oversees the activation of the action plan.
4. When a ship must seek shelter	The captain asks to seek shelter, or the Icelandic Coast Guard instructs the vessel to seek shelter on grounds of pollution risk (Odd et al., 2019). The Icelandic Coast Guard oversees activating the action plan and alerting other relevant response actions (Odd et al., 2019).

1.22.3 Roles and Responsibilities of the Actors in Oil Spill Management in Iceland

1.22.3.1 Icelandic Coast Guard

The Icelandic Coast Guard monitors marine areas for acute pollution (Odd et al., 2019). This is maintained through a combined approach consisting of using satellite images (European Maritime Safety Agency), aircraft overflight and patrols by the Coast Guard’s vessels (Odd et al., 2019). The Icelandic Coast Guard has Arctic-tested oil pollution clean-up equipment on board its patrol and SAR vessel (Thor) (Odd et al., 2019).

1.22.3.2 The Environmental Agency of Iceland

The Environmental Agency of Iceland (EAI) coordinates the response to oil spills in Iceland (Hänninen et al., 2020; Odd et al., 2019). This Agency aims to recover the oil as close to the source as possible (Hänninen et al., 2020). Physical removal is usually executed and supplemented by chemical dispersant application (Hänninen et al., 2020a). This is to be applied with care if physical removal is not

feasible. (Hänninen et al., 2020a). Confirmed oil spills and detected signs of pollution are reported to the Environmental Agency of Iceland (Odd et al., 2019). The Environmental Agency of Iceland assumes responsibility and manages acute pollution incidents on high seas (Odd et al., 2019).

1.22.3.2.1 Organizational models and command systems of the Environmental Agency Iceland.

The Environmental Agency of Iceland oversees and initiates oil spill response operations (Odd et al., 2019). The Environmental Agency of Iceland's Ocean and Water Team is responsible for marine and freshwater quality under the Department of Nature, which is supervised by the Director of the Environmental Agency of Iceland (Odd et al., 2019).

The Environmental Agency of Iceland can request the local Health Committee's assistance to evaluate the extent of pollution and assess the necessary actions at the emergency site (Odd et al., 2019). The Agency appoints a field director to oversee response actions and then contacts the Icelandic Coast Guard for assistance and equipment (Odd et al., 2019). Following the coordination of search and rescue efforts environmental issues are then addressed.

In 2006, the Environmental Agency of Iceland signed an agreement with a private oil distribution firm called Oliudriefing on response and cleanup (Odd et al., 2019). This company is responsible for storing equipment and training personnel to use it (Odd et al., 2019). The equipment stored has been deemed adequate for coastal cleanup, however, various components can be loaded onboard vessels for open-water cleanup (Odd et al., 2019). The response and cleanup agreements are activated upon the Environmental Agency of Iceland's field director's arrival (Odd et al., 2019). The polluter (responsible party) must contain the impact of the spill event and coordinate its response procedures (Odd et al., 2019).

NB: If the approach of the polluting actor was more economically feasible and had a greater efficacy, based on the "polluter pays principle", the polluter may develop a mitigation plan that satisfies the Environmental Agency of Iceland's mandate (Odd et al., 2019).

During the assessment of the mitigation plan, the Environmental Agency of Iceland will coordinate the containment operations. Regardless of the implemented mitigation plan the cleanup effort is supervised by an Environmental Agency of Iceland's field director (Odd et al., 2019). The Environmental Agency of Iceland's field director decides when to start and complete the pollution response (Odd et al., 2019). If the pollution is of such magnitude that it constitutes a threat to the public the National Commissioner of the Icelandic Police's Department of Civil Protection and Emergency Management's emergency plan is activated (Odd et al., 2019).

1.22.3.3 Pollution Control Authority

The Pollution Control Authority is divided so that the Environment Agency supervises activities that fall under I to II. annexe to law no. 7/1998, irrespective of the location within the country where the relevant establishment is located (Environmental Agency et al., 2022). The agency's supervisory role, therefore covers the entire country, as well as the fact that the agency oversees health control in the country (Environmental Agency et al., 2022).

1.22.3.4 Health Committees/Health Control Areas.

Local health committees must ensure that the provisions of the law are enforced (Environmental Agency et al., 2022). The committees must work to improve health control in their area (Environmental Agency et al., 2022). Health committees are local authorities that carry out pollution and hygiene control with activities that fall under IV (Environmental Agency et al., 2022). Local health authorities may provide ad hoc/ upon request support for overall impact assessment and recovery on land. The country is divided into health control areas, which are determined by law cf. Paragraph 2 Article 45 of the (Act on Hygiene and Pollution Prevention, 1998).

Health control areas and their operating areas are:

1. Health control area Reykjavík Operating area: Reykjavík area - Reykjavík city
2. Western Health Control Area- Area of operation: Vesturland region - Vesturland constituency and Kjósahreppur

3. Vestfjörður health control area of operation: Vestfjörður area - Vestfjörður constituency
4. Northwestern Health Control Area of operation: Northern Region of the West - Northern Region of the West
5. Northeast Health Control Area of activity: Norðurlandsvæði eystra - Norðurlandskjördem eystra
6. Austurland's health control area of operation: Austurland's constituency - Austurland's constituency
7. Southland's health control area of activity: Southland's area - Southland's constituency
8. Health control area Suðurnesja Area of operation: Suðurnesjavæðir - Reykjanesbær, Grindavíkurbær, Suðurnesjabær, Vogar Municipality
9. Health control area of Garðabær, Hafnarfjörður, Kópavog, Mosfellsbær and Seltjarnarness. Area of operation: - Hafnarfjörður market, Garðabær, Kópavogsbær, Mosfellsbær and Seltjarnarnes.



Figure 30: Map of nine current health control areas in Iceland (Environment Agency Iceland, 2022:9).

N.B. The Reykjavik control area is indicated on the map.

In 2022, the health control areas of Mosfellsbær and Seltjarnarnesbær merged with the Hafnarfjörður and Kópavog areas on the one hand and the health control area of Kjósarhrepp with the Vesturland (Environmental Agency et al., 2022).

1.22.3.5 Municipal Health Committee

The health committee supervises operations and decides when the results of cleaning are sufficient (Regulation on Response to Acute Pollution of Sea and Beaches, 2012). The municipality health committee is responsible for local monitoring and control (Regulation on Response to Acute Pollution of Sea and Beaches, 2012). Iceland was initially divided into ten health control regions each of which is an independent government (Regulation on Response to Acute Pollution of Sea and Beaches, 2012). Local health control can be divided into health committees (Regulation on Response to Acute Pollution of Sea and Beaches, 2012). They oversee the licensing and control of chemical products, hygiene practices, food, environmental quality and polluting activities within health control areas (Regulation on Response to Acute Pollution of Sea and Beaches, 2012).

1.22.3.6 Reykjavik Health Department/Committee/Authority

The activities of the Reykjavik Health Authority are divided into two inspection departments: food control and environmental control in conjunction with a monitoring unit (Reykjavik Health Authority, 2024). The Reykjavik Health Authority acts on behalf of the City of Reykjavik’s health committee and enforces Act on Hygiene and Pollution Prevention no7/1998, Food Law no 93/1995 and other laws and regulations that apply to this activity (Reykjavik Health Authority, 2024).



Figure 31: Institutional hierarchy of the Reykjavik Health Committee (Reykjavik Health Authority, 2024).

Environmental Monitoring- closely monitors the quality of the air and water in their environment and ensures the safety of the residents of Reykjavik (Reykjavik Health Authority, 2024). Health Monitoring promotes strong environmental awareness and public education in Reykjavik as well as the enforcement of laws and regulations (Reykjavik Health Authority, 2024). Some of the main functions of the Reykjavik Health Committee are listed below in Figure 32.



Figure 32: Main functions of the Reykjavik Health Committee.

1.22.3.6.1 Department of Environmental Control and Monitoring (Unit)

The Department of Environmental Control issues work permits and supervises businesses that may cause pollution in addition to institutions and companies that provide a variety of services to public services and healthcare companies (Reykjavik Health Authority, 2024).

1.22.3.7 Akureyri Fire Department-Fire Prevention Plan-Main station (Arstigur)2024

The fire prevention plan ensures that the fire brigade is staffed, organized, equipped, educated, and trained to handle statutory tasks and risks in the municipality (Akureyri Fire Department, 2024). The Akureyri Station (main) is responsible for pollution incidents (Akureyri Fire Department, 2024). The fire prevention plan was drawn up by the fire chief and must be approved by the Housing and Infrastructure Agency and the local government (Akureyri Fire Department, 2024).

The department's operations cover four municipalities which include.

- Akureyri town including Hrisey and Grimsey
- Horgar district
- Svalbardstrand district

The Fire department performs the five key fire education protection service categories and provides training to staff to handle them.

These service categories are:

- Water collection and outdoor fire fighting
- Indoor firefighting and smoke-living
- Response to pollution accidents and toxic diving
- Rescue of trapped people from structures and vehicles
- Fire safety monitoring and prevention, including monitoring of personal fire protection.

N.B. According to the contract, the fire department assists the Port of Akureyri in pollution prevention.

The statutory tasks of fire brigades are divided into the following service categories:

- Water collection and outdoor firefighting
- Indoor firefighting and smoke diving
- Response to pollution and toxic accidents, toxic diving
- Rescue of trapped people from structures and vehicles
- Fire control and prevention, including control of private fire protection.

The local government is responsible for the activities of the fire brigade including implementing fire safety inspections (Akureyri fire department, 2024). The local government decides in the fire prevention plan the scope of the fire brigade's services (Akureyri fire department, 2024). Municipalities can fulfill their obligations regarding the operation of the Fire brigade by cooperating on the operation (Akureyri fire department, 2024). In 2016, a cooperation agreement was signed (with Akureyri Port) for assistance in response to pollution accidents in the work area of the Port Association in Akureyri and for managing part of the equipment owned by the port in addition to the joint exercises that were held (Akureyri fire department, 2024).

1.22.3.7.1 Risk Assessment and Counterbalance

The size of the fire department and its organization was determined based on the risks present in the municipality (Akureyri fire department, 2024).

Three factors of fire and pollution risk in the risk assessment are as follows:

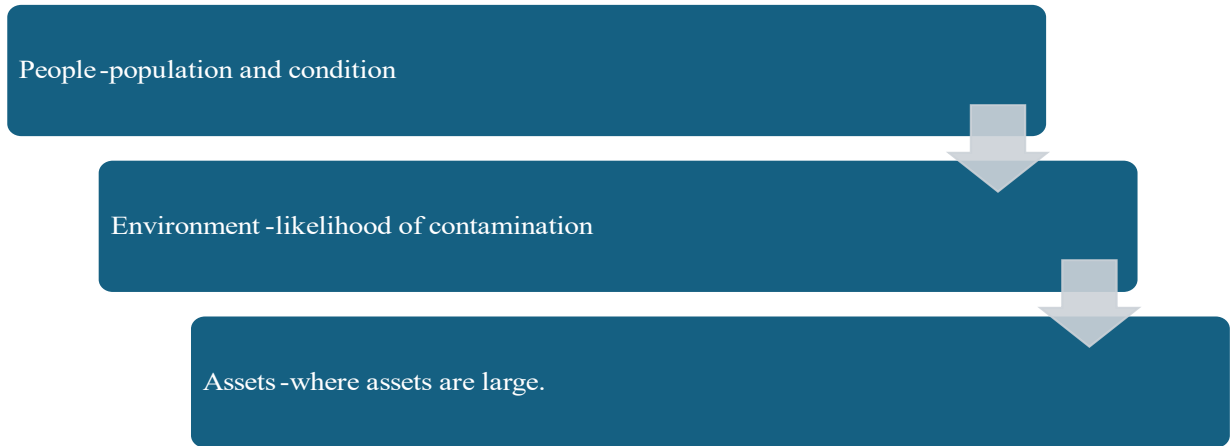


Figure 33: Risk assessment priority areas adapted from (Akureyri Fire Department, 2024).

The Fire Department can provide mutual aid to other departments upon request in case of major pollution and toxic accidents in the area in question (Akureyri fire department, 2024). The main station can also request assistance from other departments in its jurisdiction due to an existing agreement (Akureyri Fire Department, 2024).

Regulation on activities of fire brigades:

- 1) Serves to define the minimum requirements for equipment, housing and labour, and water supply for firefighting (Akureyri fire department, 2024).
- 2) Define the minimum requirements for equipment and training for pollution accidents on land and for rescuing trapped people from structures and vehicles (Akureyri Fire Department, 2024).

1.22.3.7.1.1 Risk Assessment

Risk is defined as Risk-Impact of Activities x Probability of Incident.



Figure 34: Formulae used to calculate risk by the Akureyri Fire Department adapted from (Akureyri Fire Department, 2024).

The following three tables are examples of the Risk Assessment, Risk Level and Counterbalance and Results sections from Akureyri’s Fire Action Plan 2022.

Table 29: Section of the Risk Assessment table created by (Akureyri Fire Department, 2024).

Risk	Number of Persons	Social and operations impact	Response time	State of Individuals	Condition of structure
No Risk	200>400	Over one hundred employees. /Billion in turnover	< 10min	Self-supporting	Good houses that meet a need.

Oil Depot	30>100	25>50 employees	< 10min	Self-supporting	Good houses that meet needs.
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Table 30: Risk level from (Akureyri fire department, 2024).

Risk	Probability	Consequence	Risk Level
No Risk	Significant	Catastrophe	5
Oil Depot	Increases	Catastrophe	3

Table 31: Counterbalance and Results (Oil Depot was not included in this section) (Akureyri Fire Department, 2024).

Risk	Risk level	Counterweight of the department	Fire station	Distance	Response time(mins)	Response Center
No Risk	5	1	Akureyri	2.6	9	Akureyri

Note: It may be safe to assume that oil facility-related risks are dealt with cooperatively among other fire departments.

The results of the risk assessment and risks in the fire department’s district determine the capacity of the response team to respond to these risks (Akureyri Fire Department, 2024). These may be offset by agreements made with neighbouring fire departments' mutual aid (Akureyri Fire Department, 2024).

1.23 FINLAND

1.23.1 National Response Organisation Overview

Oil spill preparedness and response is organized by the Act on Oil Pollution Response, 2009, and the Government Decree on Oil Spill Response (249/2014) as cited by (Hietala and Lampela, 2018). The Finnish Border Guard is responsible for responding to oil spills in the open sea, whereas the municipalities (the rescue departments) continue to have the responsibility of responding to onshore and in the archipelago (Hänninen et al., 2020; Hietala and Lampela, 2018; Parviainen et al., 2022). The rescue services must have an oil spill response for their area, which is approved by the Centre for Economic Affairs, Transport and the Environment (Hietala and Lampela, 2018).

The expertise of the Finnish Environment Institute and the regional centres for economic development, transport, and the environment will also remain available in the future (Parviainen et al., 2022). The current environmental data of the Finnish Environment Institute can be used in case of an accident (Parviainen et al., 2022). Volunteers, such as the World Wildlife Fund oil combatting troops, also take an active part in response planning, exercises and training (Parviainen et al., 2022).

1.23.2 National Regulations

1.23.2.1 National Strategy for The Prevention of And Response to Environmental Damage Extending To 2035.

This strategy aims to guide the preparedness of authorities, with a particular emphasis on the coordination of the tasks of the related authorities and other actors involved (Simola, 2023). In addition, preparedness cannot be achieved if resources are insufficient, so sufficient funding must be ensured (Simola, 2023).

1. The Ministry of the Interior coordinates the response to oil and chemical spills from ships (Simola, 2023).
2. The Finnish Border Guard handles rescue operations for any oil and chemical spills, from ship-sourced spills in Finland's exclusive territorial waters or economic zone and coordinates preparedness for such operations (Simola, 2023).
3. Rescue services are responsible for response actions in their own land and water area and the vicinity of the coast (Simola, 2023).
4. The Ministry is responsible for the overall management, monitoring and development of post-spill response (Simola, 2023).
5. The other actors involved in Marine pollution preparedness include the Finnish Defence Forces, The Finnish Environment Institute, The Finnish Transport and Communication Agency, National Parks Finland, the Centres for Economic Development, Transport and the Environment Centres and private companies with which the Border Guard has signed a service agreement (Simola, 2023).

Cooperation in preparedness development is carried out widely at different levels within cooperations, joint exercises and round table meetings, within the National Advisory Board for the Prevention of and Response to Oil and Chemical Spills from ships and in regional cooperation groups (Simola, 2023).

1.23.2.1.1 Preparedness

In Finland, open sea oil spill response preparedness is based on multi-purpose, state-owned vessels, some of which are also equipped to respond to ship-sourced chemical spills (Simola, 2023). Each rescue department's fleet of boats must be suitable for the department's response tasks within their entire area of responsibility.

1.23.2.1.2 Training

The Emergency Services Academy Finland is responsible for the provision of training in pollution response to the rescue services while the Border and Coast Guard Academy provides training to Border Guard staff (Simola, 2023). The other actors must also be provided with opportunities to participate in organized training events (Simola, 2023).

Rescue departments are responsible for training contract fire brigades and part-time personnel (Simola, 2023). As the ministry responsible for rescue operations, the Ministry of the Interior is also responsible for creating operating models for the recovery of costs to implement the polluter pay principle (Simola, 2023). The Ministry of the Environment supports planning in its areas of responsibility (Simola, 2023). The full recovery of costs can take several years, so costs can initially be reimbursed to the actors involved from sources such as the Finnish State budget (Simola, 2023).

1.23.2.2 Act On Oil Pollution Response 1673/2009

This act outlines the division of responsibilities between authorities and other relevant entities concerning the prevention of response to oil spills and chemical spills from ships (Act on Oil Pollution Response, 2009).

The purpose of this Act is to ensure:

1. due preparedness to respond to oil spills on land and oil and chemicals from ships (Act on Oil Pollution Response, 2009)
2. fast and efficient response to potential spills (Act on Oil Pollution Response, 2009)
3. that the impacts of spills are remedied in a manner that minimises harm to human life, property or environment (Act on Oil Pollution Response, 2009).

1.23.2.3 Rescue Services-Rescue Act 379/2011

Under section 78 of the Rescue Act, Rescue departments must oversee compliance with the provisions of Chapters 2 and 3 in their regions (Rescue Act, 379/2011). Section 79 of the Rescue Act states that rescue departments must develop a supervision plan for monitoring and oversight (Rescue Act, 379/2011). The supervisory task must be based on a high-quality and effective risk assessment and be performed regularly (Rescue Act, 379/2011). The supervision plan details the fire inspections to be carried out and other supervisory actions and describes how the implementation of the plan should be assessed (Rescue Act, 379/2011). According to section 27 of the Act on the Safe Handling of Hazardous Chemicals and Explosives, oversight of sites for the small-scale industrial handling and storage of dangerous chemicals may also be included in the supervision plan (Rescue Act, 379/2011). The supervision plan must be based on the service level decision concerning the rescue department services for the area (Rescue Act, 379/2011). Municipalities are jointly responsible for rescue services within regions designated by the Government. The country is divided into 21 rescue service regions (Rescue Act, 379/2011).

1.23.2.3.1 Supervision of Oil Spill Preparedness

Under the Rescue Act, the rescue department must oversee the oil spill preparedness of facilities in its area that store or handle oil products and other chemicals (Rescue Act, 379/2011). The level of oil spill preparedness is determined by the volumes of oil products stored or handled (Rescue Act, 379/2011). The volumes of substances and the obligations that go with them are specified in the Rescue Act. The rescue departments work closely with operators and other authorities in the matter of oil spill prevention (Rescue Act, 379/2011). The rescue department also provides guidance and advice on matters relating to oil spills (Rescue Act, 379/2011).

1.23.3 Roles and Responsibilities of The Actors in Oil Spill Management in Finland

1.23.3.1 Finnish Border Guard

The Finnish Border Guard is the government agency for maintaining and operating national oil spill response equipment (Hänninen et al., 2020b). The Border Guard provides necessary technical assistance when needed (Hänninen et al., 2020b).

1.23.3.2 Ministry of Environment Finland

The Ministry of the Environment is responsible for general guidance, monitoring, prevention and response to oil spills and chemical spills from ships, and for the development of oil and chemical spill prevention and response (Act on Oil Pollution Response, 2009).

1.23.3.3 Regional Environment Centers

Local response commanders lead oil spill response actions for local-scale incidents (Hänninen et al., 2020b).

During major oil spill incidents, neighbouring municipalities and state agencies may be called upon through the Regional Environment Center as part of the polluter pays principle (Hänninen et al., 2020b). When the polluter cannot be identified, the costs will be covered by the national oil pollution compensation fund.

1.23.3.4 The Ministry of Interior's Department for Rescue Services

This department oversees civil defence planning, issues instructions to authorities on civil Defence preparedness and ensures the required collaboration (Weckstén, n.d.). The organizational framework of these rescue services is illustrated below in Figure 35.

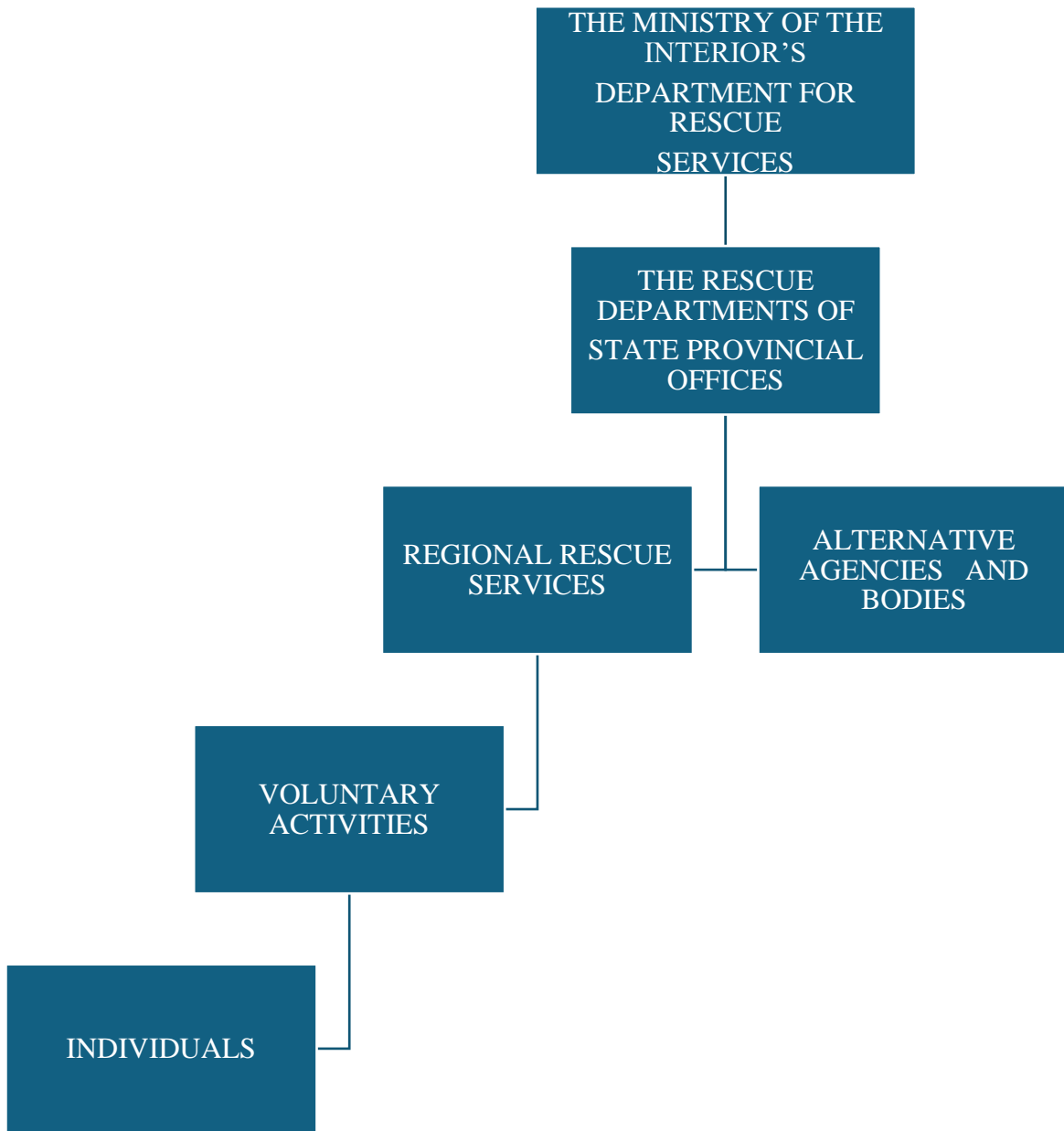


Figure 35: Organizational framework of the Rescue services in Finland adapted from (Weckstén, n.d.).

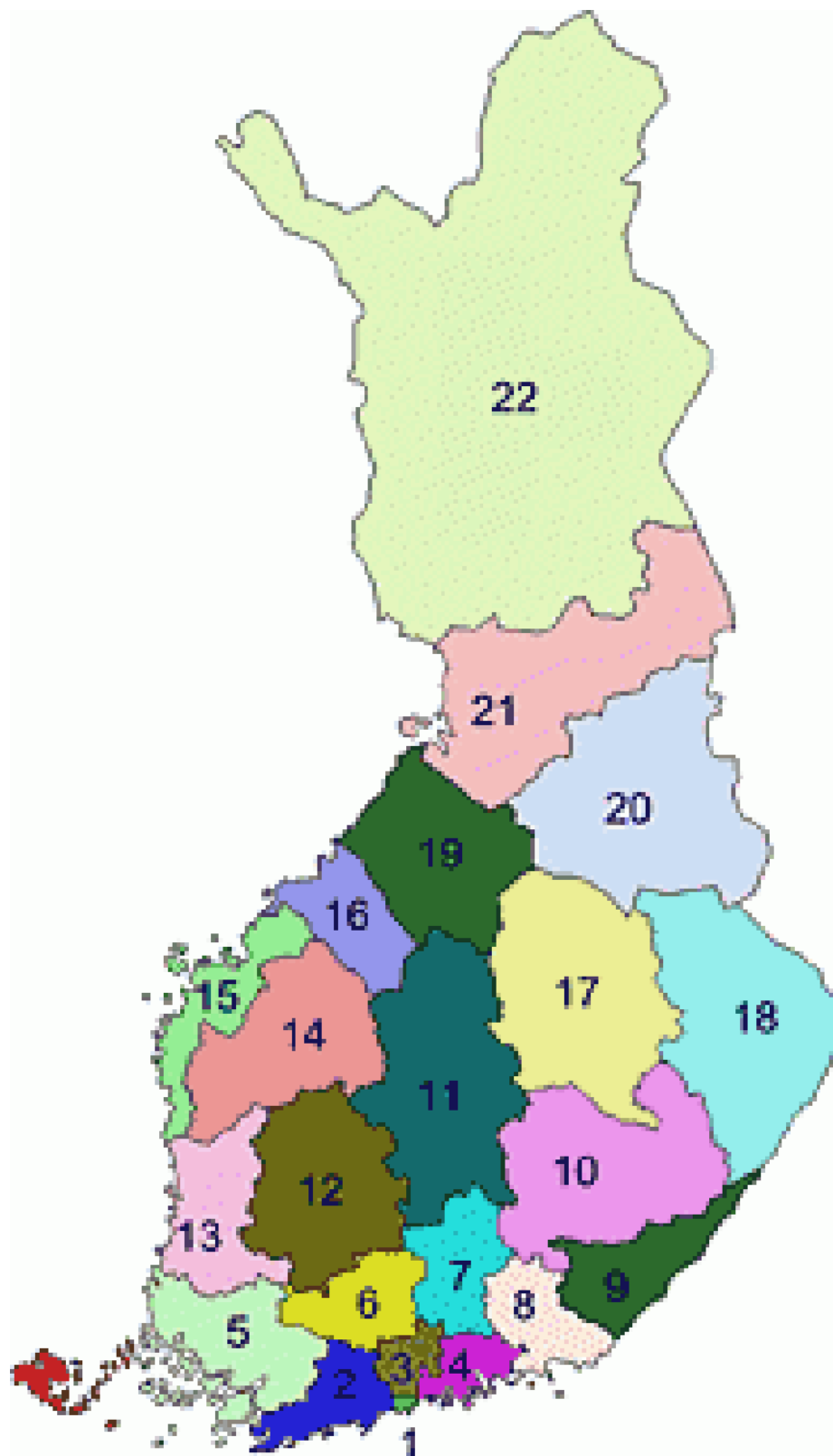


Figure 36: Distribution of the Rescue authorities in Finland from (Weckstén, n.d.:8).

Table 32: Map Legend from Figure 36 from (Weckstén, n.d.:8)

Rescue Centres
1. Helsinki
2. Western Uusimaa
3. Central Uusimaa
4. Eastern Uusimaa
5. Southwest Finland
6. Kanta-Häme
7. Päijänne Tavastia
8. Kymenlaakso
9. Southern Carelia
10. Southern Savonia
11. Central Finland
12. Pirkanmaa
13. Satakunta
14. Southern Ostrobothnia
15. Ostrobothnia
16. Central Ostrobothnia
17. Northern Savonia
18. Northern Carelia
19. River Valleys
20. Kainuu
21. Oulu-Koillismaa
22. Lapland

1.23.4 Local Level Western Uusimaa and Helsinki City

1.23.4.1 Western Uusimaa Accident Prevention Western Uusimaa-Joint Accident Prevention Plan-2023

The accident prevention plan provides a comprehensive account of the supervisory activities, expert services and communications related to safety associated with the rescue departments (Western Uusimaa Rescue Department, 2023). The joint accident prevention plan of the rescue departments for the region of Uusimaa supports and develops the harmonious and cost-effective organization of services and provides

for the timely allocation of adequate resources for appropriate action (Western Uusimaa Rescue Department, 2023). The work and its planning take better account of the client, and services are to be developed with the client in mind (Western Uusimaa Rescue Department, 2023).

1.23.4.1.1 *The impact of the service level decision, risk analysis and various phenomena on the plan.*

The accident prevention plan was based on the service level decision, the joint risk analysis for the Uusimaa rescue departments, and the Action plan for incident prevention of the Ministry of the Interior (Western Uusimaa Rescue Department, 2023). The service level decision for the rescue services in the Uusimaa area was developed for the period 2021-2024 (Western Uusimaa Rescue Department, 2023). The service level decision outlined the aims of the work of the rescue department, the resources available and the services provided and their level (Western Uusimaa Rescue Department, 2023).

The current service level represents the response to risks and threats, regarding which the rescue departments in Uusimaa have conducted a risk analysis (Western Uusimaa Rescue Department, 2023). The subsequent risk analyses illustrated/painted a picture of the current working environment and dynamics that have been associated with it or predicted. The main threats and risks were identified based on accident statistics and technical assessments, risk analyses that were prepared by the rescue departments and the assessment of the action plan (Western Uusimaa Rescue Department, 2023). As with the decisions on the service level, the risk analysis surveys covered all safety situations, from day-to-day accidents and disruptions to normal life to exceptional circumstances and emergencies (Western Uusimaa Rescue Department, 2023). As part of the risk analysis, the sites and buildings which require special focus in the Uusimaa area have been identified (Western Uusimaa Rescue Department, 2023).

1.23.4.1.1.1 *Supervision of Chemicals*

There are approximately 500 sites for supervision where dangerous chemicals are handled (Western Uusimaa Rescue Department, 2023). The number of distribution stations in the Western Uusimaa Rescue Department areas is nearly one hundred and thirty-five (Western Uusimaa Rescue Department, 2023).

Regarding oil spill response, the Rescue Department follows the internal instructions ‘Supervision of preparedness for oil spills’ (Western Uusimaa Rescue Department, 2023). The extent to which sites are prepared for oil spills is determined as part of the chemical permit process, alternatively, the requirements are based on the terms and conditions of a Finnish Safety and Chemicals Agency approved chemicals permit (Western Uusimaa Rescue Department, 2023). The sites are monitored as part of periodic supervision by qualified oil spill prevention personnel (Western Uusimaa Rescue Department, 2023).

1.23.4.1.1.2 *Supervision of oil spill preparedness*

According to the Rescue Act, the rescue department oversees oil spill preparedness of facilities in its area of operations that store or handle oil products and other chemicals (Western Uusimaa Rescue Department, 2023). The level of oil spill preparedness is determined by the volumes of oil products stored or handled (Western Uusimaa Rescue Department, 2023). The volume of substances and the obligations that go with them are specified in the Rescue Act (Western Uusimaa Rescue Department, 2023). The rescue department collaborates with operators and other authorities in oil spill prevention (Western Uusimaa Rescue Department, 2023). The rescue department also provides guidance and advice on matters related to oil spills (Western Uusimaa Rescue Department, 2023). If necessary, the municipality is responsible for the subsequent response in its area, and its various authorities and institutions must participate in the response to oil spills (Western Uusimaa Rescue Department, 2023).

1.23.4.2 *Helsinki City Rescue Department*

The Rescue service of the city of Helsinki is one of the 22 regional rescue services in our country and is responsible for the safety of the capital in collaboration with other authorities (Helsinki Region Rescue Services, 2024). The basic tasks of the rescue service are illustrated in Figure 37.

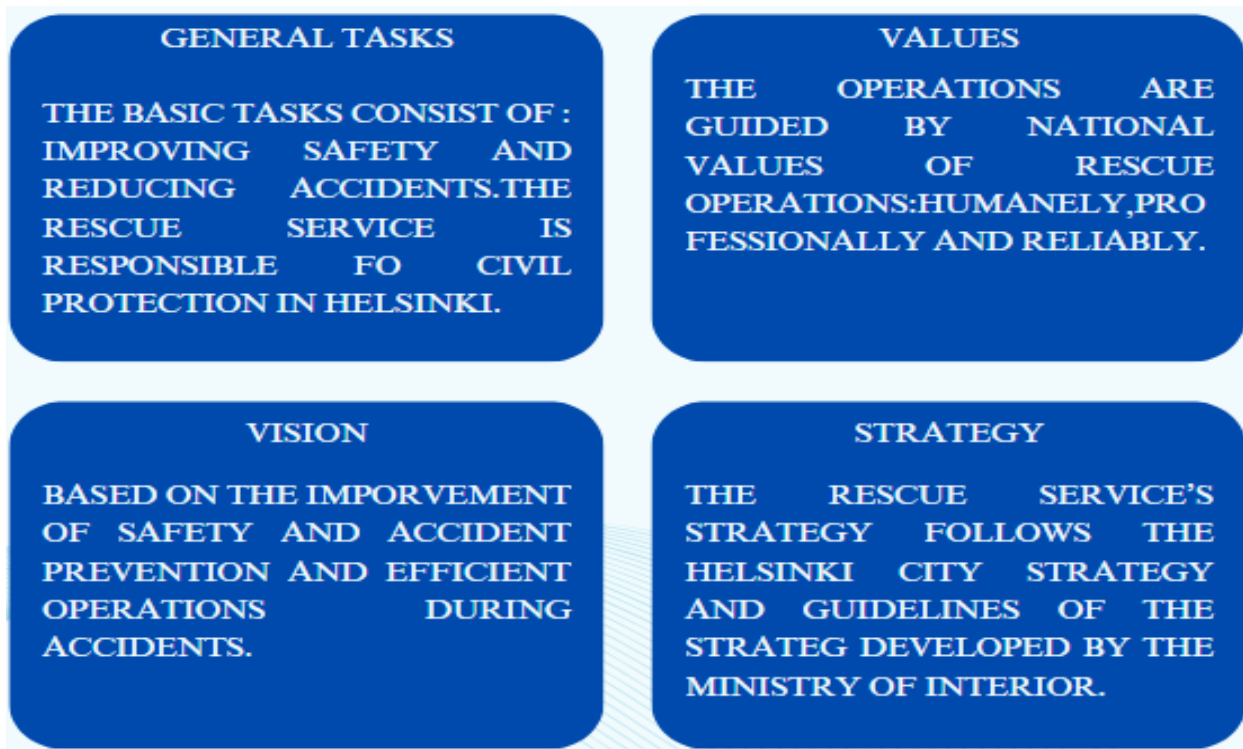


Figure 37: Helsinki Rescue Service basic operations (Helsinki Region Rescue Services, 2024).

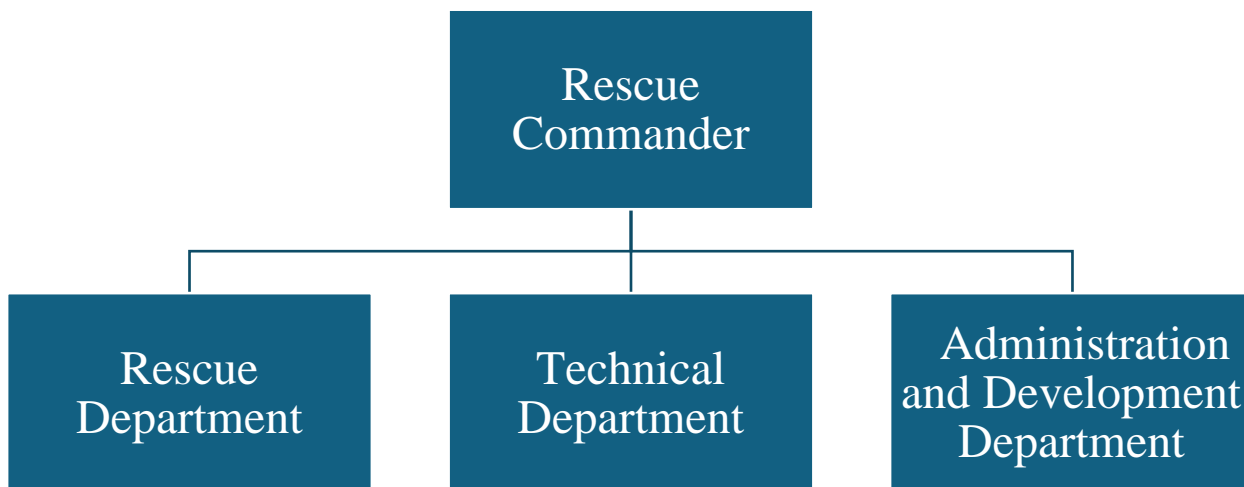


Figure 38 : Simplified organization diagram of the Helsinki Rescue Service adapted from (Helsinki Region Rescue Services, 2024).

The rescue department is further divided into three areas, which provide accident prevention, rescue operations, first aid and preparedness services (Helsinki Region Rescue Services, 2024), as illustrated in Figure 39.

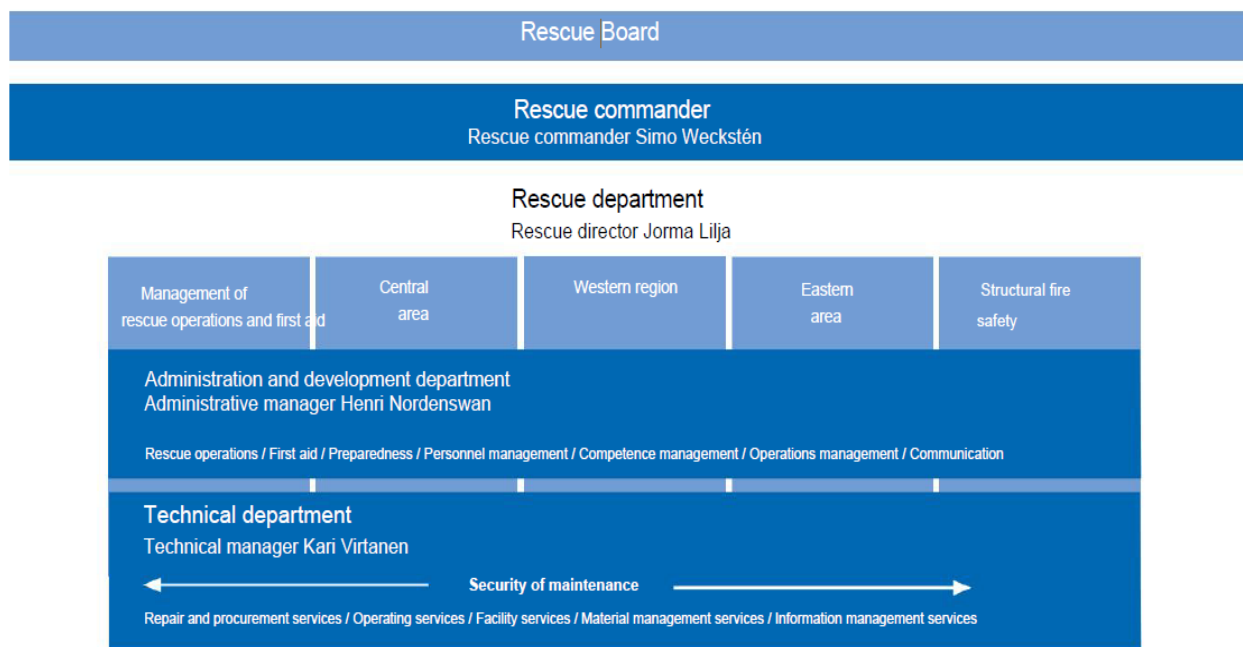


Figure 39: Matrix-based structure of the Helsinki Rescue Department from (Helsinki Region Rescue Services, 2024).

The rescue activities cover various types of accidents, such as fires, accidents involving substances, traffic accidents, natural disasters, water rescue missions, human rescue missions and oil spills (Helsinki Region Rescue Services, 2024).

1.23.4.2.1 Environmental Protection

The rescue service is responsible for environmental protection within the Helsinki area and factors in environmental protection sub-area programs in its operations (Helsinki Region Rescue Services, 2024). The rescue service manages oil control operations (Helsinki Region Rescue Services, 2024). The environmental goals of the rescue service consist of four areas:

1. Accident prevention through safety communication (awareness outreaches), training and monitoring of activities (Helsinki Region Rescue Services, 2024).
2. Environmental protection-based rescue operations should an incident occur or where there is probable threat of an incident (Helsinki Region Rescue Services, 2024).
3. The containment of damage caused by accidents and mitigate the consequences of accidents per the Rescue Act (Helsinki Region Rescue Services, 2024).
4. The institution’s consideration of environmental issues in material, real estate and other functions (Helsinki Region Rescue Services, 2024).

The rescue service carries out chemical monitoring under the action plan for accident prevention work (Helsinki Region Rescue Services, 2024). Oversight measures consist of chemical monitoring and inspection of sites involved in the industrial processing and storage of dangerous chemicals (Helsinki Region Rescue Services, 2024). In addition to inspections and reviews, chemical management measures include various statements and decisions (Helsinki Region Rescue Services, 2024).

1.23.4.2.2 Training

Every rescue worker undergoes training specifically designed for them based on the annual action plan. New employees receive a comprehensive induction to ensure an adequate competence level (Helsinki Region Rescue Services, 2024). Helsinki is a maritime port city surrounded by numerous islands, which entails special requirements for the management of maritime operations and readiness to combat oil spills

(Helsinki Region Rescue Services, 2024). The Rescue Department fleet consists of vessels purchased and best suited for oil absorption and they are also equipped for use in rescue operations (Helsinki Region Rescue Services, 2024).

The Rescue Department is an oil spill response authority in its area, following the Rescue Act (Helsinki Region Rescue Services, 2024). Preparations have been made to combat oil spills on land and at sea (Helsinki Region Rescue Services, 2024). These preparations are based on the day-to-day organization of the Helsinki Rescue Department, which is the starting point for the response measures. The Helsinki City Rescue Department consists of twelve rescue stations, four sea rescue stations, an oil spill response station (Herttoniemi Rescue Station), a technical base and a training area. Each rescue station has both rescue units and ambulances (Helsinki Region Rescue Services, 2024).

1.23.4.3 Herttoniemi Rescue Station (Within Helsinki Rescue Department)

The special expertise of Herttoniemi Rescue Station includes oil spill response in land and sea areas, if necessary, Herttoniemi Rescue Station also occupies the Santahamina oil spill response depot in the area (Uusimaa, n.d.). According to subsection 12 of the Rescue Act, risk analyses are to be provided as a standard service by the rescue services and must meet the potential of an accident (Rescue Act 379/2011).

1.24 NORWAY

1.24.1 National Response Organization Overview

Oil Spill Emergency Preparedness in Norway is divided into three parts: private, governmental and municipal (Figenschau, 2015). The Norwegian Clean Seas Association for Operating Companies maintains emergency preparedness on behalf of private operating companies within the Norwegian Continental Shelf (Figenschau, 2015). The Norwegian Coastal Administration coordinates the national preparedness efforts (Figenschau, 2015). Finally Municipal preparedness is based on risk assessments of activities in the municipalities and coastal oil pollution (Figenschau, 2015). The framework consists of Inter-municipal preparedness Committees for acute pollution where there are thirty-four emergency regions, which cover all municipalities in the country as illustrated in Figure 40.

1.24.2 National Regulations

1.24.2.1 National Plan Preparedness Against Acute Pollution and In Case of Danger of Acute Pollution in Norway 2020

The national emergency preparedness system provides an overview of current preparedness, and the maintenance of a national structure of overall preparedness to ensure an effective response to major oil spill incidents and avoid unnecessary expenses for both the public and private sectors (Norwegian Coastal Administration, 2020). This plan was developed under these obligations (Norwegian Coastal Administration, 2020). This National Plan facilitates the Norwegian Coastal Administration's management of the national system (refer to figure 40) based on the core principles of preparedness against acute pollution, namely the principles of responsibility, equality, closes, and cooperation (Norwegian Coastal Administration, 2020). The plan solidifies the development of the national preparedness system by establishing the roles and responsibilities of the related actors should an incident occur (Norwegian Coastal Administration, 2020).



Figure 40: Actors within the national preparedness system under the plan (Norwegian Coastal Administration, 2020:7).

1.24.3 Roles and Responsibilities of the Actors in Oil Spill Management in Norway.

1.24.3.1 Norwegian Coastal Administration Agency

The Norwegian Coastal Administration Agency under the Ministry of Transport and Communications is responsible for the identification and prevention of acute pollution (Bratfoss et al., 2022; Hänninen et al., 2020b). It ensures that the measures are implemented by the responsible party or municipality (Hänninen et al., 2020b). Additionally, they have approximately thirty-two inter-municipal preparedness areas that have their approved contingency plans (Hänninen et al., 2020b). These municipal preparedness areas are mandated to assist federal authorities in major spills (Hänninen et al., 2020b). This agency also supervises the responsible party in handling pollution efforts (Norwegian Coastal Administration, 2020).

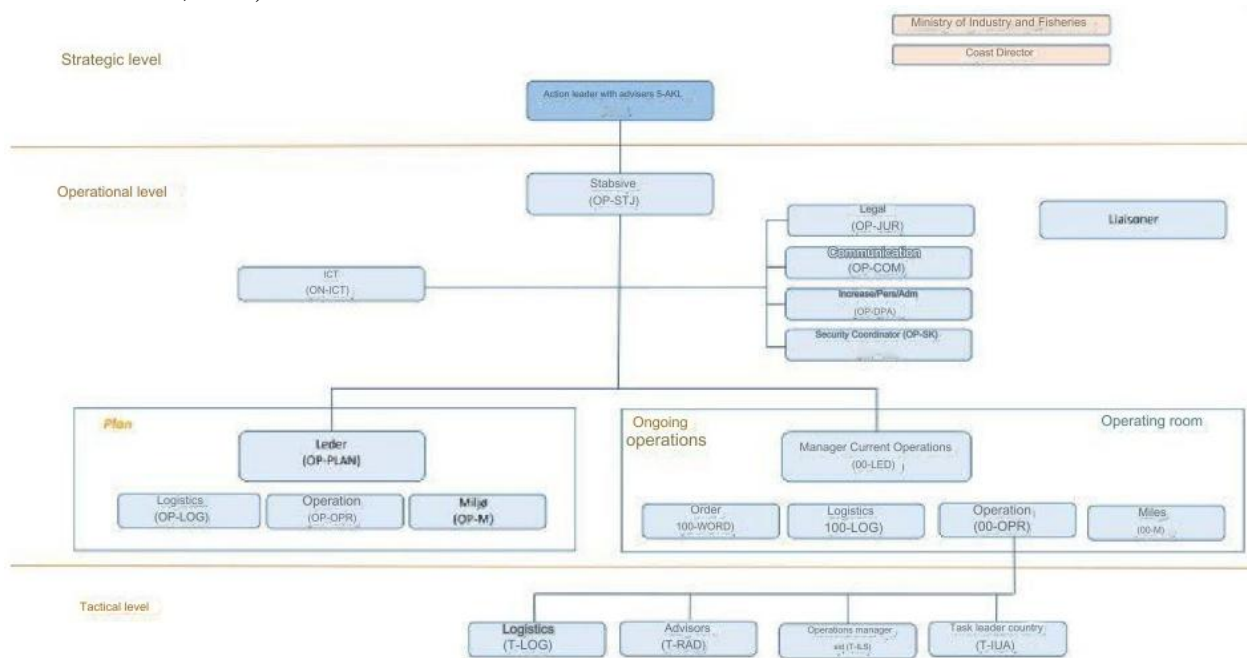


Figure 41: Organization of state-led action against acute pollution (Bratfoss et al., 2022)

Level of action	Description
Strategic level	The action leader along with his/her advisers leads and implements government actions against acute pollution (Bratfoss et al., 2022).
Operational level	The operational level is responsible for ensuring efficient and organized efforts under the strategic guidelines (Bratfoss et al., 2022). It is led by the chief of staff and contributes to effective interaction and communication internally in campaign management (Bratfoss et al., 2022). This

	level is divided into plan and ongoing operations (Bratfoss et al., 2022).
Tactical level	The focus is on implementing measures based on action orders issued by the operational level (Bratfoss et al., 2022). This is led by “operations leader sea” and “operations leader land” (Bratfoss et al., 2022). The action leaders prepare their action orders for subordinate units based on the current action order received from the operational level (Bratfoss et al., 2022).

1.24.3.2 The Norwegian Coast Guard

This agency regulates the cooperation between the Norwegian Armed Forces and the Norwegian Coastal Administration (Norwegian Coastal Administration, n.d.). The Norwegian Coastal Administration entered a cooperation agreement with the Norwegian Coast Guard (Norwegian Coastal Administration, n.d.). This consists of the adaption of various resources (buildings and vessels) as part of the cooperation effort in the oil spill response task in a manner that does not restrict the agency’s daily operations (Norwegian Coastal Administration, n.d.).

1.24.3.3 Norwegian Directorate for Civil Protection and Emergency Preparedness

The Directorate for Civil Protection maintains an overview of risk and vulnerability in society (Norwegian Coastal Administration, 2020; The Norwegian Directorate for Civil Protection, n.d.). They are the main agency for accident prevention, incident and crisis management in addition to maintaining preparedness (Norwegian Coastal Administration, 2020).



Figure 42 : Responsibilities of the directorate for civil protection and emergency preparedness (Norwegian Coastal Administration, 2020).

1.24.3.4 The Norwegian Environment Agency

This agency is responsible for the reduction of greenhouse gas emissions, the management of Norwegian natural resources and pollution prevention (Norwegian Coastal Administration, 2020). The

impertinent functions of the authority consist of the acquisition and dissemination of environmental information, training exercises execution and implementation of administrative duties, supervision and guidance at the regional level(municipal) (Norwegian Coastal Administration, 2020). Tasks in case of acute pollution are illustrated below in Figure 43.

THE NORWEGIAN ENVIRONMENT AGENCY’S TASKS DURING ACUTE POLLUTION INCIDENTS:

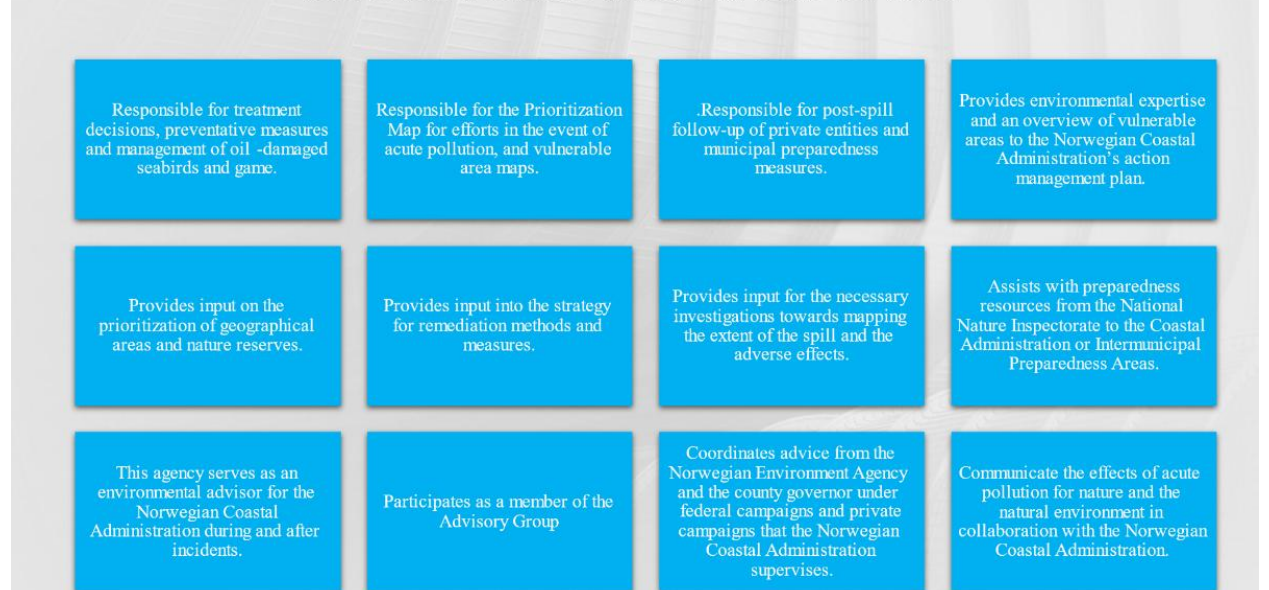


Figure 43: Norwegian Environment Agency’s tasks during acute pollution incidents.

1.24.3.5 Norwegian Maritime Authority

The Norwegian Maritime Authority supervises Norwegian and foreign vessels in Norwegian waters according to the Ship Safety Act (Norwegian Coastal Administration, 2020). In the event of pollution or suspected pollution from ships, the Norwegian Maritime Authority will be able to take samples from the vessel's cargo, lubricating oil and bunker tanks (Norwegian Coastal Administration, 2020). During oil spill incidents, the Norwegian Authority will detain the vessel until a bank guarantee is provided (Norwegian Coastal Administration, 2020). The bank guarantee serves to ensure the payment of an infringement fee or penalty (Norwegian Coastal Administration, 2020).

1.24.3.6 Petroleum Safety Authority

The Petroleum Safety Authority is responsible for safety, working environment, emergency preparedness for personnel and security in all phases of Norwegian petroleum activities (Norwegian Coastal Administration, 2020). This agency outlines the framework for petroleum activities and ensures that they are conducted responsibly (Norwegian Coastal Administration, 2020). During oil spill incidents, this agency assesses the follow-up on the incident based on the severity (Norwegian Coastal Administration, 2020). This agency also notifies other relevant authorities, such as the Norwegian Coastal Administration and the Norwegian Environment Agency (Norwegian Coastal Administration, 2020). Finally this agency follows up with the responsible operator or shipowner to contain the discharge at the source and halt the spread of the spill (Norwegian Coastal Administration, 2020).

1.24.3.7 Centre For Oil Spill Response and Marine Environment

The Centre for Oil Spill Preparedness and the Marine Environment is a competent centre for work on oil spill preparedness and marine plastic pollution (Norwegian Coastal Administration, 2020). The centre

promotes the best available scientific and experience-based knowledge and is the driving force for the development of cost-effective and environmentally friendly technologies, methods and measures for oil spill response and against marine litter (Norwegian Coastal Administration, 2020). The tasks during oil spill response are illustrated in Figure 44.

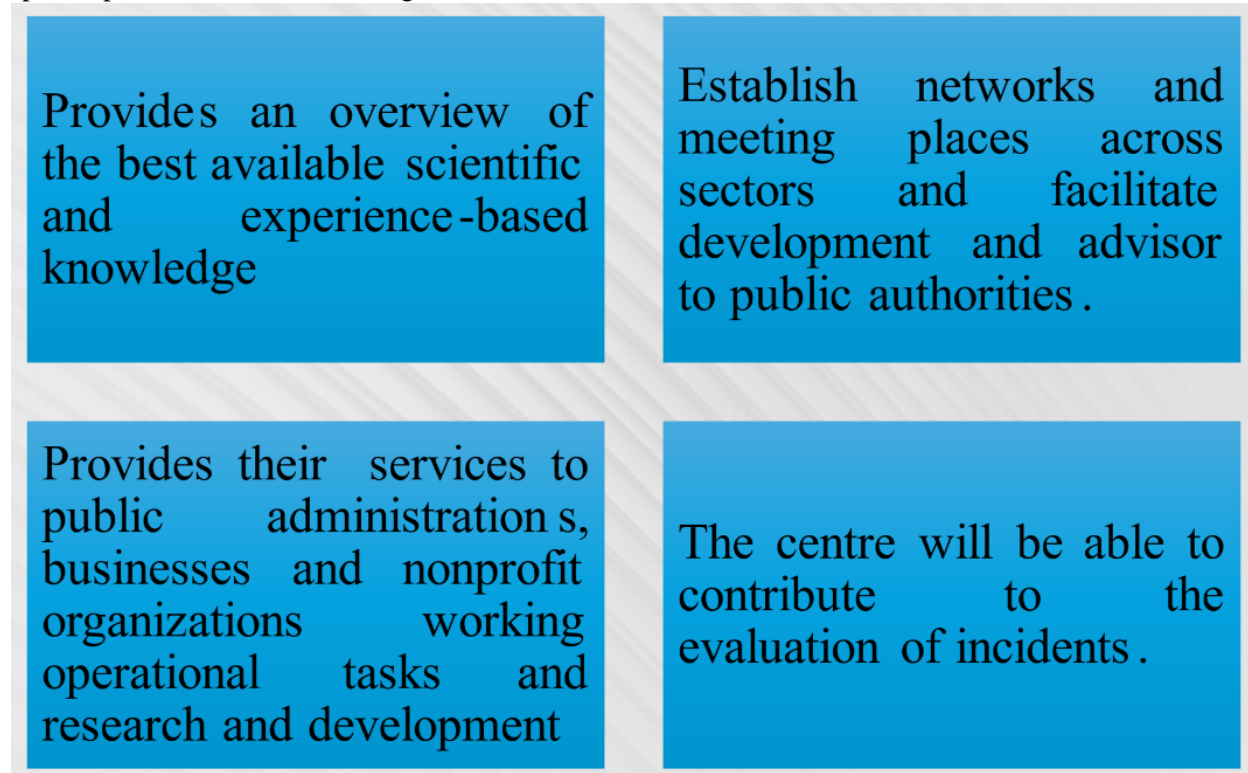


Figure 44: Centre for Oil Spill Response and Marine Environment's tasks (Norwegian Coastal Administration, 2020).

1.24.3.8 Directorate of Fisheries

This agency assists the Norwegian Coastal Administration with professional advice through participation in the Advisory Group should a spill occur (Norwegian Coastal Administration, 2020). This agency coordinates the notification and information exchange with related actors in aquaculture, full-time fishermen, and recreational fishermen who are in the immediate area of operation during an oil spill (Norwegian Coastal Administration, 2020).

1.24.3.9 County Governor

The county governor represents the state at the county level and links the municipalities and central authorities (Norwegian Coastal Administration, 2020). The County Governor monitors the activities of the municipalities per section 48 (Pollution Control Act 6/1981). The county Governor may ascertain the validity of the municipality's fulfilment of its mandates under Chapter 6 of the Pollution Control Act 6/1981 concerning acute pollution. In acute pollution incidents (oil spills) the responsibilities are outlined in Figure 45.

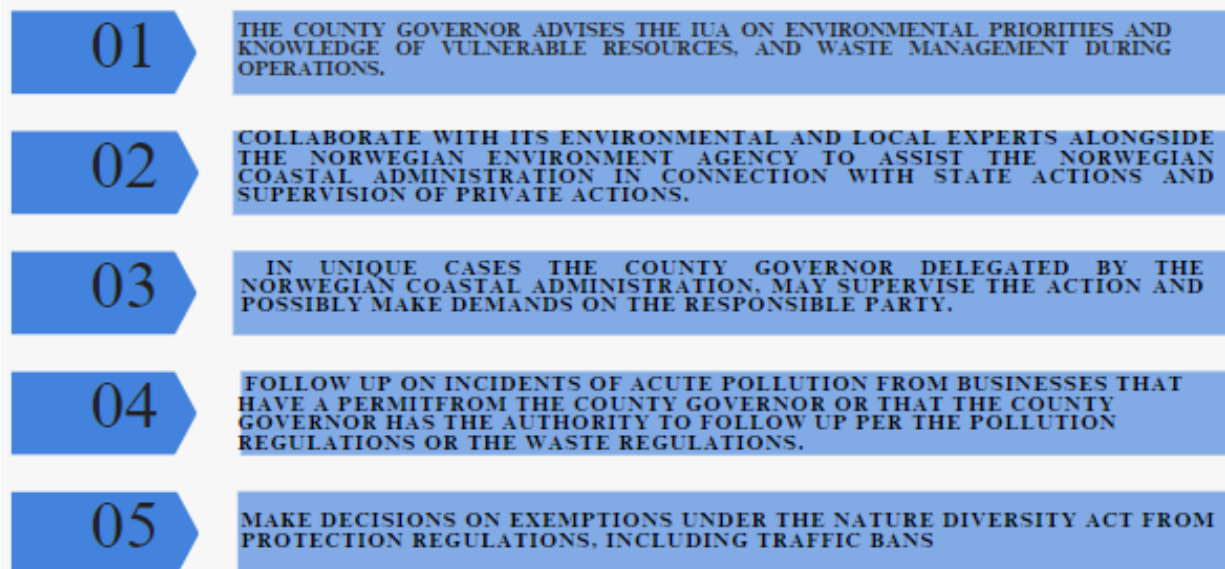


Figure 45 : County Governor’s tasks in the event of acute pollution.

1.24.3.10 Municipality

The municipalities are responsible for preparedness to handle minor cases of acute pollution that the person responsible is not able to handle themselves (Bratfoss et al., 2022; Norwegian Coastal Administration, 2020). According to section 43 of the Pollution Control Act, the municipality is responsible for developing a preparedness plan against acute pollution (Pollution Control Act 6/1981). The municipality is responsible for the implementation and maintenance of preparedness measures against minor oil spill events which the responsible party does not cover (Bratfoss et al., 2022) through preparedness and risk analyses (Norwegian Coastal Administration, 2020).

1.24.4 Local Level Lier Municipality and Western Finmark Inter-Municipal Preparedness Area

1.24.4.1 Lier Municipality General Emergency Plan 2019

This municipality emergency plan is a resource that allows prompt, rational and effective reactions in critical situations (Lier Municipal Council, 2018). Under the Civil Protection Act of 2010, all municipalities are required to develop emergency plans (Lier Municipal Council, 2018). Civil protection and rescue services are led by the municipal fire brigade (Lier Municipal Council, 2018).

The Directorate for Community Security and Emergency Preparedness requires that municipalities' preparedness efforts be implemented based on:

- Responsibility- the person responsible for a subject area in a normal situation is also responsible for the necessary emergency preparations and for handling extraordinary incidents within the area (Lier Municipal Council, 2018).
- Equality Principle- the function that is carried out during crises should be like the daily organization (Lier Municipal Council, 2018).
- Proximity principle- crisis response must be in an organized manner at the lower level (Lier Municipal Council, 2018).
- Cooperative principle- agencies and businesses have an independent responsibility to ensure the best possible cooperation with relevant actors on crisis prevention, crisis preparedness and crisis management (Lier Municipal Council, 2018).

Based on the relevant regulations a municipality must:

- prepare a comprehensive risk and vulnerability analysis (Lier Municipal Council, 2018).
- prepare an overall emergency plan (Lier Municipal Council, 2018).
- In crises, participate in the work with damage restriction measures to secure people, the environment and material/economic values (Lier Municipal Council, 2018).

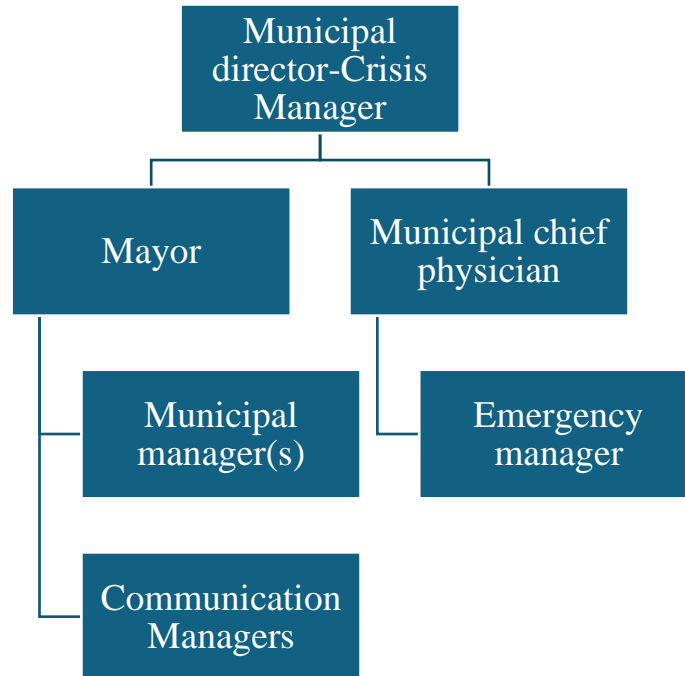


Figure 46: Structure of the Crisis management team within the municipality (Lier Municipal Council, 2018).

1.24.4.2 Intermunicipal Preparedness Areas

To facilitate inter-municipal oil response management among municipalities, Norwegian authorities have divided the four hundred and thirty municipalities into thirty-four larger sub-units called “Inter-municipal Preparedness Regions (IUA) (Wergeland, 2012; Det-Norske-Veritas, 2010). The Inter-municipal preparedness regions/areas engage in oil spill response should it be determined that the scale of the spill response operation is beyond the capacity of one municipality (Wergeland, 2012; Det-Norske-Veritas, 2010). The Inter-municipal Preparedness Areas serve to further safeguard emergency duties to handle minor spills (Hovden, 2010).

It should be noted that they have been established to respond to sea-based and shore-based spills (Wergeland, 2012; Det-Norske-Veritas, 2010). Figure 47 and Table 33 illustrate the organization of the thirty-four Inter-Municipal Preparedness Regions (IUAs) units (Wergeland, 2012; Det-Norske-Veritas, 2010).



Figure 47: Intermunicipal Preparedness Areas in Norway (Wergeland, 2012).

Table 33: Inter-municipal cooperation on preparedness against acute pollution adapted from (Norwegian Coastal Administration, n.d).

Region number	Region name	Participating municipalities
1	Ostfold	Aremark, Fredrikstad, Halden, Hvaler, Indre Østfold, Marker, Moss, Rakkestad, Råde, Sarpsborg, Skiptvet and Våle
2	Romerike	Aurskog-Høland, Eidskog, Eidsvoll, Gjerdrum, Grue, Hurdal, Kongsvinger, Lillestrøm, Lørenskog, Nannestad, Nes, Nittedal, Nord-Odal, Rælingen, Sør-Odal and Ullensaker
3	Inner Oslofjord	Asker, Bærum, Enebakk, Frogn, Nesodden, Nordre Follo, Oslo, Vestby and Ås
4	Buskerud	Drammen, Flesberg, Flå, Gol, Hemsedal, Hole, Kongsberg, Krødsherad, Lier, Modum, Nes, Nore and Uvdal, Ringerike, Rollag, Sande, Sigdal, Øvre Eiker and Ål
5	Hedmark	Alvdal, Elverum, Engerdal, Follidal, Hamar, Løten, Rendalen, Ringsaker, Stange, Stor-Elvdal, Tolga, Trysil, Tynset, Våler, Åmot and Åsnes
6	Oppland	Dovre, Etnedal, Gausdal, Gjøvik, Gran, Jevnaker, Lesja, Lillehammer, Lom, Lunner, Nord-Aurdal, Nord-Fron, Nordre Land, Ringebu, Sel, Skjåk, Søndre Land, Sør-Aurdal, Sør-Fron, Vang, Vestre Slidre, Vestre Toten, Vågå, Østre Toten, Øyer og Øystre Slidre
7	Vestfold	Færder, Holmestrand, Horten, Larvik, Sandefjord og Tønsberg

8	Telemark	Bamble, Drangedal, Fyresdal, Hjartdal, Kragerø, Kviteseid, Midt-Telemark, Nissedal, Nome, Notodden, Porsgrunn, Seljord, Siljan, Skien, Tinn, Tokke og Vinje
9	Aust-Agder	Arendal, Froland, Gjerstad, Grimstad, Risør, Tvedestrand, Vegårshei og Åmli
10	Midt-Agder	Birkenes, Bygland, Bykle, Evje og Hornes, Iveland, Kristiansand, Lillesand, Valle, og Venesla
11	Vest-Agder	Farsund, Flekkefjord, Hægebostad, Kvinesdal, Lindesnes, Lyngdal, Sirdal og Åseral
12	Sør-Rogaland	Bjerkreim, Eigersund, Gjesdal, Hjelmeland, Hå, Klepp, Kvitsøy, Lund, Randaberg, Sandnes, Sokndal, Sola, Stavanger, Strand og Time
13	Haugesund	Bokn, Bømlo, Etne, Fitjar, Haugesund, Karmøy, Kvinnherad, Sauda, Stord, Suldal, Sveio, Tysnes, Tysvær, Utsira, Ullensvang og Vindafjord
14	Bergen	Alver, Askøy, Austevoll, Austrheim, Bergen, Bjørnafjorden, Eidfjord, Fedje, Gulen, Hyllestad, Kvam, Masfjorden, Modalen, Osterøy, Samnanger, Solund, Ulvik, Vaksdal, Voss og Øygarden
15	Sogn og Sunnfjord	Askvoll, Aurland, Fjaler, Høyanger, Kinn, Luster, Lærdal, Sogndal, Sunnfjord, Vik og Årdal
16	Nordfjord	Bremanger, Gløppen, Stad og Stryn
17	Sunnmøre	Fjord, Giske, Hareid, Herøy, Sande, Stranda, Sula, Sykkylven, Ulstein, Vanylven, Volda, Ørsta og Ålesund
18	Romsdal	Aukra, Hustadvika, Molde, Rauma og Vestnes
19	Nordmøre	Aure, Averøy, Gjemnes, Kristiansund, Rindal, Smøla, Sunndal, Surnadal og Tingvoll
20	Midt-Norge	Frosta, Frøya, Heim, Hitra, Holtålen, Indre Fosen, Malvik, Melhus, Meråker, Midtre Gauldal, Oppdal, Orkland, Os, Osen, Rennebu, Røros, Selbu, Skaun, Stjørdal, Trondheim, Tydal, Ørland og Åfjord
21	Inn-Trøndelag	Inderøy, Levanger, Snåsa/Snåasen, Steinkjer og Verdal
22	Namdal	Flatanger, Grong, Høylandet, Leka, Lierne, Namsos, Namsskogan, Nærøysund, Overhalla og Røyrvik/Raarvihken
23	Helgeland	Alstadhaug, Bindal, Brønnøy, Dønna, Grane, Hattfjelldal/Aarborten, Herøy, Leirfjord, Sømna, Vefsn, Vega og Vevelstad
24	Rana	Hemnes, Lurøy, Nesna, Rana og Træna
25	Salten	Beiarn, Bodø, Fauske, Gildeskål, Meløy, Rødøy, Røst, Saltdal, Steigen, Sørfold og Værøy
26	Ofoten	Evenes, Hamarøy/Hábmera, Lødingen og Narvik

27	Lofoten og Vesterålen	Andøy, Bø, Flakstad, Hadsel, Moskenes, Sortland, Vestvågøy, Vågan og Øksnes
28	Sør-Troms	Bardu, Gratangen, Harstad, Ibestad, Kvæfjord, Lavangen/Loabága, Salangen og Tjeldsund
29	Midt- og Nord-Troms	Balsfjord, Dyrøy, Karlsøy, Kvænangen, Kåfjord/Gáivuona, Lyngen, Målselv, Nordreisa, Senja, Skjervøy, Storfjord, Sørreisa og Tromsø
30	Vest-Finnmark	Alta, Hammerfest, Hasvik, Kautokeino/Guovdageainnu, Loppa og Måsøy
31	Midt-Finnmark	Gamvik, Karasjok/Karášjoga, Lebesby, Nordkapp og Porsanger/Porsáŋggu
32	Øst-Finnmark	Berlevåg, Båtsfjord, Nesseby/Unjárgga, Sør-Varanger, Tana/Deanu, Vadsø og Vardø

1.24.4.3 Intermunicipal Preparedness Cooperation Agreement Western Finnmark-Between the Municipalities of Alta, Hammerfest, Hasvik, Kautokeino, Loppa and Måsøy Municipalities 2023

This collaborative agreement safeguards the participating municipalities' obligation to have joint preparedness against minor cases of acute pollution that may occur or cause damage within the participating municipality and which are not covered by private preparedness, in line with section 43 of the Pollution Control Act 6/1981. The agreement ensures that each participating municipality fulfils its duty to act and duty of assistance according to Sections 46 and 47 of the Pollution Act (Intermunicipal Committee against acute pollution in Western Finnmark, 2023).

1.24.4.3.1 Roles and Responsibilities

The participating municipality maintains the necessary preparedness against minor cases of acute pollution that may occur within the municipality and ensure operational readiness (Intermunicipal Committee against acute pollution in Western Finnmark, 2023). Participating municipalities must map current sources of minor cases of acute pollution and have an overview map of prioritized environmental values and vulnerable natural areas in the municipality (Intermunicipal Committee against acute pollution in Western Finnmark, 2023). Environmental risk analysis and preparedness analysis must be updated under current regulations and submitted to Hammerfest municipality at Hammerfest Fire and Rescue, which administers the collaboration (Intermunicipal Committee against acute pollution in Western Finnmark, 2023).

1.24.4.3.2 Authority

The Intermunicipal Preparedness Area West-Finnmark has the authority to make decisions about internal matters as well as manage grant schemes (Intermunicipal Committee against acute pollution in Western Finnmark, 2023). Intermunicipal Preparedness Area West-Finnmark's permanent bodies are the Board of Representatives and the Emergency Committee (Intermunicipal Committee against acute pollution in Western Finnmark, 2023). Hammerfest municipality at Hammerfest Fire and Rescue has administrative and operational responsibility for the Intermunicipal Preparedness Area West-Finnmark (Intermunicipal Committee against Acute Pollution in Western Finnmark, 2023). Hammerfest municipality/Hammerfest Fire and Rescue leads the cooperation's inter-municipal efforts through state action and inter-municipal actions (Intermunicipal Committee against acute pollution in Western Finnmark, 2023). Municipal incidents are managed by the Operations Manager for the fire service in the municipality where the damage occurred (Intermunicipal Committee against acute pollution in Western Finnmark, 2023). The Intermunicipal Preparedness Area must always be able to establish staff under the unified

management system principles and be staffed with sufficient personnel with relevant expertise and practical experience (Intermunicipal Committee against acute pollution in Western Finnmark, 2023). The host municipality is responsible for the establishment of staff within a reasonable time in the early phase of an incident. Member municipalities must contribute personnel to staff as needed to ensure continuity and endurance in unified management system staff within the Intermunicipal Preparedness Area (Intermunicipal Committee against acute pollution in Western Finnmark, 2023). In the event of a request for assistance in the occurrence of a municipal incident, the Inter-Municipal Preparedness Area must establish staff to support the emergency manager in the municipality where the damage occurred (Intermunicipal Committee against acute pollution in Western Finnmark, 2023). Hammerfest Municipality /Hammerfest Fire and Rescue is responsible for the operation, storage and maintenance of material belonging to the Intermunicipal Committee against Acute Pollution in Western Finnmark (Intermunicipal Committee against Acute Pollution in Western Finnmark, 2023). Hammerfest Municipality /Hammerfest Fire and Rescue ensures the planning and execution of an annual meeting for professional updating and joint training of staff, and a certain number of personnel from the participating municipalities with relevant expertise (Intermunicipal Committee against acute pollution in Western Finnmark, 2023).

A secretariat is established at the Hammerfest fire station for Intermunicipal Preparedness Area West Finnmark and:

- Manages day-to-day operations of Intermunicipal Preparedness Area West Finnmark
- Perform secretarial tasks for the collaboration and is a permanent member of the Emergency Preparedness Committee secretary.
- Administers meetings, professional gatherings and other activities

1.25 THE RUSSIAN FEDERATION

1.25.1 National Response Organization Overview

The Russian Federation regulates offshore oil and gas activity in the Arctic region through a complex system of rules derived from the Constitution, multiple statutes, orders, resolutions, decrees, sub-statutes regulations and other sources of law (Natalia Andreassen et al., 2019). The Russian system is based on a hierarchal command structure, which was established at multiple levels: the federal centre makes decisions, while the regions execute them and bear responsibility for conducting oil spill response operations in case of emergency (Ivanova, 2011).

Oil Spill Response in Russia is a tiered system conducted at multiple levels by the Federal executive authorities. Currently, there are approximately six integrated emergency centres in the Russian Arctic region under the Ministry of Emergency Situations of the Russian Federation (EMERCOM of Russia) (Pankratova, 2022). These centres are in the cities of Arkhangelsk, Murmansk, Vorkuta, NaryanMar, Dudinka, and Yakutsk (Pankratova, 2022). As the Northern Sea Route develops, the EMERCOM of Russia plans to install four more centres equipped with fire and rescue equipment for work in Arctic conditions, train personnel, have vessels (ships and boats) and all-terrain vehicles (Koshlaba, 2015; Matveev, 2016; Pankratova, 2022).

Table 34: Responsible party/s in various oil spill response environments.

Oil Spill Response Environment	Responsible Party
Land	The Ministry of the Russian Federation for Civil Defence, Emergencies and Elimination of Consequences of Natural Disasters (EMERCOM)
Sea	Ministry of Transport

According to the regulation (On a Unified State System of Emergency Prevention and Response, 2003) this authority consists of several federal agencies (Resolution 794, 2003). The Federal Agency of Marine and River Transport and the State Marine Rescue Service are subordinate to the Ministry of Transport (Andreassen et al., 2019). The Federal Agency of Marine and River Transport is responsible for the overall management of the oil spill response system at sea, while the State Marine Rescue Service manages the daily operational activities of the system and its rescue divisions in the region response to oil spills at sea (Andreassen et al., 2019). On the local level oil spill response operations are coordinated by dispatcher centres of maritime transport organizations, ports, Federal State Unitary Enterprise (RosMorPorts) branches shipping companies and other organizations engaging in petroleum exploration, processing and transportation (Andreassen et al., 2019).

The Ministry of Natural Resources and Ecology is responsible for policymaking, enforcement and supervision of activities related to the study, use, reproduction and protection of natural resources. The environment, enforcement and supervision are performed by two federal services: The Federal Supervisory Natural Resources Management Service and the Federal Service for Ecological, Technological and Nuclear Surveillance (Andreassen et al., 2019). The Federal Supervisory Natural Resource Management Service is subordinate to the Ministry of Natural Resources and Ecology (Andreassen et al., 2019). The Federal Services for Ecological, Technological and Nuclear Surveillance reports directly to the government (Andreassen et al., 2019).

In conjunction with The Ministry of the Russian Federation for Civil Defence, Emergencies and Elimination of Consequences of Natural Disasters, the Ministry of Natural Resources and Ecology classifies oil spills and thereby decides how much the polluting party will be fined (Andreassen et al., 2019).

1.25.1.1 Organisational model command systems and external relations

Oil spills are classified by Russian legislation in terms of their potential severity. Figure 48 outlines the General Tiered Approach to Oil Spills as adapted from (Vitalievich, 2021).

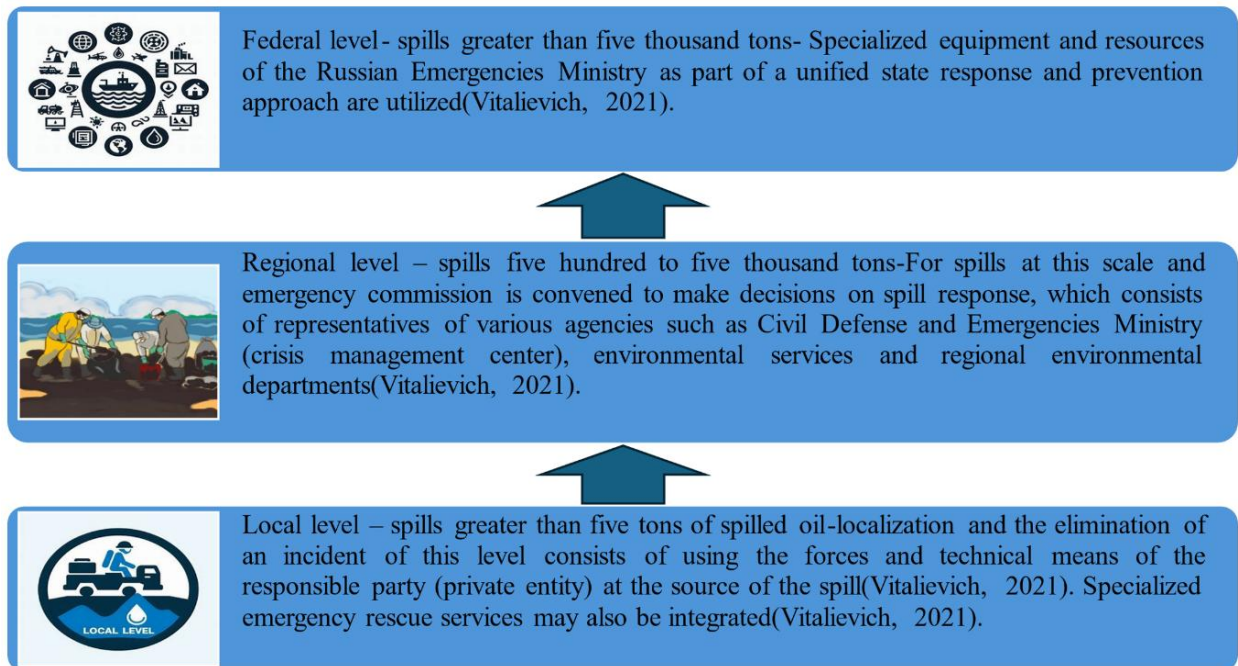


Figure 48: General Tiered Approach to Oil Spills adapted from (Vitalievich, 2021).

Under the requirements of the Decree of the Government of the Russian Federation of April 15, 2002, No. 240 (Ministerial Decree No. 240 Regarding Measures for the Prevention of Oil Pollution, 2002), all organizations with hazardous production facilities must create their formations (units) to eliminate oil and oil product spills (Decree of the Government of the Russian Federation of April 15, 2002, No. 240). Within the Ministry of Transport of Russia, federal functions of emergency rescue support for maritime transport are carried out by the State Marine Emergency and Rescue Coordination Service of the Russian Federation (Decree of the Government of the Russian Federation of April 15, 2002, No. 240). The State Marine Rescue Service of Russia includes:

- Eight basin emergency rescue teams Murmansk, Arkhangelsk, Vladivostok, Novorossiysk, Korsakov, Petropavlovsk-Kamchatsky, St. Petersburg and Astrakhan.
- Marine Rescue Coordination Centres in Murmansk, Vladivostok, Novorossiysk, St. Petersburg, Kaliningrad and Astrakhan.

1.25.2 National Legislation

Oil Spill Response Planning has been stipulated based on strict potential maximum oil spill volumes from private facilities such as oil rigs and marine terminals (Sarkova and Kelly, 2015). Oil Spill Response planning for petroleum exploration activities was based on an absolute value of 1500 tonnes which is independent of the type and design of the offshore facilities and preventive measures adopted (Russian Federation Governmental Decree No 613:2000 "On Immediate Actions on Oil Spill Prevention and Response"). There was a gradual shift towards adopting more explicit estimates for respective offshore facilities.

According to (Russian Federation Governmental Decree No1189:2014), the maximum possible volume of an oil spill can be calculated based on the maximum flow rate from the oil extraction well after

three days. This decree replaced two key Russian Governmental Decrees No 613 and 240 respectively, which are currently relevant for onshore oil spill response planning (Sarkova and Kelly, 2015). Decree 1189:2014 stipulates basic rules for oil spill prevention and response on the continental shelf, in the inland sea waters, territorial seas and adjacent zones of the Russian Federation.

The Decree implemented various essential amendments regarding oil spill response planning, two of which include according to (Sarkova and Kelly, 2015):

1. Decree No. 1189 did not stipulate the Tiered Response concept, which focused on the volume of oil spilled as was previously provided by Decrees 613 and 240.
2. The requirement to localize the response to a spill in approximately four hours from the moment of detection or based on information about the received spill is no longer in force.

Table 35: Key legislative documents regulating Oil Spill Response activities in Russia (Bambulyak, 2015:70).

Type of Statute	Date	Number	Content/Title
Federal Law	21.12.1994	68	On the protection of population and territories from natural and human-caused emergencies (edition 01.04.2012 No 23-FZ)
	22.08.1995	151	On emergency rescue services and rescuer status (edition 02.10.2012 No 287-FZ)
	30.11.1995	187	On the continental shelf of the Russian Federation (edition 30.12.2012 No 287-FZ)
	31.07.1998	155	On internal sea waters, territorial sea and coastal zone of the Russian Federation (edition 30.12.2012 No 287-FZ)
	01.10.2002	7	On environmental protection (edition 07.12.2011 No 417-FZ)
	03.06.2006	74	The Water Code of the Russian Federation (edition 28.07.2012 No 133-FZ)
	30.12.2012	287	On amendments to the Federal Law 'On the Continental Shelf of the Russian Federation' and the Federal Law 'On the Internal Waters, Territorial Sea and Adjacent Zone of the Russian Federation'
Government Resolutions	26.08.1994	989	To finance emergency preparedness and response activities in industrial enterprises, in building construction and transport (edition 13.07.2004 No 349).
	21.08.2000	613	On urgent measures for oil spill prevention and emergency response.
	15.04.2002	240	On organizing measures for oil spill prevention and response on the territory of the Russian Federation.
	30.12.2003	794	On unified state system of emergency prevention and response (edition 27.05.2005 No 335)
	23.07.2009	607	On the accession of the Russian Federation to the International Convention on Oil Pollution Preparedness, Response and Cooperation 1990.

	14.11.2015	1189	On organizing measures for oil prevention and response on the continental shelf of the Russian Federation, in internal sea waters, territorial sea and coastal zone of the Russian Federation.
Ministerial Orders	03.03.2003	156	Order of the Ministry of Nature Resources of the Russian Federation 'On approval of the instruction for defining the bottom level of oil spills for classifying an acute oil spill as an emergency'.
	28.12.2004	621	Order of the Ministry of the Russian Federation for Civil Defence, Emergencies and Elimination of Consequences of Natural Disasters 'On approval of the rules on development and endorsement of oil spill prevention and response plans on the territory of the Russian Federation'
	06.04.2009	53	Order of the Ministry of Transport of the Russian Federation 'On approval of the provision on the functional subsystem of the organization of work on oil spill prevention and response at sea from vessels and facilities regardless of their departmental and national affiliation'.

Table 36: Tiered Emergency Response of Land-based spills (Bambulyak, 2015:72).

Spill category	Amount of oil spilled (tonnes)
Local	Up to one hundred are allocated within the object borders.
Municipal	100-500 within the borders of the municipality or up to one hundred outside the facility border
Territorial	500 to 1000 within the administration borders of the federal subject/region 100-500 expanded outside the border of a municipality, or up to one hundred reaching water bodies or sea coastal area.
Regional	1000=5000 or 500-1000 expanded outside the borders of the federal subject or up to 100 if there is a risk of polluting neighbouring federal subjects/regions
Federal	More than five thousand, or the spill crosses state borders irrespective of the size of the spill

Table 37: Emergency categories of oil spills at sea (Bambulyak, 2015:73).

Spill category	Amount of oil spilled (tonnes)
Local	Up to five hundred within the object area
Regional	500-5000

Federal	Above five thousand
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The private operators are responsible for the initial provision of oil spill response in Russia (Andreassen et al., 2019). They are required to have and implement oil spill contingency plans for their projects (Order of the Government of the Russian Federation of April 15, 2002, No. 240, 2002). An analysis of various offshore contingency plans within the Russian Federation by (Andreassen et al., 2019) highlighted that some companies had integrated Incident Command System-based structures. One advantage was the potential culmination of various state, federal and local agencies into a unified organizational system with private organizations. This then enhances oil spill response coordination and prevents duplicated efforts. One example was Sakhalin Energy’s contingency plan which adopted aspects of this organizational structure as illustrated in Figure 49.

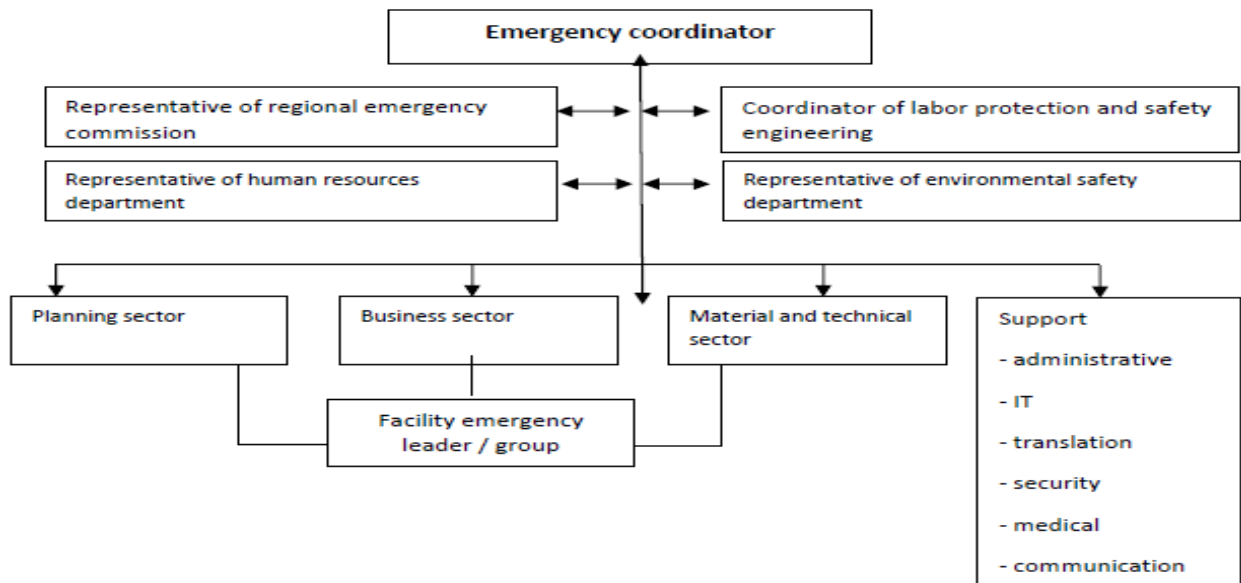


Figure 49: Incident Command System of the Sakhalin Energy’s Oil Spill Contingency Plan (Odd et al., 2019:130)

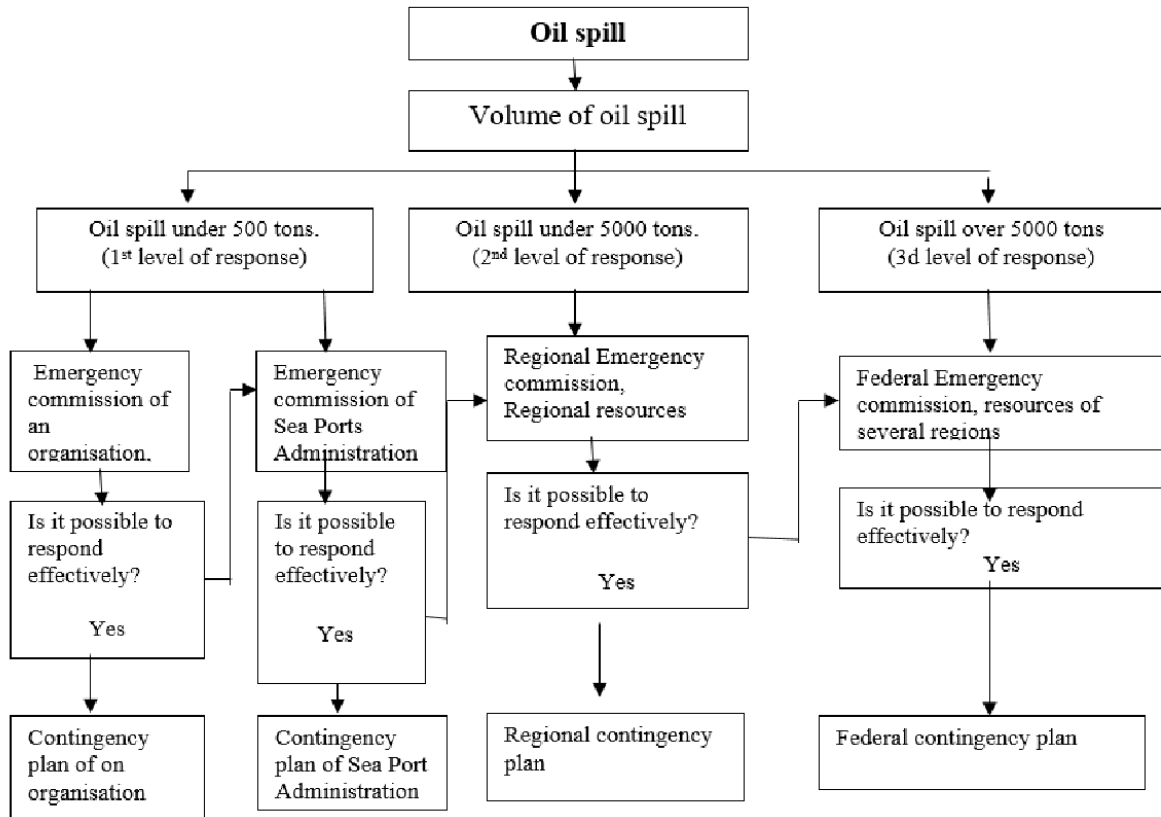


Figure 50: Patterns of shifting responsibilities according to oil spill volume, and the contingency plan of the seaport of Naryan-mar (Odd et al., 2019:131).

The incident coordination group supervises response procedures and resources to respond to emergencies. Preventive activities for oil spills in addition to the management of response resources (in the event of an oil spill) are the responsibility of Sakhalin’s Emergency Commission. The head of the commission delegates the functions of the coordination to the emergency coordinator. The emergency leader is responsible for emergency responses at their respective facility. If an oil spill at an offshore facility has been categorized under the parameters of regional emergency response, a regional response agency comes into action.

1.25.2.1 The Regional Emergency Commissions play a central role in the oil spill response system.

Emergency divisions of the marine rescue service (MorSpassluzhba) are standing response resources on the regional level in case of oil spills. A similar procedure is applied if an oil spill extends up to the federal level. Maritime operations are ensured by RosMorRechFlot as the standing managing authority at the federal level via its emergency commission. The authorities that can be involved in oil spill response consists of the Ministry of Energy EMERCOM, the Federal Fishery Agency, regional administrative bodies and local self-government bodies (Andreassen et al., 2019). Federal oil spill resources will be involved if existing oil spill resources are inadequate.

1.25.2.2 The Oil Spill Emergency Response System at The Regional Level (Murmansk Region).

Based on federal legislation, the Murmansk region's Oil Spill Emergency Response system is part of the Unified State System of Emergency Prevention and Response (Ivanova, 2011). The overall structure of the oil spill emergency response system at the regional level mainly reflects the structure at the federal level. Even though federal authorities are formally responsible for the establishment of the oil spill emergency response system, regional authorities oversee oil spill operations (Government of the Russian

Federation on The Unified State System of Prevention and Liquidation of Emergency Situations, 2003; Ivanova, 2011).

Ivanova (2011) in her study highlighted an absence of a national law that clearly defines the provisions of the oil spill emergency response in Murmansk, which is still the case. The absence of a well-defined state strategy for oil spill protection and response reflects the overall state of Russian environmental policy (Ivanova, 2011). The absence of a decisive federal environmental policy is regarded as a general characteristic of Russian Environmental governance (Hønneland and Jørgensen, 2006).

The concept of over fifty different legal documents that regulate oil spill protection and response may be assuring (Ivanova, 2011), however these documents have been formulated in an uncoordinated manner by diverse governmental bodies pursuing their interests and as a result, inconsistencies flourish (Glazov, 2008) as cited by (Sokolova, 2008).

The region's deputy government assumes the position of the head of the Emergency Commission in the event of an oil spill (Ivanova, 2011). Secondary departments of the Ministry of Transport and Ministry of Emergencies operate regionally and are responsible for oil spill response within the Murmansk region. There are approximately 10 search and rescue agencies in this region which consist of specialized oil spill response units and other rescue agencies (Commission, 2008). According to information from the (Ivanova, 2011) study, the structure of the two oil spill response organizations is stated in table 38 below.

Table 38: Hierarchical structure of the Oil Spill Emergency Response system between levels of authority and between Oil Spill Emergency Response at sea and on land (Murmansk region Government, 2008).

Levels of the Oil Spill Response system/plan	Sea		Land
Authorities	Ministry of Transport	Federal	Ministry of Emergencies
Response organizations	Secondary authorities of the Ministry of Transport	Regional	Secondary authorities of the Ministry of Emergencies
	<ul style="list-style-type: none"> • Murmansk Basin Emergency Rescue and Salvage Department (state) • Emergency Rescue Unit Navecoservice Ltd. (private) 		<ul style="list-style-type: none"> • Emergency Rescue Unit Navecoservice Ltd. (private) • Murmansk Basin Emergency Rescue and Salvage Department (state)
Oil industry	Own or contracted response units		Own or contracted response units

Contingency plans	Regional oil spill contingency plan for the Western Arctic Sector.		Murmansk Regional Oil Spill Contingency Plan.
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1.25.2.3 Oil Spill Emergency Response on Land

The Ministry of Emergencies is responsible for coordinating all rescue units and services (Ivanova, 2011; On a Unified State System of Emergency Prevention and Response, 2003). The Main Department of the Ministry of Emergencies of Russia in Murmansk represents the region as a central actor in the regional oil spill emergency response system.

1.25.3 Local Level Murmansk Region

1.25.3.1 Murmansk Regional Oil Spill Contingency Plan 2004

The land-based oil spill emergency response operations in the region of Murmansk are conducted by the Murmansk Regional Oil Spill Contingency Plan (Commission, 2008; Ivanova, 2011). This plan was developed by the regional emergency commission and finalized by the Main Department of the Ministry of Emergencies in the Murmansk region. It defines the order of actions to be taken in case of an oil spill and was valid for five years (Ministry of Emergencies of the Russian Federation, 2004). Since the Emergency Commission is a joint body, the regional contingency plan was a product of multiple agencies such as the Department for Surveillance-Murmansk Region of the Federal Supervisory Natural Resources Management Service in the Northwest federal district.

Even though the main department is primarily engaged in the oil spill emergency response activities in the region, there is no specialized oil spill emergency response unit (Ivanova, 2011). Active response activities are often outsourced by private emergency response firms such as Navecoservice Ltd (which can handle up to 500 tonnes on land (Ivanova, 2011). According to (The Government of the Russian Federation, 2014; Government of the Russian Federation, 2002) petroleum-related companies are required to establish an oil spill emergency response unit or establish a contract with a licensed oil spill emergency response organization. The Murmansk Basin Emergency Rescue and Salvage Department and Navecoservice are the main oil spill emergency response providers in the Murmansk region (Ivanova, 2011).

1.25.3.2 The Emergency Commission on Emergency Prevention and Response and Provision of Fire Security of the Government of the Murmansk Region.

The regional government established the Emergency Commission to serve a central role in the regional oil spill emergency response system (Ivanova, 2011). This commission is headed by the deputy governor (Murmansk region Government, 2008).

The commission is also the main coordinating body for the Murmansk territorial subsystem of the Unified State of Emergency Prevention and Response (Government of Russia, 2003). It mobilizes and coordinates all available resources to facilitate a successful emergency response operation in the Murmansk region (Ivanova, 2011). The governor approved the structure of the commission of the Murmansk region (Murmansk Region Government, 2009). The commission has forty-eight permanent members including representatives of the regional and city administrations, the Ministry of Emergencies, Murmansk Basin Emergency Rescue and Salvage Department, the military and the Russian Navy's Northern Fleet, the Federal Security Service, the Federal Ecological Service, Technological and Nuclear Surveillance, the Federal Supervisory Natural Resources Management Service, the regional Department of Internal Affairs and the Russian Railways (Murmansk Region Government, 2009). In addition, experts in fields such as law, hydrometeorology, oceanography and marine bio-resources may be called upon (Ivanova, 2011).

1.25.3.3 Monitoring and Science

The Murmansk Centre for Standardization and Metrology and Certification and the Murmansk regional office of the State Service for Hydrometeorology and Environmental Monitoring are both federal authorities that operate in the Murmansk region (Ivanova, 2011). The Murmansk Centre for Standardization and Metrology and Certification is under the Ministry of Industry and Energy while the State Service for Hydrometeorology and Environmental Monitoring is under the Ministry of Natural Resources and Ecology (Ivanova, 2011). This Murmansk Centre for Standardization and Metrology and Certification aims to analyze the behaviour of various petroleum products in different conditions based on samples (Sych, 2009). Since oil companies are not legally mandated to deliver oil samples to the laboratory for analysis, there is little income derived from this service (Ivanova, 2011).

The State Service for Hydrometeorology and Environmental Monitoring is responsible for monitoring environmental pollution in the region, including tracking oil spills (Ivanova, 2011). There is an absence of technical means to detect and forecast oil spill behaviour (Ivanova, 2011).

The Murmansk Marine Biological Institute and the Polar Research Institute of Marine Fisheries and Oceanography (PINRO) are responsible for studying the Arctic ecosystem (Ivanova, 2011). Their activities are partially focused on environmental safety for oil spills. The Polar Research Institute of Marine Fisheries and Oceanography has a specific focus on fisheries and is particularly concerned with ecological monitoring on the Arctic shelf (Egorov, 2008; Prishchepa and Titov, 2008). The Murmansk Marine Biological Institute has handled environmental impact assessments (in the Barents Sea area) and developed biomonitoring technology (Gudimov and Denisov, 2008).

N.B This agency has been funded by the Barents Sea regional office (NGEO) and the World Wildlife Fund for Nature Russia (Kalinka, 2008; Shavykin et al., 2008).

1.25.3.4 Oil Spill Emergency Response at Sea

The Ministry of Transport provides an emergency response at sea through two subordinate agencies that operate in the region:

- Murmansk Marine Salvage Coordination Centre's main communication point during offshore oil spill incidents. This agency receives information about spills and liaisons with the State Marine Salvage Coordination Centre in Moscow, a body that is part of the State Marine Emergency Rescue and Salvage Coordination service.
- Murmansk Basin Emergency Rescue and Salvage Department

The Murmansk Basin Emergency Rescue and Salvage Department (handles 500 to 5000 Barents Sea and Kara Sea) operates under the Regional Oil Spill Contingency Plan for the Western Arctic Sector (Government of the Russian Federation, 2003). The Central Marine Research and Design Institute developed this plan. The plan has specified:

1. the amount of oil transported
2. types of transportation vessels
3. assessment and statistical risks of possible oil spills
4. hazardous areas
5. oil spill preventive measures and emergency response hierarchy
6. notification and communication
7. emergency response logistics
8. safety measures
9. specialists training
10. cost assessment
11. compensation for environmental damage

1.25.3.5 Interorganizational coordination in the oil spill emergency response system in the Murmansk region.

The formal hierarchal structure of the oil spill emergency response systems consists of vertical and horizontal structure (Ivanova, 2011). The horizontal structure consists of ministerial agencies of various sectors such as the Ministry of Emergencies, the Ministry of Transport, and the Ministry of Natural Resources and Ecology which operate at the federal level of the oil spill emergency response system.

The vertical hierarchal structure consists of representatives delegated by the Ministries stationed in the Murmansk region. The emergency response system for oil spills is multi-sectoral, leading to hierarchical relations based on sectors within each federal ministry's domain. There is a clear division between the subsystem established for sea-based oil spill response under the Transport Ministry and land-based oil spill response led by the Ministry of Emergencies (Ivanova, 2011). Oil spill contingency plans have been established for multiple levels: objects (Ivanova and Sydnes, 2010). The main function of contingency plans is to provide a detailed algorithm of actions to be taken and by whom, during emergency response operations to ensure a timely and effective response. The regional contingency plans guide oil spill response regardless of whether it occurs at sea or on land.

1.25.4 The Murmansk Region Contingency Plan and the Regional Oil Spill Contingency Plan for the Western Arctic Sector 2008.

This plan was developed on the order of the Ministry of Transport and is acted upon by its subordinate agency the Murmansk Basin Emergency Rescue and Salvage Department. The Murmansk Regional Contingency Plan applies to oil spill emergency response operations on the land territory of the region (Murmansk region Government, 2008). This plan was developed by a group of agencies that are part of the regional Emergency Commission (Government of the Russian Federation, 2003) and finalized by the Main Department of the Ministry of Emergencies in the Murmansk region.

The plans are a crucial tool for coordinating between different organizations involved in responding to an oil spill emergency. They outline how participating authorities, response organizations, and other actors will work together. The plans consist of a general and operative part, including assessments of environmental damage and rehabilitation. They also establish formal coordination mechanisms for informing about emergencies, immediate response actions, notification procedures, environmental and situation monitoring, operational algorithms, spill containment procedures, response strategies and tactics, application of response technologies, logistics organization, and safety measures.

1.25.4.1 Roles and Responsibilities

Sea-based oil spills are handled by the Murmansk Basin Emergency Rescue and Salvage Department. The mandated area of the agency is the Russian Western Arctic Sector shown in figure 51 below and covers the Russian part of the Barents Sea, the White, the Kara Seas and the Laptev Sea up to the port of Tiksi. In the event of an offshore spill the oil facility operator or the vessels is obligated to report the incident to the Murmansk Marine Rescue Coordination Centre (MMRCC) (Ivanova, 2011). This centre is the main communication point during marine incidents such as oil spills. The officer on duty at MMRCC notifies the Murmansk Region Crisis Management Centre and other relevant authorities according to standing instructions. In cases where there is a threat of pollution reaching the shoreline, the representative of the Murmansk Basin Emergency Rescue and Salvage Department (MBERSD) informs the regional administration, the Main Department of the Ministry of Emergencies of Russia in Murmansk.



Figure 51: The area of responsibility of Murmansk Basin Emergency Rescue and Salvage Department from (Ivanova and Sydnés, 2010:149).

The centre is the main communication point during marine incidents including oil spills. The officer on duty at Murmansk Marine Rescue Coordination Centre notifies the Murmansk Region Crisis Management Centre and all other authorities according to standing instructions. In cases where there is a threat of pollution reaching the shoreline, the representative of the Murmansk Basin Emergency Rescue and Salvage Department informs the regional Administration, the Main Department of the Ministry of Emergencies of Russia in the Murmansk region and the controlling authorities.

Murmansk Basin Emergency Rescue and Salvage Department reports regularly to the federal authorities, particularly the State Marine Emergency and Salvage Coordination Service, its immediate superior subject to the Ministry of Transport during the events. In the event of an oil spill occurring on land, information is delivered to the Murmansk region Centre for Crisis Management (Murmansk region Government, 2008). The Centre is a daily management body of the regional subsystem of the Russian Unified Emergency Response system that functions under the Main Department of the Ministry of Emergencies of Russia in the Murmansk region (Ivanova, 2011; Tsuksgumchs Rossii, 2010). It collects and processes all information related to emergencies (Tsuksgumchs Rossii, 2010). The two contingency plans set up the general principles of management and outline the formal structure of the management authorities participating in emergencies. For example, the Murmansk Region Contingency Plan defines the membership and the functions of the Emergency Commission as the higher coordinating authority and its working groups. It describes the actors and resources that may take part in a response operation and the coordination procedures. These plans are supplemented by several appendices consisting of action plan graphics for the collaboration of departments and agencies during an emergency. The two plans have not been synchronized, for instance the Murmansk Region Contingency Plan outlines all the resources present in the region should an oil spill occur, however its coverage only applies to land areas (Murmansk Region Government, 2008). The Regional Emergency Commission serves as the coordinating and governance for oil spill emergency response systems during oil spill incidents. The primary function of the Emergency Commission is to organize all available means and personnel during response (Murmansk Region Government, 2009).

The Operations Control Headquarters is a unit that supports the Emergency Commission and performs the corresponding function during offshore oil spill combating operations (Government of Russian Federation, 2003). The Operational Control Headquarters and the Emergency Commission are permanent bodies headed by the deputy of the regional administration of Murmansk. The challenges highlighted by (Ivanova, 2011) consisted of the complex and technical nature of the regional contingency plans and that they would not be useful in a difficult emergency or function as an instruction that is required in specific circumstances. A probable explanation for this is a lack of adequate cooperation between the scientific community and the oil industry in Russia, which results in decision-makers receiving inadequate information on which to base their decisions (Matishov, 2008).

As highlighted by (Ivanova, 2011) the overall Oil Spill Emergency Response system of the Murmansk region has not been fully developed. The organization of this system was conducted under an extensive legislative framework formulated by the Russian government and responsible federal authorities

(Ivanova, 2011). Regional authorities are responsible for the organization, implementation and coordination of emergency response operations while federal authorities establish the overall system as noted (Ivanova, 2011).The system has been divided into sea and land sectors that function under the umbrella of two different Ministries (Ivanova, 2011).The lack of a well-defined formal unified state policy in addition to an insufficient statutory need to organize the system are two impertinent weaknesses of the Oil Spill Emergency Response system in Murmansk as highlighted by (Ivanova, 2011).The roles and responsibilities of the mandated federal agencies need to be clearly defined (Ivanova, 2011).

Funding availability constrains the ability of response organizations to procure updated equipment therefore impeding the overall effectiveness of response operations (Ivanova, 2011). The lack of a formal oil monitoring and research system further hinders the effectiveness of the Oil Spill Emergency Response system.

1.26 SWEDEN

1.26.1 National Response Organization Overview

Sweden's National Oil spill response system is coordinated by the Swedish Coast Guard under the Ministry of Defence (Hänninen et al., 2020). The central goal of Sweden's oil spill protection approach is to minimize environmental damage and damage to other societal values (National Cooperative Group for Oil Damage Prevention, 2021). There are 26 coastline response stations (Hänninen et al., 2020). The municipalities are responsible for private facilities harbours and shoreline areas and are supported by the Swedish Civil Contingencies Agency (MSB) (Hänninen et al., 2020). The Swedish Civil Contingencies Agency provides training to municipalities and has specialized response equipment depots along the coastline, which can also be integrated into regional spill response (Hänninen et al., 2020). Sweden's Strategy for Oil Damage Prevention (Strategy) and the Action until 2026 will be the main national focus for this section as they are the latest versions of each main regulatory document.

1.26.1.1 Sweden's Strategy for Oil Damage Prevention (2014 Strategy).

1.26.1.1.1 Purpose of the plan

This strategy serves to form the basis for long-term planning and create a common basis for oil spill protection efforts before, during and after an incident (National Cooperative Group for Oil Damage Prevention, 2014b). This strategy serves as a joint stakeholder national strategy document (National Cooperative Group for Oil Damage Prevention, 2014). The strategy was developed by the National Collaboration Group for Oil Damage Prevention (National Cooperative Group for Oil Damage Prevention, 2014). The related actors consisted of personnel from local, regional and central levels in Sweden and included public, private and non-governmental organizational forms (National Cooperative Group for Oil Damage Prevention, 2014).

Sweden's strategy for oil damage protection underscored that oil damage protection is a key environmental protection area of focus and is in line with other important values (National Cooperative Group for Oil Damage Prevention, 2014). The compressed strategy was supplemented by a comprehensive background report, and subsequent action plans (National Cooperative Group for Oil Damage Prevention, 2014) as illustrated in Figure 52. The strategy covers spills caused intentionally, as well as ship-sourced spills that occurred without human influence in state and municipal areas (National Cooperative Group for Oil Damage Prevention, 2014). This strategy also outlines the actions before, during and after an oil spill (National Cooperative Group for Oil Damage Prevention, 2014).

**SWEDEN'S STRATEGY FOR OIL DAMAGE
Prevention-Background Report -June 2014**

**SWEDEN'S STRATEGY FOR OIL DAMAGE
Prevention Strategy June -2014**

**Sweden's Strategy For Oil Damage Protection -
Action Plan-May 2016**

**Mapping Of Sweden's Oil Spill Preparedness -
December 2021**

**Sweden's Strategy For Oil Damage Protection -
action Plan Until The Year 2026-May 2022**

Figure 52: Evolution of Sweden's Strategy for Oil Damage Prevention adapted from (National Cooperative Group for Oil Damage Prevention, 2014b).

The strategy's procedures have been initiated and managed by the National Collaboration Group for oil damage protection (National Cooperative Group for Oil Damage Prevention, 2014b). This group consists of representatives from the following agencies: the Swedish Maritime and Water Authority, the Swedish Coast Guard, the County Administrative Board, the Swedish Civil Contingencies Agency, the Swedish Maritime Administration, the Swedish Transport Agency, and representatives from the municipal perspective (National Cooperative Group for Oil Damage Prevention, 2014). This working group was responsible for developing the strategy, follow-up, and revision of the document (National Cooperative Group for Oil Damage Prevention, 2014a). The strategy covers oil spills from intentional, unintentional actions (accidents) and spills that occur without human influence from ships in municipal and state areas of responsibility at sea, Sweden's areas of jurisdiction in the Baltic Sea (National Cooperative Group for Oil Damage Prevention, 2014a). This strategy is focused on the following priority work areas:

1.26.1.1.2 Priority Work Areas

1. Key support for environmental issues within oil damage protection
2. Risk Reduction of sea/marine oil spills.
3. The dissemination of relevant information about preventive measures.
4. Enhanced response measures.
5. Integrated central capability as a national resource.
6. Increased regional coordination capacity.
7. Enhanced competence in oil spill preparedness and response.
8. The optimization of national response resources.
9. The coordination of rescue efforts.
10. Knowledge exchange.
11. A knowledge platform which enables development

The integration of pollution prevention and management measures from local to central authorities in addition to international measures has been emphasized in this plan (National Cooperative Group for Oil Damage Prevention, 2014a). An essential component for the involvement of the related actors at the local and regional levels in oil spill-related environmental issues is the collective central support at the regional, municipal and central levels alongside the adequate allocation of responsibilities (National Cooperative Group for Oil Damage Prevention, 2014a).

1.26.1.2 Sweden's Strategy for Oil Damage Protection-Action Plan Until the Year 2026-May 2022

This action plan was developed based on the 2014 strategy and solidifies the needs stated in the strategy and prioritizes the collective work (National Collaboration Group for Oil Damage Prevention, 2022). This action plan is the second revision of the 2014 Strategy's action plan and the development of this action was supplemented by the 2021 report titled Mapping of Sweden's Oil Spill Preparedness (National Collaboration Group for Oil Damage Prevention, 2022).

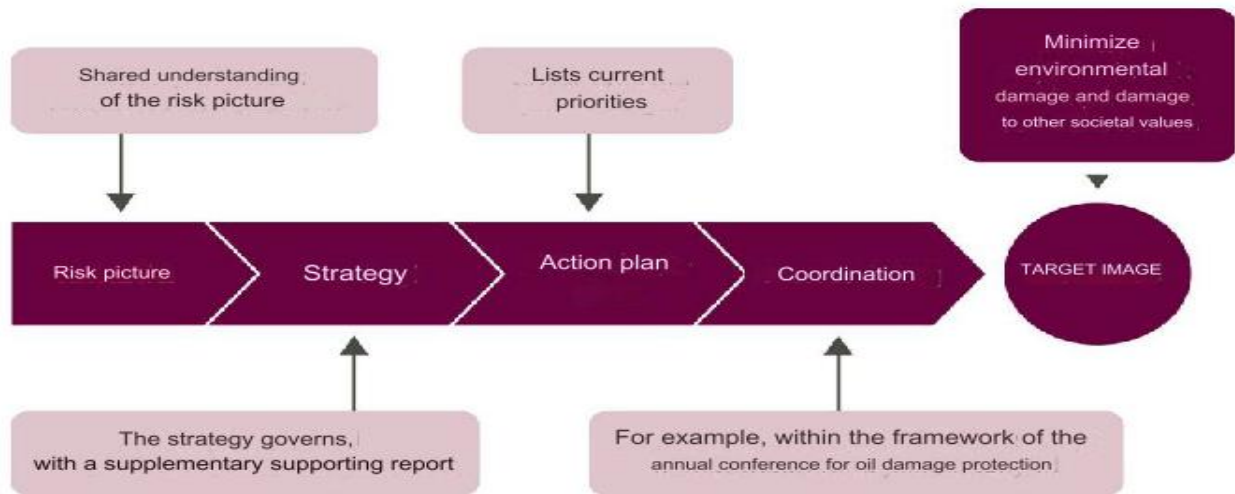


Figure 53: National process for oil spill protection consists of a risk picture, strategy, action plan and coordination from the (National Collaboration Group for Oil Damage Prevention, 2022).

Table 39: Phases of the development of the Action plan for Oil Damage Prevention (National Collaboration Group for Oil Damage Prevention, 2022).

Phase	Description
Risk picture	Consists of a comprehensive overview of the risks of sea-based accidents in large lakes presently and in the future and is a shared input value for the strategy (National Collaboration Group for Oil Damage Prevention, 2022). N.B. This can be used as a basis for risk and vulnerability analyses (National Collaboration Group for Oil Damage Prevention, 2022).
Strategy	This has been adopted by the National Collaboration Group for Oil Damage Protection member agencies and is the governing body for the national work on oil spill protection (National Collaboration Group for Oil Damage Prevention, 2022). The national collective effort is derived from the strategy’s eleven objectives (National Collaboration Group for Oil Damage Prevention, 2022).
Background Report	Consists of a complete and informative document that serves to complement the strategy (National Cooperative Group for Oil Damage Prevention, 2014a).
Action Plan	Consists of proposals for the implementation of measures and aims to solidify the needs indicated by the strategy and to prioritize the collective work (National Collaboration Group for Oil Damage Prevention, 2022). The priorities set out in the action plan must be realistic and able to be carried out by concerned and responsible actors in the next few years (National Collaboration Group for Oil Damage Prevention, 2022).
Coordination	Consists of integrating and following up the development to reach the goals of the strategy (National Collaboration Group for Oil

Damage Prevention, 2022). The results and experiences from the previous year are shared and a strategic dialogue is conducted with the relevant at the national annual conference (National Collaboration Group for Oil Damage Prevention, 2022).

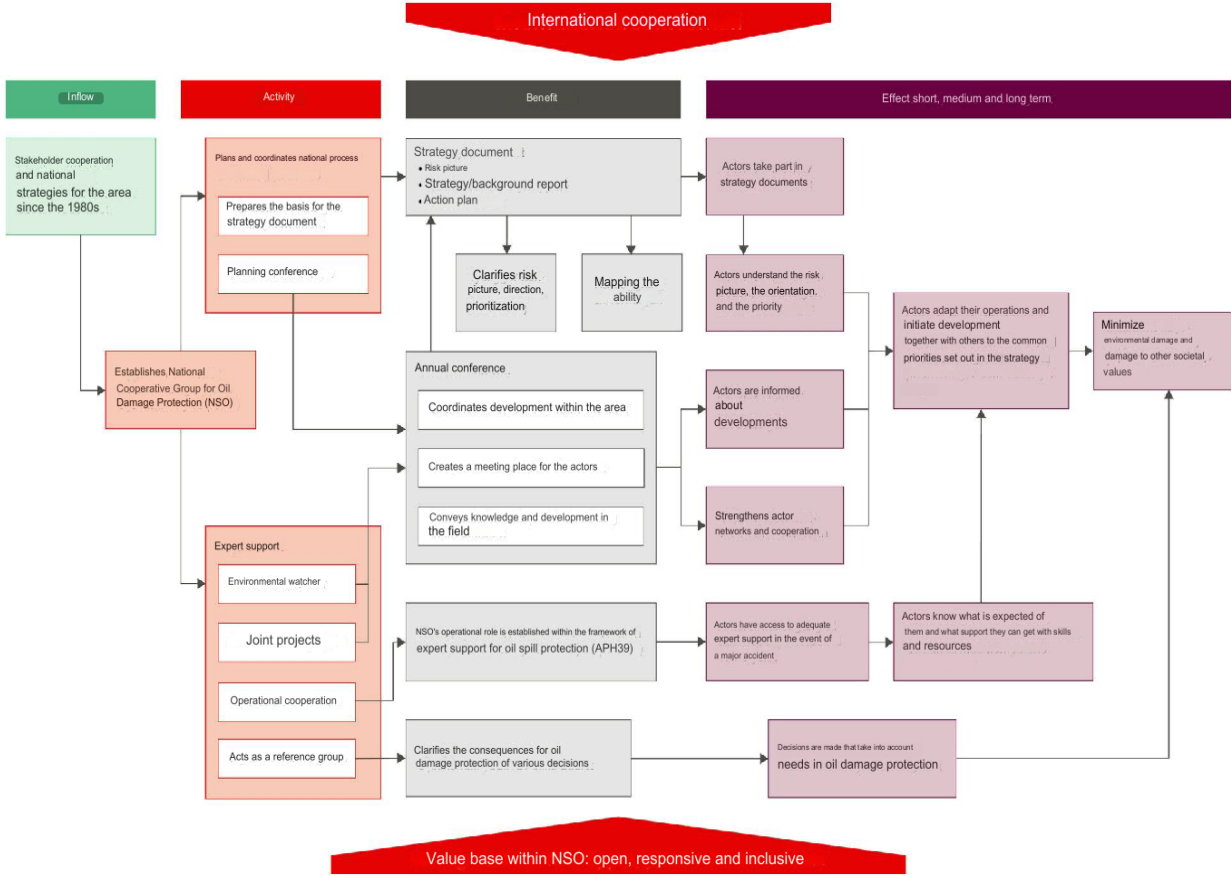


Figure 54: Business logic of the National Collaboration Group for Oil Damage Prevention (National Collaboration Group for Oil Damage Prevention, 2022).

Table 40: Roles and responsibilities for the National Collaboration Group for Oil Damage Protection (National Collaboration Group for Oil Damage Prevention, 2022).

National Collaboration Group for Oil Damage Protection tasks	Description
The establishment of a value base and Guiding principles.	<ul style="list-style-type: none"> • The shared values base was established to serve as the guiding principle of the action plan and joint projects herein (National Collaboration Group for Oil Damage Prevention, 2022). • Based on the established value base National Collaboration Group for Oil Damage Protection’s work can be accepted and is of high quality (National

	<p>Collaboration Group for Oil Damage Prevention, 2022).</p> <ul style="list-style-type: none"> • The National Audit Office reviews the state’s efforts to ensure municipal oil spill preparedness (National Collaboration Group for Oil Damage Prevention, 2022).
Activity Plans	<ul style="list-style-type: none"> • Producing data for strategy documents is the main task of the National Collaboration Group for Oil Damage Prevention (National Collaboration Group for Oil Damage Prevention, 2022). • This consists of the provision of updated orientation for the area of oil damage prevention to the relevant actors (National Collaboration Group for Oil Damage Prevention, 2022).
Planning Annual Conference	<ul style="list-style-type: none"> • Organize the annual conference for interested actors (National Collaboration Group for Oil Damage Prevention, 2022). • This serves to acquire an updated overview of the developments and challenges (National Collaboration Group for Oil Damage Prevention, 2022). • This event also provides a strategic dialogue on future priorities (National Collaboration Group for Oil Damage Prevention, 2022).
Expert Support	<ul style="list-style-type: none"> • Environmental surveillance-representatives from the collaboration group participate in many networks and acquire knowledge and news from a significant area (National Collaboration Group for Oil Damage Prevention, 2022). The collaboration group shares and interprets developments in oil spill prevention in Sweden (National Collaboration Group for Oil Damage Prevention, 2022). • Joint Projects-The collaboration group initiates development, manages, and conducts joint projects annually (National Collaboration Group for Oil Damage Prevention, 2022). The Swedish Contingencies Agency unifies and administers the collaboration group’s joint

	<p>projects (National Collaboration Group for Oil Damage Prevention, 2022). Such as revision of documents, and mapping of national oil spill preparedness capabilities through a project management approach (National Collaboration Group for Oil Damage Prevention, 2022).</p> <ul style="list-style-type: none"> • Operational cooperation- During major incidents the experts may serve as operational support through strategic coordination and advice (National Collaboration Group for Oil Damage Prevention, 2022). Drawing from the collective ability events can be analyzed and support proposals and priority areas based on current needs (National Collaboration Group for Oil Damage Prevention, 2022). • Reference group capacity provides a consensus from different positions from a general societal and environmental perspective on a specific subject area, creating a qualitative opinion (National Collaboration Group for Oil Damage Prevention, 2022).
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Table 41: Roles and responsibilities of the various agencies within the National Cooperative Group for Oil Damage Prevention (National Cooperative Group for Oil Damage Prevention, 2014a).

Actor/Agency	Roles and Responsibility
<p>The Swedish Maritime Administration (infrastructure manager)</p>	<ul style="list-style-type: none"> • The Maritime Administration guides service-producing entities in the transport sector and operations (National Cooperative Group for Oil Damage Prevention, 2014a).
	<ul style="list-style-type: none"> • Responsible for reducing the risk of grounding and sea collisions by providing accurate geographical information and pilotage.
	<ul style="list-style-type: none"> • Ensures substantial marine safety and promotes marine environmental efforts (National Cooperative Group for Oil Damage Prevention, 2014a).
	<ul style="list-style-type: none"> • Maintains sustainable sea routes, and ensures environmental protection through

	<p>pilotage maintenance, ice-breaking maritime traffic information, maritime geographical operations, and sea man service in addition to sea and aerial rescue (National Cooperative Group for Oil Damage Prevention, 2014a).</p> <ul style="list-style-type: none"> • Ensures that geographical information is compliant with international standards.
<p>The Swedish Transport Agency</p>	<ul style="list-style-type: none"> • Works toward achieving accessible, safe, and ecologically conscious transport of vessels by setting up rules, issuing permits, and conducting regular compliance assessments. • Conducts inspections of ship equipment and management systems that use Swedish ports. • Oversees Swedish efforts in compliance with International Maritime Organization regulations. • Assist the Government Offices in negotiations within the European Union, by reviewing proposals from the Commission, preparing draft instructions for meetings and participating as expert support during negotiations. • Makes representation on the European Maritime Safety Agency's board and actively takes part in technical meetings and training organized by the European Maritime Safety Agency. • The Swedish Transport Agency has the main responsibility for measures aimed at preventing oil spills from ships and accidents at sea. The agency also has responsibility concerning ship construction, equipment and operation. • The Swedish Transport Agency reports all ship accidents to the Helsinki Commission (this started as reporting of emissions). • The Swedish Transport Agency reports all emissions to the International Maritime Organization.
<p>The Sea and Water Authority</p>	<ul style="list-style-type: none"> • The Sea and Water Authority has an overall responsibility for drawing up plans

	<p>for how Sweden's sea areas can be used and how these are to be managed.</p>
	<ul style="list-style-type: none"> ● The Maritime and Water Authority's area of responsibility in case of an oil accident or an oil spill is to assist with assessments of how the spill may affect the environment. ● Furthermore, the authority's area of responsibility includes supporting a competence centre, the Oil Emergency.
	<ul style="list-style-type: none"> ● Consultants provide technical expertise during oil and chemical spill incidents on inland and sea. ● In addition, they provide advice on appropriate environmental protection measures.
	<ul style="list-style-type: none"> ● In case of major oil spills in Sweden, the Oljejouren assists with on-site advice. The oil hotline can also advise in connection with planning the follow-up of the effects after an oil spill.
<p>The Norwegian Maritime and Water Authority's</p>	<ul style="list-style-type: none"> ● Maintains an oil hotline which provides free advice and information to emergency services, county administrations and the municipalities' environmental and health protection offices in case of oil and chemical spills
<p>The Swedish Environmental Protection Agency</p>	<ul style="list-style-type: none"> ● Responsible for national coordination and prioritization when it comes to remedying pollution damage and serious environmental damage
	<ul style="list-style-type: none"> ● Responsible for the management, follow-up and examination of government grants covered by the regulation on remediation of pollution damage and state subsidies for remediation of oil spill damage.
	<ul style="list-style-type: none"> ● Allocate grants to measures that are of significant national priority.
	<ul style="list-style-type: none"> ● Reduce the risk of contaminated areas to human health and the environment.
<p>Swedish Meteorological and Hydrological Institute (SMHI)</p>	<ul style="list-style-type: none"> ● Serves as an expert authority under the Ministry of the Environment with responsibility for describing the

	<p>meteorological, hydrological, and oceanographic situation in Sweden and our surrounding seas.</p>
	<ul style="list-style-type: none"> ● Manage and develop information about weather, water and climate that provides businesses and the public with knowledge for informed decision-making.
	<ul style="list-style-type: none"> ● Contributes to local planning and the sustainability of society.
	<ul style="list-style-type: none"> ● Oceanic and atmospheric modelling through the development of Seatrack Web's oil operational forecasting system.
	<ul style="list-style-type: none"> ● This system is managed and checked year-round. The authority currently has no designated responsibility within Sweden's oil spill protection.
<p>The Swedish Coast Guard</p>	<ul style="list-style-type: none"> ● Maintains Sweden's maritime territorial waters-excluding waterways, canals, harbours and lakes other than Vanern, Vattern and Malaren.
	<ul style="list-style-type: none"> ● Responsible for Sweden's economic zone for emergency services when oil or other harmful substances have entered the water.
	<ul style="list-style-type: none"> ● Conducts environmental rescue services at sea and is a type of state rescue according to (Act on Protection against Accidents, Sweden, (2003:778)
	<ul style="list-style-type: none"> ● Establish an environmental rescue service program at sea.
	<ul style="list-style-type: none"> ● This consists of information on the current resource ability and future needs of the agency for rescue operations. ● Information on cooperation with municipalities, government authorities and relevant organizations.
	<ul style="list-style-type: none"> ● Organize the rescue service for prompt and efficient response operators.
	<ul style="list-style-type: none"> ● Conducts environmental monitoring from planes, which patrol daily over Swedish territorial waters and the Swedish economic zone.

	<ul style="list-style-type: none"> ● Frequently patrols environmental protection vessels, combination vessels, and maritime surveillance vessels that are in service.
	<ul style="list-style-type: none"> ● Monitors compliance with national and international regulations to protect the marine environment.
The Municipality	<ul style="list-style-type: none"> ● Represent Sweden in international conventions such as the Helsinki Commission as part of the Consultative Technical Group, Copenhagen Agreement and the Arctic Council.
	<ul style="list-style-type: none"> ● According to The Act on Protection against Accidents (2003:778) on protection against accidents, the rescue service is within its area of responsibility.
	<ul style="list-style-type: none"> ● Oil that threatens shorelines and coastal areas is usually considered a reason for emergency services.
	<ul style="list-style-type: none"> ● They oversee cleanup efforts according to the Environmental Protection Act, 1989.
	<ul style="list-style-type: none"> ● Coordinates remediation efforts within its geographical area of responsibility.
	<ul style="list-style-type: none"> ● Responsible for planning and preparation work and for coordinating crisis management measures taken by various actors if an oil spill.
	<ul style="list-style-type: none"> ● Disseminate information about oil spill events to the public.
County Administrative Board	<ul style="list-style-type: none"> ● The County Administrative Board handles the management of the Digital Environmental Atlas (National Collaboration Group for Oil Damage Prevention, 2022). ● Updates regional key protection areas in the Digital Environmental Atlas and instructs municipalities to ensure adequate documentation. ● Ordinance on Crisis Preparedness and heightened Preparedness, (942:2006) subsection 7, the county administrative board within its geographical area on such situations referred to in subsection 9 must

	<p>be a connecting function between local actors and the national level. (The preparedness level must be linked to the risk picture).</p>
	<ul style="list-style-type: none"> ● Support rescue leaders before, during and after the oil response operation.
	<ul style="list-style-type: none"> ● Aid in coordinating the clean-up efforts.
	<ul style="list-style-type: none"> ● If extensive rescue efforts are required of municipal rescue services, the county administrative board may take over responsibility for the municipal rescue services efforts according to the (Act on Protection against Accidents (2003:778) subsection 33.
	<ul style="list-style-type: none"> ● If several counties are affected by rescue efforts, the county administrations must agree on which country administration can take over responsibility for the rescue service in the municipalities. ● Coastal administrative boards update and integrate the regional oil spill protection plan. Supervise planning and the county's response capacity under the national oil spill prevention strategy as a starting point.
<p>The Authority for Social Protection and Preparedness is part of the Swedish Contingencies Agency.</p>	<ul style="list-style-type: none"> ● Focus on social protection and preparedness - uses through capacity building by knowledge exchange, training, support, practice, and own operational work in close cooperation with other relevant actors.
	<ul style="list-style-type: none"> ● The enhancement of public involvement in the prevention and management of incidents involving dangerous substances
	<ul style="list-style-type: none"> ● Coordinates the national collaboration group for oil damage protection, which is a strategically oriented expert working group.
	<ul style="list-style-type: none"> ● Assist the Government Offices with documentation and information in connection with serious accidents and crises.

	<ul style="list-style-type: none"> • Swedish representative in the Helsinki Commission (HELCOM)
	<ul style="list-style-type: none"> • Participates, together with the Coast Guard, in the Copenhagen Agreement and the Arctic Council.
	<ul style="list-style-type: none"> • The Coast Guard and Swedish Civil Contingencies Agency monitor issues concerning pollution on the beach.
	<ul style="list-style-type: none"> • Event of a crisis, MSB must support the coordination of the measures of the relevant authorities.

1.26.1.3 Mapping The Capability - Sweden's Oil Spill Preparedness 2021.

The purpose of the survey is to map how the work with oil spill protection looks in the counties and municipalities that have coastlines on state waters, including lakes Vänern, Vättern and Mälaren (The Swedish Agency for Community Protection and Preparedness, 2021b). The results from mapping must include, among other things the basis of the action plan for Swedish oil damage prevention 2021 (The Swedish Agency for Community Protection and Preparedness, 2021b). This mapping document can be used as a planning document for the Swedish Civil Contingencies Agency's supervision of the municipalities' mandates according to the (Act (2003:778) on protection against accidents (The Swedish Agency for Community Protection and Preparedness, 2021b). This survey was done through data collection based on quantitative methods using web survey tools (The Swedish Agency for Community Protection and Preparedness, 2021). The survey includes both a county and municipality perspective on risk and vulnerability analyses, planning, organization and the Digital Environmental Atlas (The Swedish Agency for Community Protection and Preparedness, 2021). See the map of participating county administrative boards and municipalities during the data collection period in figure 55 (The Swedish Agency for Community Protection and Preparedness, 2021).

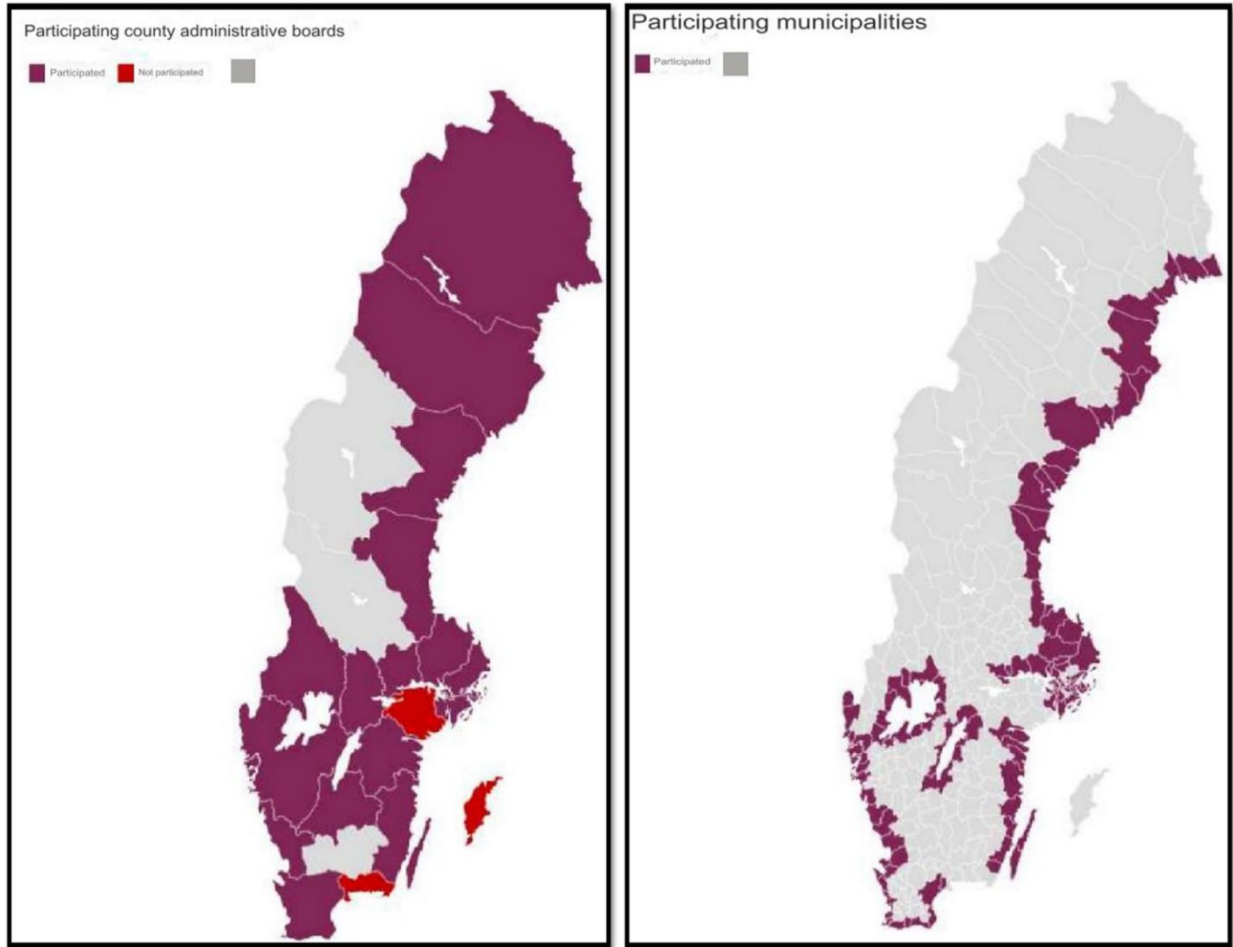


Figure 55: County administrative boards (left) and the municipalities(right) that participated in the 2021 Survey from (The Swedish Agency for Community Protection and Preparedness, 2021:7/8).

As illustrated in figure 55, many municipalities and counties did not participate in the survey. From the survey, more than seventy per cent of country administrators participated in the survey. In contrast, there were more than fifty percent of the municipalities that did not participate in the survey. The results of the survey consisted of the Risk and Vulnerability analysis, Planning and Organization, and Digital Environmental Atlas (The Swedish Agency for Community Protection and Preparedness, 2021). The risk and vulnerability assessments consist of the risk of being affected by major releases of oil from shipping activities. The country boards had to establish whether the risk and vulnerability assessments from the country boards and municipalities included the risk of being affected by major ship sourced oil spills (The Swedish Agency for Community Protection and Preparedness, 2021). The maps below highlight the country's administrations and municipalities (The Swedish Agency for Community Protection and Preparedness, 2021).

The County Administrations' Risk and Vulnerability Assessment that included the risk of being affected by major releases of oil from shipping activities .

COLOUR	DESCRIPTION
Yellow	Yes, accidents that can be handled within the county administration
Teal	Yes accidents that require cooperation with other actors.
Orange	The extent of this accident cannot be clarified in the Risk and Vulnerability Assessment.
Dark Red	No
Grey	Did not participate

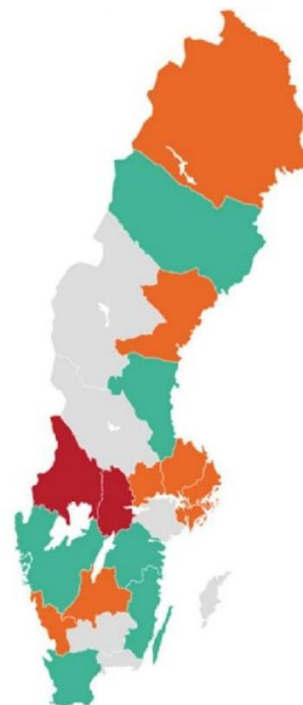
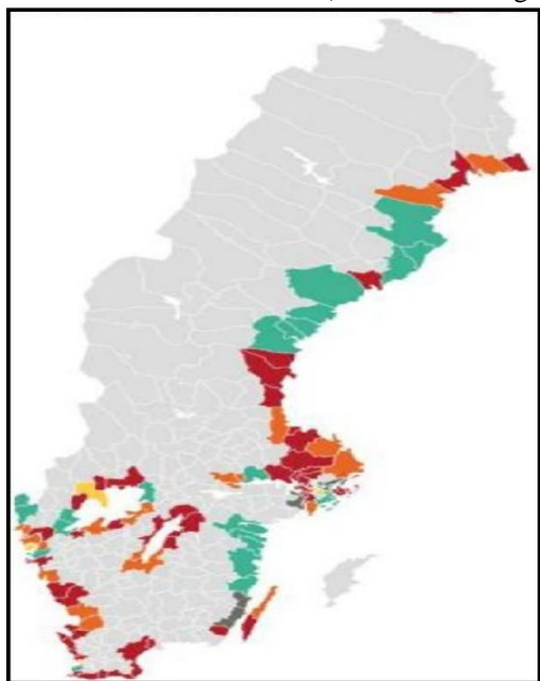


Figure 56: Distribution of Respondents to the survey about the inclusion of risk in County Risk and Vulnerability Assessments for ship-sourced oil spills (The Swedish Agency for Community Protection and Preparedness, 2021b:10).

As illustrated in figure 57, approximately two-thirds of the County administrative boards have not included the risk of ship-sourced oil spills in their risk and vulnerability assessments, in contrast to the twenty percent that included these accidents within their risk and vulnerability assessments and require assistance with other actors (The Swedish Agency for Community Protection and Preparedness, 2021b).



The Municipalities' Risk and Vulnerability Assessment that included the risk of being affected by major releases of oil from shipping activities .

COLOUR	DESCRIPTION
Yellow	Yes, accidents that can be handled within the county administration
Teal	Yes accidents that require cooperation with other actors.
Orange	The extent of this accident cannot be clarified in the Risk and Vulnerability Assessment.
Dark Red	No
Grey	Did not participate

Figure 57: Distribution of the respondents of the survey about the inclusion of risk in Municipal Risk and Vulnerability Assessments for ship-sourced oil spills (The Swedish Agency for Community Protection and Preparedness, 2021b:11).

From the municipalities that participated in this survey nearly eight of their respective risk and vulnerability assessments included the risk of oil spills from shipping activities (The Swedish Agency for Community Protection and Preparedness, 2021).

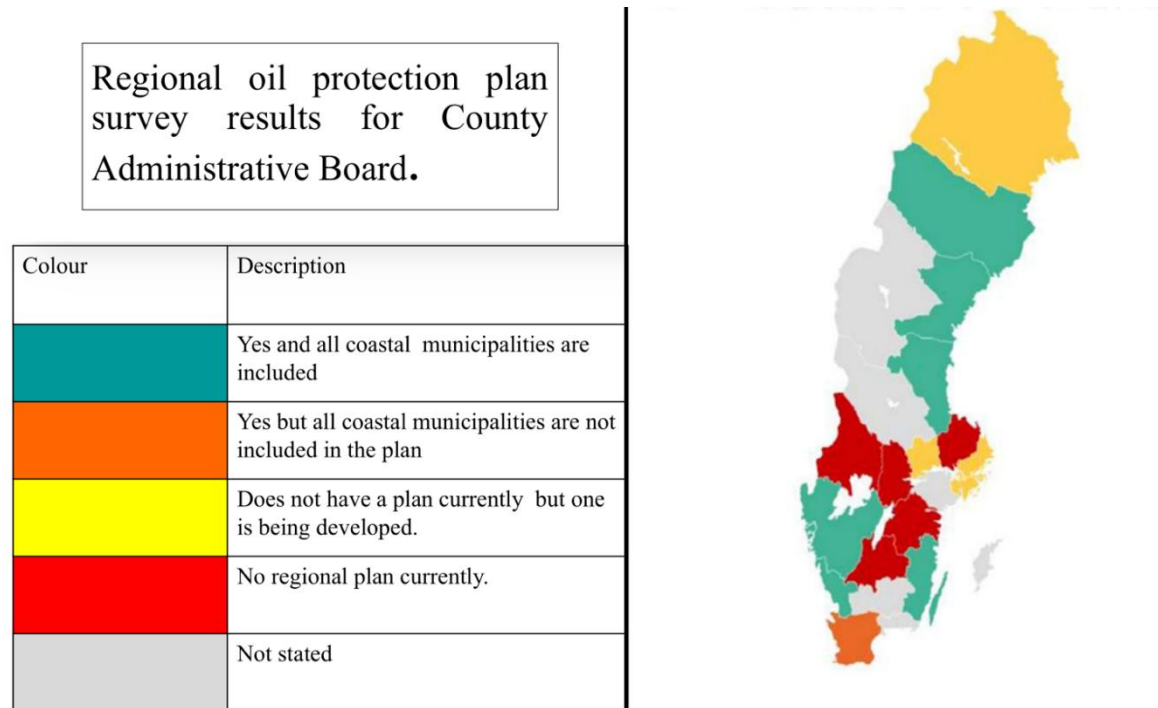


Figure 58: Distribution of the respondents to the survey on the presence of a county oil protection plan (The Swedish Agency for Community Protection and Preparedness, 2021b:19).

Approximately forty percent of the counties have a regional oil protection plan, and the coastal municipalities have been included in the plan (The Swedish Agency for Community Protection and Preparedness, 2021). Approximately seven percent of the counties have not included all their coastal municipalities in their respective plans (The Swedish Agency for Community Protection and Preparedness, 2021). Twenty percent have plans in development in contrast to the over thirty percent do not have a

regional plan at present (The Swedish Agency for Community Protection and Preparedness, 2021).

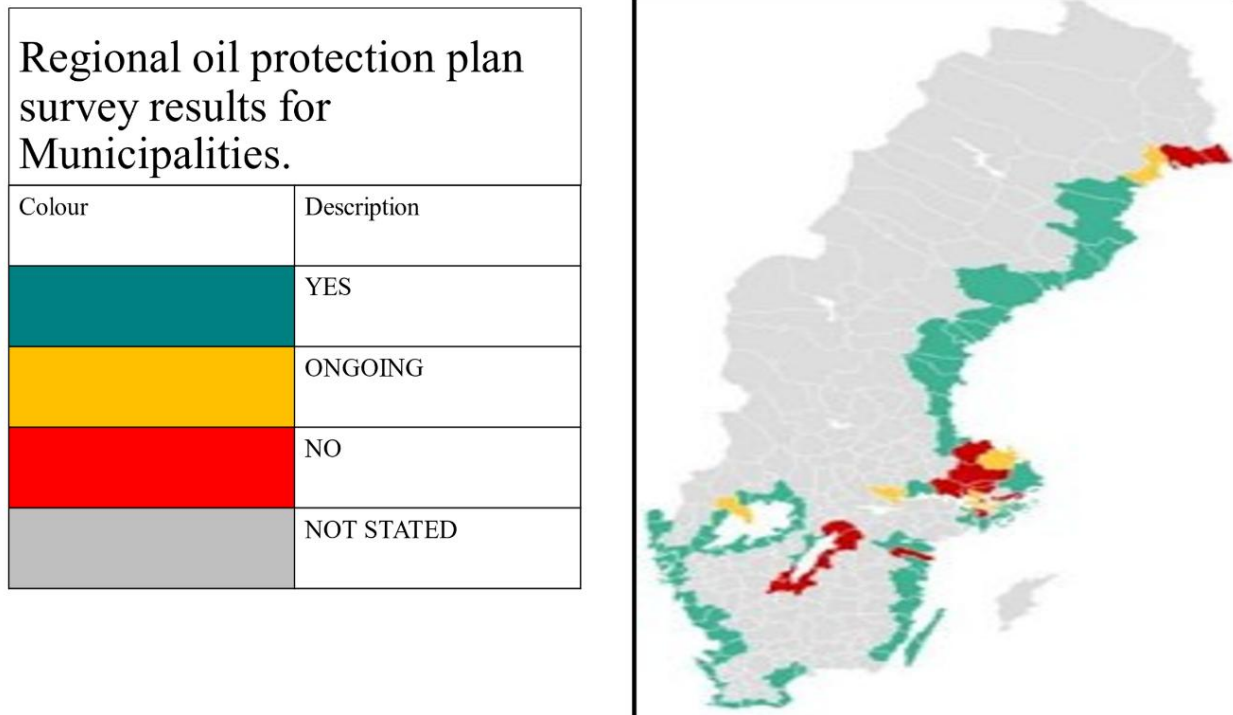


Figure 59: Distribution of the respondents on the inclusion of the presence of a Municipal oil protection plan from (The Swedish Agency for Community Protection and Preparedness, 2021b:20).

Regarding the Municipalities surveyed, over seventy percent were part of a regional or municipal oil protection plan. Ten percent of the municipalities had plans in development (The Swedish Agency for Community Protection and Preparedness, 2021). Eighteen percent of the municipalities are not included in either a municipal or regional oil protection plan.

The survey under this section also investigated the date of development of the oil protection plans at the county and municipal level (The Swedish Agency for Community Protection and Preparedness, 2021). There was a section that included the testing of these plans with comments (The Swedish Agency for Community Protection and Preparedness, 2021). There was a section that estimated the quantities of oil spills that have been dimensioned in these plans (The Swedish Agency for Community Protection and Preparedness, 2021). The prevalence of the integration of protected areas within the Digital Environmental Atlas among the municipalities and county administrative boards.

One of the comments highlighted that the extent of the use of these plans during incidents was uncertain at the two levels of administration. Checklists were used to verify the appropriate actions. There were cases where plans were not developed yet and therefore were not tried and tested.

1.26.1.3.1 The Education Training and Development Section in Sweden’s Strategy for Oil Damage Prevention.

This section consists of the established measures that serve to maintain a satisfactory level of competence among all relevant actors. Swedish oil damage prevention has been a main priority since the collaboration group’s first official document in 1984. Large-scale accidents rarely occur, but they are complex and demanding events where affected municipalities often lack previous experience to lean on. Education, practice, and development, therefore become decisive in creating and maintaining the ability to handle accidents (National Collaboration Group for Oil Damage Prevention, 2022). Major accidents are characterized by the need for cooperation and therefore, investments need to be made at all levels and in cooperation (National Collaboration Group for Oil Damage Prevention, 2022).

1.26.1.3.2 National Training and Practice Focus

The collaboration group initiated the work of developing a national training and practice orientation and communicated it with relevant actors (National Collaboration Group for Oil Damage Prevention, 2022). Evaluation tests are to be regularly ensured by rigorous testing. It can either be done in connection with real accidents or an exercise (National Collaboration Group for Oil Damage Prevention, 2022). The national education and training orientation provides comprehensive support for the actors' training planning (National Collaboration Group for Oil Damage Prevention, 2022). Testing through accidents and interventions can replace planned exercises (National Collaboration Group for Oil Damage Prevention, 2022).

1.26.1.3.3 Coordinated Regional Capability

County administrative boards with coastlines on state waters adapt, coordinate and follow up on the regional training, exercise and development needs (National Collaboration Group for Oil Damage Prevention, 2022). The County Administrative Board's coordination of the capability is based on Sweden's strategy for oil spill protection, the regional priorities in the Digital Environmental Atlas and the regional risk picture (National Collaboration Group for Oil Damage Prevention, 2022).

1.26.1.3.4 Evaluating Preparedness at The Regional Level

This ability needs to be regularly ensured by rigorous testing (National Collaboration Group for Oil Damage Prevention, 2022). It can either be done in connection with real accidents or an exercise (National Collaboration Group for Oil Damage Prevention, 2022). The national education and training orientation provides overall support for training planning in the country (National Collaboration Group for Oil Damage Prevention, 2022). Testing through accidents and interventions can replace planned exercises (National Collaboration Group for Oil Damage Prevention, 2022). Lessons learned are fed back into the region development work (National Collaboration Group for Oil Damage Prevention, 2022).

1.26.1.3.5 Priority measures at the local level

1.26.1.3.5.1 The role of coastal municipalities in the region's coordinated ability.

All municipalities with coasts facing state waters have long-term planning for training, exercise and development activities and contribute material and personnel resources to the region's coordinated capability. Per Sweden's strategy for oil spill protection, the work is based on the county government's regional coordination of oil spill preparedness, the local priorities in the Digital Environmental Atlas and the local risk picture. Coastal municipalities contribute information and strategic questions to their county board and the collaboration group.

1.26.1.3.5.2 Testing the ability at the local level

This ability needs to be regularly ensured by rigorous testing. It can either be done in connection with real accidents or an exercise. Testing through accidents and interventions can replace planned exercises. Lessons learned are returned to the region's and municipality's development work. The national education and training orientation provides comprehensive support for training planning.

1.26.2 Roles and Responsibilities of the Actors in Oil Spill Management in Sweden

1.26.2.1 The Role of The Swedish Coast Guard

1.26.2.1.1 Environmental rescue service at sea.

The Coast Guard is part of society's emergency preparedness in the maritime (Savic, 2020). The Coast Guard is also the monitoring authority with special responsibilities in the run-up to and during periods of high alert (Savic, 2020). The Swedish Coastal Guard carries out maritime surveillance and rescue service at sea (Isaksson, 2023). The coastal guard must also be able to prevent and manage crises in their area of responsibility (Isaksson, 2023). The Swedish Coast Guard is responsible for environmental rescue at sea

and works to ensure that the damage caused by the release of oil or other dangerous substances is minimized so that nature can be protected as much as possible (Swedish Coast Guard, 2022).

1.26.2.1.2 Municipal Surveillance

The municipalities carry out environmental monitoring partly based on state regulations and partly based on local needs and priorities, which is often based on the municipality's planning (The Norwegian Sea and Water Authority, 2020). A large part of the municipalities' monitoring of coastal water consists of self-control in the form of recipient control for among other things, municipal sewage treatment plants (The Norwegian Sea and Water Authority, 2020).

1.26.2.2 The Rescue Service-Working Environment to Connection with Cleanup after Oil Spills on Beaches.

The municipality is responsible for the emergency oil spill response on land (Gyllenhammar and Arvidsson, 2005; Swedish Coast Guard, 2022). The Swedish Rescue Agency is the authority that coordinates society's activities within the rescue service and exercises supervision over the municipal rescue service (Gyllenhammar and Arvidsson, 2005). The Swedish Rescue Agency assists the municipalities with staff and materials from the regional oil protection depots (Gyllenhammar and Arvidsson, 2005). Following the acute phase (containment/restriction from spreading to new areas) of the rescue service operation, clean-up commences (Gyllenhammar and Arvidsson, 2005). The Swedish Rescue Agency can assist the municipalities with personnel and materials from the five regional oil protection depots located in Botkyrka, Vänersborg, Karlskrona, Umeå and Gotland (Gyllenhammar and Arvidsson, 2005).

Oil that threatens beaches is normally considered an emergency service (Gyllenhammar and Arvidsson, 2005). When the rescue service operation in the acute phase has ended, i.e. when the oil can no longer spread and threaten new areas, the clean-up of oil-affected beaches begins (Gyllenhammar and Arvidsson, 2005). The responsibility for cleaning up after oil spills is constitutionally unregulated, which means that the municipal contingency planning for oil spills formally only covers rescue services (Gyllenhammar and Arvidsson, 2007). However, the practice is that the municipality is responsible for the cleanup within its geographical area (Gyllenhammar and Arvidsson, 2007). Cleaning up after an oil spill does not, however, constitute such an obligation for the municipality as e.g. The rescue service can supervise (Gyllenhammar and Arvidsson, 2007). On the other hand, the municipalities have the right to receive compensation from the state for such costs that have arisen because of cleaning up after an oil spill. The Swedish Rescue Agency decides on such compensation (Gyllenhammar and Arvidsson, 2007). The municipality has work environment responsibility for the clean-up staff and the so-called voluntary staff (Gyllenhammar and Arvidsson, 2007). The municipalities have a right to receive compensation from the state for clean-up costs that occur /have arisen due to clean-up efforts (Gyllenhammar and Arvidsson, 2007). This is decided by the Swedish Rescue Agency (Gyllenhammar and Arvidsson, 2007). The municipality has environmental responsibility for managing clean-up staff and volunteers.

1.26.2.3 Municipality

The municipality has an important role in the event of an oil spill, and then primarily the emergency services, which are responsible for the emergency response.

1.26.2.4 Municipal rescue service

The Act on Protection against Accidents states that a municipality must be responsible for the rescue service within the municipality's border Act (2003:778) on protection against accidents. The respective municipality is responsible for emergency services within the municipality's areas. A municipality's rescue service, or the joint rescue service association of several municipalities, is thus responsible for rescue services in the lakes and water areas that are not covered by state rescue services along the coastline and in ports.

1.26.3 Local Level Nacka Municipality and Halland County

1.26.3.1 Nacka Municipality Oil Prevention Plan-2016

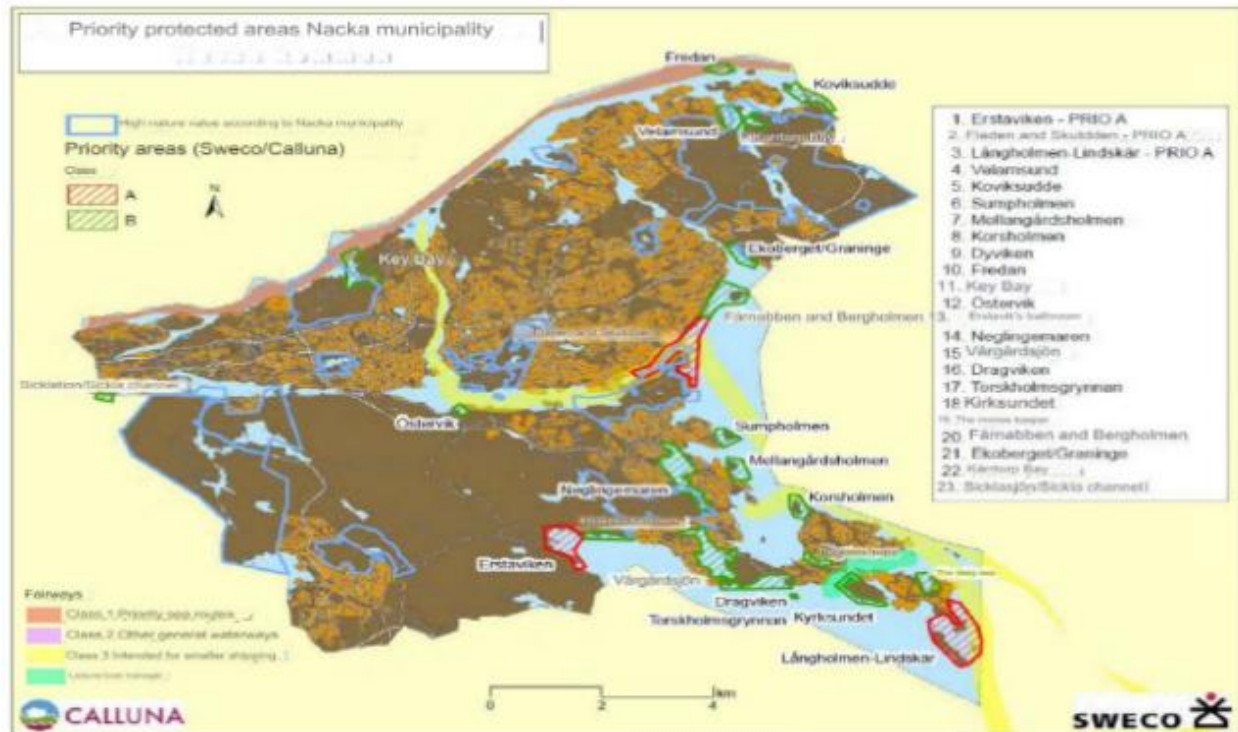


Figure 60: Nacka's Municipality Oil Prevention Plan 2016 Protected Areas (Blidberg et al., 2011:3).

The objective of the municipality's oil protection preparedness is to have the ability to combat the oil that reaches land after a spill at sea and minimize ecological and socio-economic consequences (Blidberg et al., 2011). The oil protection plan is primarily intended to be used during the municipality's preparedness work and as support for the clean-up work after a major oil spill, but it can also be used in the event of a minor oil spill. Preparedness means active work preparing various businesses for possible scenarios where these may be affected. Chemicals here refer to oil-like chemicals that are remediable and appear in nature in the same way as oil. The release of water-soluble chemical substances, such as many pesticides, cannot therefore be managed using only the oil protection plan. The municipality has no obligation to draw up an oil protection plan, however with a pre-determined organization with defined areas of responsibility, possible measures for rescue efforts, cleanup, and follow-up phase (Blidberg et al., 2011). The plan must be well anchored within the organization for it to fulfil its purpose. It is therefore important that it is updated regularly and used in exercises.

The goal of the plan is to minimize environmental damage in case of oil spills. The purpose of this oil plan is, among other things, to minimize environmental damage from oil spills. If an oil spill only affects Nacka's water areas and coasts, the crisis management group is the functional crisis management that makes overall strategic decisions for Nacka, according to Nacka's crisis management plan. The members of the crisis management group are dependent on the size and nature of the spill. If an oil spill affects several municipalities, Samverkansfunktion Stockholm Regionen becomes an actor.

1.26.3.1.1 Role of Municipality

The municipality is responsible for cleaning up oil on the beach when the rescue service is finished. The Remediation leader is the relevant manager in operation and maintenance, or the person to whom he/she delegates the task. The Municipality is responsible for:

- Logistics planning in connection with environmental remediation.

- The handling of oil-damaged or dead animals.
- The supervision of waste management through appointed actors.
- Coordination of the movement of the waste to an approved treatment facility.
- The proposal of transshipment routes for hazardous waste.

1.26.3.1.2 Responsibilities

In the event of an oil spill, responsibility is distributed between several different authorities at the central, regional, and local levels. For an oil protection effort to be successful, good cooperation between different actors is required.

1.26.3.1.3 Crisis Management

Crisis management acts according to Nacka municipality's overall crisis management plan (Blidberg et al., 2011).

1.26.3.2 Municipal Rescue Service

According to the Act (2003:778) on protection against accidents, the municipality must be responsible for the emergency services within its area. The municipal rescue service is obliged to intervene if there is a need for rapid intervention. Oil that threatens to reach shores is normally considered a reason for emergency services. If the oil has already reached the shore and the damage cannot be worsened, the action is a matter of cleanup. Oil cleanup of beaches is not regulated in any law, but the practice is that the municipality is responsible for its geographical area.

1.26.3.3 The Environment Supervision/Enforcement Unit-Environmental monitoring.

The Environment Supervision Unit is also responsible for the environmental monitoring aspects of the municipality. This is done through environmental monitoring, investigations and calculations on the air, soil, and noise quality within the municipality. Environmental monitoring also includes sampling of the lakes and coastal waters within Nacka by the Public Outdoor Environment Unit. The monitoring, together with experiences from previous inspections, provides a picture of what may need to be supported and subsequently updated. Environment monitoring serves as a means of follow-up on the local environmental goals in collaboration with the Environment Barometer (Nacka Municipality, n.d.). The Environmental Supervision Unit:

- Provides expertise on health and environmental impacts throughout cleanup operations.
- Conduct inventory on beaches that are at risk of surcharge, before markup, and document the decisions and assessments (Nacka Municipality, n.d.).
- Prioritize areas to be protected. Reprioritize when necessary.
- Assesses and consults with other experts on protection methods and remediation methods (Nacka Municipality, n.d.). The assessment should take place in consultation with experts for instance the oil emergency, the county board, the Swedish contingency agency, Swedish Environmental Research Institute.
- Supervises temporary transshipment sites for collected oil/hazardous waste (Nacka Municipality, n.d.).
- Assess when the remediation should end (Nacka Municipality, n.d.). The environmental unit must also follow lagging measures after remediation (Nacka Municipality, n.d.).

1.26.3.4 Södertörn Fire Service Association

The Södertörn Fire Protection Association is responsible for the rescue service within Nacka (Blidberg et al., 2011). A release is deemed to be a rescue service when there is a need for quick measures (Blidberg et al., 2011). Oil that threatens to reach shores is considered grounds for rescue service. When the oil has reached the shore and the damage does not worsen, the rescue service ends and can move on to clean up (Blidberg et al., 2011). Cleanup of beaches is only regulated in practice (Blidberg et al., 2011). The rescue service is responsible for the administration and compilation of costs as well as logistics and

material issues in the rescue service phase, in the event of an oil spill (Blidberg et al., 2011). They contact the Swedish Contingency Agency regarding the need for material or personnel resources from the regional oil storages (Blidberg et al., 2011). This fire service also organizes volunteers (Blidberg et al., 2011). The Södertörn Fire Service Association appoints a rescue manager for the rescue service operation (Blidberg et al., 2011). The rescue leader plans, supervises, implements and follows up the effort so that the resources are used in the best way. The resources consist of personnel, material organization and time (Blidberg et al., 2011).

1.26.3.4.1 The rescue manager's roles and responsibilities.

The rescue manager may decide that state and municipal authorities, which have the appropriate resources, should participate in the rescue work if it does not seriously impede their normal activities (Ahoniemi, 2016; Blidberg et al., 2011). If the rescue operation concerns operations across several municipalities, the rescue manager can also lead staff from several municipalities (Ahoniemi, 2016; Eva Blidberg et al., 2011). The rescue manager can also be appointed from another municipality if they have a particularly suitable competence (Ahoniemi, 2016; Blidberg et al., 2011).

1.26.3.5 Rescue service

The initial phase of the response to an oil spill is classified as an emergency service and is carried out to prevent and limit damage (Ahoniemi, 2016; Eva Blidberg et al., 2011). An emergency service response is defined as an "Urgent immediate action to prevent damage to human life, property and the surrounding environment (Ahoniemi, 2016; Eva Blidberg et al., 2011). These actions include loading and recording among others (Ahoniemi, 2016; Eva Blidberg et al., 2011). The phase consists of three parts; namely:

- Preventative measures regarding oil
- Remedial measures regarding oil
- Maintenance of general rescue service operations

1.26.3.6 The Municipality

According to practice, the clean-up is the municipality's responsibility. The remediation manager takes over the responsibility from the emergency services manager. The clean-up leader has the support of most people within the established organization that was established in connection with the oil accident. Some municipalities procure the position of decontamination manager, but even then, it is the municipality that decides if, where and how much is to be decontaminated. MSB has five mobile oils protection depots that can assist the municipality in the event of oil accidents. The oil protection reserves must support the municipality affected by the release of oil on the shoreline in state waters. The support consists of material and personnel resources which are requisitioned by the municipal rescue service or clean-up manager. The warehouses are in Umeå, Botkyrka south of Stockholm, Karlskrona, Vänersborg and Gotland. More information about the oil protection depots, which resources they have, and contact details can be found in the binder "Municipal oil protection" (2) and on MSB's website (3). Factors for deciding priorities in an oil spill, the remediation leader in addition to the advisor parties determines the priorities for damage inventory, pollution response and area reclamation. The following factors are considered during this phase:

- Degree of damage
- Risks of permanent damage
- Existence of particularly protected objects located within affected areas.
- Geographical location of the affected areas, bottom conditions and wave exposure
- Risks of disturbances to animal and bird life

1.26.3.6.1 Animals

The rescue service has a strategy for how the issue of oil-damaged birds and hunted animals(game) should be handled. The County Administrative Board and the Environmental Protection Agency's oil hotline can assist with advice and support. Non-profit organizations such as Disaster Aid for Birds and Wildlife (KFV) and the Swedish Blue Star can also assist with advice. However, their main task is to catch

and rehabilitate oil-damaged birds and hunted animals, which requires permission from the county administration and the Environmental Protection Agency. Should an oil spill only affect Nacka's water areas and coasts, the crisis management group is the functional crisis management that makes overall strategic decisions for Nacka Municipality. The composition of the crisis management group is dependent on the size and nature of the spill. If an emission affects several municipalities, Samverkansfunktion Stockholm Regionen becomes an actor.

1.26.3.7 Norwegian Sea and Water Authority

The Norwegian Sea and Water Authority is a government agency responsible for among other things sea and water planning and supervision. The Norwegian Sea and Water Authority's task is to look at how the oil and various cleaning methods affect the sea and coastal environment.

1.26.3.8 Swedish Civil Contingencies Agency

This agency can bolster the municipalities in the event of large oil spills. Municipalities can obtain materials and personnel with special skills from oil protection depots. In the event of an oil spill at sea, the rescue service can reinforce its resources with material from the Swedish Civil Contingencies Agency's oil prevention depots. The material must be transported within 25-50 miles within 10-15 hours.

N.B. The material in the oil prevention depots may not be suitable for all types of oil prevention work. It may therefore be necessary for the municipality to supplement it with equipment that is adapted to the current situation.

1.26.3.9 Swedish Environmental Protection Agency

The Swedish Environmental Protection Agency is a central environmental authority and shall, among other things, make follow-ups of the environmental effects of the release of oil. Swedish Meteorological and Hydrological Institute- This agency can make forecasts about the spread of oil in the event of a spill, with these as a basis, preventive measures can be directed to the areas where the risks of oil spills are greatest.

1.26.3.10 Halland County - Regional oil protection plan for Halland County

The County Administrative Board has geographic area responsibility at the regional level and must, in a crisis, be able to establish a management function for coordination and information, be able to work for a common direction, be responsible for the regional situational picture, be able to be a unifying function between local actors and following a decision by the government, be able to prioritize and target state and international resources that are made available (Swedish Civil Contingencies Agency, 2021).

The regional oil protection plan serves as a guidance document for the County Administrative Board, municipalities and other public, private and voluntary actors who participate in the management of an oil spill at sea (Halland County Administrative Board, 2022). The plan describes routines for coordination and direction, protective measures and resources, work after intervention and the roles and responsibilities of the actors involved (Halland County Administrative Board, 2022). The County Board's role as the geographically responsible authority and the strategy for major accidents and crises in Halland County are two key starting points for the plan (Halland County Administrative Board, 2022).

The County Administrative Board reviews the plan and its annexes every two years or as needed (Halland County Administrative Board, 2022). The revisions are communicated to the corresponding actors. Society's crisis preparedness is based on the principle of responsibility, proximity and equality in the municipality, county board and the government having responsibility over their geographical area (Halland County Administrative Board, 2022).

1.26.3.10.1 Roles and Responsibilities during an oil spill event

County Administration Board -Initially the County administrator was made the civil servant on standby via distress alarm. The County Administrative Board has the geographical area responsibility at the regional level and in crisis must:

- A) Be able to establish a management function (coordination and information)

- B) Coordinate and maintain a joint orientation of the required measures
- C) Compile an overall regional situation picture
- D) Be a conduit between local actors such as municipalities, regions, businesses and at the national level
- E) Following a state provision and decision must prioritize state and international resources that are made available
- F) Coordinate activities between Municipalities, regions, and authorities
- G) Coordinate information to the public and the media
- H) Have a Civil servant on standby 24/7 year-round who is responsible for coordinating initial work to discover. Verify, alert and inform
- I) Appoint rescue leaders if a rescue effort affects several municipalities unless the rescue leaders from the affected municipalities have decided to themselves
- J) Be able to take over responsibility for municipal emergency services. Assume a joint response with other countries and decide who leads the response

1.26.3.10.2 Coast Guard Role Integrated with the Municipality.

1.26.3.10.2.1 Municipality Emergency Services

- 1) Responsible for municipal emergency services. The rescue manager decides when and for how long the criteria for emergency services are met.
- 2) With the support of risk and spread forecasts from the Swedish Coastguard, the municipality can prevent damage to the environment by laying out barriers or beach cloths in priority areas before the oil reaches them.
- 3) When all the oil has reached land, and the damage cannot be worsened, the rescue service phase ends and the effort turn to cleaning up. In practice, the municipality is responsible for the cleanup.
- 4) Prioritize which areas are to be cleaned and which methods are to be used.
- 5) Has an agreement with a remediation company or collects oil itself that is transported on to storage pending recycling or disposal, as well as final disposal.

Halland County Administrative conducts operational collaboration in operational support staff and system management for the rescue services in Laholm, Halmstad and Hylte municipalities, as well as Rescue Service West. Among other things, management of resource requests, coordination of prioritization, and distribution of resources. Collaboration occurs with the Greater Gothenburg Rescue and rescue services in neighbouring counties.

1.26.3.11 Police

- 1) Responsible, among other things for cordoning off, investigation, evacuation, registration and search.
- 2) In the event of an oil spill on or from land, a police report must always be made. If an oil spill occurs at sea, it is instead the Coast Guard that investigates the crime according to the Act (1980:424) on measures against pollution from ships, or the Environmental Code (1998:806) as regards recreational boats.

1.26.3.12 Armed Forces

Provides support personnel and material resources. Resources are requisitioned via the County Board's (reservation standby) which in turn contracts the Swedish Coast Guard. The regional staff of the Western military region.

1.26.3.13 Authority for Communication Protection and Preparedness

- 1. Assists with support resources in connection with major accidents and crises.
- 2. Manages six mobile oil protection storage facilities that can be requisitioned directly via management rescue.

3. Serves as the contact point for requests for international reinforcement resources.
4. May support the coordination of the actions of the relevant authorities in the event of a crisis.
5. May support the municipalities with financial reporting and coordinate compensation claims.
6. When requesting resources, the Swedish Civil Contingencies Agency can manage with an inventory of available resources and give suggestions for prioritization on occasions when several actors request the same resources.

Authority for Communication Protection and Preparedness is a resource breaker when:

- Regionally available resources /experts are exhausted.
- There are extensive cross-sectoral resources and expert needs
- There is a need for highly specialized resource experts.
- In the preparatory phase, MSB is the converter of the National Cooperation Group for oil spill protection (NSO), which coordinates the work according to Sweden's strategy for oil spill protection.

1.26.3.13.1 Training

1.26.3.14 The Oil Is Loose Handbook on Municipal Oil Protection (Introductory Training Material)1997

Sweden's municipal handbook was developed by (Forsman, 1997) and was designed to provide a synopsis of community oil spill response issues, with a major emphasis on municipal responsibilities (Forsman, 1997). Civil oil spill management consists of organizational approaches, preparatory actions, preventative measures, and containment measures that serve to eliminate oil spill damage to private property, human life, and the environment that is under threat (Forsman, 1997). The manual covers oil spills that have reached waterways, and shorelines (Forsman, 1997). The handbook was mainly intended to be utilized as course material at the Swedish Rescue Services Agency's schools during training programs and exercises on municipal oil protection (Forsman, 1997).

NB: The handbook has not addressed the remediation of oil damage in soil, organization, and measures for other land-based oil spill scenarios (Forsman, 1997).

This handbook consist of three main sections:

1. Oil spills in coastal waterways, lakes, and rivers- provided a brief description of the behavioural characteristics of oil, the environmental impacts, and the risks of oil spills (Forsman, 1997). This part mainly serves to briefly explain the importance of organized oil spill management systems and provide sufficient background information for those interested in further education or specialized training in the field (Forsman, 1997).
2. The Planning and Organization section is specifically for officials and decision-makers involved in the planning process of municipal oil spill response (Forsman, 1997). It also provides an overview of the legal basis for oil spill management and related legal instruments and the contextual cases where they may be applicable (Forsman, 1997).
3. The operational Instructions and Methodology part is intended to provide the reader with the necessary theoretical background knowledge to participate in and manage various oil spill response operations in the municipal area of responsibility (Forsman, 1997).

N.B The authors acknowledge the limitations of theoretical knowledge against practical experience and training. As stated by (Forsman, 1997) the content in the handbook is structured to be used as a direct operational guidance tool during and before oil spills (Forsman, 1997).

Oil spills in coastal waters, lakes and rivers consist of three sections:

- Oil properties, compensation.
- Categorisation of health risks, accident risks in oil spill response work in addition to associated hazards.

- Oil’s Environmental Impact-Biological and Socio-Economical

1.26.3.15 Monitoring and Evaluation

1.26.3.15.1.1 Digital Environmental Atlas

The Digital Environmental Atlas controls the priorities (National Collaboration Group for Oil Damage Prevention, 2022). Preparatory work and operation measures are based on the protection of key coastal areas against pollution from sea-based accidents (National Collaboration Group for Oil Damage Prevention, 2022). Local, regional, and national protected areas are documented in the Digital Environmental Atlas and form the basis for the actors' work at all levels (National Collaboration Group for Oil Damage Prevention, 2022). Following an incident a report on Sweden’s oil security preparedness - mapping the capability is developed as a follow-up and evaluation of each municipality and county (National Collaboration Group for Oil Damage Prevention, 2022). Figure 61 below outlines the phases in which the Digital Environmental Atlas can be used regarding oil spill management.

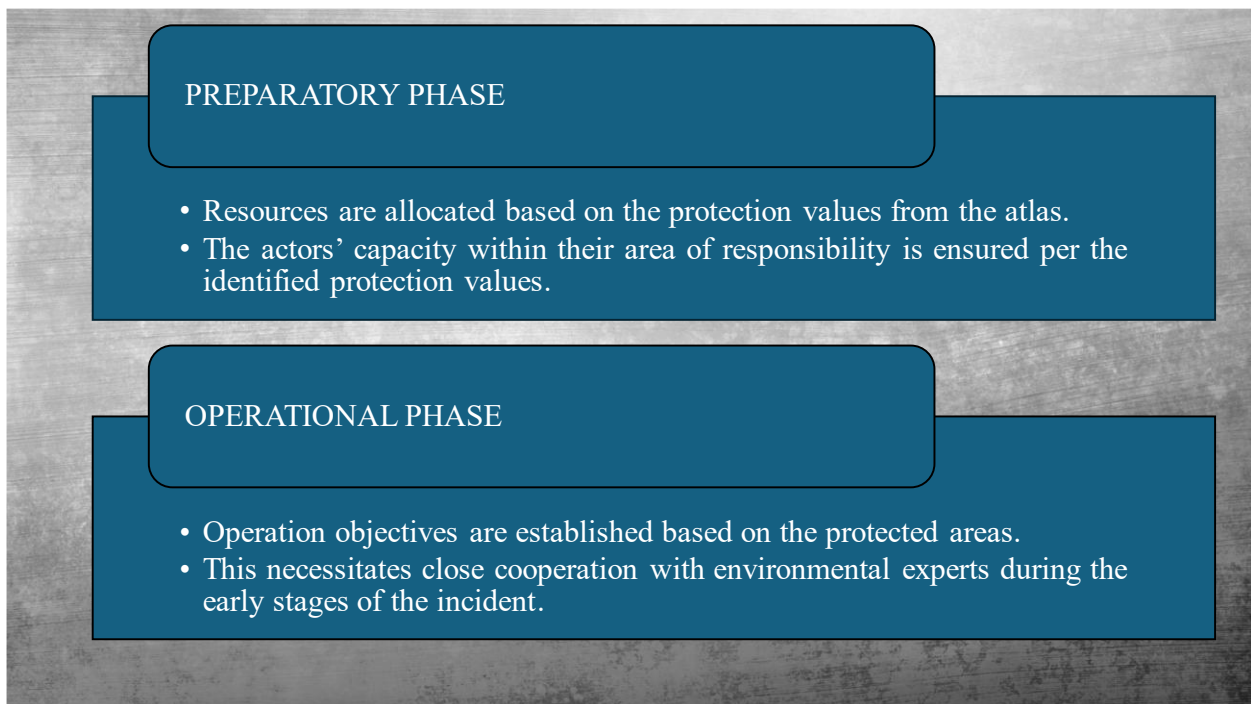


Figure 61: Importance of Digital Environmental Atlas before and after an oil spill incident (National Collaboration Group for Oil Damage Prevention, 2022).

1.26.3.15.1.1.1 Indicators for assessing the county council and municipality's general crisis preparedness.

This is a data collection form in the form of a questionnaire that serves to evaluate the preparedness levels of the county and municipality respectively (the sections may be similar, but the questions may vary). The purpose is to acquire an overall picture of the status of the county council and the municipality’s efforts in the prevention and response to emergencies.

Table 42: Assessment Indicators for the General Crisis Preparedness of a Municipality and County Council in Sweden.

Indicator	Description
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Management	This section focuses on risk management (Swedish Civil Contingencies Agency, 2015b, 2015a). Inquiries about the efforts on risk and vulnerability analysis according to the related constitutional mandate (Swedish Civil Contingencies Agency, 2015b, 2015a).
Planning	This section inquiries about the planning efforts of the municipalities and county councils (Swedish Civil Contingencies Agency, 2015b, 2015a). Whether the county council had developed an emergency plan, collaborative efforts and crisis organization (Swedish Civil Contingencies Agency, 2015b, 2015a).
Cooperation	This section focuses on the actions taken by actors within the area of operation in terms of collaboration in the planning and preparation work during emergencies (Swedish Civil Contingencies Agency, 2015b, 2015a). This also includes participation efforts(conferences), and information coordination among others (Swedish Civil Contingencies Agency, 2015b, 2015a).
Communication	This section focuses on the information channels in place to exchange information in emergencies in addition to information security measures (Swedish Civil Contingencies Agency, 2015b, 2015a).
Competence	This section focuses on staff training and exercises regarding the roles and responsibilities, knowledge of mandates and required activities, training plans, evaluations, learning from past experiences etc (Swedish Civil Contingencies Agency, 2015b, 2015a).
Resources	This section is centred around a needs analysis regarding personnel and material resources during emergency events (Swedish Civil Contingencies Agency, 2015b, 2015a). This section also deals with resource documentation requirements. Maintenance regimes, agreements with external actors and procedures for requesting personnel support (Swedish Civil Contingencies Agency, 2015b, 2015a).

1.27 UNITED STATES OF AMERICA

1.27.1 National Response Organization Overview

The Oil Pollution Act mandates oil spill preparedness and response in the United States of America (Covert, 2016). The Oil Pollution Act required the State of Alaska to prepare a statewide Master / Unified Plan that addresses the discharge of oil and hazardous substances (Department of Environmental Conservation, 2015). The Clean Water Act established the basic structure for the regulation of pollutant spills in waterways under the United States of America's jurisdiction and regulating quality standards for surface waters (Environmental Protection Agency, 2015). Oil spill liability within the United States of America is governed by the Oil Pollution Act of 1990. The Alaska State Preparedness Plan for Response to Oil and Hazardous Substance Discharges (Unified Plan) provided basic response guidelines for federal and state agencies (Alaska Department of Environmental Conservation, 2016). As per the Unified Plan, the State of Alaska was divided into ten Sub-Area Contingency Plans (Department. of Environmental Conservation, 2010). These plans contained community-specific information about their current capabilities, response measures, emergency response contact info, guidelines, resources, scenarios, and sensitive areas (Department. of Environmental Conservation, 2010). These sub-areas are the most comprehensive set of plans because they closely examine the small community perspective and identify the area of concern in the event of an oil spill (Covert, 2016). These plans provided “an organized approach and served as a medium to up-channel information to the appropriate support agency in the event of an oil spill” Mitchell. M was interviewed by (Covert, 2016).

1.27.1.1 Policies/Regulations

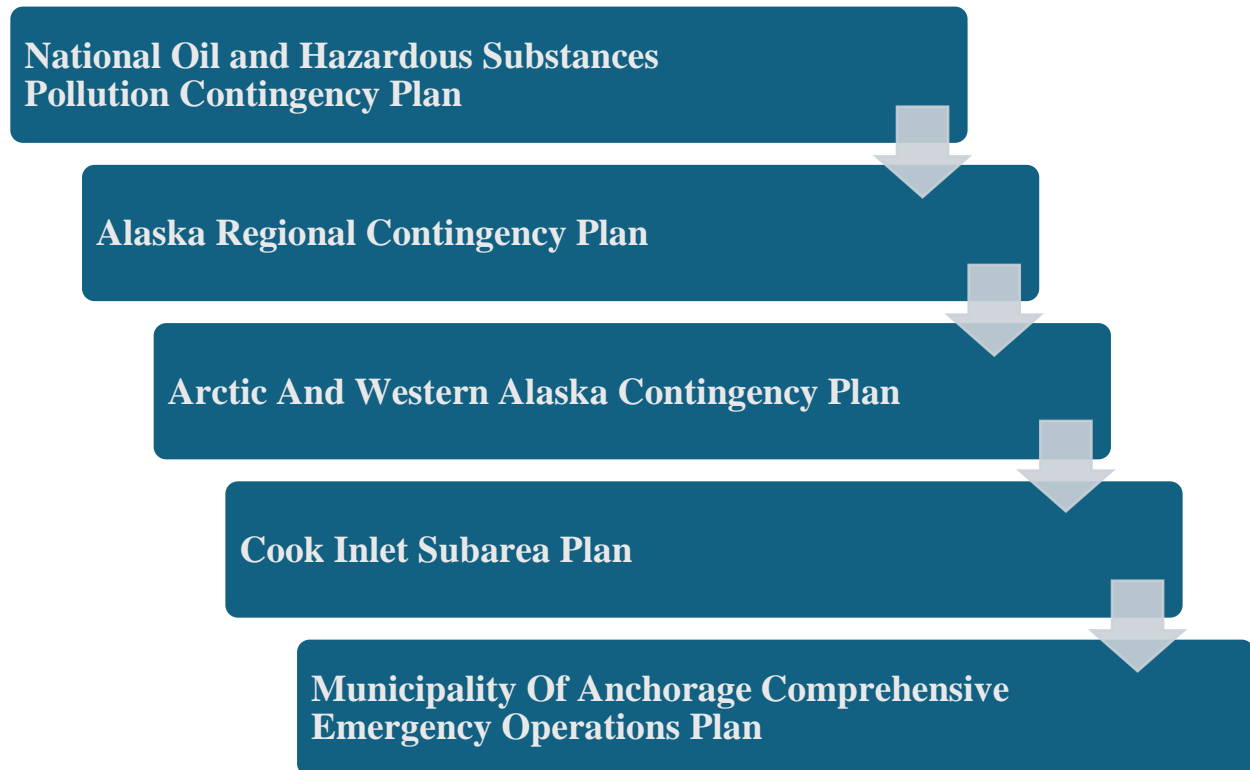


Figure 62: Levels of formal oil spill planning from the National level to the Local level adapted from (Alaska Regional Response Team, 2022).

1.27.2 National Legislation

1.27.2.1 Federal Legislative Documents

Table 43: Federal Legislative Documents from (Alaska Regional Response Team, 2022).

Legislative Documents	Purpose
National Contingency Plan	<ul style="list-style-type: none"> ● Established the Alaska Regional Response Team. ● Designates Alaska Regional Response Team responsibility for regional planning and preparedness activities before response actions, including the development and maintenance of the Regional Contingency Plan ● Designates the Alaska Regional Response Teams' responsibility for providing advice and support to the Federal On-Scene Commander, when activated during a response.
Federal Water Pollution Control Act of 1948 amended in 1972	<ul style="list-style-type: none"> ● Stipulated broad national objectives to restore and maintain the chemical, physical and biological integrity of the nation's waters. ● Significantly reorganized, expanded and amended in the Clean Water Act.
Clean Air Act of 1990	<ul style="list-style-type: none"> ● Defines the Environmental Protection Agency's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. ● The last major change in the law, the Clean Air Act Amendments of 1990, was enacted in 1990. Legislation that has passed since then has made several minor changes.
Clean Water Act of 1977	<ul style="list-style-type: none"> ● Establishes the basic structure for regulating discharges of pollutants into the Waters of the United States of America and regulating quality standards for surface waters.
Oil Pollution Act of 1990(OPA 90)	<ul style="list-style-type: none"> ● The Oil Pollution Act amended the existing Clean Water Act. ● Created the requirement for a facility for "area-level" planning and coordination structure to help supplement federal, state, tribal and local planning efforts.

	<ul style="list-style-type: none"> ● Establishes Area Committees and Area Contingency Plans as the primary components of this “area-level” structure.
National Response Framework (2019)	<ul style="list-style-type: none"> ● Guides responses to disasters and emergencies under the Stafford Act.
Robert T Stafford Disaster Relief and Emergency Act (Public Law 93-288) as amended	<ul style="list-style-type: none"> ● Establishes the Environmental Protection Agency and the United States of America Coast Guard as lead agencies for Emergency Support Function-Oil and Hazardous Response tasks during responses to incidents for which the President issues a disaster or emergency declaration. ● Establishes the National Response Framework ● The National Contingency Plan is an operational supplement to the National Response Framework. ● Authorizes Federal Emergency Management Agency to reimburse the Environmental Protection Agency/the United States of America Coast Guard for specific emergency response activities related to oil and hazardous substance incidents, when there is an emergency or major disaster declaration.
Comprehensive Environmental Response, Compensation and Liability Act	<ul style="list-style-type: none"> ● Added releases at hazardous waste sites that require emergency removal actions to the National Contingency Plans scope. ● Established the requirement for inclusion of response to hazardous substance releases in area contingency plans.
Emergency Planning and Community Right-to-Know Act	<ul style="list-style-type: none"> ● Establishes the Local Emergency Planning committees and directs Area Communities to work with them. ● Requires industry to report on the storage, use, and release of hazardous substances. ● Requires local governments to prepare chemical emergency response plans and to make information more readily available to the public on hazardous chemicals that are stored at facilities in their communities.

Superfund Amendments and Reauthorization Act	<ul style="list-style-type: none"> Requires reporting of hazardous substance storage. Reports that inform planners and responders on the presence of these substances at facilities.
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1.27.3 State Legislative Documents

Alaska statutes and regulations are specific to contingency planning. Authorities granted by the State to respond to emergencies, including oil discharges and hazardous substances releases, are addressed further in the Area Contingency Plans.

Legislative Documents	Purpose
Alaska Statue Chapter 26.23 - Disasters Article 01 - Alaska Disaster Act Sec. 26.23.077 Plan review; incident command systems	State Emergency Response Commission reviews the State Oil and Hazardous Substance Discharge Prevention and Contingency Plan.
2014 Alaska Statutes Title 46 - Water, Air, Energy, And Environmental Conservation Chapter 46.03 - Environmental Conservation Article 02 - Department of Environmental Conservation Sec. 46.03.020 Powers of the department	The Alaska Department of Environmental Conservation is empowered to adopt regulations providing for the control, prevention and abatement of all forms of pollution.
AS 46.04.030. Oil Discharge Prevention and Contingency Plans.	Requires facility and vessel operators that meet specific thresholds to prepare and submit oil discharge prevention and contingency plans to the Alaska Department of Environmental Conservation for approval.
2023 Alaska Statutes Title 46. Water, Air, Energy, and Environmental Conservation Chapter 04. Oil and Hazardous Substance Pollution Control Article 2. Oil and Hazardous Substance Discharge and Prevention Contingency Plans. Sec. 46.04.210. Regional master plan.	Requires the Alaska Department of Environmental Conservation to prepare and maintain State Oil and Hazardous Substances Discharge Prevention and Contingency Plan (State Master and Regional Plan).
18 AAC 75.496 - Regional response operations plan boundaries for non-tank vessels	Describes state requirements for regulated oil industry Oil Discharge Prevention and Contingency Plans, streamlined non crude vessel plans and Nontank Vessel Plans.
18 AAC 75.485 - Discharge exercises	Describes state requirements for regulated oil industry Oil Discharge Prevention and Contingency Plans holders.
18 AAC 75.495. Regional head discharge prevention and contingency plan boundaries	Describes state requirements for planning boundaries.

1.27.4 National Oil and Hazardous Substances Pollution Contingency Plan-2015

The National Oil and Hazardous Substances Pollution Contingency Plan (2015) serves as an organizational framework that guides the measures for the preparedness and response to the discharge of oil, hazardous substances, and pollutants (Environmental Protection Agency, 2015). This National Contingency Plan applies to the following:

- The discharge of oil into or on the navigable waters of the United States of America, on adjacent shorelines, the waters of the contiguous zone, into waters of the exclusive economic zone, or that may affect natural resources under the exclusive economic management authority of the United States of America (Environmental Protection Agency, 2015).
- The release of hazardous substances and pollutants into the environment which may present an immediate and significant danger to public health or welfare of the United States of America (Environmental Protection Agency, 2015).

Under the Comprehensive Environmental Response, Compensation and Liability Act, and Clean Water Act the national contingency plans facilitate the efficient response to oil and hazardous substance discharges (Environmental Protection Agency, 2015). This document lays out:

- The national response organization that may be activated in response operations (Environmental Protection Agency, 2015). It specifies the responsibilities of the federal, state, and local governments and describes available resources for response (Environmental Protection Agency, 2015).
- The requirements for federal, regional and area contingency plans outline state and local emergency planning requirements (Environmental Protection Agency, 2015).
- The procedures for undertaking response and removal actions (Environmental Protection Agency, 2015).
- State government's involvement in the initiation, development, selection, and implementation of response actions (Environmental Protection Agency, 2015).
- Listing of federal trustees for natural resources for purposes of the Comprehensive Environmental Response, Compensation and Liability Act, and Clean Water Act (Environmental Protection Agency, 2015).
- Measures for the participation of other stakeholders in response actions (Environmental Protection Agency, 2015).
- Procedures for compiling and providing administrative records for response actions (Environmental Protection Agency, 2015).
- National procedures for the use of dispersants and other chemicals in removals under the Clean Water Act and response actions under the Comprehensive Environmental Response, Compensation and Liability Act (Environmental Protection Agency, 2015).

1.27.5 Roles and Responsibilities of the Actors in Oil Spill Management in the United States of America.

1.27.5.1 United States of America Coast Guard

The United States of America Coast Guard provides On-Scene Commanders during oil spills from facilities and vessels under the jurisdiction of another federal agency, that is within or threatens the coastal zone (Environmental Protection Agency, 2015). The United States of America Coast Guard may designate On-Scene Commanders during the removal and containment of releases of hazardous substances, pollutants, or contaminants into or threatening the coastal zone, except as provided in paragraph of this section (Environmental Protection Agency, 2015). The United States of America's Coast Guard's On-Scene Commander may contact the cognizant Remedial Project Manager after determining whether a removal operation may require follow-up remedial procedures (Environmental Protection Agency, 2015). This

initiates the mandated planning and timely transition of these duties to the Environmental Protection Agency or state-coordinated operation (Environmental Protection Agency, 2015).

The United States of America Coast Guard Port Captains may serve as the designated On-Scene Commander for areas in the coastal zone within an Area Contingency Plan (Environmental Protection Agency, 2015). Regional Environmental Protection Agency Administrators shall delegate an On Scene Commander for areas in the inland zone for which an Area Contingency Plan is required by the Clean Water Act (Environmental Protection Agency, 2015).

1.27.5.2 Environmental Protection Agency

The Environmental Protection Agency shall designate an On- Scene Commander for spills that flow into or threaten the inland zone and may also designate Remedial Project Managers for federally funded remedial actions, except in the case of state-led federally funded response (Environmental Protection Agency, 2015). Environmental Protection Agency will also assume all remedial actions at National Priorities List sites in the coastal zone, even where the United States of America Coast Guard initiates removals, except as provided in paragraph of this section (Environmental Protection Agency, 2015).

1.27.5.3 The Alaska Department of Environmental Conservation-Spill Prevention and Response Division

The mission of this agency includes planning and response coordination with Federal and State agencies, local governments, and local responders. This agency is also responsible for the prevention of oil spills and hazardous substances, prepares for when a spill occurs, and responds rapidly to protect human health and the environment (Alaska Regional Response Team, 2022). In addition to spill response duties, this agency is responsible for the review of industry contingency plans, industry's maintenance and training records, conducting readiness drill, and conducting facility inspections to gauge industry spill prevention, preparedness, and response capabilities.

1.27.5.4 Response Teams

1.27.5.4.1 National Response Team

The National Response Team is responsible for planning and coordination (Environmental Protection Agency, 2015). The National Response Team consists of representatives from the agencies named (Environmental Protection Agency, 2015). Each agency shall designate a member of the team and sufficient alternatives to ensure representation, as agency resources permit (Environmental Protection Agency, 2015). The National Response Team will consider requests for membership of the National Response Team from other agencies (Environmental Protection Agency, 2015). Other agencies may request membership on the chair of the National Response Team (Environmental Protection Agency, 2015). The chair of the National Response Team shall be the representative of the Environmental Protection Agency, and the vice chair shall be the representative of the United States of America Coast Guard, except for a period of action during response operations (Environmental Protection Agency, 2015). During activation, the chair shall be the member agency providing the On-Scene Commander (Environmental Protection Agency, 2015). The vice chair shall maintain records of National Response Team activities along with national, regional and area plans for response actions (Environmental Protection Agency, 2015).

1.27.5.4.2 Regional Response Teams

The Regional Response Team is responsible for regional planning and oversees response and preparedness measures (Environmental Protection Agency, 2015). In the event of an oil spill, preparedness and activities will be carried out in conjunction with Area Committees, as appropriate (Environmental Protection Agency, 2015). The Regional Response Team's primary functions are illustrated in Figure 63.

Functions Of The Regional Response Team






-  Serve as the regional coordination mechanism for the development of preparedness activities before and throughout response operations.
-  Coordinates aid and advises the On -Scene Commander during response actions.
-  Serves as the advisory agency for Area Committees when appropriate and maintains inter -area coherence.
-  Ensures the alignment of Area Contingency Plans with Regional and National Contingency Plans.
-  Supervises the function of Area Committees within their area of operations .

Figure 63: Functions of the Regional Response Team from the National Oil and Hazardous Substances Pollution Contingency Plan, (2015).

The main components of the Regional Response Team mechanism consist of a standing team and an incident-based team as illustrated in Figure 64.

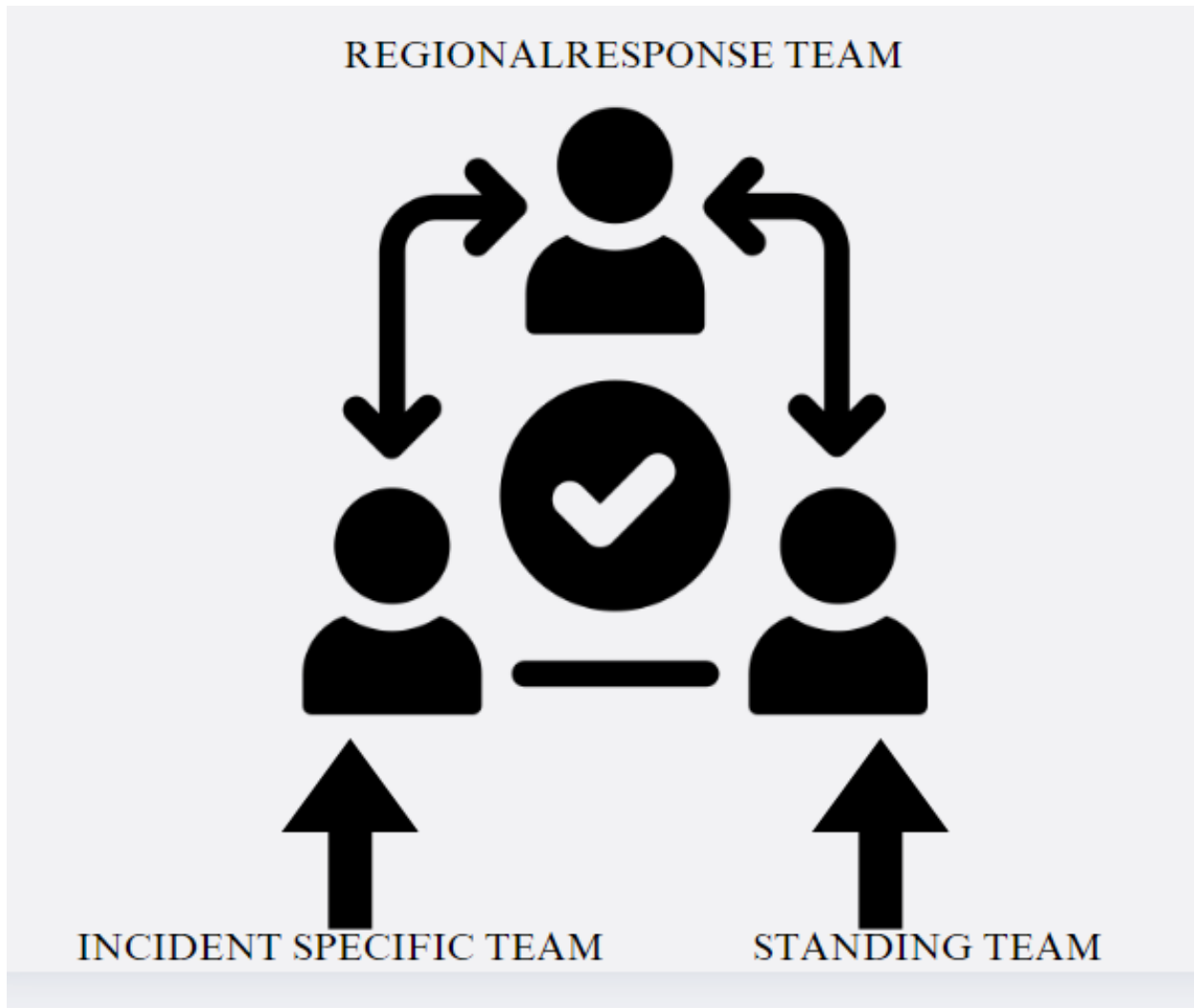


Figure 64: General structure of the Regional Response Team from the (Environmental Protection Agency, 2015).

The components of the Regional Response Team’s mechanism are described in Table 44 below.

Table 44: Components of the Regional Response Team.

Team component	Description	Area of Responsibility	Function
Standing team	consists of designated representatives from related federal agencies, state governments, and local governments.	The standing team’s authority corresponds with the standard federal regions, except for Alaska, Oceania in the Pacific, and the Caribbean area, with their respective standing Regional Response Team.	<ul style="list-style-type: none"> The role of the standing Regional Response Team consists of communication systems and procedures, planning, coordination, training, evaluation,

			<p>preparedness, and regional matters.</p> <ul style="list-style-type: none"> • The standing Regional Response Team may recommend changes to the regional response system and revise the Regional Contingency Plan as required.
Incident based team	is formed from the standing team following the activation of response operations by the Regional Response Team.	Participates as part of the Regional Response Team(agency) focused on the technical nature of the incident and the geographic location.	<ul style="list-style-type: none"> • The Role of the incident-specific team is based on the response operational requirements to a specific discharge National Oil and Hazardous Substances Pollution Contingency Plan, (2015). • The Incident-specific Regional Response Team supports the designated-On Scene Commander National Oil and Hazardous Substances Pollution Contingency Plan, (2015).

The Regional Response Team chair (designated) for the incident determines the suitable levels of activation and notification, state and local participation as part of the incident-specific Regional Response Team as outlined in the Regional Contingency Plan (Environmental Protection Agency, 2015).

The designated On-Scene Commander directs response efforts and coordinates all other efforts at a discharge or release scene (Environmental Protection Agency, 2015). The representatives of the Environmental Protection Agency and the United States of America Coast Guard shall act as co-chairs of

Regional Response Teams except when the Regional Response Team has been activated (Environmental Protection Agency, 2015). Following the activation of the Regional Response Team is activated for response actions, and the chair shall be the member agency providing the On-Scene Commander (Environmental Protection Agency, 2015).

Each participating agency should designate one member and at least one alternate member to the Regional Response Team (Environmental Protection Agency, 2015). Agencies whose regional subdivisions do not correspond to the standard federal regions may designate additional representatives to the standing Regional Response Team to ensure appropriate coverage of the standard federal region (Environmental Protection Agency, 2015). Participating states may also designate one member and at least one alternate member to the Regional Response Team. Indian tribal governments may arrange for representation with the Regional Response Team appropriate to their geographical location (Environmental Protection Agency, 2015). All agencies and states may also provide additional representatives as observers to meetings of the Regional Response Team (Environmental Protection Agency, 2015).

The Regional Response Team members may designate representatives from their agencies as resource personnel for their activities, including Regional Response Team planning, and membership on incident-specific teams supporting the On Scene Commanders/Remedial Project Managers (Environmental Protection Agency, 2015).

1.27.5.4.3 Federal Regional Response Team

Federal Regional Response Team members or their representatives assist On-Scene Commanders through their agency responsibilities, resources, and capabilities within the region (Environmental Protection Agency, 2015). During a response action, the Regional Response Team provides resources of member agencies to the On Scene Commander as specified in the Regional Contingency Plan and Area Contingency Plans (Environmental Protection Agency, 2015). Regional Response Team members should nominate appropriately qualified representatives from their agencies to work with On Scene Commanders in developing and maintaining Area Contingency Plans (Environmental Protection Agency, 2015).

Each state governor is asked to designate an office or agency representing the state on the relevant Regional Response Team. This includes developing Regional Contingency Plans, coordinating state resources, and serving as the main contact for coordinating responses with local government agencies, regardless of their representation on the Regional Response Team (Environmental Protection Agency, 2015). Local governments are invited to participate in activities on the appropriate Regional Response Team as provided by state law or as arranged by the state's representative (Environmental Protection Agency, 2015). Indian tribes are also invited to participate in such activities (Environmental Protection Agency, 2015).

The Regional Response Team may evaluate the preparedness of the participating agencies and the effectiveness of Area Contingency Plans for the federal response to discharges and releases and provide technical assistance for preparedness to the response community (Environmental Protection Agency, 2015).

The Regional Response Team:

- Reviews and provide comments on local emergency response plans (where feasible) and issues regarding the preparation, implementation, or exercise of such plans upon request of a local emergency planning committee.
- Evaluate regional and local responses to spills, considering available legal remedies, equipment readiness, and coordination among responsible public agencies and private organizations, and recommend improvements.
- Recommend revisions to the National Contingency Plan to the National Response team based on observations of response operations.
- Review the actions of the On Scene Commander actions to ensure that Regional Contingency Plans and Area Contingency Plans are effective.
- Encourage the state and local response community to improve its preparedness for response.

- In coordination with Area Committees and following applicable laws, conduct planning on the use of dispersants, surface washing agents, surface collecting agents, burning agents, and bioremediation agents.
- Provide response resources for major discharges or releases outside the region.
- Conduct or participate in training and exercises as necessary to encourage preparedness activities of the response community within the region.
- Meet at least semiannually to review response actions carried out during the preceding period, consider changes in Regional Contingency Plans, and recommend changes in Area Contingency Plans.
- Provide letter reports on Regional Response Team activities to the National Response Team twice a year.
- Ensure maximum participation in the national exercise program for announced and unannounced exercises.

1.27.5.5 On-scene commanders and Project Managers

1.27.5.5.1 On-Scene Commander: General Responsibilities.

The On-Scene Commander directs response efforts and coordinates all other efforts at a discharge or release scene. As part of the planning and preparedness for the response, the On-Scene Commander must be pre-designated by the regional or district head of the lead agency (Environmental Protection Agency, 2015). The Environmental Protection Agency and the United States of America Coast Guard shall pre-designate an On-Scene Commander for all areas in each region (Environmental Protection Agency, 2015). On-scene Commanders shall be assigned by the lead agency to manage remedial or other response actions at national priorities list sites (Environmental Protection Agency, 2015).

The On-Scene Commander is responsible for overseeing the development of the Area Contingency Plan in the On-Scene Commander's responsibility (Environmental Protection Agency, 2015). Area Contingency Plans will be developed in collaboration with the Regional Response Team and designated state and local representatives (Environmental Protection Agency, 2015). During contingency planning and response, the On-Scene Commander supervises and may review the work of Area Committees, responsible parties, contractors, and other agencies under the National Contingency Plan (Environmental Protection Agency, 2015).

1.27.5.5.2 Role of the Federal On-Scene Commander

The Federal On-Scene Commander plans and coordinates response strategies with support from the National Response Team, the Alaska Regional Response Team, and the Responsible Party, to provide resources (personnel, equipment, and technical aid) to complete an immediate and effective response to oil spills and hazardous substance discharges (Environmental Protection Agency, 2015). The National Response System is designed to support the Federal On-Scene Commander and facilitate responses to a discharge or threatened discharge of oil and/or hazardous substances (Environmental Protection Agency, 2015).

1. The National Response System supports the Federal On-Scene Commander in coordinating federal, state, tribal, and local government agencies, industry, and the responses (Environmental Protection Agency, 2015).
2. The National Response System supports the Federal On-Scene Commander's federal removal authority, under the direction of the Federal Water Pollution Control Act (Environmental Protection Agency, 2015).

1.27.5.5.3 On-Scene Coordinators

Because of the complex nature of oil and hazardous substance responses, the National Contingency Plan and the Regional Contingency Plan have designated On-Scene Commanders to act as the ultimate authority for their respective levels of government (Environmental Protection Agency, 2015). On-Scene Commanders represent all agencies from their respective Federal, State, tribal, and local governments in

the Unified Command (Environmental Protection Agency, 2015). They also are responsible for coordinating their respective organizations' activities with the activities of other response organizations (Environmental Protection Agency, 2015). The relationship between plans and The On-Scene Commander's mandated tasks is illustrated in Figure 65.

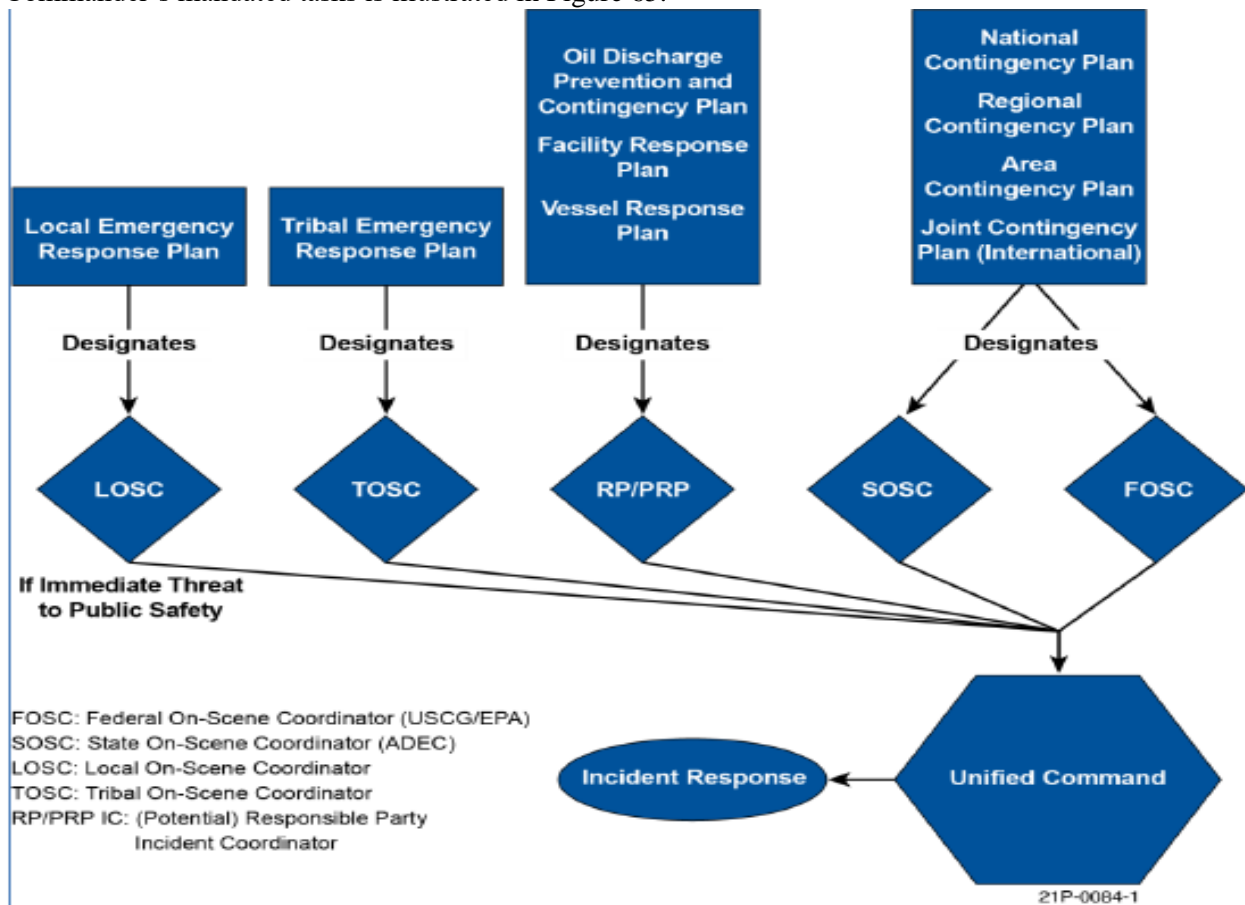


Figure 65: On-Scene Coordinators/Commanders' Relationship to Plans and mandated tasks (Alaska Regional Response Team, 2022:28).

1.27.5.5.4 Federal On-Scene Coordinator

The Federal On-Scene Commander has been mandated under the National Contingency Plan to coordinate the federal response to incidents under the authority of federal laws and regulations (Environmental Protection Agency, 2015). Federal responsibilities have been divided into a coastal zone and an inland zone, as defined by an interagency agreement within the preliminary assessment and the United States Coast Guard. In coastal areas, the Federal On-Scene Commanders for oil discharges and hazardous substance releases. For oil discharges and hazardous substance releases in the Inland zone, the Environmental Protection Agency designates the Federal On-Scene Commander.

1.27.5.5.5 State On-Scene Coordinator

The State On-Scene Commander is responsible for directing and coordinating the State's response to oil and hazardous substance discharges (Environmental Protection Agency, 2015). State On-Scene Commanders are designated by the Commissioner of the Alaska Department of Environmental Conservation (Environmental Protection Agency, 2015). The State On-Scene Commanders have been pre-designated for the following response areas: Northern Alaska, Central Alaska, and Southeast Alaska (Environmental Protection Agency, 2015). In the event of a major incident, the Commissioner may designate the Director of the Spill Prevention and Response Division or another individual to serve as the

State On-Scene Commander (Environmental Protection Agency, 2015). The State On-Scene Commander may appoint an on-scene field representative to act for the State On-Scene Commander during a response. This representative can be selectively delegated authority by the State On-Scene Commander (Environmental Protection Agency, 2015).

1.27.5.5.6 Tribal On-Scene Coordinator/Commander

The Tribal On-Scene Commander has the authority to participate within the Unified Command's response structure when tribal public health, culture, resources, or economy are threatened or impacted (Environmental Protection Agency, 2015). Tribal On-Scene Commanders are designated by tribal governments for responses that threaten traditional use areas (Environmental Protection Agency, 2015). There may be multiple Tribal On-Scene Commanders within a single Unified Command structure (Environmental Protection Agency, 2015). The Tribal On-scene Incident-Scene Commander should help facilitate effective, direct communication between the response and the tribe (Environmental Protection Agency, 2015). The delegated Tribal On-Scene Commander is required to possess a high aptitude in Incident Command Systems, and the authority to make decisions on behalf of the tribe (Environmental Protection Agency, 2015). This person must also be able to commit full-time to response operations and be knowledgeable of tribal resources (Environmental Protection Agency, 2015).

1.27.5.5.7 Local On-Scene Coordinator

Local On-Scene Commanders are normally part of the Unified Command if there is an immediate threat to public safety and/or the incident occurs within their area of responsibility (Environmental Protection Agency, 2015). Local governments may respond to a spill emergency to protect life and property (Environmental Protection Agency, 2015). In some cases, the Local On-Scene Commander may assume the role of Incident Commander until the immediate threat to public safety is abated and may participate within the Unified Command's response structure, as Local On Scene Commander, when the community's resources or economy are threatened or impacted (Environmental Protection Agency, 2015). Local On-Scene Commanders are designated by local governments with the authority to coordinate local responses to incidents (Environmental Protection Agency, 2015). If there is an immediate threat to public safety, the Local On-Scene Commander will serve as the command authority, unless the Local On-Scene Commander requests a State On-Scene Commander or Federal On-Scene Commander to assume that responsibility. Once current public safety threats have been abated, either the State On-Scene Commander and/or the Federal On-Scene Commander may assume command authority during cleanup operations, depending on the agency's response (Environmental Protection Agency, 2015). The Local On-Scene Commander can continue to serve in the Unified Command (Environmental Protection Agency, 2015).

1.27.5.5.8 Responsible Party's Incident Commander

The Responsible Party will direct and coordinate their resources in response to incidents for which they are responsible (Environmental Protection Agency, 2015). Facility or vessel response or contingency plans designate the Responsible Party (Environmental Protection Agency, 2015).

1.27.5.5.9 Deputy On-Scene Coordinators

Incidents may require one or more deputy On-Scene Commanders, who should have the same qualifications as the On-Scene Commander (Environmental Protection Agency, 2015). They may work directly with the On-Scene Commander, provide relief, or perform certain specified tasks determined by the On-Scene Commander (Environmental Protection Agency, 2015).

1.27.5.5.10 Remedial Project Manager

The Remedial Project Manager is the prime contact for remedial or other response actions being taken (or needed) at sites on the proposed or promulgated National Priorities List and for sites not on the National Priority List but under the authority of a federal agency (Environmental Protection Agency, 2015). The Remedial Project Manager's responsibilities include:

- Fund-financed response: The Remedial Project Manager coordinates and reviews the work of the Environmental Protection Agency, state and local governments, the United States of America Army Corps of Engineers, contractors, and other agencies to certify compliance with the National Contingency Plan (Environmental Protection Agency, 2015).
- Federal-lead non-Fund-financed response: The Remedial Project Manager directs and reviews the work of other agencies, responsible parties, and contractors to ensure compliance with the National Contingency Plan, Decision Records Record of Decision, consent decree, administrative order, and lead agency-approved plans applicable to the response (Environmental Protection Agency, 2015).
- Participate in all decision-making processes necessary to ensure compliance with the National Contingency Plan such as establishing agreements (if appropriate) between the Environmental Protection Agency or other federal agencies and the state (Environmental Protection Agency, 2015).

1.27.5.6 Response Policy and Scope

1.27.5.6.1 National Response Policy

The Clean Water Act requires the Federal On-Scene Commander to "ensure effective and immediate removal of a discharge of oil or hazardous substance:

- into or onto navigable waters.
- on adjoining shorelines to navigable waters.
- into or onto exclusive economic zone waters.
- that may affect natural resources belonging to, about, or under the exclusive management authority of the United States of America.

In carrying out these functions, the Federal On-Scene Commander may:

- Remove or arrange for the removal of a discharge.
- Mitigate or prevent a substantial threat of a discharge.
- Direct or monitor all federal, state, and private actions to remove a discharge.
- Recommend to the United States of America Coast Guard Commandant that a vessel discharging or threatening to discharge, be removed and, if necessary, destroyed.

If there is a discharge or substantial threat of discharge of oil or hazardous substance that is of the size or scale as to be a substantial threat to the public health or welfare of the United States of America, the On-Scene Commander directs the federal, state, and private response and mitigating actions to remove the discharge or prevent(or limit) the threat of the discharge (Environmental Protection Agency, 2015). The Federal On-Scene Commander may utilise alternative techniques, countermeasures or available procedures per the National Contingency Plan and this Regional Contingency Plan (Environmental Protection Agency, 2015).

1.27.5.6.2 State Response Policy

State governments have broad statutory authority to protect human health and the environment by overseeing responses (Environmental Protection Agency, 2015). Furthermore, the State is required to maintain an independent response capability for incidents in which the responsible party has not been confirmed, requests assistance, or fails to respond adequately (Environmental Protection Agency, 2015). State law predesignates the Alaska Department of Environmental Conservation as the State On-Scene Commander for all spill responses (Environmental Protection Agency, 2015). The State uses an Incident Command System for spill response and clarifies the roles of all parties involved to ensure a coordinated approach to spill containment and cleanup (Environmental Protection Agency, 2015). The Area Contingency Plans describe the response role of the State On-Scene Commander when the spiller is unknown or fails to adequately clean up the discharge (Environmental Protection Agency, 2015). State statute designates the Alaska Department of Environmental Conservation as the lead agency for State spill responses (Environmental Protection Agency, 2015). The Alaska Department of Environmental

Conservation has the authority to assume control of containment and cleanup on behalf of the State when the State On-Scene Commander determines that the spiller is unknown or is not performing adequately (Environmental Protection Agency, 2015). The Alaska Incident Management System guide describes the three State response roles (Environmental Protection Agency, 2015).

1.27.5.6.2.1 Coordination

The State assumes an overseeing role for every spill (Environmental Protection Agency, 2015). State response activities are focused on oversight when the State On-Scene Commander is satisfied with the responsible party's approach to responding adequately to a spill, and the spiller neither requests nor needs supplemental assistance (Environmental Protection Agency, 2015). In the supervisory role, the Alaska Department of Environmental Conservation and other State agencies ensure that the responsible party effectively manages the initial response (containment), cleanup, and disposal of contaminated debris, and ensures that environmental restoration is acceptable to the State, local authorities, and the public (Environmental Protection Agency, 2015). In its oversight capacity, the Alaska Department of Environmental Conservation may issue emergency orders directing the Response Plan to take specific actions (Environmental Protection Agency, 2015). In addition, the Alaska Department of Environmental Conservation is responsible for documenting, enforcing, and recovering damages, including spill-related costs (Environmental Protection Agency, 2015). The number of State agencies involved in oversight is dependent on the scope of the spill (size and complexity) (Environmental Protection Agency, 2015). If there is no federal response authority (and thus no Unified Command or Federal On-Scene Commander), Federal Trustee agencies may be involved along with State agencies under the coordination of the State On-Scene Commander (Environmental Protection Agency, 2015).

1.27.5.6.3 Tribal Response Policy

Tribal authorities can establish policies that define the manner and scope in which they participate under the National Contingency Plan's preparedness and response measures within their areas of concern (Environmental Protection Agency, 2015). Tribal authorities can designate a Tribal On-Scene Commander to serve in the Unified Command with federal and State partners (Environmental Protection Agency, 2015). These authorities may appoint personnel to serve as part of the Incident Management Team, particularly the Environmental Unit (Environmental Protection Agency, 2015). On the other hand, should there be an inability to appoint personnel (unavailable staff) to serve within the Unified Command or the Incident Management Team the tribal authority can serve as a knowledge holder via the Liaison Officer to provide information to the Unified Command, offer resources, and receive response updates (Environmental Protection Agency, 2015).

1.27.5.6.4 Local Response Policy

The local governmental subdivision or Local Emergency Planning Committee can establish the local response policy (Environmental Protection Agency, 2015). Local governments can designate a Local On-Scene Commander to serve in the Unified Command with federal and state partners (Environmental Protection Agency, 2015). They can appoint staff to serve in the Incident Management Team, particularly the Environmental Unit (Environmental Protection Agency, 2015). Should the local authority not have available staff to serve in the Unified Command or Incident Management Team, they can establish an information exchange relationship with the Unified Command via the Liaison Officer to provide information to the Unified Command, offer resources, and receive response updates (Environmental Protection Agency, 2015).

1.27.5.6.5 Responsible Party/Potential Responsible Party Response Policies

The Responsible Party is responsible for containment, cleanup, and contaminant disposal, including associated restoration and damage costs (Environmental Protection Agency, 2015). If the Responsible Party is unknown, fails to respond, or the response is judged to be inadequate by the State On-Scene Commander or Federal On-Scene Commander, state or federal agencies with jurisdiction have the authority to take over the response and cost recovery against the Responsible Party (Environmental Protection Agency, 2015).

Facility and vessel contingency plans must be consistent with the Regional Contingency Plan and the applicable Area Contingency Plan(s) (Environmental Protection Agency, 2015).

Contingency plan requirements direct each operation to identify personnel who will serve as command staff for a spill incident (Environmental Protection Agency, 2015). For Regional Contingency Plans, the Responsible Party's Incident Commander will serve as the Responsible Party/Potential Responsible Party's Incident Commander (Environmental Protection Agency, 2015). For each incident, the Responsible Party will direct the response activities of the responsible parties' response structure (Environmental Protection Agency, 2015).

1.27.5.7 Federal Agencies and Response Operations

Federal agencies have duties established by statute, executive order, or Presidential directive which may apply to federal response actions following, or in the prevention of, the discharge of oil or release of a hazardous substance, pollutant, or contaminant (Environmental Protection Agency, 2015). The duties of these agencies may be dimensioned under the areas of restoration, rehabilitation, replacement, or acquisition of equivalent natural resources (Environmental Protection Agency, 2015). The National Response Team, Regional Response Team, Area Committees' organizational framework, and the National Contingency Plan, Regional Contingency Plans and Area Contingency Plans, facilitate the cooperation of agencies in the execution of the following duties (Environmental Protection Agency, 2015).

Federal agencies may be called upon by an On-Scene Commander during response planning and implementation to assist in their respective areas of expertise, as described in consistent with the agencies' capabilities and authorities.

In addition to their general responsibilities, federal agencies should:

- a. Provide required information to the key stakeholders such as the secretary of the National Response Team, Regional Response Teams, Area Committees, and On-Scene Commanders/Remedial Project Managers (Environmental Protection Agency, 2015).
- b. Provide representatives to the National Response Team and Regional Response Teams and otherwise assist Regional Response Teams and On-Scene Commanders, as necessary, in formulating Regional Contingency Plans and Area Contingency Plans (Environmental Protection Agency, 2015).
- c. Notify key stakeholders such as the National Response Team, Regional Response Teams, and Area Committees, which are consistent with national security considerations, of changes in the availability of resources that would affect the operations implemented under the National Contingency Plan (Environmental Protection Agency, 2015).

1.27.5.7.1 Federal agencies: additional responsibilities and assistance.

During preparedness planning or active response, various federal agencies may be called upon for technical advice and assistance within their respective areas of expertise (Environmental Protection Agency, 2015).

These federal agencies include:

- a. The United States of America Coast Guard - provides the National Response Team chair and vice-chairs for the standing Regional Response Teams and predesignated On Scene Commanders for the coastal zone (Environmental Protection Agency, 2015). The United States of America Coast Guard maintains command, control, and surveillance facilities during discharges of oil and hazardous substances in coastal areas (Environmental Protection Agency, 2015). The United States of America Coast Guard may offer technical expertise in domestic and international fields of port safety and security, maritime law enforcement, ship navigation and construction, and the staffing, operation, and safety of vessels and marine facilities (Environmental Protection Agency, 2015).
- b. The Environmental Protection Agency- chairs the National Response Team and co-chairs, with the United States of America Coast Guard. The standing Regional Response Teams: provide predesignated On Scene Commanders for all inland areas for which an Area

Contingency Plan is required under the Clean Water Act and for spills occurring in the inland zone and Remedial Project Manager's for remedial actions except as otherwise provided and generally provides the scientific support coordinator for responses in the inland zone (Environmental Protection Agency, 2015). The Environmental Protection Agency provides expertise on human health and ecological effects of oil discharges or releases of hazardous substances, pollutants, or contaminants; ecological and human health risk assessment methods; and environmental pollution control techniques (Environmental Protection Agency, 2015). Access to the Environmental Protection Agency's expertise can be facilitated through the Environmental Protection Agency representative to the Research and Development Committee of the National Response Team; the Environmental Protection Agency Office of Research and Development provides through the Environmental Protection Agency's Science, Planning and Regulatory Evaluation Office (Environmental Protection Agency, 2015). The Environmental Protection Agency also provides legal expertise on the interpretation of the Environmental Response, Compensation and Liability and other environmental statutes (Environmental Protection Agency, 2015). The agency may also enter into a contract or cooperative agreement with the appropriate state to implement a response action (Environmental Protection Agency, 2015).

- c. The Federal Emergency Management- Agency provides guidance policy and program advice and technical assistance in hazardous materials, chemical and radiological emergency preparedness activities. The Federal Emergency Management Agency's primary point of contact for administering financial and technical assistance to state and local governments to support their efforts to develop and maintain an effective emergency management and response capability is the Preparedness, Training and Exercises Directorate.

1.27.5.7.2 State and Local Government Participation in Response.

(a) The state governor shall designate a state official/representative as a representative within the appropriate Regional Response Team (Environmental Protection Agency, 2015). The representative may fully participate in the related Regional Response Team's activities (Environmental Protection Agency, 2015). Each state governor shall designate a lead state agency that will coordinate the state-led response operations (Environmental Protection Agency, 2015). This agency designates the lead state response official for federal and/or state-led response operations and coordinates with any other state agencies, as appropriate (Environmental Protection Agency, 2015). Local governments are encouraged to participate in activities on the appropriate Regional Response Team as may be provided by state law or arranged by the state's representative (Environmental Protection Agency, 2015). Tribal authorities that are interested in participating in response operations must assign a representative or an agency to represent the tribal government on the appropriate Regional Response Team (Environmental Protection Agency, 2015).

(b) Appropriate local and state officials (including tribal authorities) will participate as part of the response structure as provided in the respective Area Contingency Plan (Environmental Protection Agency, 2015).

(c) In addition to meeting the requirements for local emergency plans under the Superfund Amendments and Reauthorization Act, state and local government agencies must include contingency planning for responses, consistent with the National Contingency Plan, Regional Contingency Plan, and Area Contingency Plan in all emergency and disaster planning (Environmental Protection Agency, 2015).

(d) For facilities not addressed under the Comprehensive Environmental Response, Compensation and Liability Act states must undertake response actions themselves or use their authorities to compel potentially responsible parties to undertake response actions (Environmental Protection Agency, 2015).

(e) States are required to enter into cooperative agreements according to the Comprehensive Environmental Response, Compensation and Liability Act to enable them to undertake actions authorized under the National Contingency Plan (Environmental Protection Agency, 2015).

(f) Because state and local public safety organizations would normally be the first government representatives at the scene of a discharge or release, they are expected to initiate public safety measures that are necessary to protect public health and welfare, and that are consistent with containment and cleanup requirements in the National Contingency Plan and are responsible for directing evacuations according to existing state or local procedures.

1.27.5.8 Planning Requirements



Figure 66: Integrated Contingency Planning in the United States adapted from (Environmental Protection Agency, 2015).

1.27.5.8.1 Federal Contingency Plans

There are three levels of contingency plans under the national response system: The National Contingency Plan, Regional Contingency Plans, and Area Contingency Plans are outlined in Figure 67 below. These plans are available for inspection at the Environmental Protection Agency’s regional offices or the United States of America Coast Guard district offices, addresses and telephone numbers for these offices may be found in the United States of America Government Manual, issued annually, or in local telephone directories.

(a) The National Response Team is responsible for national planning and coordination (Environmental Protection Agency, 2015).

(b) The Regional Response Team is responsible for regional planning and coordination (Environmental Protection Agency, 2015).

(c) Area-based planning and coordination is led by the jurisdiction-designated federal on-scene commander and its area committee(s) which consist of federal, state and local agencies (Environmental Protection Agency, 2015). Some responsibilities of these committees are:

(1) The preparation of an Area Contingency Plan for their areas.

(2) Coordination with federal, state, and local authorities to improve contingency planning and ensure collaborative response efforts, including procedures for recovery, cleanup, and protection of sensitive areas, as well as rescue and rehabilitation of wildlife.

(3) Coordination with appropriate federal, state, and local officials to expedite decisions for the use of dispersants and other mitigating substances and devices.

(d) The State Emergency Response Commission designates emergency planning districts, appoints Local Emergency Planning Committees, supervises their activities, and reviews local emergency response plans. The State Emergency Response Commission establishes procedures for receiving and processing requests from the public for information.

(e) Local emergency planning districts are designated by the State Emergency Response Commission to facilitate the preparation and implementation of emergency plans. The Local emergency planning committees prepare local emergency response plans for their respective emergency planning districts. The Local Emergency Planning Committee appoints a chair and determines the rules for the Local Emergency Planning Commission. The Local Emergency Planning Committee designates an official to serve as coordinator for information and designates in its plan a community emergency coordinator.



The National Contingency Plan- serves as a hierarchical framework that guides the measures for the preparedness and response to the discharge of oil, hazardous substances and pollutants.



Regional Contingency Plans- consist of information on the suitable facilities and resources in the region, from government, commercial, academic, and other sources.



Area Contingency Plans- serve as guiding documents in the removal of worst-case discharges, and the mitigation or prevention of major threats of such as spills from vessels, and offshore and onshore facilities that operate within or near the area of jurisdiction.

Figure 67: Key aspects of National, Regional and Area Contingency plans for hazardous substance discharge management per federal planning guidelines.

The Area Contingency Plan provides a well-coordinated response that is integrated and compatible, to the greatest extent possible, with all appropriate response plans of state, local, and non-federal entities, and especially with Title III local emergency response plans. The Area Contingency Plan should include:

- a. A description of the covered area, including special economic or environmental areas at risk.
- b. Clear responsibilities for owners/operators and federal, state, and local agencies for responding to and preventing discharges.
- c. A list of available equipment and personnel for effective response and prevention.
- d. Procedures for expedited decisions on the use of dispersants.
- e. Integration with other contingency plans and operating procedures.

1.27.5.9 Alaska Regional Contingency Plan -2022

The Alaska Regional Response Team's policy mandates that response actions on non-federal lands should be monitored or executed by the most immediate level of government with the authority and capability to conduct such activities (Alaska Regional Response Team, 2022). The first level of response will be the Response Plan, followed by tribal and/or local government agencies, followed by state agencies when tribal or local capabilities are exceeded (Alaska Regional Response Team, 2022). Should the required response capability extend beyond the state's response capability, the Environmental Protection Agency or United States of America Coast Guard are mandated to undertake response measures to safeguard public health, welfare of the United States of America, or the environment from the discharge or releases of oil and other hazardous (Alaska Regional Response Team, 2022). The need for a federal response is based on evaluation by the Federal On-Scene Commander (Alaska Regional Response Team, 2022). The United States of America's Coast Guard has three Area Contingency Plans that cover, in part, how to respond to an oil or hazardous substance spill in the State of Alaska (Alaska Regional Response Team, 2022). This usually consists of the identification, prioritization, and cleanup strategies for sensitive areas, followed by the identification of contractors and equipment (Alaska Regional Response Team, 2022). The Environmental Protection Agency has incorporated the inland area into one Area Contingency Plan (Alaska Regional Response Team, 2022). The United States of America Coast Guard's and Environmental Protection Agency's Area Contingency Plans are separate documents that are compatible with and may be used in conjunction with the Regional Contingency Plan for inland and coastal spills (Alaska Regional Response Team, 2022). These plans, when implemented in conjunction with other provisions of the National Contingency Plan, will be adequate to remove a worst-case discharge and mitigate or prevent a substantial threat of such a discharge (Alaska Regional Response Team, 2022).

The primary purpose of the Regional Contingency Plan consists of:

- Guidance document to planners in the preparation of an organized framework of federal, state, tribal, and local response to a discharge, or substantial threat of discharge, of oil and other hazardous substance from a vessel or on/offshore facility operating within Alaska's boundaries and surrounding waters (Alaska Regional Response Team, 2022). Area Contingency Plans address the response component based on the following scenarios "an average probable discharge", "a maximum most probable discharge," and a "worst-case discharge," including discharges from fire or explosion (Alaska Regional Response Team, 2022). These planning scenarios provide coverage of the range of spills that are likely to occur in the Alaska region (Alaska Regional Response Team, 2022). Hazardous materials response scenarios are also included, where appropriate (Alaska Regional Response Team, 2022).
- Guidance to the Regional Response Team and its role in supporting a response to an oil discharge or hazardous substance release (Alaska Regional Response Team, 2022). For the Alaska Regional Contingency Plan and the subsequent Area Contingency Plan, the worst-case discharge for a vessel is the discharge of its entire cargo in adverse weather conditions (Alaska Regional Response Team, 2022). The worst-case discharge for an offshore or onshore facility is the largest foreseeable discharge in adverse weather conditions (Alaska Regional Response Team, 2022). These scenarios are further described in the individual Area Contingency Plans (Alaska Regional Response Team, 2022). The Area Committees are preparedness and planning bodies and comprise federal, state, tribal, and local representatives, as well as other stakeholders (Alaska Regional Response Team, 2022). The On-Scene Commander coordinates the activities of Area Committees and assists in the development of comprehensive Area Contingency Plans under National, Regional and Area Contingency Plans (Alaska Regional Response Team, 2022).

The mandated activities specified alternative plans such as vessel response plans, offshore facility response plans, onshore facility response plans, and the National Strike Force Coordination Centre's operating procedures (Alaska Regional Response Team, 2022). The Federal On-Scene Commander and State-On Scene Commander for each planning area will identify the composition of the Area Committee in their respective Area Contingency Plans (Alaska Regional Response Team, 2022). The Area Committee also directs the activities of working groups that periodically update their respective Area Contingency Plans. Multiple working groups might be involved in an Area Contingency Plans update, depending on the

needs of the Area Committee to review, revise and/or develop plan content (Alaska Regional Response Team, 2022). Working group composition can and should be adjusted to promote the greatest efficiency (Alaska Regional Response Team, 2022).

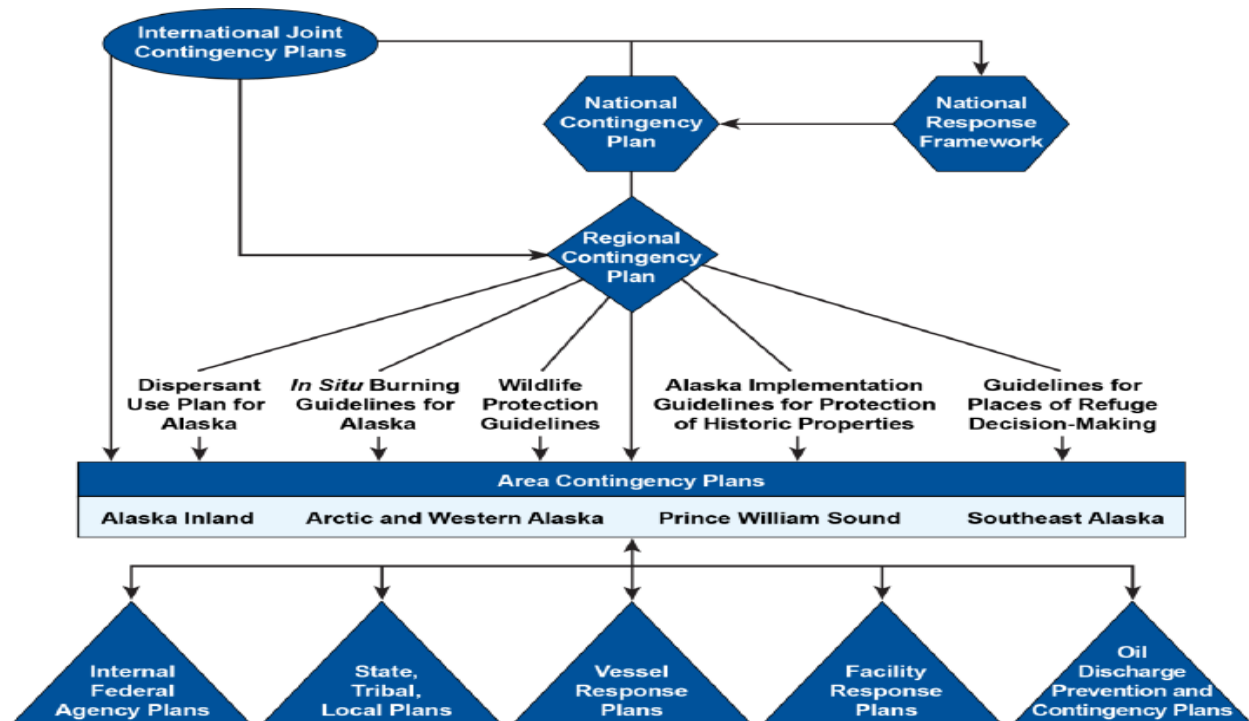


Figure 68: Relationship of Contingency Plans throughout various administrative levels from (Alaska Regional Response Team, 2022:2).

Under the National Oil and Hazardous Substances Contingency Plan (NCP) response and planning framework, the Alaska Regional Response Team manages the Alaska Region (Alaska Regional Response Team, 2022). The respective Regional Response Team leads the development and management of Alaska’s Regional Contingency Plans (Alaska Regional Response Team, 2022).

The Alaska Regional Response Team collaborates with the United States of America Coast Guard, the Environmental Protection Agency and the Alaska Department of Environmental Conservation to provide relevant information on the roles, functions, responsibilities and capabilities of these agencies according to the regulatory provisions (Alaska Regional Response Team, 2022).

The National Contingency Plan stipulates the practical extent of the Regional Contingency Plan and:

- | |
|---|
| <ul style="list-style-type: none"> ● Facilitate and coordinate timely, effective response by various federal agencies and other organizations to discharges of oil or releases of hazardous substances, pollutants, or contaminants. |
| <ul style="list-style-type: none"> ● Coordinate with state emergency response plans and Area Contingency Plans. This is established by collaborating with the Alaska State Emergency Response Commission. |
| <ul style="list-style-type: none"> ● Contain lines of demarcation between the inland and coastal zones, as mutually agreed upon by the United States of America Coast Guard and Environmental Protection Agency. |

1.27.5.9.1 Area Contingency Planning

According to the Oil Pollution Act 90 and the National Contingency Plan, the Area Committee is responsible for developing and maintaining the Area Contingency Plan for their area. Federal law, the

Environmental Protection Agency and the United States of America Coast Guard guidance requires that each Area Contingency Plan:

- Must be adequate to remove the worst-case discharge and mitigate a substantial threat of discharge when implemented in conjunction with the National Contingency Plan; consist of procedures for mechanical recovery, dispersal, In-situ burning, shoreline cleanup, protection of sensitive environmental area, rescue and rehabilitation of fisheries/wildlife.
- Describe procedures to be followed for obtaining an expedited decision regarding the use of dispersants in-situ burning, mitigating substances and devices.
- Describe the area covered by the plan, addressing the presence and proximity of natural resources and areas sensitive for environmental, cultural, or economic reasons, including:
 1. Population concentration, Location of drainage/topographic and geographical features
 2. Location of drinking water resources and intakes
 3. Coastal areas such as beaches, ports, and recreational areas.
 4. Areas of seasonal significance
 5. Migratory bird flyways
 6. Critical habitat for threatened or endangered species
 7. Cultural resources and historic properties
- Describe the responsibilities of owners and federal, state, tribal and local agencies in removing a discharge.
- Identify response resources, including equipment and personnel
- Describe how the plan is integrated into other Area Contingency Plans and facility response plans.

1.27.5.9.2 State Planning Requirements

Alaska Statutes, Sections 46.04.200-210 specify state requirements to develop and maintain statewide and multiple regional Oil and Hazardous Substance Discharge and Prevention Contingency Plans. The State's plan requirements are compatible with the federal requirements described above but do not mirror them exactly; the State's required Master Plan is compatible with the federal Regional Contingency Plan. The State's Regional Master Plans are comparable with the federal requirements for Area Contingency Plans. The Regional Contingency Plans and Area Contingency Plans were written with the goal that they would meet both federal and state planning requirements in Alaska.

Table 45: State Planning Requirements adapted (Alaska Regional Response Team, 2022).

State Master Plan (Alaska Statutes 46.04.200)	Develop, annually review, and revise, as necessary, the State Oil and Hazardous Substance Contingency Plans (State Master Plan and Regional Plans) (Alaska Statutes 46.04.200).
	Clarify and specify the assessment, containment, and cleanup responsibilities of the following: State, federal, and municipal agencies. Facility operators and private parties whose property may be affected by catastrophic oil and/or hazardous substance discharge (Alaska Statutes 46.04.200).

	<p>Describe the ICS and specify responsibilities in an emergency response for State, federal, and municipal agencies.</p> <p>Facility operators- private parties whose property may be affected by catastrophic oil and/or hazardous substance discharge (Alaska Statutes 46.04.200).</p> <p>Consider elements of pending or approved vessel/facility contingency plans (Alaska Statutes 46.04.200).</p> <p>Identify actions necessary to reduce the likelihood of catastrophic oil discharges and significant discharges of hazardous substances (Alaska Statutes 46.04.200).</p>
<p>Regional Master Plans (AS 46.04.210)</p>	<p>Contained detailed, localized information regarding:</p> <ul style="list-style-type: none"> Facility locations Facility hazard assessments Transportation corridors Environmentally sensitive areas <p>Emergency spill response equipment and personnel Regional Master Plans (Alaska Statutes 46.04.210).</p> <p>Information regarding local emergency response capability, including the status of Local Emergency Planning Committees Regional Master Plans (Alaska Statutes 46.04.210).</p>

1.27.5.9.3 Local Planning Requirements

1.27.5.9.3.1 Local Emergency Planning Committees and Local Emergency Response Plans.

The Superfund Amendment and Reauthorization Act of 1986, Title III, and Alaska Statute 26.23.073 require the formation of Local Emergency Planning Committees within designated Local Emergency Planning Districts. These Local Emergency Planning Committees supervise the development of Local Emergency Response Plans/Emergency Operations Plans (Emergency Planning Districts and Committees, 2007). The contents of Local Emergency Response Plans are illustrated in Figure 69:

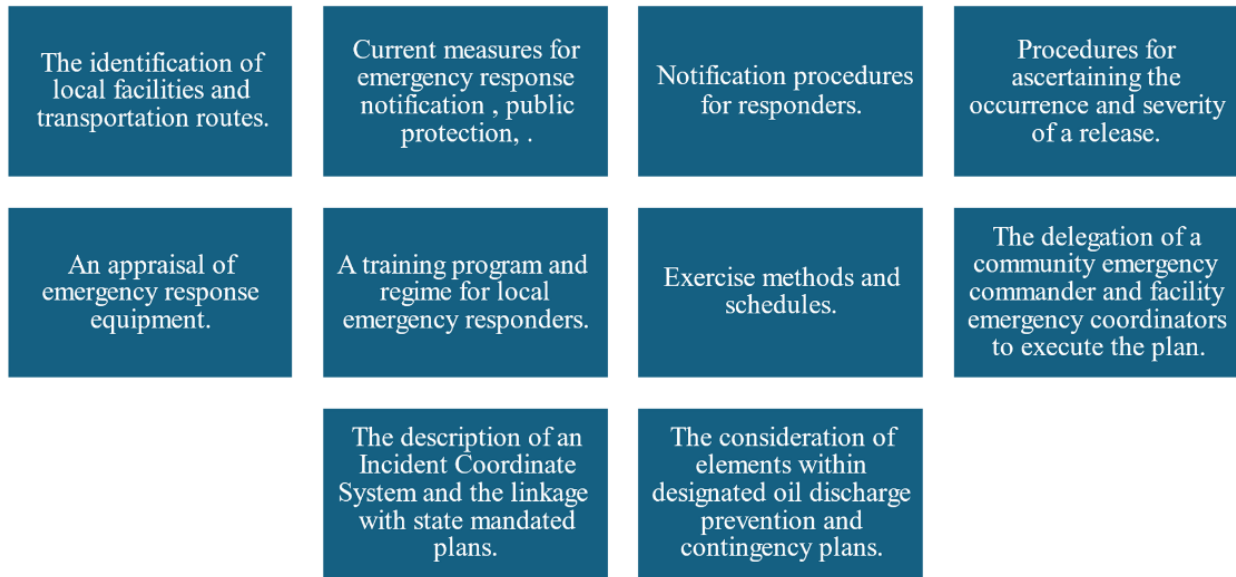


Figure 69: General components of a Local Emergency Response Plan.

1.27.5.9.3.2 City and Borough Emergency Plans

Cities and boroughs are required to have a written local or inter-jurisdictional disaster emergency plan for their area that is prepared, maintained, and distributed to all appropriate officials (Alaska Statutes 26.23.060: Local and Interjurisdictional Disaster Services, 2007). This disaster emergency plan must include a clear and complete statement of the emergency responsibilities of all local agencies and officials (Alaska Regional Response Team, 2022).

1.27.5.9.3.3 Geographic Planning Boundaries

This Regional Contingency Plan covers the entire State of Alaska and offshore waters that are subject to state and/or federal jurisdiction (Alaska Regional Response Team, 2022). This regional plan is further subdivided into four area contingency planning regions namely:

- Arctic and Western Alaska, Prince William Sound, Southeast Alaska, and Inland Area/Region

These planning regions are specified in Table 46 and Figure 70 and have been delineated for developing geographic-specific Area Contingency Plans (Alaska Regional Response Team, 2022). The Federal and State On-Scene Commanders’ response jurisdiction has been included in the Area Contingency Plan (Alaska Regional Response Team, 2022).

Table 46: Geographic Boundary Terminology within the Alaska Regional Contingency Plan.

Area Contingency Plan	On Scene Commander	Geographic Boundary and Area of Responsibility
Southeast Alaska	Federal On-Scene Commander-United States of America Coast Guard Sector Juneau	Captain of the Port Zone Southeast Alaska
	State On Scene Commander-Alaska Department of Environmental Conservation	Southeast Area: Southeast Alaska Geographic Zone

Prince William Sound	Federal On-Scene Commander- United States of America Coast Guard MSU Valdez	Captain of the Port Zone Prince William Sound
	State On Scene Commander- Alaska Department of Environmental Conservation	Central Area Prince William Sound Geographic Zone.
Arctic and Western Alaska	Federal On-Scene Commander- Sector Anchorage	Captain of the Port Zone Western Alaska
	State On Scene Commander- Alaska Department of Environmental Conservation	Central Areas: <ul style="list-style-type: none"> ● Bristol Bay ● Cook Inlet ● Kodiak ● Western Alaska Geographic Zones Northern Areas: <ul style="list-style-type: none"> ● Northwest Arctic ● North Slope Geographic Zones
Inland Area	Federal On-Scene Commander- Environmental Protection Agency	Inland zone of Alaska
	State On Scene Commander- Alaska Department of Environmental Conservation	Central Area, Northern Area, and Southeast Alaska Area. All geographic zones, locations within the “inland zone”.

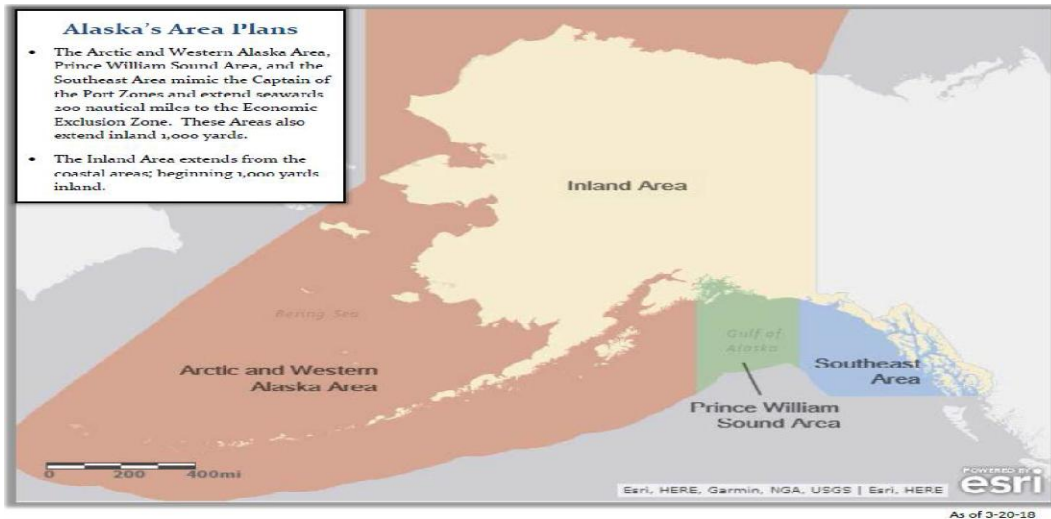


Figure 70: Alaska Area Planning Regions/Area Plans from (Alaska Regional Response Team, 2022:13).

1.27.5.9.3.4 Area Contingency Plans

Area Contingency Plan serves as a reference document to be used by agencies engaged in responding to environmental emergencies in a defined geographic area (Alaska Regional Response Team, 2022). Elements include maps, contacts and notifications, resources, sensitive areas, hazard analysis, response strategies and worst-case discharge, and response management roles and responsibilities.

The general contents of Area Contingency Plans are listed in Figure 71 below:

A description of the area covered by the plan, including the areas of special economic or environmental importance that might be damaged by a discharge.

A description of the responsibilities of an owner/operator and federal, state, tribal, and local agencies in removing, mitigating, or preventing a substantial threat of a discharge.

A list of equipment (including firefighting equipment), dispersants or other mitigating substances and devices, and personnel available to an owner/operator and federal, state, and, local agencies, to ensure an effective and immediate removal of a discharge.

A description of procedures to be followed for obtaining an expedited decision regarding the use of dispersants.

A detailed description of how the plan is integrated into other Area Contingency Plans, Vessel Response Plans, Oil Discharge Prevention and Contingency Plans, and Fish Resources Permit for onshore and offshore facilities.

A detailed annexe containing a Fish and Wildlife and Sensitive Environments Plan that is consistent with the Regional Contingency Plan and National Contingency Plan.

Figure 71: Main components of Area Contingency Plans adapted from (Alaska Regional Response Team, 2022).

Table 47: Core elements of area contingency plans.

ELEMENTS	DESCRIPTION
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1. Wildlife Protection Planning Guidelines	An Area Contingency Plan must include a detailed annex containing a Fish and Wildlife and Sensitive Environments Plan that is consistent with the Regional Contingency Plan and the National Contingency Plan (Alaska Regional Response Team, 2022).
2. Geographic Response Strategies	Area Committees may create Geographic Response Systems as a means of prioritizing given resources for site-specific planning and response tactics (Alaska Regional Response Team, 2022). The scope and nature of these plans are described in greater detail in the Area Contingency Plan (Alaska Regional Response Team, 2022).
3. Update Procedures and Timelines	<p>The periodic update of Area Contingency Plans is led by their respective Area Committee as stipulated by the Clean Water Act, and the United States of America Coast Guard’s requirements (Alaska Regional Response Team, 2022; Environmental Protection Agency, 2015).</p> <p>The Area Committees under the direction of state and federal on-scene commanders, update Area Contingency Plans when required, and will either collectively or individually conduct suitable stakeholder outreaches under current mandates and agency policies (Alaska Regional Response Team, 2022).</p>
4. Plan Style and Format	The style and template of the Alaska Regional Contingency Plan have been advised by the Statewide Planning Committee (Alaska Regional Response Team, 2022). This template facilitates the alignment of subsequent documents (Area Contingency plans) under an agreed style and structure (Alaska Regional Response Team, 2022).

1.27.5.10 Arctic And Western Alaska Area Contingency Plan 2022

The Arctic and Western Alaska planning area includes the coastal waters north of Prince William Sound planning area, north to the international border between Canada and the United States of America, including adjacent shorelines and waters up to two hundred nautical miles offshore from the mean low-tide coastline (Alaska Department of Environmental Conservation, 2022). The area of responsibility designated under the Arctic and Western Area Contingency Plan 2022 is delineated in Figure 72 (Alaska Department of Environmental Conservation, 2022). The area extends one thousand yards inland from the coastline of the waters subject to the tide and seaward to two hundred nautical miles offshore from the (Alaska Statutes: AS 46.04.200. State Master Plan, 2023) mean low tide coastline (Alaska Regional Response Team, 2022).

1.27.5.10.1 Geographic Zone



Figure 72: Map of the planning area for the Arctic and Western Alaska Area Contingency Plan from (Alaska Regional Response Team, 2022:7).

The Arctic and Western Alaska Area Response Structure is outlined as follows:

- Federal Role in Incident Response-This is led by the United States of America Coast Guard whose focus is coastal oil discharge and hazardous substance release response (Alaska Regional Response Team, 2022). They also serve as the Federal On-Scene Coordinator in the Unified Command. The United States of America Coast Guard’s role in the Unified Command varies based on the size and type of the spill.
- State Role in Incident Response- The Alaska Department of Environmental Conservation leads the State of Alaska in oil discharge and as the State On-Scene Commander in the Unified Command.
- Tribal Role in Incident Response-response communication response and tribes. It consists of a representative that ensures that the needs, priorities, and concerns are reflected in the incident objectives and the decision-making of the unified command. Deploy tribal resources to support the response and aid the efficient and effective response through integrated coordination.
- Local Role in Incident Response (Local on-scene coordinator)-The local government through the Local On-Scene Commander directs and coordinates local incident response measures. The Local On-Scene Commander coordinates local responses to incidents. The local On-Scene Commander represents the community. The Local On-Scene Commander will serve as the incident commander providing that the immediate threat to human life has been resolved. The Local On- Scene Commander may request a state or federal agency to assume that responsibility. Local Emergency Response Plans /Emergency Operations Plans and Small Community Emergency Response Plans provide information regarding resources and emergency actions at the local and community levels.
- Responsible Party-the containment, controlling and cleaning up any oil or hazardous substance spilt per the specified Oil Spill Response Plan required by federal law and/or Oil

Discharge Prevention and Contingency Plan required by state law. The Responsible Party is required to:

- a) Notify federal, state, tribal and local authorities in the event of an oil spill.
- b) Respond to an incident and effectively execute a response using their existing resources.
- c) Securing additional contractual expertise and equipment when necessary.

The activities of the Responsible Party are supervised/overseen by the Federal On-scene Commander and State On-scene commander. If the activities are determined to be inadequate, they can augment or take over the response activities.

1.27.5.10.2 Subarea Committee

The primary role of the Subarea Committee is to act as a preparedness and planning body for the Subarea (Environmental Protection Agency, 2015). The pre-designated Federal On-Scene Commander for the subarea and the pre-designated State On-Scene Commander from the Alaska Department of Environmental Conservation comprise the primary membership of the Subarea Committee (Environmental Protection Agency, 2015). Each member is empowered by their agency to make decisions on their organisation's behalf and commit the organisation to carry out roles and responsibilities as described in this plan and the Unified Plan (Environmental Protection Agency, 2015). The pre-designated Federal On-Scene Commanders for the area and the State On-Scene Commander will chair the committee (Environmental Protection Agency, 2015). They will select work group members and provide general directions and guidance for the work groups and the Subarea Committee (Environmental Protection Agency, 2015).

1.27.5.11 Cook Inlet Subarea Contingency Plan

The State of Alaska has subdivided the state into ten planning regions such as the Cook Inlet Region (United States of America Coast Guard, 2017). This Subarea Contingency Plan addresses the Cook Inlet Region, in alignment with federal stipulations (and to avoid confusion with federal terms), the region is referred to as the Cook Inlet Subarea (Environmental Protection Agency, 2015). The Cook Inlet Subarea encompasses the boundaries of the Kenai Peninsula Borough, the Municipality of Anchorage, and the Matanuska-Susitna Borough, including adjacent shorelines, waters of Cook Inlet and seaward water boundaries that are two hundred nautical miles from which the territorial sea is measured (Environmental Protection Agency, 2015).

This subarea contingency plan supplements the Alaska Federal/State Preparedness Plan for Response to Oil and Hazardous Substance Discharges (Environmental Protection Agency, 2015). The Subarea Contingency Plan, in conjunction with the Unified Plan, outlines a coordinated strategy of federal, state, and local response measures in response to a discharge or probable threat of discharge of hazardous substances from vessels, offshore or onshore facilities, or vehicles operating within the Cook Inlet Subarea (Environmental Protection Agency, 2015).

This plan is a response framework and pre-incident guide that identifies vulnerabilities in the existing response structure before an incident occurs (Environmental Protection Agency, 2015). According to the Oil Pollution Act (OPA) of 1990, the plan outlined parameters for vessel and facility response plans (Environmental Protection Agency, 2015). Consistency reviews of federal and industry plans are based on the environmental and economically significant areas, and their specific protection strategies. In addition, the area's available resources (equipment and personnel) are in comparison to the area's mandated response requirements (Environmental Protection Agency, 2015).

1.27.5.12 Local Level Municipality of Anchorage

1.27.5.12.1 Municipality of Anchorage 2022

The Comprehensive Emergency Operations Plan was designed to provide general information on the Municipality's approach to the response and recovery to major incidents within its jurisdiction such as measures, roles and responsibilities, agency specific measures to be conducted (Municipality of Anchorage Office of Emergency Management, 2022). This Comprehensive Emergency Operations Plan is an integration of the principles and requirements from federal and state legislature (Municipality of

Anchorage Office of Emergency Management, 2022). This plan is intended to be used in conjunction with applicable local emergency operations plans and the Alaska State Emergency Operations Plan under the National Incident Management System (Municipality of Anchorage Office of Emergency Management, 2022). This Emergency Plan consists of four sections as illustrated in Figure 73 and explained in Figure 74.

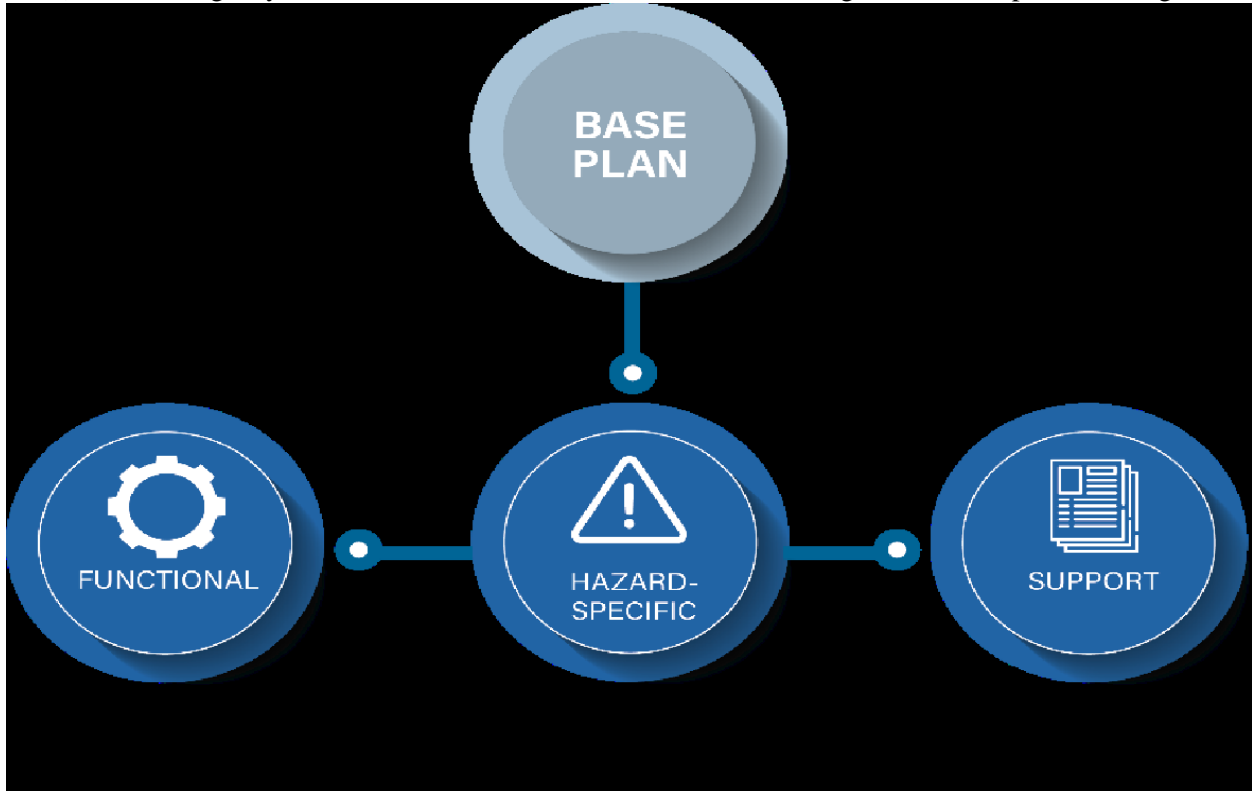


Figure 73: Relationships of the Four Components of the Emergency Operations Plan (Municipality of Anchorage Office of Emergency Management, 2022).



Figure 74: Components of the Municipality of Anchorage’s Comprehensive Emergency Operations Plan (Municipality of Anchorage Office of Emergency Management, 2022).

1.27.5.12.2 Land-Based Oil Spill Response in the Municipality of Anchorage.

The Anchorage Fire Department provides incident responses to Hazardous and Toxic Material incidents/spills within Anchorage on both public and private property (Municipality of Anchorage Office of Emergency Management, 2022). This Department assumes the role of Local On-Scene Coordinator. Significant events, a State On-Scene Coordinator and a Responsible Party On-Scene Coordinator are assigned as part of the Unified Command (Municipality of Anchorage Office of Emergency Management, 2022).

1.27.5.12.3 Oil Spill Response in Coastal Waters in the Municipality of Anchorage according to (Municipality of Anchorage Office of Emergency Management, 2022).

The United States of America’s Coast Guard has jurisdictional authority to manage oil spills occurring in coastal waters and approximately one thousand yards inland (Municipality of Anchorage Office of Emergency Management, 2022). The United States of America’s Coast Guard assumes the role of Federal On-Scene Coordinator for incidents within these areas (Municipality of Anchorage Office of Emergency Management, 2022).

1.27.5.12.3.1 Anchorage Regional Stakeholder Committee

Rapid Response Support Centers are activated for significant incidents to advise the Unified Command and provide recommendations on incident priorities, objectives and community concerns (Municipality of Anchorage Office of Emergency Management, 2022). Even though Regional Stakeholder Committees do not set incident priorities or allocate resources, they advise the Unified Command and

provide recommendations on the incident action plan (Municipality of Anchorage Office of Emergency Management, 2022). Each Regional Stakeholder Committee is adjourned by an elected chairperson (Municipality of Anchorage Office of Emergency Management, 2022).

1.27.5.13 Regional Citizens Advisory Council

The Regional Citizens Advisory Council informs residents, communities, and interested parties on the evaluation and verification of emergency spill response and clean-up efforts (Municipality of Anchorage Office of Emergency Management, 2022). The Regional Citizens Advisory Council can transfer local knowledge and concerns of communities to incident commanders that are valuable to operational decisions (Municipality of Anchorage Office of Emergency Management, 2022). The council operates as an auxiliary resource within the Unified Command and participates in the Stakeholder Committee when it is established and functions for oil spill response operations (Municipality of Anchorage Office of Emergency Management, 2022). The main responsibilities of the Regional Citizens Advisory Councils are illustrated in Figure 75:



Figure 75: Main responsibilities of the Regional Citizens Advisory Council (Inslee, 2013).

1.27.5.14 Cook Inlet Regional Citizens Advisory Council

The Cook Inlet Regional Citizens Advisory Council is a local citizens group with an Oil Pollution Act of 1990-mandated role in Cook Inlet spill response activities (Inslee, 2013). The Cook Inlet Regional Citizens Advisory Council serves as a formal mechanism under the Oil Pollution Act of 1990 to increase the representation (via public participation) in supervising Cook Inlet's oil industry (transportation and production) (Inslee, 2013). Their key strategy is to build an understanding of what natural resources are at risk, what and where the greatest risks are, and how we can prevent and mitigate those risks from oil industry operations in Cook Inlet (Inslee, 2013).

The Cook Inlet Regional Citizens Advisory Council then uses this knowledge to manage the natural and wildlife resources for the citizens of Cook Inlet (Inslee, 2013). In this role, the Regional Citizens Advisory Council participates with the incident management team at the emergency operations centre and monitors on-water activities during a spill (Inslee, 2013). The Regional Citizens Advisory Council has four primary tasks to perform during a spill: observe, verify, inform, and advise (Inslee, 2013). Cook Inlet Regional Citizens Advisory Council provides local knowledge and technical expertise within the Incident Command System structure e.g., as part of the Operations, Planning Sections and the Joint Information Center (Inslee, 2013).

1.27.5.15 Community Spill Response Agreements

The Alaska Department of Environmental Conservation has established approximately forty-five formal Community Spill Response Agreements with boroughs and municipalities across Alaska (State of Alaska Department of Environmental Conservation, 2024), as illustrated in Figure 76. These agreements stipulate that communities are required to take initial response actions for oil spills within their area of responsibility (State of Alaska Department of Environmental Conservation, 2024).

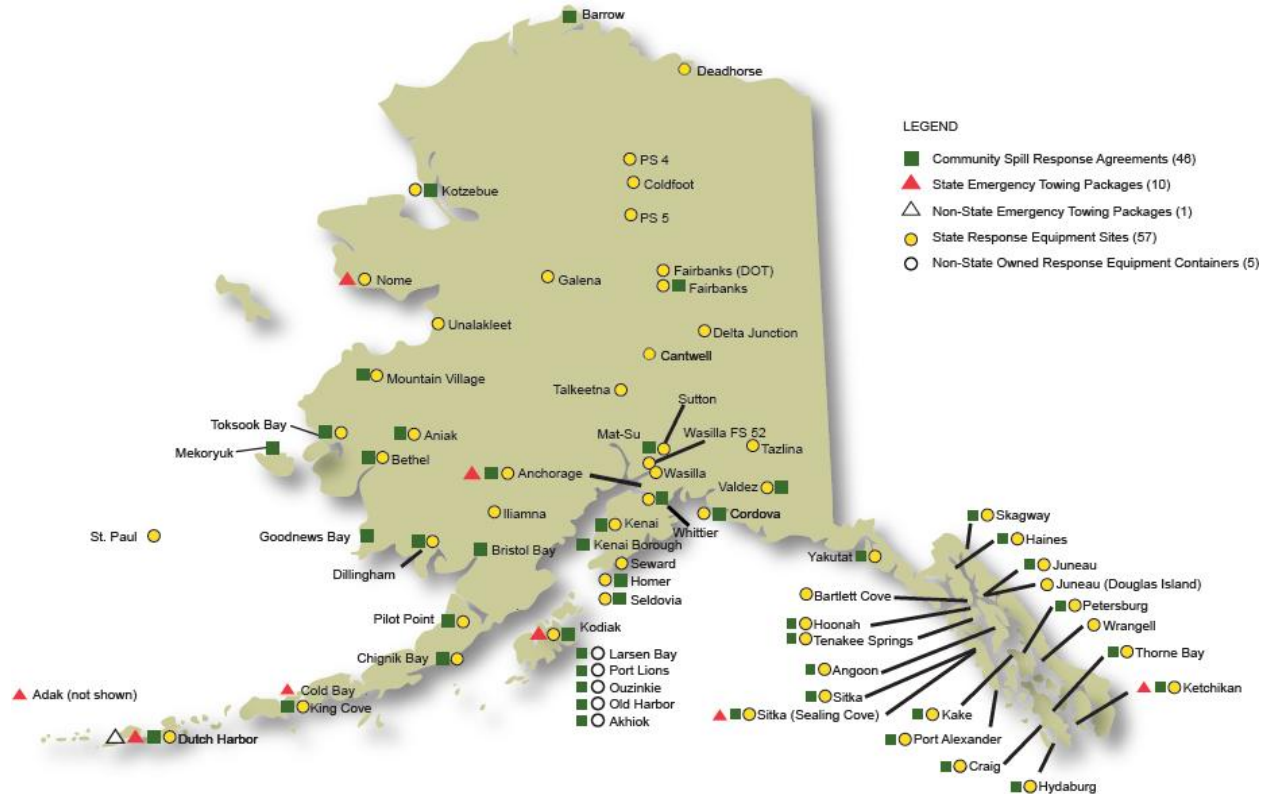


Figure 76: Map of Community Response Agreement signatories and Oil Spill Response resources across the state of Alaska (State of Alaska Department of Environmental Conservation, 2024).

These agreements facilitate the Alaska Department of Environmental Conservation to reimburse local governments for spill response activities undertaken at the request of the State On-Scene Commander (State of Alaska Department of Environmental Conservation, 2024). The Alaska Department of Environmental Conservation may reimburse the community for costs incurred in the response, containment and recovery of any spill recovery actions involved (State of Alaska Department of Environmental Conservation, 2024). The Alaska Department of Environmental Conservation can activate a generic agreement in emergency response situations to reimburse communities that lack a signed Community Spill Response Agreement (State of Alaska Department of Environmental Conservation, 2024).

1.27.5.16 Alaska Oil Spill Curriculum 1990

The Alaska Oil Spill Curriculum was established in 1990 to provide effective, usable lessons and information to schools in Alaska and around the nation about the hazards of oil spills (Mickelson, 1990). The lessons provided are for students of various educational levels and serve to:

- Increase awareness of their surrounding environment
- Create an understanding of the technical aspects of oil spills and hazardous waste management
- Explore the potential impacts of oil spills and informed decision-making
- Provide various lessons that focus on topics such as habitats to energy conservation (exercises).

- Aid students in grasping the fundamental aspects of oil spills, challenges faced in clean operations and technological advances made.
- Explore the potential impact of oil spills on wildlife

1.27.5.17 Small Community Emergency Response Plan (SCERP)

This is a guidance document which contains essential, community-specific, information that can aid the community’s response approach to a disaster (Alaska Regional Response Team, 2022). The Small Community Emergency Response Plan does not replace the community or borough Emergency Operations Plan (Alaska Regional Response Team, 2022). The Small Community Emergency Response Plan supports an Emergency Operations Plan as a quick response reference tool to assist communities with limited response capabilities within the first seventy-two hours of an event (Alaska Division of Homeland Security and Emergency Management Planning Section, n.d.; Alaska Regional Response Team, 2022).

The development and update of the Small Community Emergency Response Plan are essential (Alaska Division of Homeland Security and Emergency Management Planning Section, n.d.; Alaska Regional Response Team, 2022). Inefficient integration of the expertise of community members and interested parties may significantly degrade the overall effectiveness of this phase (Alaska Division of Homeland Security and Emergency Management Planning Section, n.d.; Alaska Regional Response Team, 2022).

The Alaska Division of Homeland Security and Emergency Management Planning Section may design tabletop and field exercises for communities that apply the principles of the community response plans (Alaska Division of Homeland Security and Emergency Management Planning Section, n.d.).The proposed community incident command system is in alignment with the hierarchical National Incident Command Structure requirements as illustrated in Figure 77. It should be noted that each incident determines the required positions in the Incident Command structure.

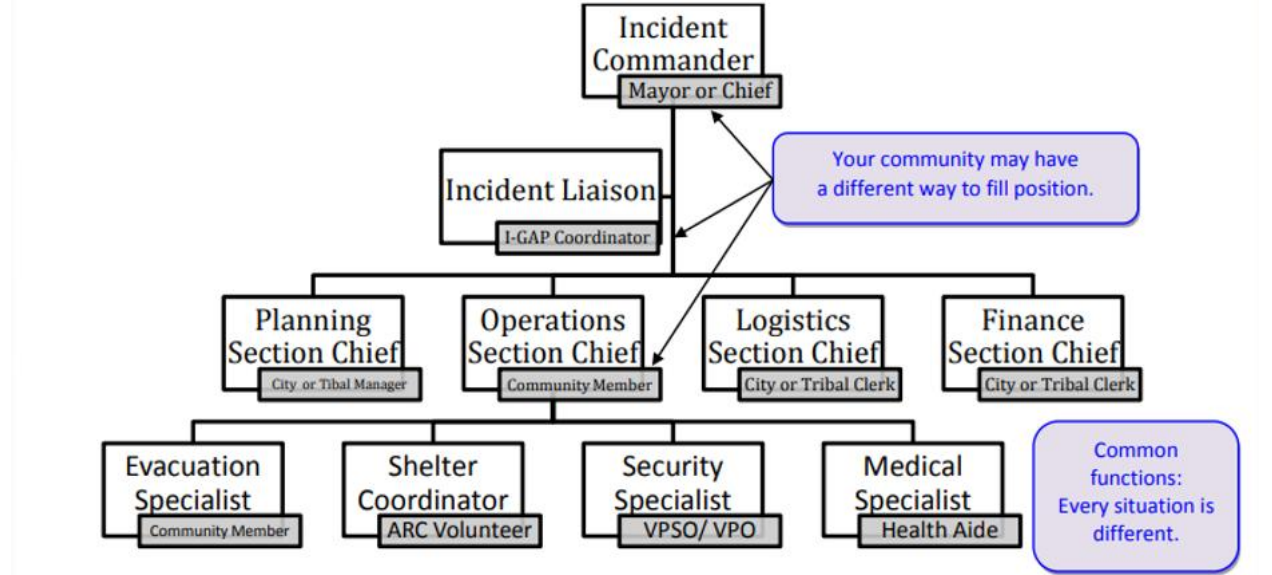


Figure 77: Sample Incident Command System from the (Alaska Division of Homeland Security and Emergency Management Planning Section, n.d.).

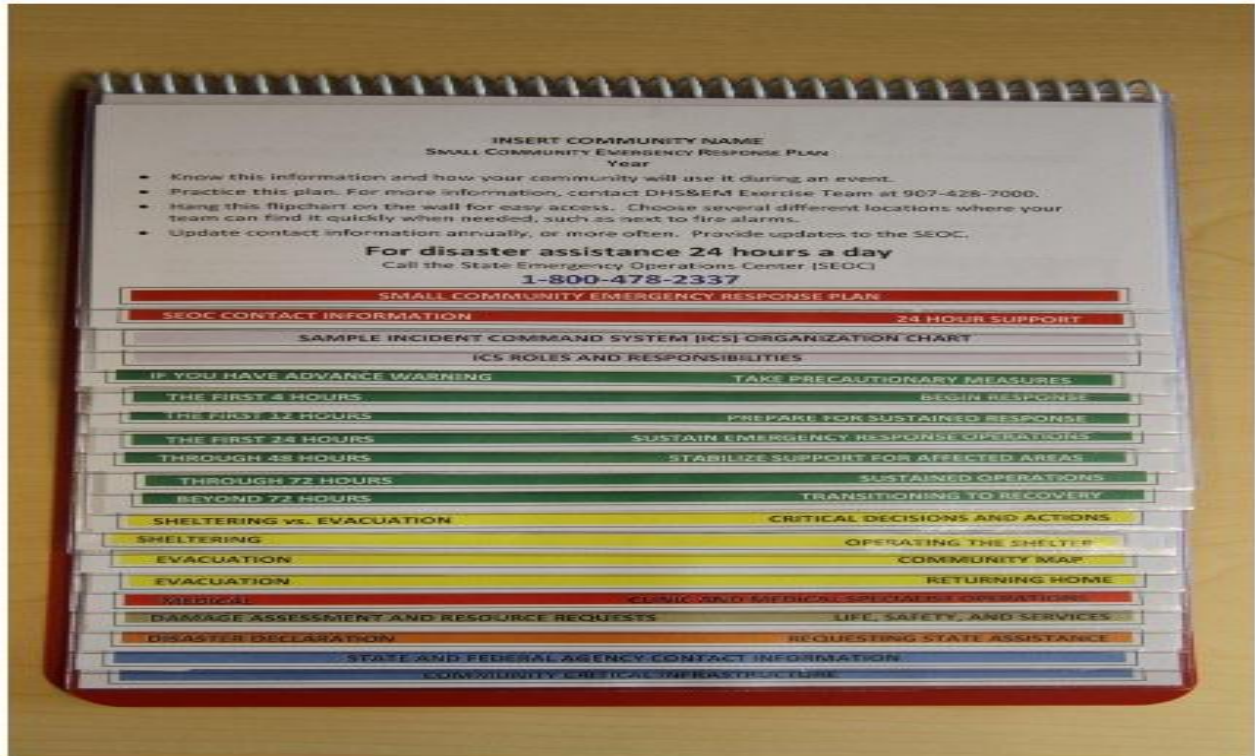


Figure 78: Sample of a small Community Emergency Response Plan from the (Alaska Division of Homeland Security and Emergency Management Planning Section).

1.27.5.18 Community Response Organizations

1.27.5.18.1 Seldovia Oil Spill Response Team.

Communities interested in increasing their oil spill response capability may develop their response organization (Inslee, 2013). The Seldovia Oil Spill Response Team is a non-profit oil spill response organization located in Seldovia, Alaska, fourteen miles southwest of Homer (Inslee, 2013). The organization was pulled together after the community's experiences during the Exxon Valdez incident (Inslee, 2013). Following the 1989 spill community leaders formed the Seldovia Oil Spill Response Team with the intent to be prepared to respond to local spills and to protect local resources in the event of another catastrophic spill (Inslee, 2013). Today the SOS exists as the sole community-based spill response organization in Alaska (Inslee, 2013). To remain response-ready the Seldovia Oil Spill Response Team must conduct training, maintain response equipment and pay for overhead expenses, including insurance (Inslee, 2013). The responder base for the Seldovia Oil Spill Response Team is approximately fifteen people (Inslee, 2013). The organization has a small cache of response equipment which is supplemented by Alaska Department of Environmental Conservation response equipment (Inslee, 2013). The costs of maintaining the capacity of the Seldovia Oil Spill Response Team to respond are not recouped from the actual response activities (Inslee, 2013). As such the issue of funding has been the largest challenge facing the Seldovia Oil Spill Response Team in the last several years (Inslee, 2013). The main source of funding for this organization comes from an agreement with the Cook Inlet Oil Spill Response Organization Inc (CISPRI) to have the Seldovia Oil Spill Team maintain one of the Cook Inlet Oil Spill Response Organization Inc. response barges in Seldovia (Inslee, 2013). The Seldovia Oil Spill Response Team personnel are also paid to attend training with Cook Inlet Oil Spill Response Organization Inc. (Inslee, 2013). To receive funding for response activities, the Seldovia Oil Spill Response Team has an Emergency Response Basic Ordering Agreement with the United States of America Coast Guard (Inslee, 2013). These agreements are signed with non-governmental entities (Inslee, 2013). The United States of America Coast Guard and the

entity pre-determine the rates for the cost of the cleanup, allowing for quicker call-out of responders and equipment by the United States of America Coast Guard (Inslee, 2013). In addition to the agreement with the United States of America Coast Guard, the Seldovia Oil Spill Response Team uses an agreement with the City of Seldovia (Inslee, 2013). The Seldovia Oil Spill Response Team has a generic agreement with the City of Seldovia which allows the City to call upon the Seldovia Oil Spill Response Team to respond to local spills (Inslee, 2013). The City of Seldovia is then reimbursed by the State and then Seldovia reimburses the response team (Inslee, 2013). In the face of these tough economic challenges for the Seldovia Oil Spill Response Team, resulting from a limited number of responses and high overhead costs, it is the leadership of a core cadre of individuals with the memory and motivation from the Exxon Valdez which keeps the organization going (Inslee, 2013).

This team functions as a community-based response team that focuses on spill education, prevention, preparedness and response towards environmental protection (Seldovia Oil Spill Response Team, 2015). This team was formed during the Exxon Valdez spill based on volunteers who deployed a 40,000 ft boom (Seldovia Oil Spill Response Team, 2015). Developed a skimming task force. It was formed by workers and supported by the State of Alaska (Seldovia Oil Spill Response Team, 2015).

Table 48: The services provided by the Seldovia Oil Spill Response Team (Seldovia Oil Spill Response Team, 2015).

Response Services	Readiness Services	Community Service
Rapid response to small spills	HAZWOPER (Hazardous Waste and Emergency Response Standard) Training	Education
First response to larger spills	Incident management training	Information
Implementation of response plans/GRS	Maintenance of response equipment	Assistance
Mutual aid to other response organizations		
Incident management services to aid local and state agencies		

1.28 CONCLUSION

This document review consisted of skimmed segments of various sources of information that outlined the role of local authorities and communities in oil spill response and planning as part of a systems approach. This document review focused on the eight Arctic Council countries and Greenland. This deliverable served as the primary data source for the subsequent deliverables and the product. The approaches at the municipal/local level consisted of individual segments and top-down administrative approaches and excluded ports/harbour facilities, and private facilities (offshore and onshore) since they are regulated under separate guidelines.

APPENDICES REFERENCES

1. Act (2003:778) on protection against accidents (Act (2003:778) on protection against accidents), Sweden, 2003, Pub. L. No. 778 (2003). <https://www.global-regulation.com/translation/sweden/2988972/regulation-%25282003%253a789%2529-for-protection-against-accidents.html>
2. Act on Hygiene and Pollution Prevention, Pub. L. No. 7 (1998). <https://www.thingi.is/lagas/nuna/1998007.html>
3. Act on Oil Pollution Response, Pub. L. No. 1673, Act on Oil Pollution Response (2009).
4. Afenyo, M., J. C., and N. A. K. Y. (2019). Climate change and Arctic shipping: A method for assessing the impacts of oil spills in the Arctic. *Transportation Research Part D: Transport and Environment*, 77, 476-490.
5. Afenyo, M., Ng, A. K. Y., and Jiang, C. (2022). A Multiperiod Model for Assessing the Socioeconomic Impacts of Oil Spills during Arctic Shipping. *Risk Analysis*, 42(3), 614–633. <https://doi.org/10.1111/RISA.13773>
6. Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic (MOSPA). (2013).
7. Ahoniemi, A. (2016). Excerpts from Chapters 2, 4 and 5 Excerpt from Nacka municipality's oil control plan.
8. Akureyri fire department. (2024). Akureyri Fire Department Fire Prevention Plan.
9. Alaska Department of Environmental Conservation. (2016).. Alaska Unified Plan.
10. Alaska Department of Environmental Conservation. (2022). Arctic And Western Alaska Area Contingency Plan. <https://dec.alaska.gov/spar/ppr/contingency-plans/response-plans/Arctic-western-area/>
11. Alaska Division of Homeland Security and Emergency Management Planning Section. (n.d.). Small Community Emergency Response Plan. Retrieved October 16, 2024, from <https://ready.alaska.gov/Plans/SCERP>
12. Alaska Oil Spill Commission. (1990). *Spill: The Wreck of the Exxon Valdez Final Report*.
13. Alaska Regional Response Team. (2010). Unified Plan-The Alaska Federal/State Preparedness Plan for Response to Oil and Hazardous Substance Discharges/Releases.
14. Alaska Regional Response Team. (2022). Alaska Regional Contingency Plan. <http://www.alaskarrt.org>
15. Alexei Bambulyak, A. K. S. and M. S. (2015). Oil-Spill Response in the Russian Arctic. In S. R. F. and G. H. Leif Christian Jensen (Ed.), *Preview Hardback Handbook of the Politics of the Arctic*. Edward Elgar.
16. Allianz Global Corporation and Specialty (AGCS). (2019). Safety and shipping review: An annual review of trends and developments in shipping losses and safety.
17. Anastasia Qupee. (n.d.). What Guardians Do — Land Needs Guardians. Retrieved November 9, 2024, from <https://landneedsguardians.ca/what-guardians-do>
18. Andre Legare. (n.d.). Marine Ecosystem Monitoring and Emergency Response Chart_Draft2_.
19. Arctic Monitoring and Assessment Programme. (2023). Arctic Monitoring and Assessment Programme: Data Compilation.
20. Arnautu, D., and Dagenais, C. (2021). Use and effectiveness of policy briefs as a knowledge transfer tool: a scoping review. *Humanities and Social Sciences Communications* 2021 8:1, 8(1), 1–14. <https://doi.org/10.1057/s41599-021-00885-9>

21. Avannaata Municipal Administration. (2019). Avannaata Municipality Meeting Report.
22. Batten, B.T. 1990. Press interest in sea otters affected by the T/V Exxon Valdez oil spill: a star is born. In K. Bayha and J. Kormendy (eds). Sea otter symposium: proceedings of a symposium to evaluate the response effort on behalf of sea otters after the Exxon Valdez oil spill into Prince William Sound, Anchorage, Alaska, 17-19 April 1990. US Fish and Wildlife Service Biological Report 90:32-40. (2)
23. Belle Mickelson, E. T. J. B. J. B. (1990). ALASKA OIL SPILL CURRICULUM (Elizabeth Trowbridge, Ed.). The Oil Spill Recovery Institute Prince William Sound Science Center.
24. Bi, H., Wang, Z., Yue, R., Sui, J., Mulligan, C. N., Lee, K., Pegau, S., Chen, Z., & An, C. (2025). Oil spills in coastal regions of the Arctic and Subarctic: Environmental impacts, response tactics, and preparedness. In *Science of the Total Environment* (Vol. 958). Elsevier B.V. <https://doi.org/10.1016/j.scitotenv.2024.178025>
25. Björn Forsman. (1997). The oil is loose. Handbook on municipal oil protection. Statens räddningsverk.
26. Björn Forsman. (2012). ENSACO - Environmental Atlas. www.sspa.se
27. Blake James Wergeland. (2012). A High North Strategy? An assessment of Place-vulnerability in Finnmark Country and the Norwegian Government's Policies towards Mitigation Oil Spills in Barents Sea. Norwegian University of Life Sciences.
28. Blight, L. K., and Canadian Sea Otter Recovery Team Fisheries and Oceans Canada. (2004). Gap assessment and options report: Oil spill preparedness and sea otters in British Columbia. <https://doi.org/10.13140/RG.2.2.24162.43202>
29. Canada. Tanker Safety Expert Panel, and Canada. Transport Canada. (2013). A review of Canada's ship-source oil spill preparedness and response regime: setting the course for the future. (Ottawa).
30. Canadian Coast Guard. (2022). Marine Spills Contingency Plan-Arctic Chapter (0001).
31. Canadian Coast Guard Central and Arctic Region Regional Response Plan. (2008).
32. Canadian Coast Guard Environmental Response Department. (2005). Keewatin Region, Nunavut Area Plan.
33. CANDEM Agreement between the Government of Canada and the Government of the Kingdom of Denmark for Cooperation Relating to the Marine Environment, Pub. L. No. 19 (1983). <https://www.treaty-accord.gc.ca/text-texte.aspx?id=101887>
34. Carter, N., Dawson, J., Cook, A., and Nunavut, R. B. (2019). Arctic Corridors and Northern Voices Governing Marine Transportation in The Canadian Arctic. <https://doi.org/10.20381/ruor39361>
35. Chang, S. E.; S. J.; D. K.; P. M. (2014). Consequences of oil spills: A review and framework for informing planning. 19(26).
36. Charlotte Gyllenhammar, and Linn Arvidsson. (2007). Working Environment in Connection with cleanup after oil spills on beaches-The rescue service.
37. Chen, B., Zhang, B., Li, P., Cai, Q., Lin, W., & Liu, B. (2012). From challenges to opportunities: towards future strategies and a decision support framework for oil spill preparedness and response in offshore Newfoundland and Labrador.
38. Chen, J., Zhang, W., Wan, Z., Li, S., Huang, T., and Fei, Y. (2019). Oil spills from global tankers: Status review and future governance. In *Journal of Cleaner Production* (Vol. 227, pp. 20–32). Elsevier Ltd. <https://doi.org/10.1016/j.jclepro.2019.04.020>
39. Chesterfield Inlet New Power Plant Project Submission to Nunavut Planning Commission. (n.d.).
40. Christopher Covert. (2016). Small Community Oil Spill Preparedness Research Project Item Type Report. <http://hdl.handle.net/11122/7795>

41. Christiansen, F. G. (2021). Greenland petroleum exploration history: Rise and fall, learnings, and future perspectives. *Resources Policy*, 74. <https://doi.org/10.1016/j.resourpol.2021.102425>
42. Commission. (2008). Commission on Emergency Prevention and Response and Provision of Fire Security of the Government of the Murmansk Region.
43. Community and Government Services. (2022). Nunavut Emergency Management. Annual Report 2021-2022. Iqaluit.
44. Cook Inlet Regional Citizens Advisory Council. (n.d.). Advisory Council Model.
45. Copland L, D. J. and C. A. (2019). Impacts of climate change on navigational choke points for ships operating in the Canadian Arctic Report to Transport Canada Northern Transportation Adaptation Initiative.
46. County Administrative Board in Västra Götaland County, U. for C. P. and S. (2023). Regional Oil Protection Plan for Västra Götaland county.
47. Crown-Indigenous Relations and Northern Affairs Canada. (2019). Crown-Indigenous Relations and Northern Affairs Canada. Arctic and Northern Policy Framework: Safety, Security, and Defence Chapter.
48. Daisy, N. S., Hafezi, M. H., Liu, L., and Lee, K. (2022). A Comprehensive Review of Canadian Marine Oil Spill Response System through the Lens of Decanting Regulations and Practices. In *Journal of Marine Science and Engineering* (Vol. 10, Issue 9). MDPI. <https://doi.org/10.3390/jmse10091310>
49. DANISH DEFENCE COMMAND. (2023). Government of Denmark- Preparedness to combat pollution of the sea with oil and other harmful substances (Contingency Plan)).
50. Danish Emergency Management Agency. (2022). Chemical, Biological, Radiological, Nuclear, and high yield Explosives (CBRNE) incidents Guidelines for efforts.
51. Dawson, J., P. L., H. S., C. L., and J. M. (2018). Temporal and spatial patterns of ship traffic in the Canadian Arctic from 1990 to 2015. *Arctic*, 71(1), 15–26.
52. Dawson, J., Pizzolato, L., Howell, S. E. L., Copland, L., and Johnston, M. E. (2018). Temporal and spatial patterns of ship traffic in the Canadian Arctic from 1990 to 2015. *Arctic*, 71(1), 15–26. <https://doi.org/10.14430/Arctic4698>
53. DeCola, T.L. Robertson, K.M. Trimpert., and E.G. (2001, July). Fostering Community Support for Community Planning Projects in Rural Alaskan Communities. Proceedings of the 12th Biennial Coastal Zone Conference.
54. Department of Environmental Conservation. (2015). UNIFIED PLAN AND SUB-AREA CONTINGENCY PLANS.
55. Det-Norske-Veritas. (2010). Report for OLF/Norwegian Clean Seas Association for Operating Companies - Summary of Differences between Offshore Drilling Regulations in Norway and U.S. Gulf of Mexico.
56. Devens, J. (2000). Community involvement versus big oil A Case Study of the Policy Process. www.pwsrca.org
57. Egorov S.A, Z. V. B. and Z. S. V. (2008). Environmental aerial–space monitoring in the extraction of hydrocarbon raw materials. *Oil and Gas of Arctic Shelf 2008. Proceedings of International Conference. Workshop 5. Ecology, Environmental Monitoring and Protection. Murmansk*, 139–140.
58. Ekaterina Sych. (2009, June 3). Nikolay Dedkov: “Officials and oil workers are not concerned about the well-being of the Arctic.” Bellona Environmental Transparency Center.

59. Environment and Climate Change Canada. (2021). MARINE POLLUTION SPILLS CANADIAN ENVIRONMENTAL SUSTAINABILITY INDICATORS. <https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/marine-pollution-spills.html>
60. Environment and Climate Change Canada. (2022a). Environment and Climate Change Canada. Inuit Guardians.
61. Environment and Climate Change Canada. (2022b, April 25). The government of Nunavut ordered to pay a \$100,000 fine for the Rankin Inlet diesel fuel spill into Hudson Bay - Canada.ca. Environment and Climate Change Canada. <https://www.canada.ca/en/environment-climate-change/news/2022/04/government-of-nunavut-ordered-to-pay-100000-fine-for-rankin-inlet-diesel-fuel-spill-into-hudson-bay.html>
62. Environment and Climate Department Tarnby City Center. (2023). Tarnby Municipality Beach cleaning plan 2023.
63. Environmental Agency, Transport Office, and The Land Guard of Iceland. (2022). Action plan for response to acute pollution outside port areas and the use of ship hangouts.
64. Eva Blidberg, Ingrid Håstad, and Petra Wallberg. (2011). General Oil Protection Plan for five municipalities in Södertörn; Haninge, Nacka, Nynäshamn, Södertälje and Tyresö-Nacka Municipality Oil Prevention Plan.
65. Fedina, M. (2017). OIL SPILLS: A PUBLIC ORGANIZATIONS AND INDIGENOUS PEOPLES' PERSPECTIVE THE CASES OF THE KOMI REPUBLIC AND NENETS AUTONOMOUS OKRUG (RUSSIA). University of Finland.
66. Figenschau, C. (2015). Emergency preparedness organization for offshore oil recovery operations in Norway EN310E: Master of Science in Energy Management.
67. Fisheries and Oceans Canada. (2022). Northern Low-Impact Shipping Corridors.
68. Fisheries and Oceans Canada, and Canadian Coast Guard. (2020). Canada's Oceans Protection Plan Pan-Atlantic Report.
69. Frisso, G. M. (2022a). Vulnerability, Arctic Indigenous Groups and Oil Spills. Yearbook of International Disaster Law Online, 3(1), 352–373. https://doi.org/10.1163/26662531_00301_014
70. Frisso, G. M. (2022b). Vulnerability, Arctic Indigenous Groups and Oil Spills. Yearbook of International Disaster Law Online, 3(1), 352–373. https://doi.org/10.1163/26662531_00301_014
71. Gary Stern, and Eric Collins. (2024). GENICE II Research Oversight Committee (ROC) Science Report.
72. GENICE II Program - Canadian Watershed Information Network. (2024). <https://canwin-datahub.ad.umanitoba.ca/data/en/project/genice-ii-program>
73. Genome Canada. (2022, July 26). GENICE II: Reimagining Monitored Natural Attenuation as an Oil
74. Gondar, D. (2016). Inuit Knowledge and Environmental Assessment in Nunavut, Canada.. Sustain Science, 11, 153–162.
75. Government Decree on Oil Spill Response (249/2014), Pub. L. No. 249 (2014).
76. Government of Canada, G. of N. G. of the N. Territories. (2014).. Northwest Territories – Nunavut Spills Working Agreement.: Aboriginal Affairs and Northern Development.
77. Government of Greenland. (2014). Greenland's oil and mineral strategy 2014-2018(Appendices).
78. Government of Northwest Territories. (2018, May 25). GNWT launches new online spill reporting and tracking tool | Government of Northwest Territories. Government of Northwest Territories.

<https://www.gov.nt.ca/en/newsroom/news/gnwt-launches-new-online-spill-reporting-and-tracking-tool>

79. Government of Northwest Territories and Government of Nunavut. (1998). Environmental Protection Act | CanLII. <https://www.canlii.org/en/nu/laws/stat/rsnwt-nu-1988-c-e-7/latest/rsnwt-nu-1988-c-e-7.html>
80. Government of Nunavut. (n.d.). Environmental Guideline Spill Contingency Planning and Reporting Regulations. www.gov.nu.ca/environment/
81. Government Of The Russian Federation On The Unified State System Of Prevention And Liquidation Of Emergency Situations, Pub. L. No. 794 (2003).
82. Greenland Command. (2009). Contingency Plan For Greenland Command To Combat Pollution Of The Sea With Oil And Other Harmful Substances In The Water Beyond Greenland (Main Plan) Part 1.
83. Gudimov A.V. and Denisov V.V. (2008). From traditional biomonitoring to continuous ecological biomonitoring in the near future. *Oil and Gas of Arctic Shelf 2008. Proceedings of International Conference. Workshop 5. Ecology, Environmental Monitoring and Protection.*, 96–99.
84. Gyllenhammar, C., and Arvidsson, L. (2005). Emergency services working environment in the context of oil spill clean-up operations on beaches 2007-12-20. www.DeepL.com/pro
85. Halland County Administrative Board. (2022). Regional oil protection plan for Halland county 2022. www.lansstyrelsen.se/halland
86. Hanna Odén, Annika Tegeback, and Jonas Fejes. (2011). Follow-up after oil cleanup for Swedish Civil Contingencies Agency. www.ivl.se
87. Hänninen, N., Adetunji, A., and Pavlov, V. (2020). Oil Spill Response Infrastructure in the NPA region Project report. <http://app4sea.interreg-npa.eu>
88. Helsinki City Rescue Department. (n.d.). Expertise at sea | Helsinki City Rescue Department. Retrieved November 21, 2024, from <https://pelastustoimi.fi/en/helsinki/services/rescue-operations/special-situations-and-expertise/expertise-at-sea>
89. Hietala, M., and Lampela, K. (2018). Equipment guides for oil spill response environmental management guidelines 4 | 2018 Environmental Protection Ministry of the Environment. www.DeepL.com/pro
90. Holderied, K., and Aderhold, D. (2018). Exxon Valdez Oil Spill Long-term Monitoring Program (Gulf Watch Alaska) Final Report Science Coordination and Synthesis for the Long-term Monitoring Program Exxon Valdez Oil Spill Trustee Council Project 16120114-H Final Report.
91. Hønneland G. and Jørgensen J.H. (2006). *The ups and downs of environmental governance*. Lanham: University Press of America, 142–161.
92. Hughes, L. (2017). *Ship-Based Oil Spill Response Capacity in the Beaufort Sea*. Report to WWF Canada. :
93. Inatsisartut. Inatsisart Act No. 14 of 26 May 2010 on Rescue Preparedness in Greenland and Fire and Explosion Prevention Measures., Pub. L. No. 14 (2010).
94. Inuit Tapiriit Kanatami.: a. Arctic and Northern Policy Framework: Inuit Nunangat.: ITK. (2019).
95. Inslee, J. (2013). *A Changing Horizon: Building Community Oil Spill Response Capacity in the Arctic*.
96. Intermunicipal Committee against acute pollution in Western Finnmark. (2023). Cooperation agreement on the Municipal Task Community “Intermunicipal Committee against acute pollution

- in Western Finnmark”-between the municipalities of Alta, Hammerfest, Hasvik, Kautokeino, Loppa and Måsøy municipalities.
97. International Environmental Organization of Municipalities. (2022). International Environmental Organization of Municipalities KIMO Denmark-Annual Report 2022.
 98. International Guide for the Assessment of Oil Spill Response Planning and Preparedness. (2023). www.arpel.org
 99. International Tanker Owners Pollution Federation Limited. (2014). SAMPLING AND MONITORING OF MARINE OIL SPILLS.
 100. International Tanker Owners Pollution Federation Limited. (2018a). COUNTRY AND TERRITORY PROFILES. <http://www.itopf.org/knowledge-resources/countries-territories-regions/>
 101. International Tanker Owners Pollution Federation Limited. (2018b). GREENLAND COUNTRY PROFILE -A summary of oil spill response resources and arrangements worldwide.
 102. Ivanova, M. (2011). Oil spill emergency preparedness in the Russian Arctic: A study of the Murmansk region. *Polar Research*, 30(SUPPL.1). <https://doi.org/10.3402/polar.v30i0.7285>
 103. Ivanova, M., and Sydnes, A. K. (2010). Interorganizational coordination in oil spill emergency response: A case study of the Murmansk region of Northwest Russia. *Polar Geography*, 33(3–4), 139–164. <https://doi.org/10.1080/1088937X.2010.545755>
 104. Jakobsen, U. (2022). Natural Hazards and Emergency Prevention, Preparedness and Response in Greenland. www.marpart.no
 105. Jelena Savic. (2020). More effective protection in raw water sources VÄNERN, Sweden Jelena Savic Civil Protection Methodology Development Unit.
 106. John Van Dusen. (2016, July 14). 500 litres of fuel spilled into Hudson Bay near Rankin Inlet. CBC News.
 107. Jonas Henriksson, Johanna Stadmark, and Sofie Hellsten. (2018). National priority layer in the Digital Environmental Atlas. To use in connection with an oil spill.
 108. Joselito Guevarra. (2008). INTEGRATING LOCAL COMMUNITIES AND RESOURCES INTO OIL SPILL PLANNING, PREPAREDNESS AND RESPONSE.
 109. Julia Fredriksson, Sonja Dobo, and Margaretha Ericsson. (2015). Mapping of Institutional Architecture for Protection from Oil Spills in the Baltic Sea Region -Survey results and report.
 110. Julke Brandt. (n.d.). Post Spill Monitoring-Case Study and Lessons Learned.
 111. Kalinka O.P, S. A. A. and V. P. S. (2008). Assessment of vulnerability to oil contamination of Kola Bay coasts. *Oil and Gas of Arctic Shelf 2008. Proceedings of International Conference. Workshop 5. Ecology, Environmental Monitoring and Protection.*, 174–178.
 112. Kalle Isaksson. (2023). The accident year is 2023. National Conference Oil Damage Protection 2023.
 113. Kevin Knapp. (2023). ‘Ongoing monitoring’. In Discussion Notes with a staff of the Canadian Coast Guard meeting 15 December 2023.
 114. Kikkert P., and Lackenbauer W.P., b. (2019). Bolstering Community-Based Marine Capabilities in the Canadian Arctic. 15(2):. *Canadian Naval Review*, 15(2), 11-16.
 115. Kikkert P., P. C. A., and L. W. P. (2023). Mitigating the Tyranny of Time and Distance: Community-based Organizations and Marine Mass Rescue Operations in Inuit Nunangat. In: In Bartenstein, K, and Chircop A., eds. *Shipping in Inuit Nunangat. Governance Challenges and Approaches in Canadian Arctic Waters*. Brill Nijhoff.
 116. Kingdom of Denmark. (2011). Kingdom of Denmark Strategy for the Arctic 2011– 2020.

117. Kitka, J. (2018). Public Safety and Security in Greenland, Arctic Canada, and Alaska.
118. Koshlaba S.N. (2015). Organization of interdepartmental interaction during the liquidation emergency oil spills // Problems of prevention and elimination of emergencies in the Arctic, including issues of emergency oil spills: All-Russian Research Institute for Problems of Civil Defence and Emergencies Ministry of Emergencies of Russia, 92–97.
119. Lalonde S, and Bankes, N. (2023). Indigenous Self-Determination and the Regulation of Navigation and Shipping in Canadian Waters. In Shipping in Inuit Nunangat. Governance Challenges and Approaches in Canadian Arctic Waters. Brill Nijhoff.
120. Légaré, A., R. M., and Anderson, N. (2009). Nunavut Tunngavik Inc. An Examination of its mode of Operation and its Activities. In: Bone.
121. Maaiké Knol, and Peter Arbo. (2014). Oil spill response in the Arctic: Norwegian experiences and future perspectives. *Marine Policy*, 50(PA), 171–177. <https://doi.org/10.1016/j.marpol.2014.06.003>
122. MacNeill, C. M. (2021). Inuit Nunangat Regional Overlap: Reciprocal Harvesting and Wildlife Management Agreements. *American Indian Law Journal*, 9(2), 294-331.
123. Marchenko, N., Andreassen, N., Borch, O. J., Kuznetsova, S., Ingimundarson, V., & Jakobsen, U. (2018). Arctic Shipping and Risks: Emergency Categories and Response Capacities. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation*, 12(1), 107–114. <https://doi.org/10.12716/1001.12.01.12>
124. Marine Spills Contingency Plan – National Chapter (2018).
125. MARINE STRATEGY ACT-Promulgation, Pub. L. No. 1161, Promulgation of the Marine Strategy Act (2019).
126. Matishov G.G, D. V. V. and S. A. A. (2008). Theory and practice of ecological support of oil-and-gas developments on the Arctic Shelf (intermediate results). *Oil and Gas Arctic from the Arctic Shelf. Proceedings of International Conference. Workshop 5. Ecology, Environmental Monitoring and Protection.*, 14–31.
127. Matveev A.V. (2016). Mathematical modelling of optimization of the structure of Arctic integrated emergency rescue centres of the Russian Emergencies Ministry // Problems of risk management in the technosphere.. 4(40), 105–111.
128. Matveev A.V. (2017). Strategic planning of forces and means of the Russian Emergencies Ministry in the Arctic zone // *National Security and Strategic Planning*. 4(20), 32–42.
129. Ministerial Decree No. 240 Regarding Measures for the Prevention of Oil Pollution., Pub. L. No. 240 (2002). <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC076974/>
130. Ministry of Environment Denmark. (2019). Danish Marine Strategy II focuses on a clean and healthy marine environment. www.mfv.dk.
131. Municipality of Anchorage Office of Emergency Management. (2022). Municipality of Anchorage Comprehensive Emergency Operations Plan.
132. Murmansk region Government. (2008). Oil spill contingency plan for the Murmansk territorial subsystem of the Unified state emergency system.
133. Nacka Municipality. (n.d.-a). Environmental Enforcement Unit | Nacka municipality. Retrieved October 9, 2024, from <https://www.nacka.se/medarbetare/enheter/miljotillsynsenheten/om-enheten/>
134. Nacka Municipality. (n.d.-b). Nacka Municipality Environmental Barometer. Retrieved October 9, 2024, from <https://www.nacka.se/medarbetare/enheter/miljotillsynsenheten/om-enheten/>
135. Natalia Andreassen, Emmi Ikonen, and Odd Jarl Borch. (2019). Organizing emergency response in the European Arctic: A comparative study of Norway, Russia, Iceland and Greenland.

136. National Collaboration Group for Oil Damage Prevention. (2022). Sweden's strategy for oil damage prevention-Action plan until the year 2026.
137. National Cooperative Group for Oil Damage Prevention. (2014a). Sweden's strategy for oil damage prevention– Background report.
138. National Cooperative Group for Oil Damage Prevention. (2014b). Sweden's strategy for oil damage prevention (Strategy). National Cooperative Group for Oil Damage Protection.
139. National Cooperative Group for Oil Damage Prevention. (2021). Sweden's strategy for oil damage prevention strategy.
140. National Oil and Hazardous Substances Pollution Contingency Plan (2015).
141. Nuka Research and Planning Group, L. and M. S.-L. and M. C. (2004). Combining the Firehouse Model and Community-based Response Teams for an Improved Regional Oil Spill Response System in Alaska Report to Cook Inlet Regional Citizen's Advisory Council and Prince William Sound Regional Citizens' Advisory Council.
142. Nuka Research and Planning Group. (2005). Community Oil Spill Response Forum Final Report to Prince William Sound Regional Citizens Advisory Council and Cook Inlet Regional Citizens Advisory Council.
143. Nuka Research and Planning Group, L. P. C. L. (2010). OIL SPILL PREVENTION and RESPONSE IN THE U.S. ARCTIC OCEAN.
144. Nunavut General Monitoring Plan. (2022). Nunavut General Monitoring Plan. 2019-2022, Call for Proposals. Iqaluit: Nunavut General Monitoring Plan.
145. Nunavut Land Claim Agreement, Pub. L. No. 1 (1993).
146. Odd, N. A., Borch, J., and Ikonen, E. (2019). Organizing emergency response in the European Arctic: A comparative study of Norway, Russia, Iceland and Greenland Editors.
147. Odd, N. A., Borch, J., and Schmied, J. (2018). Maritime emergency preparedness resources in the Arctic-capacity challenges and the benefits of cross-border cooperation between Norway, Russia, Iceland and Greenland MARPART Project Report 4 Editors.
148. Oil Pollution Act (OPA) of 1990, Pub. L. No. 2701, 2701 (1990). <https://www.epa.gov/laws-regulations/summary-oil-pollution-act>
149. Olga Sarkova, and Axel Kelly. (2015). Analysis of our regulations and authorities' roles in Russia in case of transboundary oil spill in the Barents Sea. www.vipsyst.com
150. On a Unified State System of Emergency Prevention and Response, Pub. L. No. 794 (2003).
151. On Approval of the Rules on Development and Endorsement of Oil Spill Prevention and Response Plans on the Territory of the Russian Federation. Order No. 621 of 28 December 2004, Pub. L. No. 621 (2004).
152. On the Commission for Emergency Prevention and Response and Provision of Fire Security of the Murmansk Region Government, Pub. L. No. 160 (2009).
153. Order of the government of the Russian federation of April 15, 2002, No. 240, Pub. L. No. 240 (2002).
154. O'Rourke, R. (2011). Changes in the Arctic: Background and Issues for Congress.
155. Pålsson, J. (2016). Oil spill preparedness in Sweden: prevention, planning, and Oil spill preparedness in Sweden: prevention, planning, and response for large accidents response for large accidents [World Maritime University]. https://commons.wmu.se/all_dissertations

156. Pankratova M.V. (2022). Functional model of control of forces and means of the Ministry of Emergency Situations. Russia in the elimination of oil and oil product spills in the Arctic zone of the Russian Federation. <http://vestnik.igps>
157. Perkins, R., and Loring, P. (2014a). =Environmental Impacts of Arctic Oil Spills and Arctic Spill Response Technologies Literature Review and Recommendations Arctic Oil Spill Response Technology Joint Industry Programme.
158. Picou, J. S., Gill, D. A., Dyer, C. L., Curry, E. W., and Picou, J. S. (1992). Disruption and stress in an Alaskan fishing community: initial and continuing impacts of the Exxon Valdez oil spill.
159. Pizzolato, L., Howell, S. E. L., Derksen, C., Dawson, J., and Copland, L. (2014). Changing sea ice conditions and marine transportation activity in Canadian Arctic waters between 1990 and 2012. *Climatic Change*, 123(2), 161–173. <https://doi.org/10.1007/s10584-013-1038-3>
160. Prince William Sound Regional Citizens Advisory Council. (2024a). Community Outreach. <https://www.pwsrcac.org/outreach/>
161. Prince William Sound Regional Citizens' Advisory Council. (2024). Long-Term Environmental Monitoring. Prince William Sound Regional Citizens' Advisory Council. <https://www.pwsrcac.org/programs/environmental-monitoring/Itemp/>
162. Prince William Sound Regional Citizens Advisory Council. (2024b). Valdez community engages with on-water oil spill response training. <https://www.pwsrcac.org/announcements/valdez-community-engages-with-on-water-oil-spill-response-training/>
163. Prishchepa B.F. and Titov O.V. (2008). Problems of interaction between oil-and-gas and fishing industries on the shelf of Arctic seas. Oil and gas of Arctic Shelf 2008. Proceedings of International Conference. Workshop 5. Ecology, Environmental Monitoring and Protection., 35–36.
164. Regulation on Response to Acute Pollution of Sea and Beaches-, Pub. L. No. 1010 (2012).
165. Regulations on Vessels Used in Oil Recovery Operations, Pub. L. No. 9 (2011).
166. Reykjavik Health Authority. (2024). Environmental Monitoring | Reykjavík. <https://reykjavik.is/umhverfiseftirlit>
167. Robertson, T. L., DeCola, E. G., Alcantra, R., and Wassilie, C. (2003). Fostering A Grassroots Approach to Oil Spill and Emergency Response Planning in The Yukon River Watershed's Native Villages. PROTECTING HISTORICAL, CULTURAL, and WILDLIFE RESOURCES, 887–891. <http://meridian.allenpress.com/iosc/article-pdf/2003/1/887/2350125/2169-3358-2003-1-887.pdf>
168. Rodin, M., Downs, M., Petterson, J., and Russell, J. (1992). Community impacts resulting from the Exxon Valdez oil spill.
169. Rodon., T. (2014). “Working Together”: The Dynamics of Multilevel Governance in Nunavut. *Arctic Review on Law and Politics*, 2(5), 250–270.
170. Russian Federation Governmental Decree as of November 14, 2014, No. 1189 On Organizing of Prevention and Response of Oil Spills on the Continental Shelf of the Russian Federation, in the Inland Sea Waters, Territorial Sea and Adjacent Zone of the Russian Federation, Pub. L. No. 1189 (2014).
171. Seldovia Oil Spill Response Team. (2015). Seldovia Oil Spill Response Team a Local Emergency Response Team 1989-Present.
172. Shavykin A.A. Kalinka O.P. Duhno G.N. Saprygin V.V. Zyryanov S.V. (2008). Assessment of the Barents Sea water area integral vulnerability to oil spills. *Assessment of Environmental Contamination in the Oil and Gas Complex.*, 3, 13–22.
173. Shipping and Aviation Rescue Council. (2020). Rescue Council For Shipping And Aviation The Search And Rescue Service In Greenland Sar-Greenland. www.forsvaret.dk/ako

174. Sikuki Nuuk Harbour A/S. (2022). Sikuki Nuuk Harbour A/S Annual Report 2022-eng.
175. Sikuki Nuuk Harbour A/S. (2023). Sikuki Nuuk Harbour A/S Annual Report 2023.
176. Skinner, S. K., and Reilly, W. K. (1989). The EXXON VALDEZ Oil Spill a Report to the President the National Response Team.
177. Sokolova N. (2008). Relevancy of legislative base. (Nuzen bazobyj zakon). 13.
178. Soromotin Andrey Vitalievich. (2021). Emergency Spills of Oil and Oil Products. Elimination of Consequences of Spills. (Google Translated, Trans.). International agricultural journal, 10.
179. Spansvoll, C. A., Wenke, A., Brude, W., Solberg, K. E., Gl, D., and Holst-Andersen, J. P. (2016). SPE-179264-MS Oil Spill Contingency Study for Greenland-Risk Reduction and Oil Spill Response. <http://onepetro.org/SPEHSE/proceedings-pdf/16HSE/3-16HSE/D031S044R002/1395192/spe-179264-ms.pdf/1>
180. Spill Response Strategy in the Arctic - Genome Canada. <https://genomecanada.ca/project/genice-ii-reimagining-monitored-natural-attenuation-oil-spill-response-strategy-arctic/>
181. St Lawrence Global Observatory. (n.d.). COASTAL ENVIRONMENTAL BASELINE PROGRAM. Retrieved October 25, 2024, from <https://ogsl.ca/en/coastal-environment-baseline-program/>
182. State of Alaska Department of Environmental Conservation. (2024). Community Spill Response Agreements and Local Response Equipment. <https://dec.alaska.gov/spar/ppr/response-resources/local-response/>
183. State of Washington Department of Ecology. (2014). Focus on Vessels of Opportunity. www.oilspills101.wa.gov
184. Stern, G., and Collins, E. (n.d.). 2020 LARGE-SCALE APPLIED RESEARCH PROJECT COMPETITION: GENOMIC SOLUTIONS FOR NATURAL RESOURCES AND THE ENVIRONMENT APPLICATION FORM Project Title: GENICE II: Reimagining Monitored Natural Attenuation as an Oil Spill Response Tool in the Arctic.
185. Swedish authority for social protection and preparedness. (2010). A guide to establishing an oil protection plan for the municipality Manual oil protection plan.
186. Swedish Civil Contingencies Agency. (2011). An evaluation of preparation, abilities and management. The oil spill on Tjörn in 2011.
187. Swedish Coast Guard. (2022). Swedish Coast Guard Annual Report 2022.
188. Swedish Rescue Agency. (2006). Updated supplement of the Oil is Loose Handbook.
189. Tarnby Municipal Board. (2012). Tarnby Municipality Emergency Preparedness Plan.
190. Taukie., D. (2020). Inuit Marine Monitors Track Shipping Traffic in Real-Time. Indigenous Guardians Toolkit:.
191. Taukie, D., and Wilman I. (2019). Inuit Marine Monitoring Program. Concept of Inuit-Led Marine Monitoring in Nunavut.
192. Tessier C. (2019). The policy brief: a tool for knowledge transfer.
193. The authority for social protection and preparedness. (2011). Municipal Oil Protection, Environmental Atlas. http://www.gis.lst.se/ivl/faktablad/Manual_Digital_Miljoatlas.pdf
194. The authority for social protection and preparedness regulations and general advice on the content and structure of the municipality's action program for preventive activities and emergency services., Pub. L. No. 1, Ordinance (2021).
195. The Emergency Management Act Consolidation Act No. 660 of 10 June 2009. Applicable (The Emergency Management Act), Pub. L. No. 660, The Emergency Management Act (2009).

196. The National Audit Office. (2024). The Danish Ministry of Defence's marine pollution preparedness and response to oil and chemical spills in Danish Waters-Extract from Rigsrevisionen's report submitted to the Public Accounts Committee 2023-2024.
197. The Norwegian Sea and Water Authority. (2020). Marine strategy for the North Sea and the Baltic Sea Monitoring program 2021-2026. www.havochvatten.se
198. The Shipping and Aviation Rescue Board. (2017). The Shipping and Aviation Rescue Board annual report for the sea and air rescue service in Greenland 2016.
199. The Swedish Agency for Community Protection and Preparedness. (2021a). Handbook - Content and structure of the municipalities' action programs according to the act on protection against accidents.
200. The Swedish Agency for Community Protection and Preparedness. (2021b). Mapping the ability Sweden's oil protection preparedness 2021 Mapping the ability.
201. The Swedish Agency for Community Protection and Preparedness. (2022). Manual in municipal crisis preparedness – 4. Risk catalog – Oil spills and pollution accidents at sea.
202. The Swedish Authority for Community Protection and Preparedness. (2010). Remediation manual for oil on Swedish beaches.
203. Transport Canada. (2018). Canada's Marine Safety and Security System.
204. Transport Canada. (2019). Ship-Source Oil Spill Response and Preparedness Regime Report to Parliament, 2011-2016.
205. Transportation Safety Board of Canada. (2014). Marine Investigation Report M14C0219 - Transportation Safety Board of Canada. <http://www.tsb.gc.ca/eng/rapports-reports/marine/2014/M14C0219/M14C0219.html>
206. Trine Jonassen. (2022, April 26). Government of Nunavut Fined \$100,000 for Hudson Bay Fuel Spill | High North News. High North News. <https://www.highnorthnews.com/en/government-nunavut-fined-100000-hudson-bay-fuel-spill>
207. Tsuksgumchs Rossii. (2010, November). Centre for Crisis Management of the Main Department of the Ministry of Emergencies of Russia in the Murmansk region.
208. Vaughan, S. (2010), 2010 Fall Report of the Commissioner of the Environment and Sustainable Development, Environment and Sustainable Development, Canada.
209. Vesthimmerland Municipality. (2022). Environmental monitoring plan for Vesthimmerland Municipality.
210. Walker, A. H. (2017, May). Strengthening Preparedness and Response Decision-Making at the Local Level: Adaptations to Manage Better and Suffer Less.
211. Walker, A. H., Mcpeek, M., Scholz, D., and Associates, S. and. (2013). Community Engagement Guidance for Oil and HNS Spills. A report for Pembrokeshire County, Wales, UK. 179 pages. <https://doi.org/10.13140/RG.2.1.3613.7683>
212. Walter B. Parker. (1990). Spill: The Wreck of the Exxon Valdez.
213. Webler, T., and Lord, F. (2010a). Planning for the human dimensions of oil spills and spill response. In *Environmental Management* (Vol. 45, Issue 4, pp. 723–738). <https://doi.org/10.1007/s00267-010-9447-9>
214. Webler, T., and Lord, F. (2010b). Planning for the human dimensions of oil spills and spill response. In *Environmental Management* (Vol. 45, Issue 4, pp. 723–738). <https://doi.org/10.1007/s00267-010-9447-9>
215. Western Uusimaa Rescue Department. (2023). HIKLU Accident prevention plan-Western Uusimaa (Google Translate, Trans.).

216. White, G. (2020). *Indigenous Empowerment through Co-Management: Land Claims Boards, Wildlife Management, and Environment Regulations*. UBC Press.
217. Wilson, N. J., Sinclair, J., and Collins, E. (2023). *GENICE II: Reimagining Monitored Natural Attenuation as an Oil Spill Response Tool in the Arctic*. <https://genomeprairie.ca/project/genice-ii/>
218. World Wildlife Fund. (2017). *Oil spill response capacity in Nunavut and the Beaufort sea responding to arctic shipping oil spills: risks and challenges*.