ANNEX F

APPENDIX I –OIL DISPERSANT GUIDELINES FOR ALASKA

The "Oil Dispersant Guidelines for Alaska" provided in this appendix are available on the ARRT website at: http://www.akrrt.org/UnifiedPlan/F-Annex.pdf .

Oil Dispersant Guidelines Advisory Notes:

1. **NOTE:** Effective September 27, 2008, the U.S. Department of the Interior (DOI) no longer approves of the preauthorization of the use of dispersants in Prince William Sound and Cook Inlet in areas referred to as Zone 1. For areas where there is no preauthorization by EPA, ADEC, DOI, and DOC, Paragraph (b) of Section 300.910 of the National Contingency Plan provides that the FOSC, with the concurrence of the EPA representative to the RRT and, as appropriate, the concurrence of the RRT representative from the state(s) with jurisdiction over the navigable waters threatened by the release or discharge, and in consultation with the DOC and DOI natural resource trustees, when practicable, may authorize the use of dispersants that are listed on the NCP Product Schedule. However, because the EPA, ADEC, and DOC continue to support preauthorization of dispersant use in areas previously designated as Zone 1, only consultation with DOI, when practicable, is required for those areas.

2. Revisions to these guidelines are developed by the Science and Technology Committee and approved by the ARRT. The most current version of the guidelines is provided on the ARRT website at: http://www.akrrt.org/UnifiedPlan/F-Annex.pdf.

RRT OIL DISPERSANT GUIDELINES FOR ALASKA

This appendix contains Oil Dispersant Guidelines for Alaska and specific guidelines for Cook Inlet. Both documents were approved by the ARRT in April 1986. The specific guidelines for Prince William Sound were approved by the ARRT on March 6, 1989.

1. Background:

The capability to adequately respond to an oil spill in Alaska can be hampered by the great distances involved, poorly developed transportation networks, an inadequate labor force, limited mechanical spill cleanup technology, and severe weather conditions. The use of oil dispersing chemicals provides a supplemental response method to existing conventional cleanup techniques and allows spill-response personnel some additional control over the type and location of spill impacts.

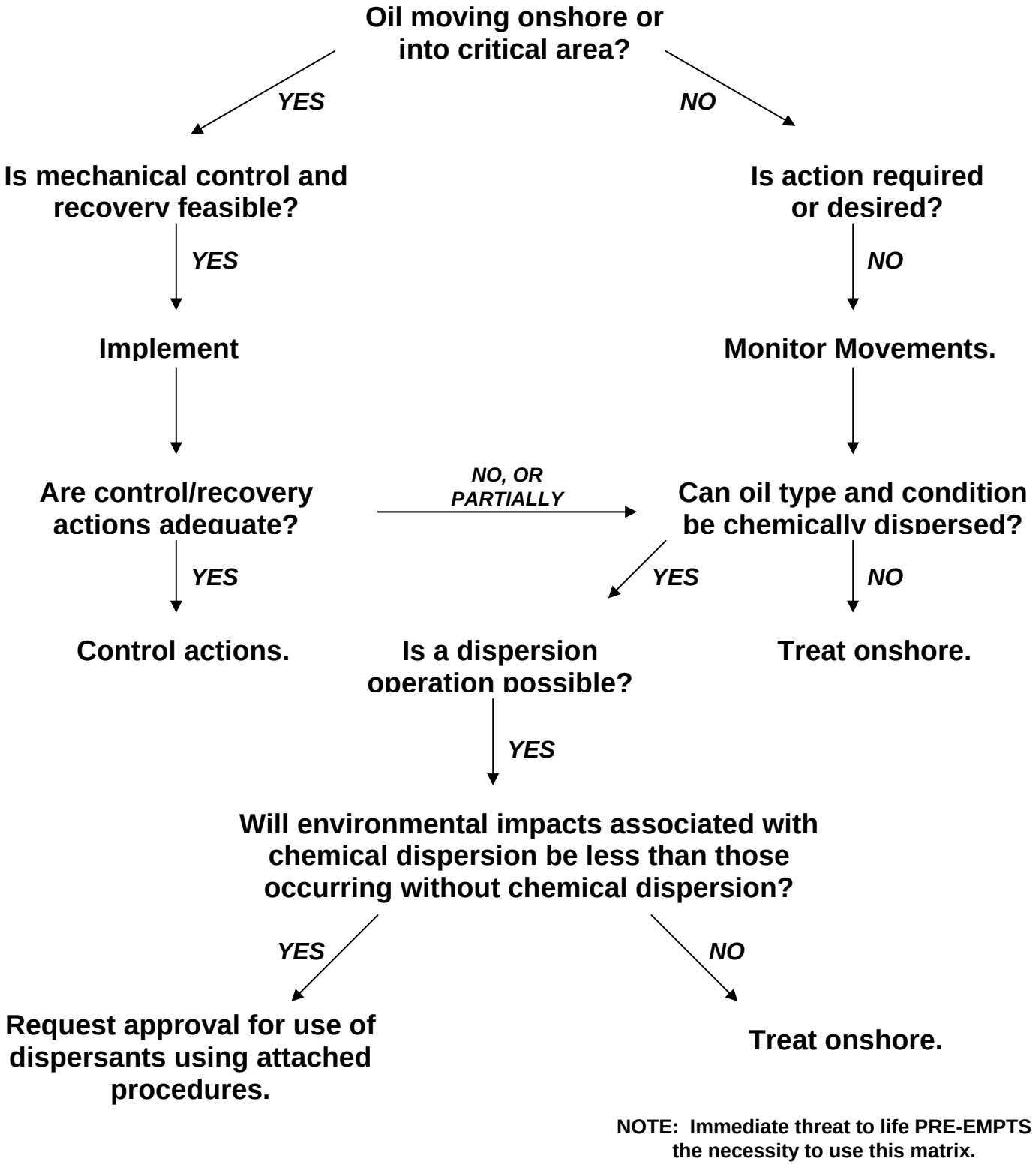
Oil-spill "dispersants" are complex chemical formulations consisting of a blend of surfactants, or detergents, in a mixture of solvents. Dispersants, when applied to a slick of floating oil, reduce the interfacial tension between the oil and the water and thus allow the oil to be broken into small droplets by the action of the wind, waves, and currents. This process disperses oil into the water column and reduces hydrocarbon concentrations on the water surface.

Dispersant use is an important issue in Alaska because Alaskan marine waters support extremely valuable commercial, subsistence, and recreational fisheries; large and important populations of birds and mammals; and a growing oil industry. Since dispersants can be utilized to mitigate the extent of oil-spill impacts, specific resources can be protected, if necessary. For example, some resources such as birds are known to be more vulnerable to spilled oil than others, an acceptable compromise may be to protect these resources by dispersing an oil slick in a less sensitive, deep-water environment. In general, the compromise that must be evaluated is between the short-term impacts of introducing dispersed oil into the upper water column, and the long-term impacts of allowing oil to continue to float on the water surface and/or strand. In many cases, adverse effects from chemically dispersed oil are much less than those that result from stranded oil in biologically sensitive areas, or to sea birds or marine organisms that float at the water surface, such as some fish eggs.

To be effective, dispersants must be applied in a timely manner; oil allowed to weather on the ocean surface becomes difficult, if not impossible, to disperse chemically. At present, as authorized by the National Oil and Hazardous Substances Contingency Plan, the U.S. Coast Guard On-Scene Coordinator (OSC) may use dispersants in response to a spill that endangers human life, or to prevent or substantially reduce hazard to human life. Alternatively, the OSC, with the concurrence of the EPA representative to the ARRT and the State of Alaska, may use those dispersants on the NCP Product Schedule list to mitigate the effects of spilled oil. In either case, the OSC must examine conventional response alternatives, such as containment and cleanup, for comparison to dispersant application. Dispersant use would be considered only when an effective conventional response is not feasible or not totally adequate in containing/controlling the spill. Figure 1 outlines the logic used by the OSC to determine the feasibility of chemically dispersing oil spills in environmentally sensitive areas.

These guidelines are subject to periodic review and update, and are designed to streamline and expedite the decision-making process. They allow the timely and effective use of dispersants as an oil-spill-response tool to minimize environmental impacts. The guidelines are to be in force for the application of dispersants in any marine waters of Alaska.

Figure 1 - Dispersant Decision Matrix



NOTE: Immediate threat to life PRE-EMPTS the necessity to use this matrix.

2. Effects of Dispersants.

Decisions concerning potential dispersant use must be based on an evaluation of potential impacts from dispersed versus undispersed oil since dispersing a slick at one site introduces more oil into the water column than would be caused by a surface slick. This means that effects on water column organisms may be increased at one site so that effects can be decreased or eliminated at other sites. Examples of such compromises include untreated oil threatening highly aggregated populations of surface utilizing organisms (migrating or staging populations of seabirds, breeding sites of birds or mammals) or particularly oil-sensitive coastal areas (spawning, nursery or feeding areas for fish, salt marshes, seagrass beds), and dispersed oil threatening aggregated populations of water column organisms (migrating salmon, fish or crab eggs or larvae).

The effects of oiling on marine birds and fur-bearing marine mammals are well-known: the extremely long residence time of stranded oil and the resulting high probability of chronic impact on both the subtidal benthos and the water column have been illustrated by the Baffin Island Oil Spill (BIOS) experiment (Boehm, 1983). Alternatively, the effects of chemically dispersing oil into the water column are transient, but may be severe.

For the most sensitive organisms, exposure to hydrocarbon concentrations greater than 0.1 parts per million (ppm) for 96 hours may result in the death of 50 percent or more of the exposed organisms (Moore and Dwyer, 1974, corroborated for Alaskan species by Rice et al., 1984); exposure to similar concentrations for lessening periods of time usually results in declining mortalities. Because of the proven rapid decline in the concentrations of hydrocarbons in the water column after the chemical dispersion of an oil slick, it is expected that mortalities will be low. Zooplankton, specifically crustacean larvae and pelagic fish eggs and larvae, are among the most sensitive organisms and will suffer the largest mortalities. Larger and non-surface layer-dwelling organisms will suffer lesser mortalities. However, predicting the exact expected mortalities is difficult due to the rapidly changing concentrations of hydrocarbons in the water column.

In theory, if a slick 0.1-1.0 mm in thickness is completely mixed into a static water column one meter deep, concentrations of dispersed oil of 100-1,000 ppm can be achieved (Table 1). In an actual situation, the water column would not be static, and vertical and horizontal diffusions would rapidly dilute the dispersed oil. In a series of field experiments performed off the coast of New Jersey, a dispersed oil concentration of 100+ ppm was measured in the top one-third meter of the water column one minute after application of the chemical dispersant. A second measurement made one hour after dispersant application indicated that this concentration had declined to 5 ppm. At one meter deep in the water column, the maximum concentration of dispersed oil measured was 30 ppm. At all depths, the measured concentration of dispersed oil declined rapidly until it was almost undetectable at 5 hours after dispersant application (Figure 2; Mackay and Wells, 1983; McAuliffe et al., 1980).

The toxicity of the dispersants presently stockpiled for use in marine waters is low, compared to that of petroleum hydrocarbons. For most of the dispersants presently on the U.S. EPA acceptance list, concentrations of 1 to 30 ppm were lethal to 50 percent of Mysidopsis bahia, a crustacean zooplankter, exposed to that concentration for 96 hours (Table 2). M. bahia is an excellent organism to use in toxicity assays as it is extremely sensitive.

Other marine organisms exhibit LC_{50}'s ranging up to 100,000 ppm for these same dispersants (Table 3). In any case, the possibility of exposing organisms to concentrations of 1 ppm (or greater) of dispersants or dispersed oil for 96 hours, as the result of the dispersion of a real spill, is moderate to low. This is

Figure 2 - **Illustrative Plot of Total Concentration of Oil Under a Chemically Dispersed Slick Formed From 100 Barrels of Dispersant-Treated Oil at Stated Depths as a Function of Time (Mackay and Wells, 1983; McAuliffe et al, 1980)**

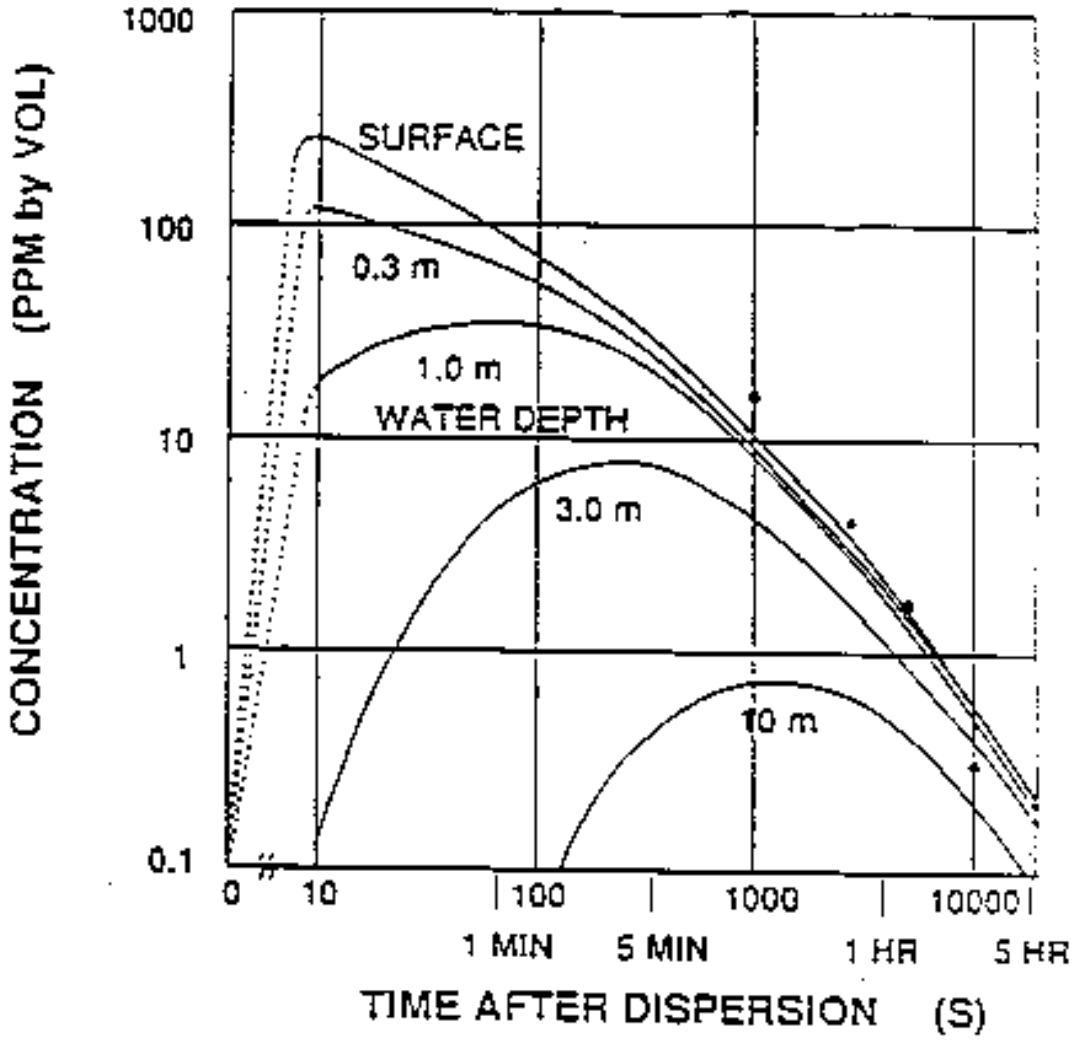


Table 1. Concentrations of Dispersed Oil in Water as Functions of Oil Thickness and Water Depth.

Appearance of Oil on Water	Approximate Oil Thickness (mm)	Concentration of Dispersed Oil in Water (ppm) if Uniformly Mixed, When the Water Depth Is: 1m	2m	5m	10m	20m
Barely visible	4×10^{-5}	0.04				
Silvery sheen	8×10^{-5}	0.08	0.04			
First trace of color	1.5×10^{-4}	0.15	0.08	0.03		
Bright bands of color, iridescent	3×10^{-4}	0.3	0.15	0.06	0.03	
Colors tend to be Dull	1×10^{-3}	1.0	0.5	0.2	0.1	0.05
Colors are fairly dark, little evidence of rainbow tints	2×10^{-3}	2.40	1.0	0.4	0.2	0.1
Brown or black	0.01	10.0	5.0	2.0	1.0	0.5
Black/dark brown	0.1	100.0	50.0	20.0	10.0	5.0
Black/dark brown	1.0	1000.0	500.0	200.0	100.0	50.0

Table 2. Relative Effectiveness and Toxicity of Some Chemical Dispersants on U.S. Environmental Protection Agency Approval List to Mysidopsis Bahia, a Crustacean Zooplankter (Anderson et al., 1985).

Dispersant	(15°C) Dispersant: Oil Ratio (DOR90)*	(25°C) 96-h LC_{50} ppm
Atlantol AT-7	0.130	6.6
BP1100WD	0.009	1.4
Finsol OSR-7	0.038	204.0
Arcochem D-609	0.007	29.0
Corexit 9527	0.009	31.9
Corexit 7664	0.500	515.0
Corexit 8667	0.028	2.0
Petrocon N/T#4	0.018	15.0
Ameriod OSD/LT	0.110	6.7
Slick-A-Way	0.240	16.0
Conco K	0.580	3.5
BP1100X	0.150	17.0
Magnus Maritec	0.012	8.0
Petromend	0.008	3.7

*DOR_{90} is the ratio of dispersant to oil required to disperse 90 percent of the oil (i.e., a low ratio indicates high effectiveness).

Table 3. Acute Lethal Toxicity of Some Oil Spill Dispersants to Marine Organisms--A Selection of Current Data (modified Wells, 1984).

Species/Stage	Dispersant	Threshold Concentrations Expressed as Four-Day LC50's, ppmabc
Invertebrates		
Stony coral (Madracis mirabilis)	Shell Dispersant LTXE	162 (1 day)
Oligochaete (Marionina subterranea)	Corexit 766	
	Finasol OSR-2	>1000
	Finasol OSR-5	
Intertidal limpet	BP1100X	3700 (approx.)
(Patella vulgata)	BP1100WD	270 (approx.)
Crustaceans		
Amphipods (Gammarus spp.)	Water-based dispersants	>10000
	Petroleum-based dispersants	200 " 130
Mysids (Neomysis sp.)	Water-based dispersants	>4500
	Petroleum-based dispersants	-150
Amphipod (Gammarus oceanicus)	AP oil dispersant	10-100 (1.5 days)
Brown shrimp (Crangon crangon)	10 conventional dispersants	3300->10000 (2 days)
	7 concentrated dispersants (unnamed)	2800->10000 (2 days)
Grass shrimp	Corexit 7664	>104 (27°C)
(Palaemonetes pugio)		nontoxic (17°C)
	Atlantic-Pacific	1000 (27°C),
	Gold Crew	1800(17°C)
	Nokomis-3	150 (27°C), 380 (17°C)
		140 (27°C), 250 (17°C)
Fish		
Fish larvae (Pleuronectes platessa, Solea solea)	Corexit 7664	400
Gobies (Chasmichthys,Luciogobius)	Shell dispersant LT	440-480
Stickleback (Gasterosteus aculeatus)	Water-based dispersants	950 " 250
	Petroleum-based dispersants	>10000
Dace (Phoxinus phoxinus)	Water-based dispersants	1400 " 200
Coho salmon (Oncorhynchus kisutch)	BP1100X	1700
Killifish (adult)	AP oil dispersant	Approx. 100 (2 days),
(Fundulus heteroclitus)	(GFC Chemical Co.)	50-100 (3 days)

[a] Unless otherwise noted.

[b] Examples of water-based dispersants are Corexit 7664, Cold Clean 500, and Finasol OSR-7.

[c] Examples of petroleum-based dispersants are Corexit 8667, Corexit 9550, and BP- 1100x.

dependent on the size of the slick treated and the vertical and horizontal diffusivities in the water under and around the slick.

The BIOS, an experimental oil spill designed to examine the "worst case" effects of dispersant use on the biota of nearshore areas in the Arctic, released chemically dispersed oil from a diffuser pipe placed near the bottom of the study bay. Concentrations of dispersed oil exceeding 160 ppm were measured at one point during this release. More widespread and sustained concentrations of 50 ppm for 4 to 5 hours rapidly declined to 0.03-0.05 ppm (Figure 3). Subsequent examination and long-term monitoring over a three year period of the benthic community in this bay revealed that, while there was some stressing of the organisms as indicated by gaping clams immediately after the spill, chemically dispersed oil concentrations of this magnitude and duration had no significant long-term effects on the sediments or the biota (Cross et al., 1984). In comparison, a similar amount of oil allowed to strand without treatment on the beach of a nearby bay is gradually leaching off the beach into the subtidal area, where it is being accumulated by the benthic organisms.

3. General Alaska Dispersant-Use Criteria.

The dispersant use criteria developed for Alaska classify coastal waters into three dispersant use zones. In all cases, the use of dispersants will be based on the determination that the impact of dispersants or dispersed oil will be less harmful than non-dispersed oil. These zones are defined by: 1) physical parameters such as bathymetry and currents; 2) biological parameters such as sensitive habitats or fish and wildlife concentration areas; 3) nearshore human use activities; and 4) time required to respond.

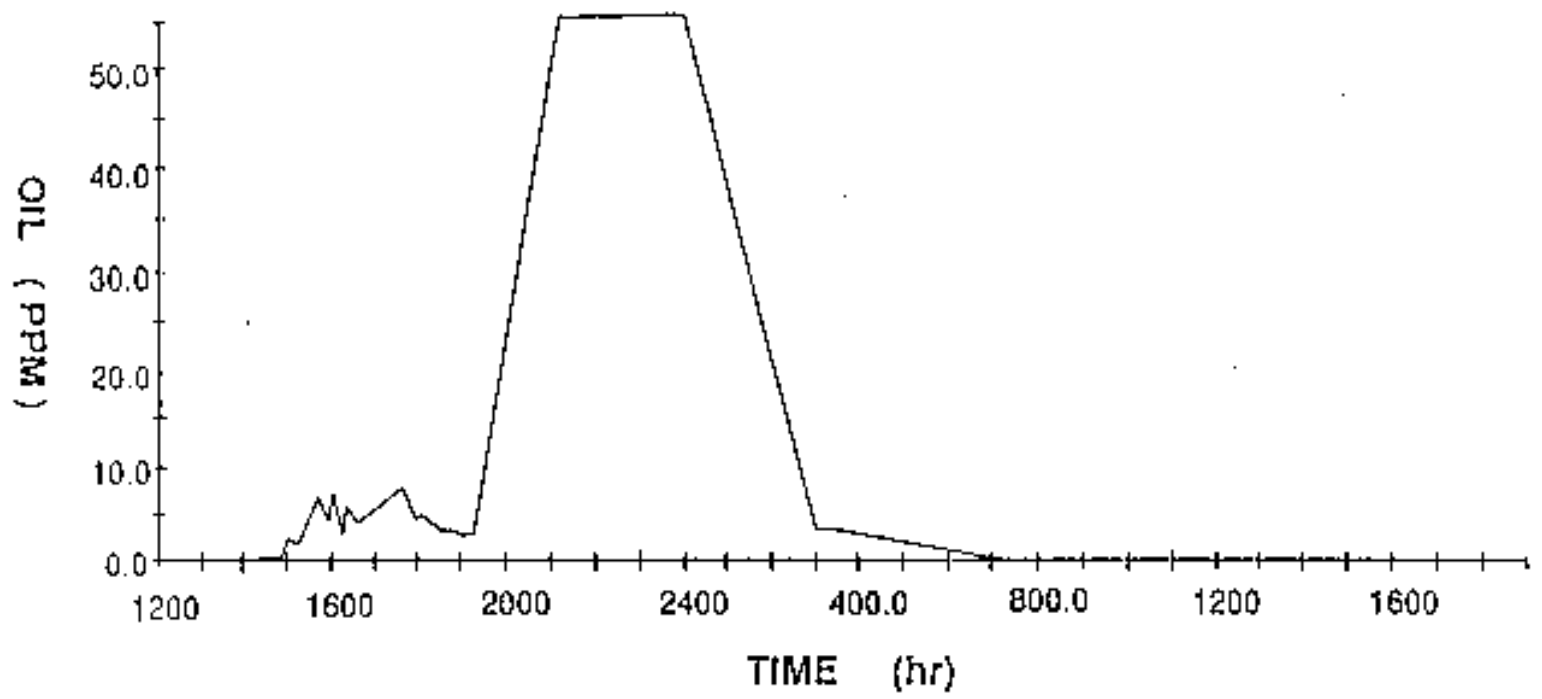
a. Zone 1.

The use of dispersants in Zone 1 is acceptable and should be evaluated after consideration of mechanical means as a response tool to mitigate oil-spill impacts. The OSC is not required to acquire approval from EPA or the State of Alaska prior to use of dispersants in this zone. However, the OSC will notify the EPA and the State of the decision as soon as practicable.

Zone 1 is defined as an area in which dispersant use should be considered as a means to prevent or reduce the amount of oil reaching the shoreline or other sensitive resources, including:

- endangered or threatened species protected by Federal and State governments;
- nesting, spawning, breeding, and nursery areas for mammals, birds, fish, and shellfish;
- fish and wildlife concentration areas where these animals feed, rest, or migrate;
- sensitive marine habitats, including:
    - seagrass beds
    - kelp beds
    - shellfish beds
    - tidal flats
    - marshes
    - shallow subtidal areas
    - low energy bays and harbors
    - rocky intertidal areas;
    - aquaculture and commercial areas which are shallow enough to allow impacts from oil spills; and
    - recreational and industrial areas.

Figure 3 - Concentrations of Dispersed Oil Measured at a Point Approximately 120 m from the Diffuser Pipe (8 m of Depth) Before, During, and After the BIOS Dispersed Oil Release



Zone 1 areas are characterized by water conditions (depth, distance, and currents) that will allow dispersed oil to be rapidly diluted to low concentrations, and are far enough away from sensitive resources that dispersant operations would not cause disturbances. In this zone, there is a significant likelihood that spilled oil will impact sensitive resources, and an immediate response is required in order to mitigate environmental consequences.

b. Zone 2.

The use of dispersants is conditional in Zone 2 in order to protect sensitive wildlife and other resources. The Federal OSC is required to consult with the RRT and obtain approval of the EPA and the State of Alaska prior to the use of dispersants in Zone 2. A spill in Zone 2 must be continuously monitored and the need for dispersant-response actions reappraised accordingly.

Zone 2 areas are characterized by water conditions (depth, distance, and currents) that will allow rapid dilution of dispersed oil to low concentrations, a sufficient distance from sensitive resources that an immediate response is not necessary and dispersant operations would not cause disturbances.

c. Zone 3.

The use of dispersants is not recommended in Zone 3. Dispersants may be used in Zone 3 if, on a case-by-case basis, it is determined that the disturbance of the organisms and/or direct exposure to dispersants or dispersed oil would be less deleterious than the impact of spilled oil. As in Zone 2, the OSC is required to consult with the RRT and obtain approval of the EPA and the State of Alaska prior to the use of dispersants in Zone 3.

Zone 3 is defined as the area immediately in or around the resources requiring protection, including the resources themselves. Dispersant use in this area may disturb resources, may not have adequate time for effectiveness, may directly expose the resources to dispersants, or may expose other resources to unacceptably high levels of dispersed oil. Examples of these resources are provided below:

- endangered or threatened species protected by Federal and State governments;
- nesting, spawning, breeding, and nursery areas for mammals, birds, fish, and shellfish;
- fish and wildlife concentration areas where these animals feed, rest, or migrate:
- sensitive marine habitats, including:
    - seagrass beds
    - kelp beds
    - shellfish beds
    - tidal flats
    - marshes
    - shallow subtidal areas
    - low energy bays and harbors
    - rocky intertidal areas;

- aquaculture and commercial areas which are shallow enough to allow impacts from oil spills; and

- recreational and industrial areas.

4. Oil Spill Response Checklist: Dispersant Use.

The Oil Spill Response Checklist: Dispersant Use in Zone 1, and the Oil Spill Response Checklist: Dispersant Use in Zones 2 and 3 and in Undesignated Areas are included as Tabs C and D, respectively. These checklists serve as guidelines for the FOSC to seek RRT approval for dispersant use. The FOSC will use the incident specific information provided in the checklists in conjunction with the "Oil Dispersant Guidelines for Alaska" as the basis for his/her decision regarding dispersant use.

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TAB A: SPECIFIC GUIDELINES FOR THE USE OF DISPERSANTS IN COOK INLET.

General: Because of the presence of large numbers of commercially valuable adult salmon, that section of Cook Inlet north of a line drawn along the latitude at Anchor Point north of Kachemak Bay is considered to be Zone 3 during the period from July 1 to August 15. The general rationale is presented below and illustrated in Figure 4.

a. Upper Cook Inlet (North of Point Possession and North Foreland). [See Figure 4]

Upper Cook Inlet is unique because the extreme upper portion contains two Zone 3 designations (dispersant use not recommended) which are based upon tidal stages. During the first three hours of an ebb tide, the Zone 3 boundary is roughly defined by the five-fathom isobath. For periods outside this time window, Zone 3 is defined as the area north of a line between Point Possession and North Foreland.

A dual Zone 3 designation is needed because dispersant use during a flood tide could result in relatively high concentrations of dispersed oil impacting shallow waters or intertidal habitats. Restricting dispersant use in this area to the ebb tide period eliminates these concerns while still allowing dispersant use in the northern portion of Upper Cook Inlet. Providing the option for dispersant use in this area is deemed desirable due to:

- the high spill potential;
- the difficulty in mechanically containing spills;
- the extreme tidal fluctuations which rapidly transport spilled oil; and
- sensitive coastal habitats requiring protection from potential oil contamination.

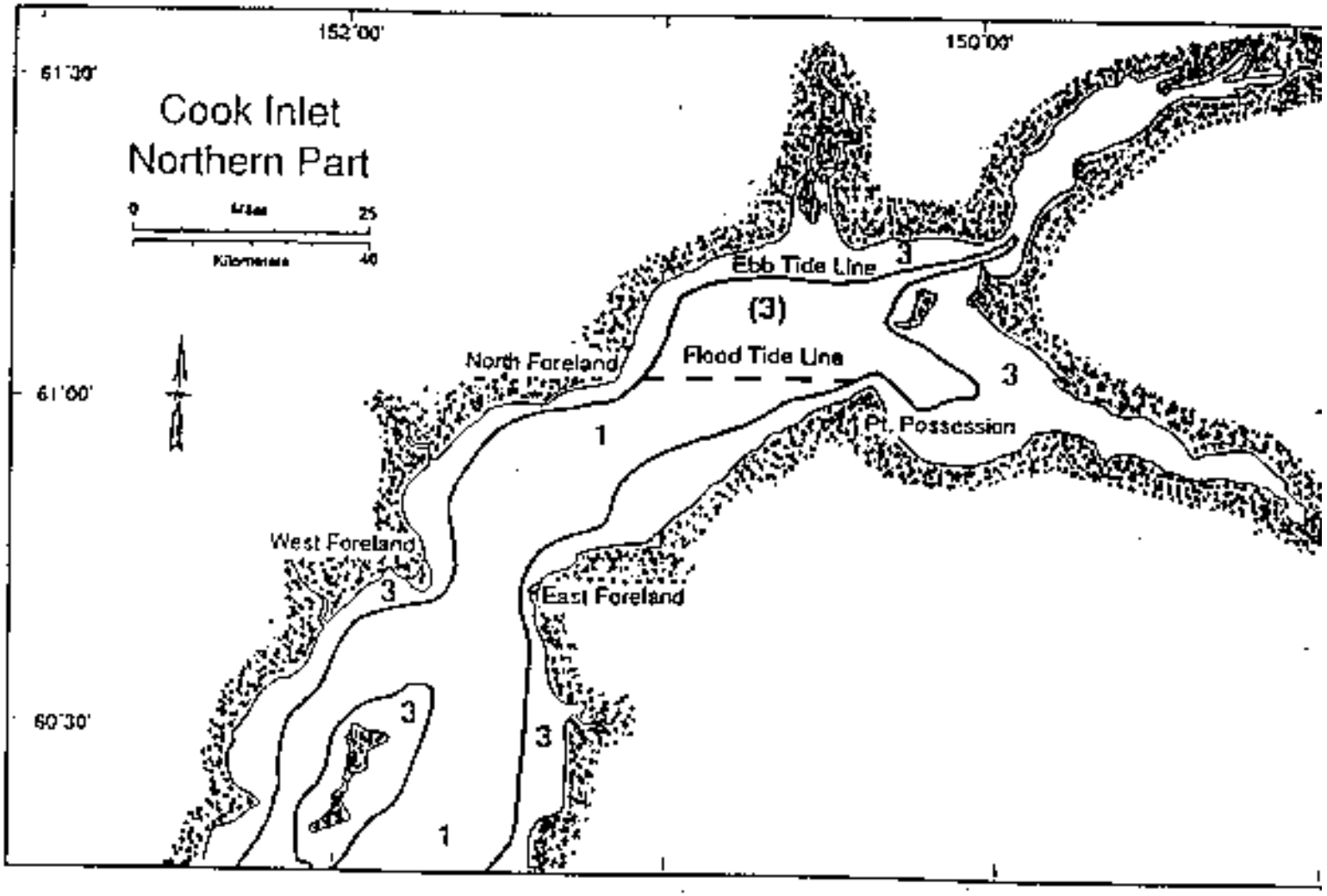
(1) Zone 3 - Ebb Tide.

The Ebb Tide Zone 3, which exists only during the first 3 hours of an ebb tide, occurs shoreward of the five-fathom isobath. This shallower isobath is used because: 1) the ebb tide will rapidly transport the dispersed oil to deeper waters; 2) benthic communities in Upper Cook Inlet exhibit relatively low productivity; and 3) increased water depths from the high tide stage will enhance dilution capabilities.

(2) Zone 1 - Ebb Tide.

The Ebb Tide Zone 1, which exists only during the first 3 hours of an ebb tide, extends outward from the five-fathom isobath. Dispersant use is restricted to an ebb tide period to prevent high concentrations of dispersed oil from being transported to shallow nearshore waters.

Figure 4 - Cook Inlet Dispersant Use Zones, Northern Sector



(3) Zone 3 - Flood Tide.

The Flood Tide Zone 3 is defined as the area north of a line extending from Point Possession to the North Forelands, for all periods outside of the first three hours of an ebb tide. This designation is necessary due to the potential for strong tidal currents to rapidly transport high concentrations of dispersed oil into important shoreline habitats.

b. Middle Cook Inlet - South of a Line Between Point Possession and North Foreland to East Foreland and West Foreland. (See Figures 4 and 5)

(1) Zone 3.

Zone 3 occurs inshore of the five-fathom isobath near the northeast shoreline of this section. The five-fathom isobath is used in this area due to a lack of fish and wildlife resources and the presence of strong currents that run parallel to the shoreline. The Zone 3 designation extends out to the 10-fathom isobath along the southeast shoreline to provide protection to the Swanson River estuary area. Along the west shoreline, the Zone 3 boundary follows the 10-fathom isobath.

(2) Zone 1.

The remaining waters within this Inlet section are designated as Zone 1. This designation will allow for an immediate dispersant use decision to protect important fish and wildlife resources in Cook Inlet.

c. Lower Cook Inlet - South of East and West Forelands.

(1) Zone 3.

Zone 3 occurs inshore of the 10-fathom isobath. The 10-fathom isobath provides ample protection to the razor clam beaches and several river estuaries along the east and west shorelines, including Redoubt Bay where large numbers of birds seasonally reside. Around Kalgin Island, a Zone 3 designation is established along the five-fathom isobath due to strong currents that run parallel to the shoreline and the two- to five-mile buffer provided by the five-fathom isobath. Kachemak and Kamishak Bays are given special protection through an expanded Zone 3 area due to the important fishery resources associated with these bays. The shoreline in the extreme southern portions of Cook Inlet drops off rapidly resulting in the 10-fathom isobath being located very near the shoreline. Consequently, Zone 3 is defined as an area extending one mile out from the shoreline for areas exhibiting such shoreline characteristics. The one-mile buffer distance will allow for dilution of dispersed oil prior to impacting the shoreline or shallow-water areas. See Figure 5 for dispersant use zones.

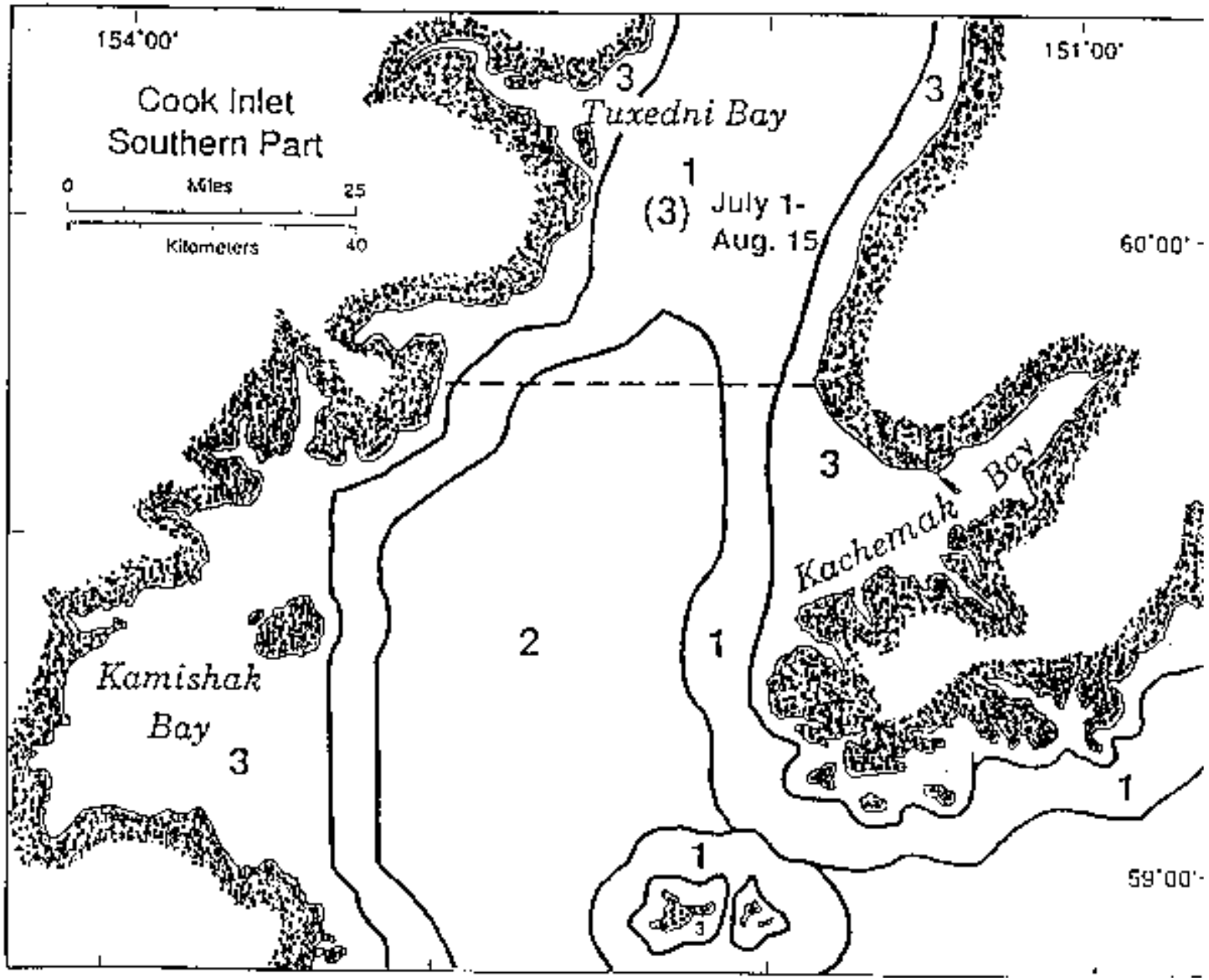
(2) Zone 1.

Zone 1 is identified as an approximately five-mile wide buffer area extending outside of Zone 3. It is believed that the five-mile wide Zone 1 area will provide adequate time to conduct a dispersant response prior to oil entering the sensitive Zone 3 area.

(3) Zone 2.

The remaining waters within this section of Cook Inlet are designated as Zone 2.

Figure 5 - Cook Inlet Dispersant Use Zone, Southern Sector



TAB B: SPECIFIC GUIDELINES FOR THE USE OF DISPERSANTS IN PWS

General. The dispersant use guidelines for Prince William Sound (PWS) focus on the tanker traffic lanes and reflect the remoteness and fjord geomorphology of the Sound. Designation of the tanker lanes primarily as Zone 1 was deemed desirable due to:

- the large volume of oil transported through the sound via these lanes;
- the difficulty in mechanically containing and removing spilled oil; and
- the likelihood that dispersant use would assist in minimizing the environmental effects of a spill, particularly oil contamination of sensitive coastal resources and habitats.

Most of the area outside the tanker lanes has been designated as Zone 3 due to the variety and abundance of biological resources in PWS. The general rationale for the guidelines is presented below. The specific zones are illustrated in **Figure 6.**

a. Port of Valdez and Valdez Arm (North of Latitude 60^{o} 47') - Figure 6.

(1) Zone 3. Tatitlek Narrows and Columbia Bay are designated as Zone 3.

(2) Zone 2. In general, the areas inshore of the 100-fathom isobath and north of Rocky Point and Point Freemantle are designated as Zone 2.

(3) Zone 1/Zone 2 (Seasonal Designation).

This small portion of Prince William Sound consists almost entirely of tanker traffic lanes and includes the tanker loading berths at the terminus of the Trans-Alaska Pipeline. The Port of Valdez and Valdez Arm also support sensitive fisheries resources, such as outmigrating juvenile salmon, herring spawning and rearing areas, immigrating adult salmon; and commercial fishing activities. Consequently, this portion of the Sound has been designated Zone 1 from October 16 to February 28, when fisheries resources are least abundant; and Zone 2 from March 1 to October 15, when fisheries resources and harvest activities are at a peak. The Zone 2 designation will allow a case-by-case decision on dispersant use. Such a decision will be based on the potential for impact(s) to environmental resources.

b. Main Body of Prince William Sound - Figure 7.

(1) Zone 3.

The majority of the waters within this section of Prince William Sound are designated as Zone 3. This provides protection for abundant and diverse biological resources of these areas and eliminates the procedural difficulties of classifying the complicated and extensive shoreline.

Figure 6 - Prince William Sound Dispersant Use (Valdez Arm)

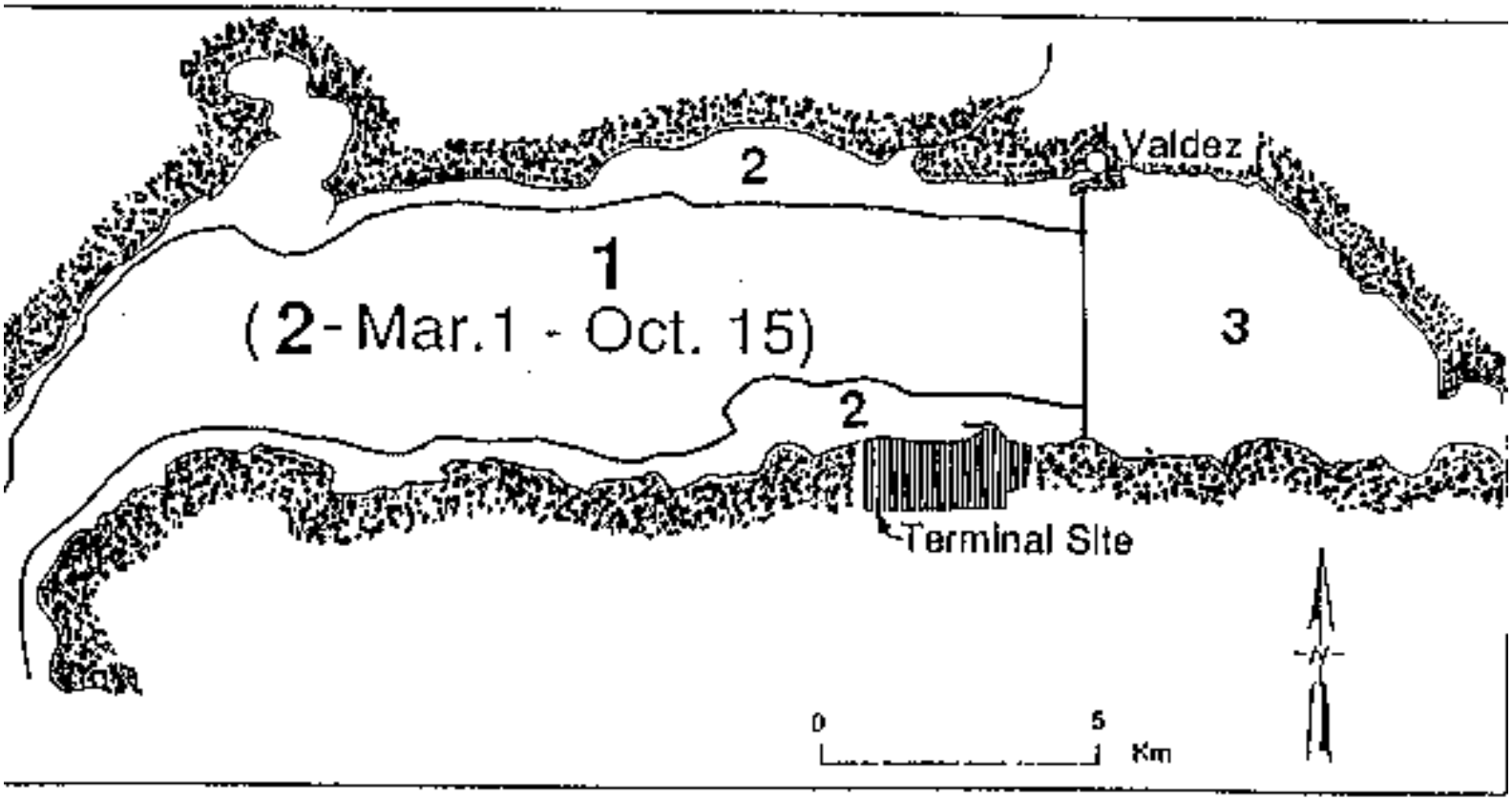


Figure 7 - Prince William Sound Dispersant Use (Main Body)

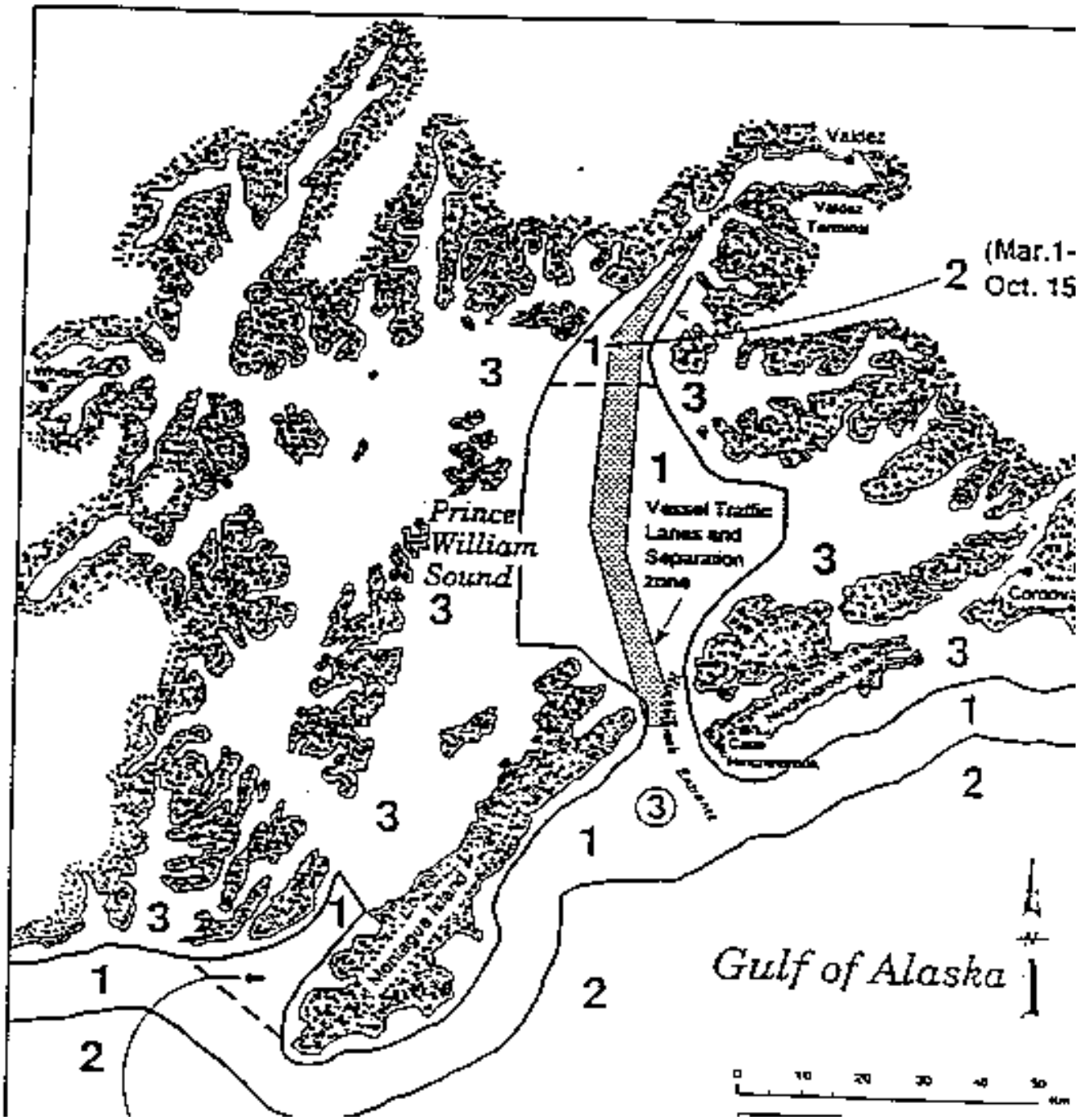
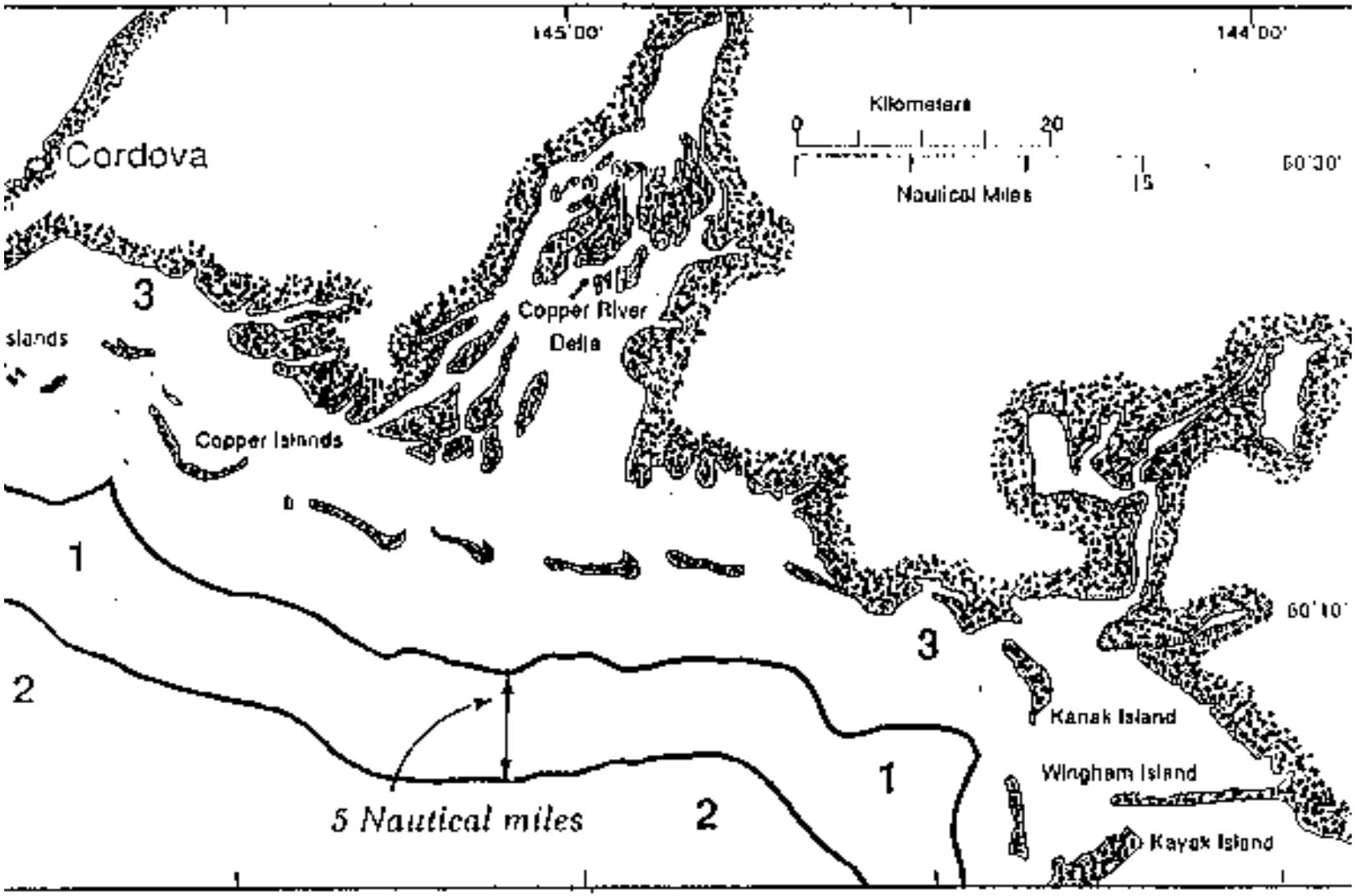


Figure 8 - Prince William Sound Dispersant Use (Copper River Delta)



(2) Zone 1.

The tanker traffic lanes and a variable extending on either side of these lanes are designated as Zone 1. The width of this zone is determined by the need to minimize adverse effects on sensitive resources and the morphology of the Sound.

c. Hinchinbrook Entrance.

(1) Zone 1/Zone 3.

Hinchinbrook Entrance, which is included in the tanker traffic lanes is designated Zone 1, with the exception of an area one nautical mile in radius around Seal Rocks. The area around Seal Rocks is designated as Zone 3, reflecting the importance of this area to marine mammals and seabirds.

d. Copper River Delta (East of Hinchinbrook Entrance) - Figure 8.

(1) Zone 3.

The area inshore of the three-mile (statute miles) territorial limit along the coast from Cape Hinchinbrook to Kayak Island is designated as Zone 3. This wide Zone 3 designation provides protection for the coastal resources and sensitive marsh and tidal flat habitats of the Copper River Delta area.

(2) Zone 1.

Zone 1 is identified as an approximately five nautical-mile wide buffer extending seaward of Zone 3. This width should provide adequate time to conduct a dispersant response to oil entering the sensitive Zone 3.

(3) Zone 2. The waters seaward of Zone 1 are designated as Zone 2.

e. Montague Island (West of Hinchinbrook Entrance).

(1) Zone 3.

Zone 3 occurs inshore of a line drawn approximately one nautical-mile off the outside coasts of Montague and Elrington Islands and extending east to Cape Junken. In this area, the water depth increases rapidly with distance offshore. A distance of one nautical-mile should provide sufficient depth for adequate mixing and dilution of dispersed oil.

(2) Zone 1.

Zone 1 is identified as an approximately five nautical-mile wide buffer area extending seaward of Zone 3. This designation will allow for a rapid decision on dispersant use to minimize adverse effects on the sensitive resources in Zone 3.

(3) Zone 2. The waters seaward of Zone 1 are designated as Zone 2.

(4) Zone 1/Zone 2 (Seasonal Designation).

The southern end of Montague Strait--south from a line drawn from the northern end of Latouche Island to Point Bazil and to a line drawn between Point Cleare and a point 0.5 nautical-miles south of Point Elrington (59 55 latitude and 148 15 longitude)--is designated as Zone 1 from October 1 to March 31 and as Zone 2 from April 1 to September 30. This dual designation is due to the presence of fisheries resources and commercial harvest activities as well as the potential use of the area by oil tankers.

The following forms are not included in this copy of the Dispersant Guidelines:

Tab C - Oil Spill Response Checklist: Dispersant Use in Zone 1
Tab D - Oil Spill Response Checklist: Dispersant Use in Zones 2 and 3 and in Undesignated Areas

The forms are available as separate files at the ADEC Permits Tool website (dec.alaska.gov/spar/perp/permits).

The following pages contain improved figures as follows:

Figure 4. Cook Inlet Dispersant Use Zones, Northern Sector

Figure 4a. East Foreland Dispersant Use Zone – Enlargement

Figure 4b. Drift River Tanker Loading Terminal Dispersant Use Zone – Enlargement

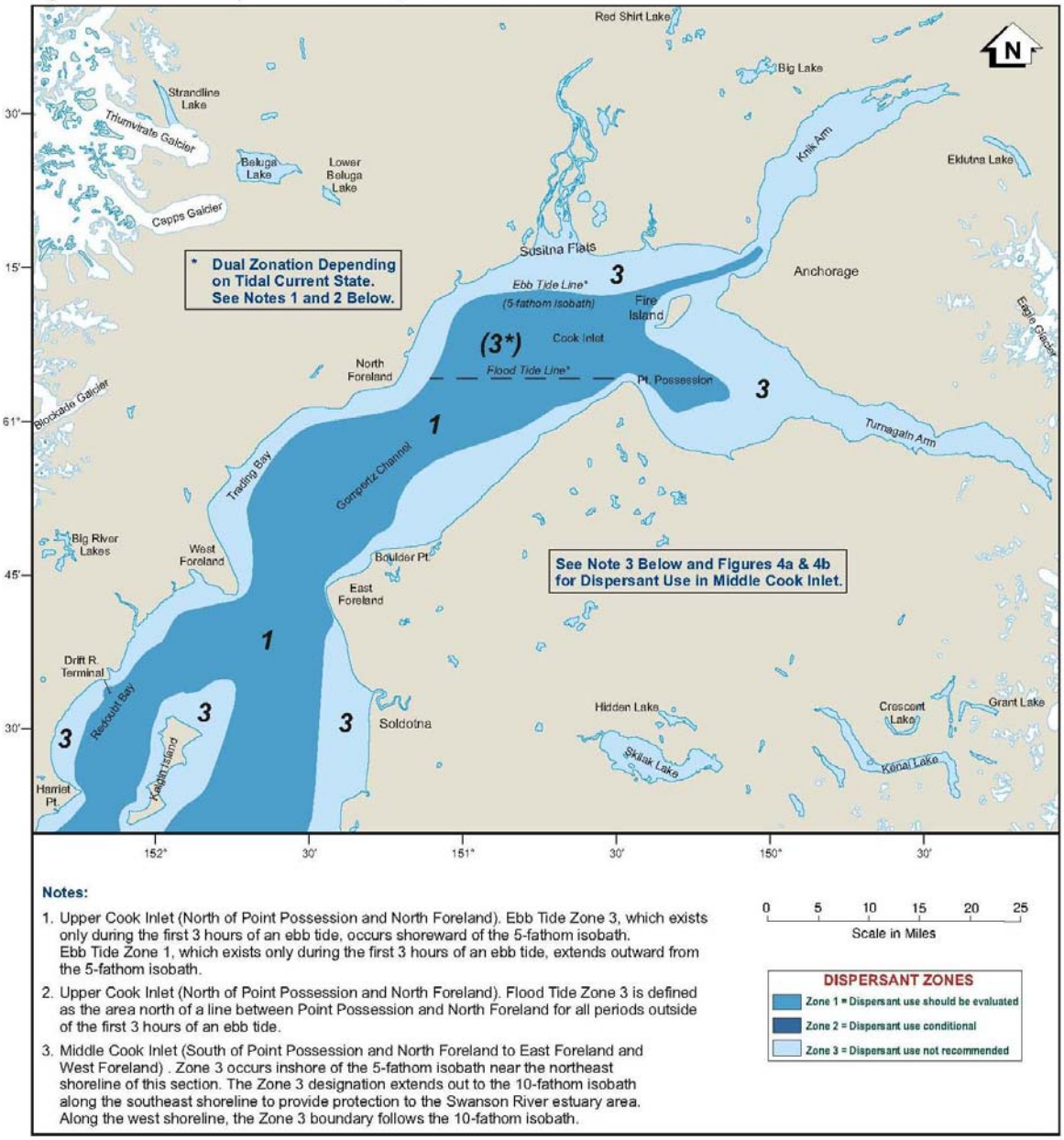
Figure 5. Cook Inlet Dispersant Use Zones, Southern Sector

Figure 6. Prince William Sound Dispersant Use (Valdez Port)

Figure 7. Prince William Sound Dispersant Use (Main Body)

Figure 8. Prince William Sound Dispersant Use (Copper River Delta)

Figure 4 - Cook Inlet Dispersant Use Zones, Northern Sector



Notes:

1. Upper Cook Inlet (North of Point Possession and North Foreland). Ebb Tide Zone 3, which exists only during the first 3 hours of an ebb tide, occurs shoreward of the 5-fathom isobath. Ebb Tide Zone 1, which exists only during the first 3 hours of an ebb tide, extends outward from the 5-fathom isobath.
2. Upper Cook Inlet (North of Point Possession and North Foreland). Flood Tide Zone 3 is defined as the area north of a line between Point Possession and North Foreland for all periods outside of the first 3 hours of an ebb tide.
3. Middle Cook Inlet (South of Point Possession and North Foreland to East Foreland and West Foreland) . Zone 3 occurs inshore of the 5-fathom isobath near the northeast shoreline of this section. The Zone 3 designation extends out to the 10-fathom isobath along the southeast shoreline to provide protection to the Swanson River estuary area. Along the west shoreline, the Zone 3 boundary follows the 10-fathom isobath.

Figure 4a - East Foreland Dispersant Use Zone – Enlargement

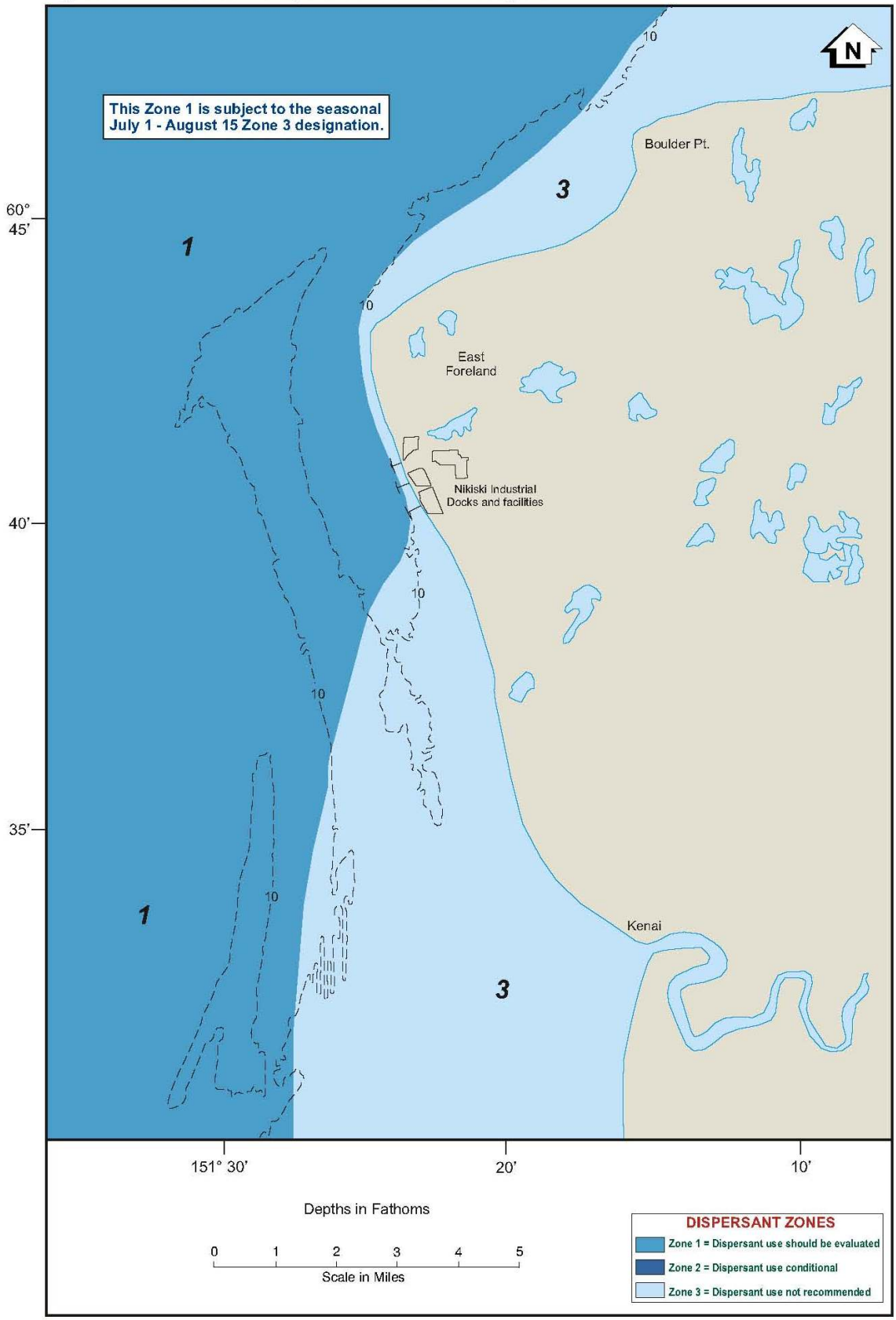


Figure 4b - Drift River Tanker Loading Terminal Dispersant Use Zone – Enlargement

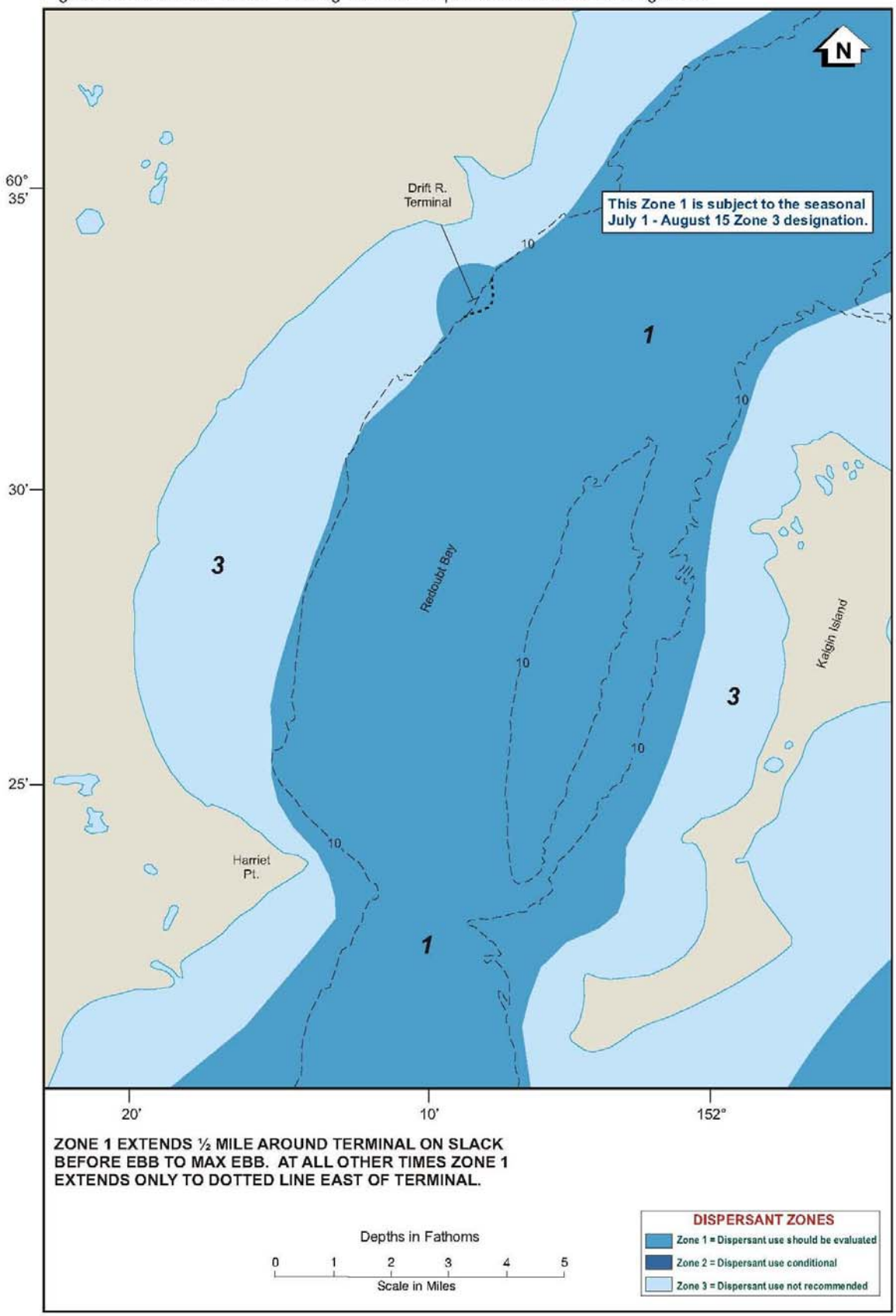


Figure 5 - Cook Inlet Dispersant Use Zones, Southern Sector

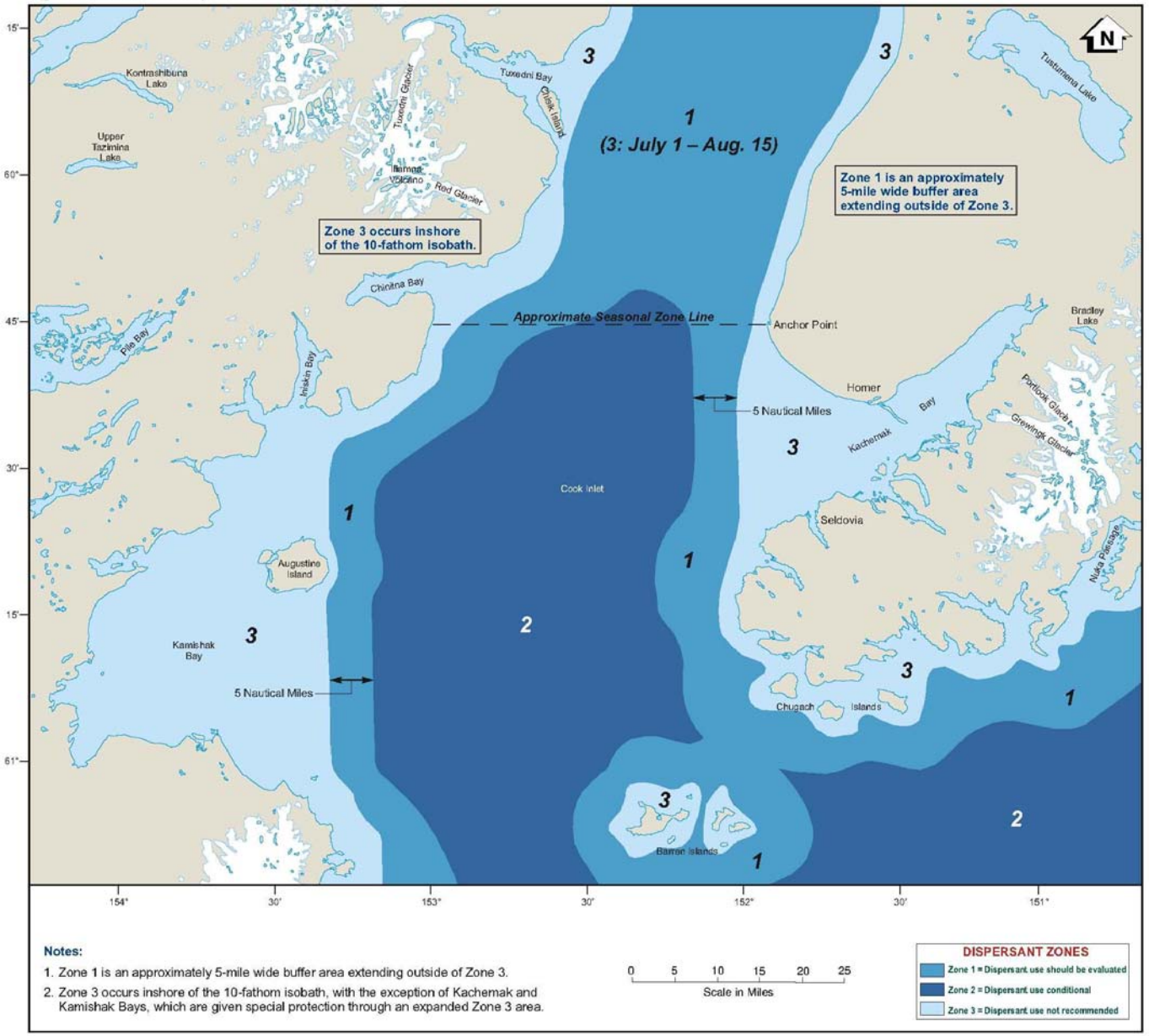
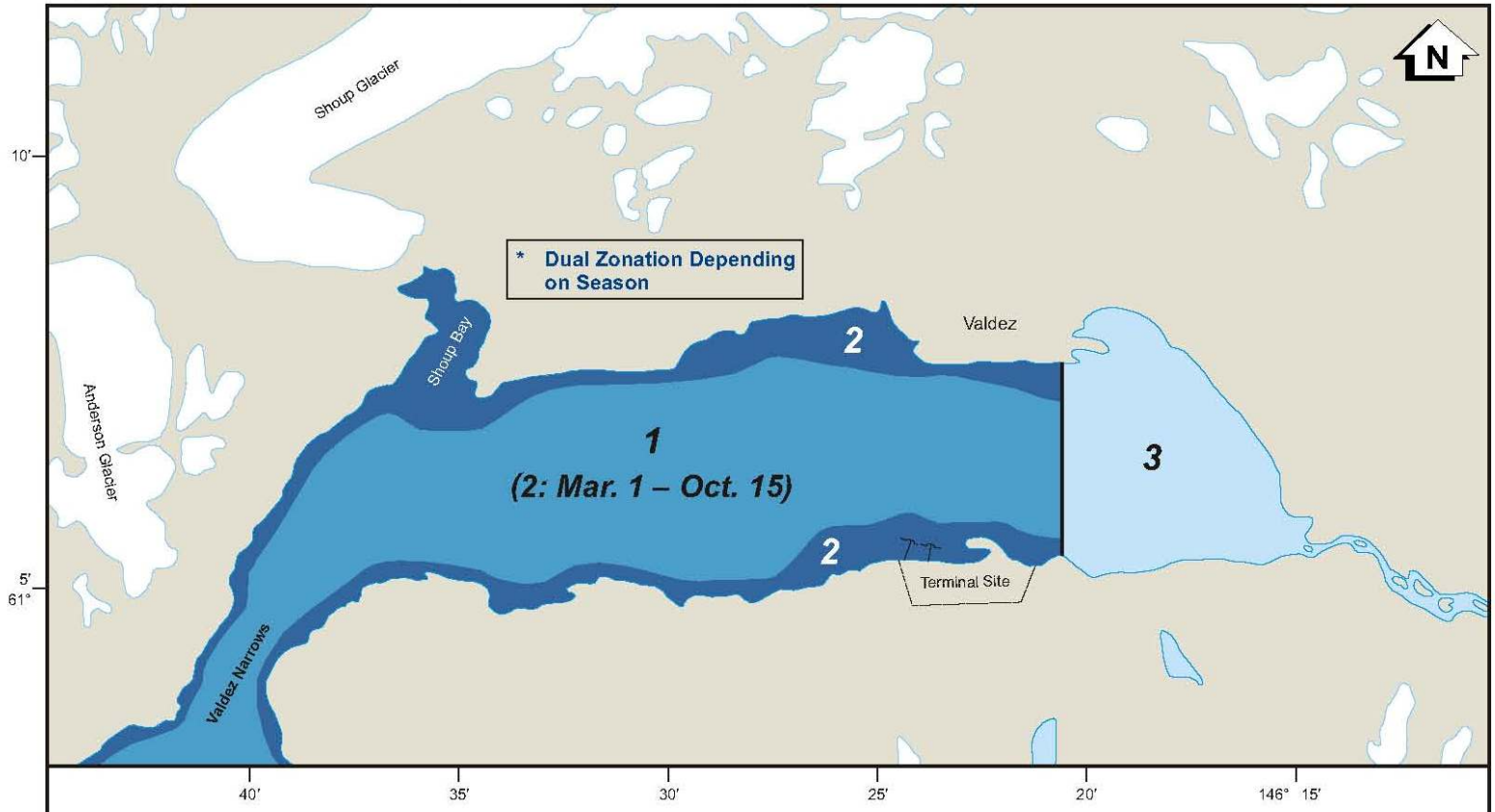


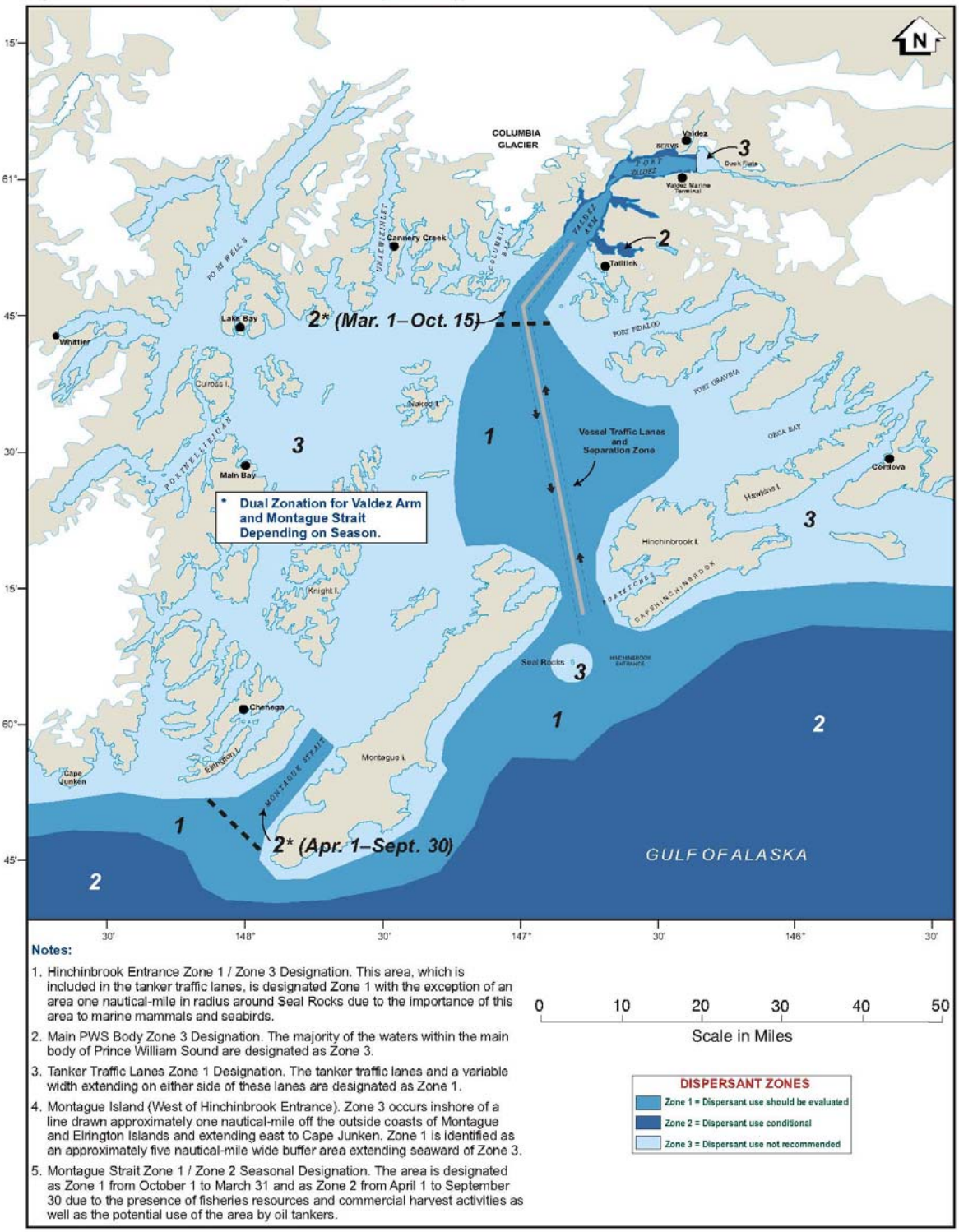
Figure 6 - Prince William Sound Dispersant Use (Valdez Port)



Notes:

1. Zone 1/ Zone 2 Seasonal Designation. This portion has been designated Zone 1 from October 16 to February 28, when fisheries resources are least abundant; and Zone 2 from March 1 to October 15, when fisheries resources and harvest activities are at a peak.
2. Zone 2. In general, the areas inshore of the 100-fathom isobath and north of Rocky Point and Point Freemantle are designated as Zone 2.
3. Zone 3. Tatitlek Narrows and Columbia Bay are designated as Zone 3.

Figure 7 - Prince William Sound Dispersant Use (Main Body)



Notes:

1. Hinchinbrook Entrance Zone 1 / Zone 3 Designation. This area, which is included in the tanker traffic lanes, is designated Zone 1 with the exception of an area one nautical-mile in radius around Seal Rocks due to the importance of this area to marine mammals and seabirds.
2. Main PWS Body Zone 3 Designation. The majority of the waters within the main body of Prince William Sound are designated as Zone 3.
3. Tanker Traffic Lanes Zone 1 Designation. The tanker traffic lanes and a variable width extending on either side of these lanes are designated as Zone 1.
4. Montague Island (West of Hinchinbrook Entrance). Zone 3 occurs inshore of a line drawn approximately one nautical-mile off the outside coasts of Montague and Elrington Islands and extending east to Cape Junken. Zone 1 is identified as an approximately five nautical-mile wide buffer area extending seaward of Zone 3.
5. Montague Strait Zone 1 / Zone 2 Seasonal Designation. The area is designated as Zone 1 from October 1 to March 31 and as Zone 2 from April 1 to September 30 due to the presence of fisheries resources and commercial harvest activities as well as the potential use of the area by oil tankers.

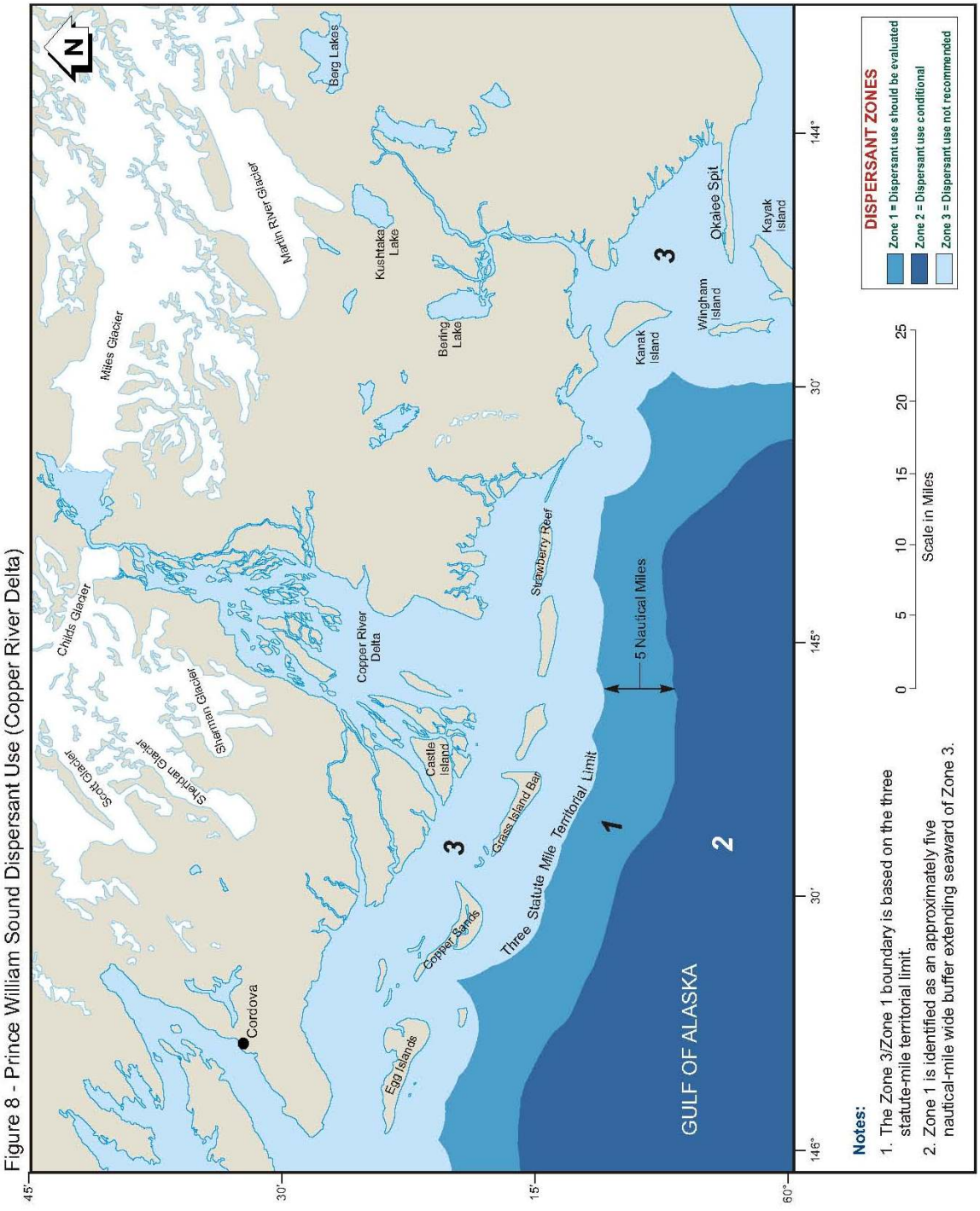


Figure 8 - Prince William Sound Dispersant Use (Copper River Delta)
N
Berg Lakes
Martin River Glacier
Miles Glacier
Kushtaka Lake
Bering Lake
Childs Glacier
Scott Glacier
Sheridan Glacier
Sherman Glacier
Copper River Delta
Castle Island
Grass Island Bar
Strawberry Reef
Kanak Island
Wingham Island
Okalee Spit
Kayak Island
Cordova
Egg Islands
Copper Sands
Three Statute Mile Territorial Limit
5 Nautical Miles
GULF OF ALASKA
1
2
3
3
45'
30'
15'
60°
146°
30'
145°
30'
144°
0
5
10
15
20
25
Scale in Miles
DISPERSANT ZONES
Zone 1 = Dispersant use should be evaluated
Zone 2 = Dispersant use conditional
Zone 3 = Dispersant use not recommended
Notes:
1. The Zone 3/Zone 1 boundary is based on the three statute-mile territorial limit.
2. Zone 1 is identified as an approximately five nautical-mile wide buffer extending seaward of Zone 3.