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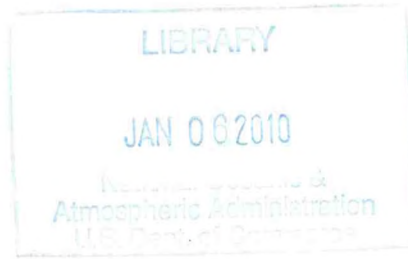


**Oil and Hazardous Materials  
Response Reports**

**October 1991-September 1992**

**HAZARDOUS MATERIALS RESPONSE & ASSESSMENT DIVISION  
OFFICE OF OCEAN RESOURCES CONSERVATION & ASSESSMENT  
NATIONAL OCEAN SERVICE  
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION**

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## **Oil and Hazardous Materials Response Reports**

**October 1991-September 1992**

**February 1993**

National Oceanic and Atmospheric Administration  
Office of Resources Conservation and Assessment  
Hazardous Materials Response and Assessment Division  
Seattle, Washington 98115



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**B**etween October 1, 1991 and September 30, 1992, NOAA's Hazardous Materials Response and Assessment Division Scientific Support Coordinators and scientific staff provided the U.S. Coast Guard with technical and operational assistance to 142 spill incidents in the Nation's coastal zone. These responses included 69 oil spills, 14 chemical spills, 7 spills of unknown material, 2 sewage spills, 2 black silt spills (thought at first to be oil), 1 garbage spill, 1 carbon black spill, 1 human body, and 1 fish egg spill (thought to be oil). In addition to the spills listed, NOAA assisted the U.S. Coast Guard with 44 simulation exercises.

This volume of reports has been modified from previous editions to follow the format established for the Oil Spill Case Histories Report prepared in 1992 by the Division with U.S. Coast Guard Research and Development Center support. Future volumes will also follow this layout so that major spills meeting the criteria for inclusion may be incorporated easily into updated case histories reports.

Each report in this volume is organized as follows:

- A list of headers that summarizes the spill name; location; product; size; use of dispersants, bioremediation, and *in-situ* burning; other special interests; shoreline types affected; and keywords.
- A brief *incident summary* including weather conditions and description of the overall spill response.
- A description of the behavior of the spilled material including movement, evaporation, mousse formation, and dispersion.
- A discussion of countermeasures and mitigation.
- A description of other *special interest issues* such as communication problems, unusual hazards encountered, and large losses of organisms.
- A list of *references* that document the response operations.

Although the master list on the following pages includes all of the incidents for which the Division provided support, only those incidents where the pollutant actually entered the environment are reported on in this volume. These reports are abbreviated and are meant to serve only as a summary of the Division's response to requests from Federal On-Scene Coordinators for each of the events.

Additional details on any of the responses may be obtained from the appropriate Scientific Support Coordinator or U.S. Coast Guard office.

## Spill Report Keys

**Name of Spill:**

**NOAA SSC:**

**Date of Spill (mmddyy):**

**Location of Spill:** text description

**Latitude:** degrees, minutes, N or S

**Longitude:** degrees, minutes, E or W

**Spilled Material:** specific product

**Spilled Material Type:**

Type 1 - Very Light Oils (jet fuels, gasoline)

Type 2 - Light Oils (diesel, No. 2 fuel oil, light crudes)

Type 3 - Medium Oils (most crude oils)

Type 4 - Heavy Oils (heavy crude oils, No. 6 fuel oil, bunker c)

Type 5 - Hazardous material

**Barrels (or weight in pounds if hazardous material):**

**Source of Spill:** tank vessel, non-tank vessel, barge, facility, pipeline, platform

**Resources at Risk:** See A

**Dispersants:** Yes or No

**Bioremediation:** Yes or No

***In-situ* Burning:** Yes or No

**Other Special Interest:**

Destruction of marshes, mangroves, or tidal flats

Extraordinary successful salvage operations

Massive habitat loss

Massive wildlife impact

Oil/ice interactions and adverse weather conditions

Unusual, experimental, or innovative cleanup techniques

**Shoreline Types Impacted:** See B

**Keywords:** See C

**Incident Summary:**

- Date and time of incident
- Location of incident
- Weather at time of incident
- Summary of events
- Actions of responsible party and response organizations
- Level of federal involvement
- Duration of response

**Behavior of Spilled Material:**

- Formation of slicks, sheen, or mousse
- Movement on the water of spilled material
- Movement in the air of spilled material
- Areas impacted
- Amount spilled; amount recovered (land, sea, contaminated debris)
- Amount not recovered (sinking, evaporation, weathering, dissolution)

**Countermeasures and Mitigation:**

- Control at incident site
- Offloading and lightering operations; movement of vessel
- Precautionary protection of sensitive areas
- Open water recovery
- Shoreline cleanup
- Removal and disposal of spilled material or contaminated debris

**Other Special Interest Issues:** See D

**NOAA Activities:**

- Involvement in response (on-scene, by phone and fax)
- Support provided
- Participation in committees and special projects
- Unusual responsibilities
- Meetings attended/recommendations made
- Duration of NOAA support

**References:**

## Spill Report Keys

A

### Resources at Risk

#### Habitats

(See *shoreline types* key below), eelgrass beds, submerged aquatic vegetation (SAV), kelp, coral reefs, worm beds

#### Marine Mammals

Whales, dolphins, sea lions, seals, sea otters, manatees, walruses, polar bears, population concentration areas, haulouts, migration routes, seasonal use areas

#### Terrestrial Mammals

Mustelids, rodents, deer, bears, population concentration areas, intertidal feeding areas

#### Birds

Diving coastal birds, waterfowl, alcids, petrels, fulmars, shorebirds, wading birds, gulls, terns, raptors, rookeries, foraging areas, wintering areas, migration stopover areas, wintering concentration areas, nesting beaches, migratory routes, critical forage areas

#### Fish

Anadromous fish, beach spawners, kelp spawners, nursery areas, reef fish (includes fish using hard-bottom habitats) spawning streams, spawning beaches, estuarine fish, demersal fish

#### Mollusks

Oysters, mussels, clams, scallops, abalone, conch, whelk, squid, octopus, seed beds, leased beds, abundant beds, harvest areas, high concentration sites

#### Crustaceans

Shrimp, crabs, lobster, nursery areas, high concentration sites

#### Reptiles

Sea turtles, alligators, nesting beaches, concentration areas

#### Recreation

Beaches, marinas, boat ramps, diving areas, high-use recreational boating areas, high-use recreational fishing areas, State Parks

#### Management Areas

Marine Sanctuaries, National Parks, Refuges, Wildlife Preserves, Reserves



Resource Extraction

Subsistence, officially designated harvest sites, commercial fisheries, power plant water intakes, drinking water intakes, industrial water intakes, intertidal and subtidal mining leases, fish/shrimp/bivalve/plant aquaculture sites, log storage areas

Cultural

Archaeological sites, Native American Lands

**B Shoreline Types Impacted**

brackish marshes  
coarse gravel beaches  
coarse sand beaches  
coastal structures  
consolidated seawalls  
consolidated shores  
cypress swamps  
developed upland  
eroding bluffs  
exposed bedrock bluffs  
exposed bluffs  
exposed fine sand beaches  
exposed riprap  
exposed rocky platforms  
exposed rocky shores  
exposed scarps  
exposed seawalls  
exposed tidal flats  
exposed tidal flats (low biomass)  
exposed tidal flats (moderate biomass)  
exposed unconsolidated sediment bluffs  
extensive intertidal marshes  
extensive salt marshes  
extensive wetlands  
fine sand beaches  
flats  
freshwater flat  
freshwater marshes  
freshwater swamps  
fringing salt marshes  
fringing wetlands  
hardwood swamps  
levees  
low banks  
mangroves  
marshes  
mixed sand and shell beaches

mixed sediment beaches  
piers  
riprap  
salt marsh  
saltwater marshes  
sand/gravel beaches  
shell beaches  
sheltered bedrock bluffs  
sheltered fine-grained sand beaches  
sheltered impermeable banks  
sheltered mangroves  
sheltered marshes  
sheltered rocky shores  
sheltered seawalls  
sheltered tidal flats  
shelving bedrock shores  
spoil bank  
supratidal marshes  
swamp  
tidal mudflat  
unforested upland  
unvegetated steep banks and cliffs  
vegetated bluffs  
vegetated low banks  
vegetated riverbank  
vertical rocky shores  
wavecut platforms

**C Key words**

air activated pumps  
bioremediation  
Center for Disease Control  
Clean Bay Inc.  
containment boom  
Corexit 9527  
dispersant  
endangered species  
evaporation  
exposed rocky shores  
filter fences  
Food and Drug Administration  
ground truth  
high-pressure warm-water washing  
hydro-blasting  
*in-situ* burning  
International Bird Rescue and Research Center  
International Tanker Owners Pollution Federation (ITOPF)

low-pressure washing  
NAVSUPSALV  
NOAA National Marine Fisheries Laboratory  
Pacific flyway  
potential spill  
propane cannons  
remote sensing  
recoiling  
salvage  
seafood harvesting ban  
shallow water recovery  
siphon dams  
skimmers  
SLAR (side-looking airborne radar)  
smothering  
sorbent boom  
sorbent pompoms  
starshell-type device  
tourism losses  
vacuum trucks  
volunteers  
weed cutters  
weir/pump skimmer

**D Other Special Interest Issues**

Effects to tourism, recreation areas, or personal property  
Closure of commercial or recreational fishing areas and public lands  
Closure of shipping lanes and vehicle traffic routes  
Wildlife impacts and rehabilitation  
Ecological destruction and habitat loss due to spilled material impacts  
Ecological destruction and habitat loss due to cleanup operations  
Effects to human health and safety  
Bioremediation, dispersant, *in-situ* burning operations  
Unusual, experimental, or innovative cleanup techniques  
Complex successful salvage operations  
Logistical or operational problems (including adverse weather conditions)  
Interaction with foreign or Native authorities  
Media interest  
Volunteer response and organization  
Studies conducted; ongoing research

## FY 92 Spill Responses

### October 1, 1991- September 30, 1992

Date of Incident	No.	Report Name	Commodity Involved	USCG District	NOAA Involvement
2 Oct 91	1	<i>Hyundai #12</i> Shumagin Islands, AK	oil	17	phone
4 Oct 91	2	Kiptopeke Concrete Ships Cape Charles, VA	oil	5	1 on scene
7 Oct 91	3	*F/V <i>Captain J. Fiddler</i> Cape Flattery, WA	oil	13	phone
14 Oct 91	4	South Timbalier Block 38 Louisiana Coast	oil	8	on scene
15 Oct 91	5	Neches River Beaumont, TX	oil	8	phone
17 Oct 91	6	Huron Shores Macinac, MI	oil	9	on scene
18 Oct 91	7	Chevron Platform Mississippi River	oil	8	phone
31 Oct 91	8	*Scott Paper Mill Everett, WA	mineral oil	13	phone
31 Oct 91	9	*M/V <i>Hajin Pohang</i> Seattle, WA	oil	13	phone
05 Nov 91	10	<i>Michelle Lane</i> Martha's Vineyard, MA	oil	1	on scene
11 Nov 91	11	* <i>Sunset Bay</i> Ruilla Bay, AK	oil	17	phone
14 Nov 91	12	*San Juan, Puerto Rico	unknown	7	
15 Nov 91	13	*City Gas & Transmission Wilmington, NC	oil	5	phone
18 Nov 91	14	*F/V <i>Georgia</i> Whidbey Island, WA	oil	14	phone

\* The asterick indicates that a report is not included for this incident.

Date of Incident	No.	Report Name	Commodity Involved	USCG District	NOAA Involvement
20 Nov 91	15	M/V <i>Yupex</i> Honolulu, HI	oil	14	on scene
24 Nov 91	16	F/V <i>Windrunner</i> Kodiak, AK	oil	17	phone
26 Nov 91	17	*P/C <i>Prime Time</i> Seattle, WA	oil	14	phone
28 Nov 91	18	M/V <i>Lavaux</i> Long Beach Harbor, CA	oil	11	1 on scene
29 Nov 91	19	*F/V <i>Ocean Champion</i> San Juan Island, WA	oil	13	phone
3 Dec 91	20	*P/C <i>Pagan</i> Whidbey Island, WA	oil	13	phone
6 Dec 91	21	F/V <i>Eijyu Maru</i> Palau	oil		phone
10 Dec 91	22	M/V <i>President Madison</i> Duwamish Waterway, WA	oil	13	on scene
12 Dec 91	23	CONOCO Pipeline East Timbalier Island, LA	oil	8	phone
13 Dec 91	24	Toledo Seepage Maumee River, OH	oil		chemical analysis
16 Dec 91	25	*Lawrence Petroleum Lawrence Pass, LA	black silt initially thought to be oil	8	
16 Dec 91	26	*LCU <i>Dragon I</i> Palau	oil		
23 Dec 91	27	Aviva America Barge Breton Sound, LA	oil	8	phone
24 Dec 91	28	*Mystery Spill Portland, OR	unknown	13	phone
25 Dec 91	29	Mobil 35 Kill Van Kull, NY/NJ	gasoline	1	on scene
26 Dec 91	30	Hess Bayonne Terminal Bayonne, NJ	oil	1	on scene

Date of Incident	No.	Report Name	Commodity Involved	USCG District	NOAA Involvement
28 Dec 91	31	M/V <i>Tai Chung</i> Willamette River, OR	oil	13	phone
29 Dec 91	32	<i>Lindsey Frank</i> Saugerties, NY	gasoline	1	phone
3 Jan 92	33	C/V <i>Santa Clara</i> Delaware Bay	arsenic trioxide	5	on scene
4 Jan 92	34	Nikiski Terminal East Cook Inlet, AK	oil	17	on scene
4 Jan 92	35	CONOCO Pipeline #2 LA	oil	8	on scene
6 Jan 92	36	*Sabine Pass Port Arthur, TX	fish eggs initially thought to be oil	8	phone
8 Jan 92	37	C/V <i>Santa Clara</i> Charleston, SC	magnesium phosphide arsenic trioxide	5	on scene
11 Jan 92	38	USN <i>Kiska</i> San Francisco, CA	oil	11	phone
15 Jan 92	39	*T/V <i>Carol V</i> East Rockaway Inlet, NY	gasoline	1	phone
19 Jan 92	40	Steuart Petroleum Washington, D.C.	oil	5	on scene
23 Jan 92	41	*M/V <i>Hyderabad</i> Cape Hatteras, NC	chemical	5	phone
24 Jan 92	42	F/S <i>Evergrace</i> Cape Henry, VA	chemical	5	3 on scene
26 Jan 92	43	Styrene Morgan City, LA	chemical	8	4 on scene
30 Jan 92	44	*Soldotna Sewage Treatment Plant Kenai Peninsula, AK	chlorine	17	phone
04 Feb 92	45	CONOCO Pipeline #2 Grand Isle, LA	oil		5 on scene

Date of Incident	No.	Report Name	Commodity Involved	USCG District	NOAA Involvement
16 Feb 92	46	*Mystery Spill Strait of Juan de Fuca, WA	unknown	13	phone
16 Feb 92	47	Owls Head Sewage New York Harbor, NY	sewage	1	phone
20 Feb 92	48	Pass Tante Phine Venice, LA	oil	8	4 phone
27 Feb 92	49	Mystery Spill Tarague Beach, Guam	unknown	14	on scene
03 Mar 92	50	*Mystery Spill Guam	oil		phone
08 Mar 92	51	*Unmanned pump station Gulf of Mexico	black silt initially thought to be oil	8	phone
08 Mar 92	52	Southampton Mystery Spill Long Island Sound, NY	oil	1	phone
08 Mar 92	53	*Mystery Spill Bellingham, WA	oil	13	phone
11 Mar 92	54	Toluene Barge Intracoastal Waterway, TX	chemical	8	
12 Mar 92	55	*M/V <i>Bolu</i> Wilmington, NC	oil	5	phone
12 Mar 92	56	Unknown Barge Bayou Sorrel Locks, LA	vinyl acetate	8	phone
12 Mar 92	57	*Mystery Spill Chetco River Harbor, OR	unknown	13	phone
16 Mar 92	58	St. Eustatius Refinery St. Eustatius Island, Caribbean	oil	7	2 on scene
1942	59	* <i>Empire Night</i> off the coast of Maine	mercury, copper, WW II ammunition	1	1 on scene
18 Mar 92	60	*R/V <i>Jean Charcot</i> Tumon Bay, Guam	oil	14	phone
19 Mar 92	61	*F/V <i>Leviathan</i> Admiralty Inlet, WA	oil	13	phone

Date of Incident	No.	Report Name	Commodity Involved	USCG District	NOAA Involvement
21 Mar 92	62	<i>Venture Luna</i> Dutch Harbor, AK	IFO	17	phone
25 Mar 92	63	Texaco Puget Sound Refinery Anacortes, WA	oil	17	on scene
26 Mar 92	64	<i>G. H. Vanderborgh Sr.</i> Miami River, FL	calcium carbide	7	1 on scene
26 Mar 92	65	<i>F/V Silver Star</i> Kodiak Islands, AK	oil	17	phone
07 Apr 92	66	Kodiak Air Station Kodiak, AK	aviation fuel	17	phone
18 Apr 92	67	<i>T/V Katina P</i> Maputo, Mozambique	oil	Interntional	2 on scene
25 Apr 92	68	ARCO King Salmon Platform MacArthur River Field, AK	oil	17	phone
06 May 92	69	*Kalama chlorine spill Kalama, WA	chlorine	13	phone
13 May 92	70	*Orcas Power and Light Lopez Island, WA	mineral oil	13	phone
18 May 92	71	*Kosrae Diesel Spill Kosrae, Yapp Federated State of Micronesia	oil	International	phone
06 Jun 92	72	*Fire Island, New York	tarball	1	phone
17 Jun 92	73	* <i>F/V Betsy</i> Deception Pass, WA	oil		phone
22 Jun 92	74	* <i>T/B Miss Jane</i> Baltimore, MD	oil	5	phone
30 Jun 92	75	Train Derailment Superior, WI	aromatic concentrates	9	on scene



Date of Incident	No.	Report Name	Commodity Involved	USCG District	NOAA Involvement
04 Jul 92	76	T/V <i>Canadian Liberty</i> Fort Mifflin, PA	BRC-17	5	on scene
06 Jul 92	77	*Industrial Effluent Port Angeles, WA	sewage	13	phone
08 Jul 92	78	Bridgeton 7-Up bottling plant Bridgeton, New Jersey	oil	5	1 on scene
31 Jul 92	79	*Anderson Air Force Base Guam	ammonia	14	phone
01 Aug 92	80	*fishing vessel Puget Sound, WA	oil	13	phone
03 Aug 92	81	Unocal Tank Farm Avila Beach, CA	oil	11	2 on scene
04 Aug 92	82	Milwaukee Harbor homicide Milwaukee, WA	human body	9	phone
04 Aug 92	83	Allied Towing Barge ATC 114 Elizabeth River, VA	oil	5	phone
07 Aug 92	84	<i>Queen Elizabeth II</i> Buzzards Bay, MA	oil	1	on scene
14 Aug 92	85	*M/V <i>Heredia</i> Gulf of Mexico	oil	8	phone
21 Aug 92	86	*Mystery Drum New Harbor, NY	unknown	1	phone
24 Aug 92	87	*Fuel Tank Turkey Point, FL	oil	7	phone
27 Aug 92	88	*Mystery Spill off New Jersey	unknown	5	phone
27 Aug 92	89	*Garbage Spill New York Harbor	garbage	5	phone
28 Aug 92	90	*LPC Chemical Orington, MA	chemical	1	phone
28 Aug 92	91	*Typhoon Omar Guam	oil	14	phone

Date of Incident	No.	Report Name	Commodity Involved	USCG District	NOAA Involvement
28 Aug 92	92	F/V <i>Loon</i> Nuka Bay, AK	oil	17	phone
31 Aug 92	93	*F/V <i>Blue Diamond</i> Republic of Palau	oil	14	phone
01 Sep 92	94	Texaco Pipeline Timbalier Island, LA	oil	8	phone
08 Sep 92	95	*Rouge River Mystery Spill Melvindale, MI	oil	9	1 on scene
11 Sep 92	96	*T/V <i>Affinity</i> Port of Albany, NY	carbon black	1	phone
29 Sep 92	97	Brayton Point Power Plant Brayton Point, RI	oil	1	phone
30 Sep 92	98	Greenhill Petroleum Timbalier Island, LA	oil	8	6 on scene



# U.S. COAST GUARD DISTRICT 1

<i>Michelle Lane</i> .....	3
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<i>Lindsey Frank</i> .....	9
Owls Head Sewage Spill .....	11
Southampton Mystery Spill.....	13
Fire Island, New York .....	15
<i>Queen Elizabeth II</i> .....	17
Brayton Point Power Plant.....	19



<b>Name of Spill:</b>	<i>Michelle Lane</i>
<b>NOAA SSC:</b>	Stephen Lehmann
<b>Date of Spill:</b>	11/05/91
<b>USCG District:</b>	1
<b>Location of Spill:</b>	Nomansland Island, Massachusetts
<b>Latitude:</b>	41°51' N
<b>Longitude:</b>	70°48' W
<b>Spilled Material:</b>	diesel
<b>Spilled Material Type:</b>	2
<b>Barrels:</b>	59.5
<b>Source of Spill:</b>	fuel tanks
<b>Resources at Risk:</b>	gray seals haul-out area, sea birds, benthic organisms
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-Situ Burning:</b>	N
<b>Other Special Interest:</b>	Nomansland Island is a USN bombing target
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	Clean Harbors Cooperative, ordnance

#### **Incident Summary:**

During a storm on October 31, 1991, (a violent "nor'easter" referred to by the Federal Emergency Management Agency as "Nor'easter SAM") the 50-foot, steel-hulled fishing vessel *Michelle Lane* ran hard aground on the southern shore of Nomansland Island (southwest of Martha's Vineyard). The crew was rescued by U.S. Coast Guard (USCG) search and rescue crews. The hull was intact and no release was reported. Due to the force and timing (at high tide) of the storm, the vessel was transported over a long, shallow, rocky approach and deposited in the sand and cobble at the high-tide line. Because the ship was stable and its hull intact, the probability of release was considered small.

#### **Behavior of Spilled Material:**

No oil was released.

#### **Countermeasures and Mitigation:**

The vessel was grounded on an island used by the U.S. Navy (USN) for aircraft bombing practice and it was not known if live ordnance was on the shore. With the live ordnance issue unresolved, the primary concern was protecting response personnel. Consensus among the USCG On-Scene Coordinator (OSC), Department of the Interior (DOI), Massachusetts Department of Environmental Protection (MDEP), and NOAA was that if live ordnance existed on the island, attempts to burn the vessel in-place should be initiated. The bombs used by the USN were in

fact reusable "dummy" bombs and presented no significant hazard to on-scene personnel.

Another unique feature of this spill was that the approach to the island on which the vessel was grounded was very shallow and obstructed by large rocks, making a fuel transfer to a barge extremely hazardous and complex. Offloading from the vessel to a contracted barge was rejected for these reasons.

A plan was devised to remove the oil by way of 350-gallon tanks slung under a contracted helicopter. The parking lot at Gay Head Beach on Martha's Vineyard was used as a staging area. Rhode Island Department of Environmental Management, MDEP, and NOAA reviewed the proposed route for significant resources that might be put at risk if the tanks were to be released midflight. There were no resources at risk in the proposed path that warranted changing the plan.

The operation began on November 15, 1991, and was completed in less than a day with no release reported. The vessel, when offloaded, was turned over to the USN for disposal, destruction, or other action to be determined following negotiations with the owner.

#### **NOAA Activities:**

NOAA was notified of the incident on November 5, 1992, by the USCG Marine Safety Office, Providence. NOAA's Scientific Support Coordinator identified a maximum excursion zone (worst case) in the event of a total release and helped formulate the plan used to offload the product from the grounded vessel

#### **References:**

Research Planning Institute. 1980. Sensitivity of coastal environments and wildlife to spilled oil: Massachusetts. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 49 maps.

<b>Name of Spill:</b>	<i>Mobil 35</i>
<b>NOAA SSC:</b>	Ed Levine
<b>Date of Spill:</b>	12/25/91
<b>USCG District:</b>	1
<b>Location of Spill:</b>	Kill Van Kull, New York/New Jersey
<b>Latitude:</b>	38°50'00" N
<b>Longitude:</b>	074°10'10" W
<b>Spilled Material:</b>	unleaded and midgrade gasoline
<b>Spilled Material Type:</b>	1
<b>Barrels:</b>	450
<b>Source of Spill:</b>	tank barge
<b>Resources at Risk:</b>	benthic organisms, marsh grass, shore birds, waterfowl, gulls, wintering areas, fish
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	shoreline impacts, benzene testing, human health exposures.
<b>Shoreline Types Impacted:</b>	seawalls, riprap and piers, fine-sand beaches, sheltered tidal flats
<b>Keywords:</b>	evaporation

#### **Incident Summary:**

At 1800 on December 25, 1991, the tank barge *Mobil 35* grounded in the Kill Van Kull, between Elizabeth, New Jersey and Staten Island, New York. The tug *Terrocamo Girls* and the barge *Mobil 35* had moved out of the channel to avoid an on-coming tug and barge. Dredging activities in the Kill Van Kull had reduced the vessel traffic lanes to half their usual width. *Mobil 35* was carrying 21,000 barrels of unleaded gasoline and 14,000 barrels of midgrade gasoline. The barge suffered two holes in the hull near the #1 starboard tank spilling 450 barrels of unleaded gasoline. The spill was carried to the west by wind and currents. No recovery was attempted due to the volatile nature of the product. Evaporative loss of over 50 percent was expected within the first hour, and 90 percent evaporation was expected by morning. Water temperature was approximately 45°F, winds were from the north at 15 knots, and the air temperature was 30°F. Breathalyzer and blood tests on the barges' personnel showed that drugs or alcohol were not involved in the accident.

#### **Behavior of Spilled Material:**

Most of the gasoline evaporated overnight. On a first-light overflight, the U.S. Coast Guard (USCG) reported small patches of sheen in the Arthur Kill visible from the air.



**Countermeasures and Mitigation:**

Immediately after the spill, vehicular traffic was closed for 20 minutes on the Bayonne Bridge, which lies just east of the spill site. Vessel traffic was stopped for preliminary assessment of the scene and then reopened with safety zone restrictions. Local fire departments, the New Jersey Department of Environmental Protection, and the New York Department of Environmental Conservation personnel responded. Air sampling showed that explosive levels had not been reached. Monitoring personnel for benzene exposure also proved negative.

The barge was refloated about 2100, December 25 and taken behind Shooters Island. After a diver's survey, temporary patches were applied and the *Mobil 35* was moved to a pier to await daylight to ensure the repair held. By 1300, December 26, the barge was moved to Port Mobil on Staten Island for offloading, then to a dry dock for permanent repairs.

No cleanup actions were taken, but protective boom was placed around Shooters Island.

**NOAA Activities:**

The SSC was notified of the incident at 1830 on December 25, 1991, by the USCG. NOAA provided tide and current information to the USCG.

NOAA's Scientific Support Coordinator participated in a boat survey of the area on the morning of December 26. No dead or affected birds or other animals were observed. Some pockets of product were located around Shooters Island.

<b>Name of Spill:</b>	Hess Bayonne Terminal
<b>NOAA SSC:</b>	Ed Levine
<b>Date of Spill:</b>	12/26/91
<b>USCG District:</b>	1
<b>Location of Spill:</b>	Bayonne, New Jersey
<b>Latitude:</b>	38°50' N
<b>Longitude:</b>	74°10' W
<b>Spilled Material:</b>	#6
<b>Spilled Material Type:</b>	4
<b>Barrels:</b>	24
<b>Source of Spill:</b>	tank barge transfer
<b>Resources at Risk:</b>	benthic organisms, marsh grass, shore birds, waterfowl, gulls, wintering areas, fish
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	N
<b>Shoreline Types Impacted:</b>	seawalls, riprap, and piers
<b>Keywords:</b>	none

#### **Incident Summary:**

At 1800 on December 26, 1991, the tank barge *Maine* overflowed while loading #6 oil at the Hess Bayonne Terminal. The barge had been boomed during transfer operations. The U.S. Coast Guard (USCG) Captain of the Port New York (COTPNY) dispatched a Pollution Response Team to evaluate the situation. Approximately 200 gallons of #6 oil were seen in the water and 1,000 gallons on deck. Cleanup contractors were on scene manually removing the oil from the water.

#### **Behavior of Spilled Material:**

The #6 oil remained within the boom except for a few small pancakes.

#### **Countermeasures and Mitigation:**

The vessel was boomed and the floating oil was manually removed. The case was closed the next day.

#### **NOAA Activities:**

NOAA was notified of the incident on December 26, 1991, by USCG COTPNY. NOAA's Scientific Support Coordinator participated in a boat survey of the area on the following morning. No dead or affected birds or other animals were observed. Some small patches of tarballs were seen.



<b>Name of Spill:</b>	<i>Lindsey Frank</i>
<b>NOAA SSC:</b>	Ed Levine
<b>Date of Spill:</b>	12/29/91
<b>USCG District:</b>	1
<b>Location of Spill:</b>	Hudson River off Saugerties, New York
<b>Latitude:</b>	42°02'50" N
<b>Longitude:</b>	73°55'30" W
<b>Spilled Material:</b>	gasoline
<b>Spilled Material Type:</b>	1
<b>Barrels:</b>	215
<b>Source of Spill:</b>	barge
<b>Resources at Risk:</b>	waterfowl, shorebirds, gulls, anadromous fish
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	water intakes
<b>Shoreline Types Impacted:</b>	brackish marshes, coarse gravel beaches, exposed tidal flats, freshwater swamps, piers, riprap
<b>Keywords:</b>	evaporation

#### **Incident Summary:**

On December 29, 1991, the master of the tug *Jolene Rose* notified the U.S. Coast Guard (USCG) Captain of the Port New York (COTPNY) that the tank barge *Lindsey Frank* had touched bottom off Magdalen Island in the Hudson River at Tivoli Reach, but was still underway. A sheen was noted. The barge's capacity was 21,000 barrels of gasoline in 14 cargo tanks.

The winds were southeast at 14 knots, visibility 2 nautical miles in rain and fog, and the tide was ebbing.

The barge remained trim and continued upriver to its destination at the Atlantic Refineries docks in Rensselaer, New York. The barge master sounded tanks and reported tank #1 had taken on approximately four inches of water, but all other tanks appeared intact.

The COTP notified the New York Department of Environmental Conservation, county police, and NOAA.

#### **Behavior of Spilled Material:**

An estimated 9,000 gallons of gasoline may have been released, but evaporated before it reached the shoreline. The rate of release was estimated to be about 20 gallons per hour after the initial release.

**Countermeasures and Mitigation:**

No countermeasures or further mitigation actions were undertaken, except to monitor the vessel's movement and follow with a USCG boat to look for further sheening. The case was closed December 30, 1991, after offloading the cargo.

**NOAA Activities:**

NOAA was notified of the incident on December 29, 1991, by the USCG COTPNY. NOAA reported concern for drinking water intakes north of Poughkeepsie, New York. Due to the slow rate of release, no further action was suggested.

<b>Name of Spill:</b>	Owls Head Sewage Spill
<b>NOAA SSC:</b>	Ed Levine
<b>Date of Spill:</b>	02/16/92
<b>USCG District:</b>	1
<b>Location of Spill:</b>	Brooklyn, New York
<b>Latitude:</b>	40°38' N
<b>Longitude:</b>	74°02' W
<b>Spilled Material:</b>	sewage
<b>Spilled Material Type:</b>	NA
<b>Barrels:</b>	238,000 per day
<b>Source of Spill:</b>	wastewater treatment plant
<b>Resources at Risk:</b>	shellfish
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	human health
<b>Shoreline Types Impacted:</b>	exposed seawall
<b>Keywords:</b>	none

#### **Incident Summary:**

On February 16, 1992, the Owls Head Wastewater Treatment Plant in Bay Ridge, Brooklyn, New York spilled raw sewage into Upper New York Harbor. The spill was caused by a malfunction in the valve system. By early morning of February 17 the valve had been repaired.

#### **Countermeasures and Mitigation:**

Since sewage is soluble in water, no countermeasure activity was attempted.

#### **Other Special Interest Issues:**

Raw sewage is a concern for human health due to possible tainting of shellfish caught for human consumption. However, there were no commercial shellfish beds near the spill.

#### **NOAA Activities:**

NOAA was notified of the incident on February 16, 1992, by the U.S. Coast Guard (USCG) Marine Safety Office (MSO) New York. MSO requested resources at risk information and a trajectory analysis for the spilled sewage. NOAA told MSO that the material would spread throughout the water column and mix in Upper New York Harbor. There was a chance, depending on actual currents and winds, that some sewage could make its way into the Kill Van Kull.

NOAA indicated that there should be no effect on human health because there were no active commercial shellfish beds in the area and the bathing season was not underway. At NOAA's request, the USCG sent a small boat to the scene to observe the movement of the sewage. The wind was blowing hard enough to cause white caps on the water. The on-scene observers saw no sewage, nor were they able to spot the outflow at any distance from the facility. NOAA also suggested having the New York City Department of Environmental Protection sample the water in the area of the spill.

**Reference:**

Research Planning Institute. 1985. Sensitivity of coastal environments and wildlife to spilled oil: New York Harbor and Hudson River. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 19 maps.

<b>Name of Spill:</b>	Southampton Mystery Spill
<b>Date of Spill:</b>	03/10/92
<b>Location of Spill:</b>	Southampton, Long Island, New York
<b>Latitude:</b>	Unknown
<b>Longitude:</b>	Unknown
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	Unknown
<b>Barrels:</b>	Unknown
<b>Source of Spill:</b>	Unknown
<b>Resources at Risk:</b>	least tern, herring and black back gulls, razor-billed auk, murre, oyster catcher, black skimmer, and the endangered tiger beetle
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-Situ Burning:</b>	N
<b>Other Special Interest:</b>	oiled birds
<b>Shoreline Types Impacted:</b>	Medium- to coarse-sand beaches, inlets to marsh areas
<b>Keywords:</b>	remote sensing, endangered species

#### **Incident Summary:**

On March 8, 1992, the U.S. Coast Guard (USCG) Captain of the Port (COTP) Long Island Sound received a report of oiled birds washing ashore on Long Island; however, no spill had been reported. The oiled birds were treated at a local animal hospital by a veterinary assistant who had experience in cleaning oiled wildlife. The weather at the time of the incident was fair with light on-shore winds.

On March 10, the USCG On-Scene Coordinator (OSC) reported tar patties and tarballs ranging from dime to half-dollar size at the high-tide line on Southampton Beach in a band approximately one-foot wide by three miles long,

A USCG overflight using side-looking airborne radar (SLAR) reported what appeared to be oil 85 miles southeast of Montauk, Long Island. Visual confirmation of this sighting was impossible because of storm warnings. Weather offshore was expected to be 40- to 50-knot winds with 15- to 25-foot seas. After the storm on March 11, a USCG SLAR flight was flown but no oil was sighted. The Pollution Fund was opened and the OSC hired Tri-State Bird Rescue to coordinate wildlife rescue.

A storm on March 11 dispersed the oil on the beach, making cleanup unnecessary. The response lasted less than ten days with most of the time devoted to bird rescue operations. Of the 47 birds treated, 25 lived.



### **Behavior of Spilled Material:**

The bird species coming ashore were primarily pelagic. Pelagic species generally feed and live well offshore, coming near shore only during the breeding season. Known for their ability to swim great distances, it was assumed that these birds swam ashore after being oiled, indicating that the source of the oil was somewhere offshore several miles. A small spill (or release) could have occurred and drifted into a convergence zone where it came in contact with rafting birds. A trajectory hindcast of the area showed that the most likely source of the spill was a vessel coming from the area of the Long Island Sound Race sometime on March 6 or 7. More specific identification was not possible. The only oil seen was on the birds and the tarballs on the beach. Other than oil removed from the animals, no oil was recovered.

### **NOAA Activities:**

NOAA was notified of the incident on March 9, 1992, by the USCG COTP Long Island Sound. NOAA responded by telephone, electronic mail, and facsimile machine. The NOAA Scientific Support Coordinator notified the U.S. Department of the Interior (DOI) and the U.S. Fish and Wildlife Service (USFWS) of the incident and requested their expertise to coordinate bird rescue. DOI requires permits to handle migrating species, but Tri-State Bird Rescue is recognized by them to handle oiled animals so the issuing of permits was not necessary.

NOAA's involvement with this release lasted through March 17.

### **References:**

NOAA Hotline 88, 2 reports

Research Planning Institute. 1985. Sensitivity of coastal environments and wildlife to spilled oil: Long Island. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 41 maps.

<b>Name of Spill:</b>	Fire Island, New York
<b>NOAA SSC:</b>	Ed Levine
<b>Date of Spill:</b>	06/06/92
<b>USCG District:</b>	1
<b>Location of Spill:</b>	Democrat Point to Robert Moses Bridge on the ocean side, Fire Island, New York
<b>Latitude:</b>	40°37.5' N
<b>Longitude:</b>	073°18.5' E
<b>Spilled Material:</b>	weathered tarball
<b>Spilled Material Type:</b>	4
<b>Barrels:</b>	unknown
<b>Source of Spill:</b>	unknown
<b>Resources at Risk:</b>	none
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	recreational beach
<b>Shoreline Types Impacted:</b>	coarse sand beaches
<b>Keywords:</b>	Oil Pollution Act of 1990

#### **Incident Summary:**

At 1836 on June 6, 1992, the Manager of Robert Moses State Park notified the U.S. Coast Guard (USCG) that tarballs were on the beach at Fire Island, New York. Weather at the time of notification was winds west-southwest at 7 knots, temperature 60°F, with calm seas. However, just before the stranding, the winds had been very strong and persistent from the southeast at 15 to 25 knots and small craft warnings had been in effect. The On-Scene Coordinator (OSC) ordered overflights and hired a cleanup contractor to pickup tarballs and oiled debris. These actions were all funded by the Oil Pollution Act of 1990. The case was closed on June 9, 1992.

#### **Behavior of Spilled Material:**

There were tarballs and oil scattered along the high-tide line for approximately four and a half miles. The cleanup contractor recovered 45 cubic yards of tarballs and contaminated debris.

#### **Countermeasures and Mitigation:**

Shoreline cleanup consisted of manually removing the tarballs and disposing of the oiled debris.

#### **Other Special Interest Issues:**

Significant political and public pressure was applied to ensure speedy cleanup and re-opening of the approximately four miles of public recreational beaches crowded with

bathers. The Governor wanted to bring in minimum security prisoners to aid in cleanup. The OSC declined.

**NOAA Activities:**

NOAA was notified of the incident on June 7, 1992, by the New York State Department of Environmental Conservation's representative. The State was concerned about the closing of the beach to bathers when the Governor was due to arrive the next day. On June 7, the USCG Captain of the Port Long Island Sound requested a hindcast to determine the origin of the stranded oil. After being given the location and history of events, a hindcast trajectory analysis was prepared and forwarded to the USCG. The hindcast indicated that the source of the spill was most likely the Nantucket-Ambrose Traffic Lane. Nothing further was requested from NOAA.

<b>Name of Spill:</b>	<i>Queen Elizabeth II</i>
<b>NOAA SSC:</b>	Ed Levine
<b>USCG District:</b>	1
<b>Date of Spill:</b>	08/07/92
<b>Location of Spill:</b>	Buzzards Bay, Massachusetts
<b>Latitude:</b>	41°22.1' N
<b>Longitude:</b>	70°57.7' W
<b>Spilled Material Product:</b>	Bunker fuel
<b>Spilled Material Type:</b>	4
<b>Barrels:</b>	< 1
<b>Source of Spill:</b>	non-tank vessel
<b>Resources at Risk:</b>	Wilson's storm petrels, northern fulmars, Cory's shearwaters, sooty shearwaters, gannets, greater shearwaters
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	high media interest due to notoriety of vessel, interaction with foreign authorities
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	containment boom, endangered species, tourism losses

#### **Incident Summary:**

At 2158, on August 7, 1992, the cruise ship *Queen Elizabeth II*, on her way to New York, ran aground on an uncharted mound about four miles south of Buzzards Bay Tower, Cape Cod, Maine. At the time of the incident, the winds and seas were calm and visibility was about ten nautical miles. The only damage to the ship appeared to be the breaching of two ballast tanks and one fuel tank. The fuel tank was empty, but a small sheen became visible around the ship.

Soon after its grounding, the vessel freed herself and anchored approximately eight miles south of Cuttyhunk Island. The U.S. Coast Guard (USCG) helped coordinate passenger disembarkment. After all passengers were taken to Newport, Rhode Island, the vessel moved to Boston, Massachusetts for dry-docking, inspection, and repairs.

#### **Behavior of Spilled Material:**

Only a light sheen in the immediate area of the ship was observed. The amount of oil lost was estimated to be less than 40 gallons. None was recovered.

#### **Countermeasures and Mitigation:**

Containment boom was deployed around the ship by the USCG.

**NOAA Activities:**

NOAA was notified of the incident at 0100 on August 8, 1992, by the USCG Captain of the Port (COTP) Providence, Rhode Island. The COTP asked for a trajectory of the oil's possible movement. The NOAA Scientific Support Coordinator (SSC) reported on scene at 1100 and provided trajectory analyses from the vessel's initial impact site, the anchorage site, and her movement to dry dock. Also, the SSC reported on resources at risk in the offshore area and shoreline protection priorities.

NOAA was released by the COTP on August 10, 1992.

**References:**

NOAA Hotline 99, 2 reports

Research Planning Institute. 1983. Sensitivity of coastal environments and wildlife to spilled oil: Rhode Island. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 21 maps.

<b>Name of Spill:</b>	Brayton Point Power Plant
<b>NOAA SSC:</b>	Ed Levine
<b>Date of Spill:</b>	09/29/92
<b>Coast Guard District:</b>	1
<b>Location of Spill:</b>	Brayton Point, Rhode Island
<b>Latitude:</b>	41°42.6' N
<b>Longitude:</b>	71°11.5' W
<b>Oil Product:</b>	#6
<b>Oil Type:</b>	4
<b>Barrels:</b>	47
<b>Source of Spill:</b>	facility
<b>Resources at Risk:</b>	clam beds (hard and soft shelled), marsh
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	brackish marshes, man-made shoreline, river banks
<b>Keywords:</b>	none

#### **Incident Summary:**

At 1030, September 29, 1992, 2,000 gallons of #6 oil was spilled on the Brayton Point Power Plant's property during a transfer operation. About 50 gallons of oil made its way into the Tauton River. The responsible party deployed approximately 1,300 feet of boom around the spill and hired contractors to remove the oil. The weather at the time of the incident was a sunny 65°F, with winds from the south-southeast at 15 knots.

The U.S. Coast Guard Captain of the Port (USCG COTP) Providence responded with personnel and a small boat to assess the spill and monitor cleanup operations.

#### **Behavior of Oil:**

The oil was boomed at the spill site. Only a small amount escaped and traveled a short distance down the Tauton River causing slight impacts on man-made shorelines and river banks.

#### **Countermeasures and Mitigation:**

The responsible party boomed the spill area and hired a cleanup contractor. The spill was fairly well controlled, but shorelines needed cleaning. The shoreline cleanup consisted mainly of manually removing stranded oil and disposing of oiled debris.

#### **NOAA Activities:**

NOAA's involvement in this response was minimal. The Scientific Support Coordinator provided resources at risk information by phone to the USCG COTP.

**References:**

Research Planning Institute. 1983. Sensitivity of coastal environments and wildlife to spilled oil: Rhode Island. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 21 maps.

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<b>Name of Spill:</b>	Huron Shores
<b>NOAA SSC:</b>	Jay Rodstein
<b>Date of Spill:</b>	10/17/91
<b>USCG District:</b>	9
<b>Location of Spill:</b>	Freedom, Michigan
<b>Latitude:</b>	44°44' N
<b>Longitude:</b>	84°38' W
<b>Spilled Material:</b>	#6 oil
<b>Spilled Material Type:</b>	4
<b>Barrels:</b>	14
<b>Source of Spill:</b>	unknown
<b>Resources at Risk:</b>	lake trout that spawn on nearshore rocky reefs, endangered plants found at the sand dune line
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	cobble
<b>Keywords:</b>	none

#### **Incident Summary:**

On Thursday morning, October 17, 1991, a resident, walking the beach near Freedom, Michigan, noticed oil on the shore. The U.S. Coast Guard (USCG) Marine Safety Office (MSO) Sault Ste. Marie was notified and sent an investigation team to the scene. The team estimated that 700 gallons of heavy oil had washed ashore over a three-mile stretch. Personnel from USCG Air Station Traverse City on an overflight later in the day observed no oil floating on the water. Other residents had walked the same shoreline on October 15 and noticed no oil. Oil samples from two vessels in the vicinity were sent to the USCG Central Oil Identification Laboratory for fingerprint analysis.

Because the source of the pollutant was unknown, a sample was sent to NOAA's contract oil chemists at Louisiana State University (LSU) for screening. This screening survey indicated the pollutant was a #6 oil. Since no unusual peaks were identified in the chromatogram, no chemical contamination was suspected.

A sample for disposal was acquired and sent to a commercial laboratory for analysis to meet requirements for disposal. Because the analysis was delayed, it was not completed and provided to the area chosen for disposal, Kendall/Otsego Landfill, until November 4.

Cleanup operations were completed on October 26. The contaminated material was left in dumpsters at the Huron Shores Campground. Security was provided by the USCG. Approval for disposal was received from the Kendall/Otsego Landfill on November 5 and disposal was completed on November 11. Vessels that had transited the area

during the two weeks before the incident were sampled in an attempt to identify the source. No source was identified.

**Countermeasures and Mitigation:**

Minimal, non-intrusive cleanup was recommended for the predominantly cobble shoreline. An environmental sensitivity report was prepared and provided to the On-Scene Coordinator. Removing fully coated cobbles and wiping lesser impacted cobbles were the cleanup procedures used. Specific lanes for crossing from the shore to upland areas were identified to minimize impact to the vegetation.

**NOAA Activities:**

NOAA was notified of the incident at 1300, October 17, 1991, by the USCG MSO Sault Ste. Marie. At 1800, the MSO asked the Scientific Support Coordinator to come to the scene to identify resources at risk, recommend ecologically effective cleanup strategies, and help develop a cleanup plan. A Hotline was initiated.

**Reference:**

NOAA Hotline 66, 8 reports

Research Planning Institute. 1985. Sensitivity of coastal environments and wildlife to spilled oil: Lake Michigan Eastern Shore An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 23 maps.

<b>Name of Spill:</b>	Toledo Seepage
<b>NOAA SSC:</b>	Jay Rodstein
<b>Date of Spill:</b>	12/13/91
<b>USCG District:</b>	2
<b>Location of Spill:</b>	Maumee River, Ohio
<b>Latitude:</b>	41°40'50" N
<b>Longitude:</b>	83°29'00" W
<b>Spilled Material:</b>	#6 fuel oil
<b>Spilled Material Type:</b>	4
<b>Barrels:</b>	unknown
<b>Source of Spill:</b>	contaminated soil
<b>Resources at Risk:</b>	none
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	joint investigation
<b>Shoreline Types Impacted:</b>	man-made harbor structures
<b>Keywords:</b>	none

#### **Incident Summary:**

On September 18, 1991, a continuous light sheen was reported seeping from the storm drain on the east bank of the Maumee River immediately north of the Toledo terminal railroad bridge. This storm drain has been the source of other reported sheens. U.S. Coast Guard (USCG) Marine Safety Office (MSO) Toledo personnel, in an effort to trace the sheen to its source, hired a contractor to enter the storm sewer. The contractor (EMC) observed a muddy, oil-laced ooze emanating from the storm sewer wall at the former Phillips Petroleum Refinery.

#### **Behavior of Spilled Material:**

According to USCG personnel on scene, a continuous light sheen at the outfall dissipated within 10 meters of the discharge point. There was no observed impact to the primarily man-made harbor structures, and no estimate of the amount released was made. There was likely a large volume of residual petroleum in the soils adjacent to the storm sewer line and visible sheens were being released during periods of high water.

#### **Countermeasures and Mitigation:**

The USCG deployed sorbent boom at the outfall. No additional mitigation measures have been taken.

**Other Special Interest Issues:**

In 1985, MSO Toledo and the Ohio Environmental Protection Agency had investigated and encouraged Phillips Petroleum Corporation, whose refinery was next to the storm sewer, to improve retaining walls between the refinery and the storm sewer.

MSO notified Phillips Petroleum and other potential responsible parties who have pipelines in the area. None of those contacted would accept responsibility for the release. Because of the anticipated long-term nature of this project, the USCG requested that the U.S. Environmental Protection Agency take authority at the site, which they agreed to do.

**NOAA Activities:**

NOAA was notified of the incident on December 13, 1991, by the USCG On-Scene Coordinator (OSC) who requested an analysis of the spilled material to determine whether the pollutant was a petroleum product or a hazardous substance. The OSC also asked NOAA to consider whether there were any unusual constituents that might warrant emergency action.

Louisiana State University performed the analysis for NOAA and determined that the ooze contained a medium-to-heavy fuel oil and various polynuclear aromatic hydrocarbons. However the hazardous substances identified are naturally occurring constituents of petroleum and hence Oil Pollution Act of 1990 regulations appear to apply. There were no extremely toxic or unusual constituents identified in the screening analysis.

<b>Name of Spill:</b>	Superior, Wisconsin Train Derailment
<b>NOAA SSC:</b>	Jay Rodstein
<b>Date of Spill:</b>	06/30/92
<b>USCG District:</b>	9
<b>Location of Spill:</b>	Intersection of State Highway 35, the Nemadji River, and the Burlington Northern rail line, Superior, Wisconsin.
<b>Latitude:</b>	46°37' N
<b>Longitude:</b>	92°07' W
<b>Spilled Material:</b>	aromatic concentrates, cyclopentadiene
<b>Spilled Material Type:</b>	5
<b>Barrels:</b>	600
<b>Source of Spill:</b>	derailed railcar
<b>Resources at Risk:</b>	endangered bald eagles and peregrine falcons, soras wrens, marsh wrens, walleye, bullhead, northern pike, rock bass, yellow perch, frogs, toads, turtles, snakes, salamanders, shrews, hares, weasels, skunks
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	population evacuation, vegetated riverbank
<b>Keywords:</b>	Centers for Disease Control, containment boom, evaporation, low-pressure washing, salvage, sorbent boom

### Incident Summary:

At 0255 on June 30, 1992, 14 cars, 3 carrying hazardous materials, derailed and fell approximately 70 feet from the railroad bridge at Highway 35 into the Nemadji River, seven miles south of Superior, Wisconsin. The car containing aromatic concentrates began leaking into the river. Other railcars carrying liquid propane gas and butadiene were also derailed but were not breached. Immediate evacuation of approximately 50,000 residents of Superior, Wisconsin and Duluth, Minnesota was begun by local authorities because of the odorous and visible plume caused by the spill. Most of those evacuated were allowed to return to their homes on July 1. The weather was clear, temperature 57°F, with winds out of the northwest at 10 knots.

Burlington Northern immediately accepted responsibility and hired contractors to perform salvage, cleanup, and monitoring. However, local, Minnesota, Wisconsin, and Federal agencies supplemented the responsible party's resources to ensure public safety and reduce impact.

### **Behavior of Spilled Material:**

Aromatic concentrates are a by-product of the production of ethylene from natural gas. The mixture is clear and resembles a diesel-fuel grade petroleum product. Approximately 25,000 gallons of the 30,000-gallon railcar's contents were released into the river. The material formed a surface sheen, but no mousse. The spilled product was carried approximately 19 miles from the spill site to the mouth of the Nemadji River. On the basis of currents estimated at one to two knots on June 30, the initially spilled product reached the Duluth-Superior Harbor 12 to 18 hours after the derailment, although, sheen was never observed in the harbor. More product was lost on July 1 because flooding caused boom failure.

Impact along the Nemadji was minor because the river is fast-moving and the product evaporated rapidly. The product was carried into the Duluth-Superior Harbor before booms could be deployed. A small fish kill was observed on June 30 by the Wisconsin Department of Natural Resources (WDNR) who also reported chemically burned vegetation at the high-water line on a section of the riverbank.

Persistence in the water column and some sediments was greater than expected. Expectations were zero, but were actually in the low parts per billion range at several locations several days after the incident. This may have been due to the turbulence of the river.

The odor of the aromatic concentrates (cyclopentadienes) remained for a week following the release. The persistence of the odor caused the public and local response officials to believe the monitoring was ineffective and that there was still product present. This was not the case; the detectors were simply less sensitive than human senses to the odor.

### **Countermeasures and Mitigation:**

The U.S. Coast Guard (USCG) Captain of the Port (COTP) Duluth was the first Federal official on scene and alerted the Strike Team and NOAA. The U.S. Environmental Protection Agency (EPA) On-Scene Coordinator (OSC) arrived the evening of June 30 and took command of the spill site. An evacuation zone of five by six miles was maintained until July 3, when offloading the three railcars containing hazardous materials was completed.

The USCG deployed boom at the mouth of the river and the states initiated air monitoring in communities and water monitoring in the Duluth-Superior Harbor and Lake Superior. Local agencies controlled evacuation and site access.

Sorbent and barrier booms were deployed on June 30 at four sites between the incident and the Duluth-Superior Harbor. Collection, using skimmers, was attempted with limited success (estimates of product recovered from the river are about 100 gallons). Booms were set below the damaged railcar and the remaining

contents, approximately 5,000 gallons, were pumped into tank trucks on July 1. Debris was collected and taken to a regional landfill as hazardous waste.

Transfer directly to other railcars was considered too risky, so tank trucks took the cargo to a local rail facility where it was transferred to undamaged railcars. Aromatic concentrates were offloaded first, followed by the butadiene, and finally the liquid propane gas.

The priority of human health issues and the pollutant's rapid movement did not allow time to protect some sensitive environments. Booms were set at various locations to reduce the quantity of product moving down river and to collect pollutants before they reached the harbor. Low-pressure, cold-water flushing was proposed as a method of shoreline cleanup. However, product volatility and flood conditions rendered this unnecessary.

#### **Other Special Interest Issues:**

Evacuation of the city of Superior and parts of Duluth caused significant effects to tourism and recreation areas during the July 4 weekend. No dollar estimates are known at this time. Public lands and recreational fishing along the Nemadji were restricted through the holiday weekend.

Offloading the railcars was complicated by the limited access to the derailed vehicles and adverse weather. A road was built for salvage equipment and tank trucks so they could reach the spill site. This road building required a full day, and was complicated by heavy rains and flooding. The transfer was safely completed on July 3.

Burlington Northern used a mobile laboratory that included a gas chromatograph with a purge and trap unit. This equipment allowed near-real-time data critical in assessing the fate of the pollutant. This approach was only appropriate for detection of volatile organic compounds. Benzene was used as the specific target compound. Several days into the spill, as volatile levels decreased, heavier organic constituents of the aromatic concentrates were substituted as target compounds. This analysis required off-site analytical support.

There was national media interest on June 30, primarily due to the population evacuation. Regional media interest persisted through July 4.

WDNR and the U.S. Fish and Wildlife Service (USFWS) are contemplating a damage assessment. Autopsies are being performed on fish and wildlife found near the river. EPA's laboratory in Duluth is performing bioassays using the aromatic concentrates that may result in improved knowledge of aquatic toxicities.



**NOAA Activities:**

NOAA was notified of the incident on June 30, 1992, by the USCG OSC and was requested to come on scene. While the NOAA Scientific Support Coordinator (SSC) was en route, the SSC team provided reports identifying resources at risk and chemical fate of the pollutant to the OSC and established contacts for river flow and weather information. On July 1, the SSC initiated an environmental assessment work group coordinated by the WDNR. Other team members were brought to the scene on July 3. The SSC team acted as advisors to WDNR to develop and assess the RP's environmental monitoring program including sampling protocols, analytical methods, and data evaluation. Heavy rains and flooding persisted throughout the time spent on scene so close coordination with the National Weather Service's River Forecast Center in Minneapolis and office at Duluth Airport was important.

NOAA was on scene from June 30 through July 5 and gave continued support through July 31. Monitoring continued after the team's departure and developed into a damage assessment by the WDNR and the USFWS. The assessment of reports and data continued through mid-August from home offices.

**Reference:**

NOAA Hotline 96, 3 reports

<b>Name of Spill:</b>	Milwaukee Harbor Homicide
<b>NOAA SSC:</b>	Jay Rodstein
<b>Date of Spill:</b>	08/10/92
<b>USCG District:</b>	9
<b>Location of Spill:</b>	Menominee River, Milwaukee, Wisconsin
<b>Latitude:</b>	43°02'00" N
<b>Longitude:</b>	87°54'47" W
<b>Spilled Material:</b>	body of young female
<b>Spilled Material Type:</b>	N/A
<b>Barrels:</b>	N/A
<b>Source of Spill:</b>	homicide
<b>Resources at Risk:</b>	none
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	none

#### **Incident Summary:**

At noon on August 7, 1992, the body of a young female was discovered in the Menominee River, less than a mile west of its confluence with the Milwaukee River, Milwaukee, Wisconsin. The Milwaukee Police Department (MPD) asked the U.S. Coast Guard (USCG) for information about surface water movement to ascertain the location from which the body could have been dumped.

#### **NOAA Activities:**

NOAA was notified of the incident on August 10, 1992, by the USCG Marine Safety Office (MSO) Milwaukee. NOAA was asked whether a body found in the Menominee River on August 7 could have entered the harbor from the Milwaukee River, if it had been dumped there on August 4. NOAA's Scientific Support Coordinator (SSC) was asked to respond directly to Detective Nowicki of the MPD.

The SSC contacted the USCG MSO Milwaukee, University of Wisconsin-Milwaukee, and National Weather Service River Forecast Center, Minneapolis for information about river flow; the National Ocean Service Great Lakes Water Level Section, Rockville, Maryland for water level information; and the National Weather Service Forecast Office, Milwaukee for information on wind speed and direction for the four-day period, August 3 through 7. After compiling the climatologic and hydrologic data, the SSC reported that the body could move to the position at which it was found if it had been dumped in the Milwaukee River.



## U.S. COAST GUARD DISTRICT 5

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**Name of Spill:** Kiptopeke Concrete Ships, Potential Impact Assessment  
**NOAA SSC:** Gary Ott  
**Date of Spill :** November and December 1991  
**USCG District:** 5  
**Location of Spill:** Kiptopeke Beach, Cape Charles, Virginia  
**Latitude:** 37°10' N  
**Longitude:** 76°00' W  
**Spilled Material:** residual bunker oils  
**Spilled Material Type:** 4  
**Barrels:** potential 800  
**Source of Spill:** nine sunken concrete vessels forming a breakwater  
**Resources at Risk:** birds, shellfish, fish, reptiles  
**Dispersants:** N  
**Bioremediation:** N  
**In-situ Burning:** N  
**Other Special Interest:** detailed risk assessment for a potential release of weathered bunker oil  
**Shoreline Types Impacted:** sandy shoreline, salt marsh, East Coast migratory flyway  
**Keywords:** none

#### **Incident Summary:**

Approximately a quarter of a mile from the shoreline of Kiptopeke Beach, Cape Charles, on the eastern shore of Chesapeake Bay, Virginia, nine concrete ships containing bunker oil form a breakwater. In October 1991 the U.S. Coast Guard (USCG) Marine Safety Office (MSO) Hampton Roads directed that oil in at least five of these vessels be removed. In late October 1991, when weather permitted, International Marine Services (IMS) began pumping operations. Access to the oil in the concrete vessels' tanks was precarious because the vessels' decks had severely deteriorated leaving reinforcing rods and large holes exposed.

#### **Behavior of Spilled Material:**

The bunker oils were very thick and required the use of special pumps. Following the removal of most of the bunker oil from the vessels, a major storm in December 1991 caused a release of some sheen and a small amount of product from one of the deteriorating tanks. There was not a great amount of oil remaining in the tanks and it dissipated with the storm.

#### **Other Special Interest Issues:**

Numerous dead seagulls had collected in the open tanks of the concrete ships and fallen into the bunker oils. The removal of the oil caused movement of the material in the tanks and the layers of oil on the water containing organic matter were broken.

Considerable amounts of hydrogen sulfide gas, a toxic gas caused by rotting material in anaerobic conditions, was released during some of the pumping operations. The amount of hydrogen sulfide gas reached levels that required special safety procedures to insure the workers' safety.

#### **NOAA Activities:**

NOAA was notified of the incident on October 4, 1991, by MSO Hampton Roads. The Federal On-Scene Coordinator (FOSC) needed assistance in three areas: creating an operational safety plan for the removal process, hydrogen sulfide monitoring procedures, and chemical characterization and general screening of the oil in the sunken ships for other substances that would not be normal components of bunker oils (i.e., PCBs).

NOAA recommended air monitoring procedures using Dräger tubes that resulted in the discovery of the toxic hydrogen sulfide gas. After this discovery, NOAA suggested procedures that insured the safety of response workers by keeping the concrete vessels well ventilated.

Chemical characterization proved the samples to be bunker oils with surprisingly little weathering. NOAA prepared a detailed risk assessment of impact on the environment if the containment provided by the deteriorating concrete structures should fail for the FOSC. NOAA's report to the FOSC noted that the location of the ships, on the eastern shore of Chesapeake Bay, was at the largest and most productive estuary in the United States, and was at an important migratory pathway for many species of birds.

NOAA informed the FOSC shoreline types that could be impacted included mostly sandy shoreline. However, Fisherman's Island, just south of the vessels, also contained considerable salt marsh vegetation and is a major bird nesting colony for wading birds, shorebirds, herring gulls, and royal terns. This section of shoreline is along the main East Coast migratory flyway. During the spring and fall there are large numbers of birds present.

The removal action was completed without further incident in late December 1991.

#### **References:**

Louisiana State University. 1991. Report on concrete ship bunker oils. Baton Rouge: Institute for Environmental Studies, Louisiana State University. 5 pp.

NOAA. 1980. Sensitivity of coastal environments and wildlife to spilled oil, State of Virginia. Boulder, Colorado: Hazardous Materials Response Project, National Oceanic and Atmospheric Administration. 104 maps.

RPI. 1992. Potential impacts from oil aboard the concrete ships, SSC Report to the OSC. Yorktown, VA: National Oceanic and Atmospheric Administration. 14 pp.

<b>Name of Spill:</b>	<i>C/V Santa Clara I</i>
<b>NOAA SSC:</b>	Ed Levine
<b>USCG District:</b>	5
<b>Date of Spill:</b>	01/03/92
<b>Location of Spill:</b>	Atlantic Coast off Cape May, New Jersey
<b>Latitude:</b>	38°53.5' N
<b>Longitude:</b>	74°14.5' W
<b>Spilled Material:</b>	arsenic trioxide
<b>Spilled Material Type:</b>	5
<b>Amount:</b>	155,250 pounds
<b>Source of Spill:</b>	container vessel
<b>Resources at Risk:</b>	mixed sand and shell ocean bottom, whales, dolphins, sea turtles, reef fish (includes fish using hard-bottom habitats), black sea bass, clams, harvest areas, high concentration sites, crabs, high concentration sites, recreational fishing areas, commercial fisheries
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	Notice to Fishermen, ROV, side-scan sonar array
<b>Shoreline Types Impacted:</b>	N
<b>Keywords:</b>	endangered species, evaporation, Food and Drug Administration, NAVSUPSALV, NOAA National Marine Fisheries Service Laboratory, remote sensing, salvage, seafood harvesting ban, shallow water recovery, tourism losses

### Incident Summary:

On January 3, 1992, the container vessel *Santa Clara I* was damaged during a storm while transiting 30 miles off the New Jersey coast. Damage to the ship's bow was noticed when a pilot boarded her on January 4 to steer her to Baltimore, Maryland (see also *Santa Clara I*–Baltimore). An inspection in Baltimore revealed broken intermodal containers and arsenic trioxide spilled on the ship's deck, with a further 21 containers missing, including four hundred forty-one 375-pound arsenic trioxide drums.

The response involved a helicopter sonar search, re-acquiring the helicopter targets with a vessel and identifying them with a remotely operated vehicle (ROV) video camera, and, finally, removing the drums. Beginning in mid-January, U.S. Navy Helicopter Mine Squadron 14 searched for the lost containers via underwater mine detection equipment using towed side-scan sonar array.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Fund was accessed for \$250,000. Before the response ended, the Fund ceiling was raised to \$6 million.



### **Behavior of Spilled Material:**

Arsenic trioxide is a highly poisonous metal oxide used as an insecticide, herbicide, and wood preservative. It is noncombustible, but will burn at high temperatures, producing arsine gas, and is highly toxic by ingestion or inhalation. The lethal ingestion dosage for an adult is 5 mg/kg; a dose equal to two aspirin-size tablets.

Assessing the actual risk to the environment and human health was of utmost concern to the On-Scene Coordinator (OSC). It was determined that the greatest risk to humans was by direct contact with the arsenic trioxide. The drums were discovered in an active shellfish bed and fishermen could contact the material by pulling a drum onboard during a shellfish trawl. A secondary pathway of lower probability was through the consumption of tainted shellfish.

Because arsenic trioxide is fairly insoluble in water and was discovered in three piles from ruptured drums instead of being dispersed over a large area, it was expected to take a relatively long time to completely dissolve in the water column. Larger-scale impacts from arsenic trioxide entering the ecosystem could be expected to be minor because inorganic arsenic is readily converted to organic arsenic in the marine environment, and organic arsenic is much less toxic than inorganic arsenic. Near-field acute toxicity associated with the piles of arsenic trioxide is possible, particularly to those benthic organisms underlying or near the three piles. However, broader ecosystem or resource impacts, such as contamination of a widely distributed shellfish stock, is unlikely.

### **Countermeasures and Mitigation:**

On February 12, 1992, at the request of the states of Delaware and New Jersey health departments and the FDA, NOAA's National Marine Fisheries Service (NMFS) closed the area around the debris field to commercial fishing using powers granted under the Magnuson Act. This decision was based on the threat to human health from direct contact or consumption of tainted commercial fisheries products, rather than the effect of arsenic trioxide on the marine organisms themselves.

The NMFS research vessel *Gloria Michelle* began water and bottom sampling in the area; the fishing vessel *Betty C* shellfish sampling. No dockside monitoring of catch, either sport or commercial, was deemed necessary.

NMFS monitored the collection of water, sediment, and tissue samples. Analysis of water and sediment samples in the debris field and surrounding area indicated that all arsenic concentrations were within background values. The FDA's analyses of the clam tissue samples collected by the *Betty C* reported that arsenic levels were well within the range of values found in commercial shellfish from other areas of the United States, and thus provided no grounds for concern.

On January 13, navy helicopters encountered the first sonar contacts on the ocean bottom, three containers and several drums. The EPA research vessel *Peter W. Anderson* began sonar searches for the containers and drums following the track line of the *Santa Clara* from New York City, but was released when a vessel chartered by the U.S. Navy Supervisor of Salvage (NAVSUPSALV) arrived to conduct side-scan sonar and ROV searches.

In mid-March the Potentially Responsible Party (PRP), insurer for the ship owner, began further surveying of the vessel's track line, recovering drums and containers for final disposal. The PRP devised a re-survey plan for the track line with side-scan sonar and ROV underwater video from one mile north of the recorded position to the Delaware Bay entrance buoys.

NOAA historical weather and risk analyses estimated that the drums would be buried by ocean sediments within 1 to 2 years, probably remaining intact on the ocean floor for about 30 years.

A variety of options were discussed for handling the drums including removing them completely, disposing of them in place by drilling holes in them to allow the product to seep out, exploding them, or simply leaving the drums on the ocean bottom. Complete removal would make monitoring unnecessary; destruction in place would require annual or semiannual sampling for one to two years; slow disposal in place would require a longer-term program, about five years; and leaving the drums as they were would require the longest-term monitoring, more than five years. The evaluation of monitoring results should be the primary input for determining the duration and scope of the monitoring program.

NOAA's Hazardous Materials Response and Assessment Division's evaluation of the effects of pressure on the drums, resulted in four possible scenarios: 1) a certain percentage of the drums might remain totally intact; 2) a certain percentage might have their integrity breached and the head air space partially fill with water; 3) a certain percentage might have their integrity breached and the head air space totally fill with water; and 4) a certain percentage of the drums might totally lose their sealing lids.

Cases 1, 3, and 4 posed no concern for pressure effect, but case 2 did. As the drums are brought to the surface, the air inside will expand as the outside water pressure is diminished. Since the chemical reaction of arsenic trioxide with seawater will not produce gas by-products, this head space can only be less than the original head space if a drum is breached and partially fills with water. Therefore, no over pressure of the drum would occur when it reached the surface.

In early April, the PRP-funded equipment conducted test salvage and recovery operations at the main debris site by placing drums in racks and overpacking drums with cement on the ocean bottom. The tests confirmed that overpacked drums brought to the surface would not explode because water pressure would be slowly reduced by gradual outgassing. Moreover, two drums pressure tested at the David Taylor Research

Center in Annapolis, Maryland, showed signs of damage to lids and crinkling. Water leakage hardened cement that was used inside the drums as a substitute for the arsenic trioxide.

By May 7, the PRP ended its search and recovery operations because there was no location for temporary storage and impending bad weather would prevent land disposal of the arsenic trioxide still to be recovered by the deadline of May 8. After that date an EPA-imposed land ban will be in effect and arsenic trioxide can no longer be disposed of in landfills, but must be burned. The Coast Guard retained equipment to continue the search when the weather permitted. Search efforts resumed unsuccessfully in Delaware Bay and along the track line on May 11; the Coast Guard concluded its search efforts on May 21.

The decision to cease search operations for the remaining missing container and drums revolved around the probability of finding them. After all areas of concern were searched with state-of-the-art technologies and declared arsenic trioxide free, and the OSC was assured that potential areas for human contact were free of drums, search operations were discontinued.

A Sea Grant Advisory Notice was issued to commercial fishermen and related industries at risk of encountering the 94 remaining arsenic trioxide drums whose location was unknown. The Notice advised on the hazards of arsenic trioxide, how to handle and report it, and listed hospitals capable of treating contaminated individuals.

EPA classified the arsenic trioxide as a chemical product, not a waste, allowing it to be disposed of in a landfill or shipped back to its owner for recycling. Due to customs and transport concerns, the disposal option was used. By late May, 16 shipping containers of 320 overpacked drums were delivered to GSX Landfill in Pinewood, South Carolina for disposal.

#### **Other Special Interests:**

The Coast Guard and NMFS performed a Section 7 Endangered Species Act review due to the presence of Ridley turtles in the recovery operations area. The Section 7 review concluded that this endangered species was not at increased exposure because recovery operations were confined to the bottom.

Media interest was very high throughout the response. The NOAA National Weather Service "Notice to Fishermen" broadcasted the general location of the containers and advised that they were probably located in an active shellfishing area, requesting vessels to avoid the area of survey operations.

**NOAA Activities:**

NOAA developed a variety of discussion papers addressing bottom currents in the area; biotoxicity for plants, shrimp, fish, birds, and plankton should the drums be breached; and the chemistry and fate of arsenic trioxide in the ocean. In addition, NOAA produced track-line maps of the vessel, loading diagrams of the deck cargo to aid search operations, and sonar shadow return graphics from the information gathered by the helicopter search crews.

**References:**

Material Safety Data Sheet–Arsine #178. March 1986. Genium's Reference Collection. Schenectady, NY, Genium Publishing Corp.

Material Safety Data Sheet–Arsenic Trioxide #194. June 1986. Genium's Reference Collection. Schenectady, NY, Genium Publishing Corp.

NOAA Hotline 80, 66 reports

NOAA. 1990. The CAMEO™ 3.0 Manual. Washington, D.C.: National Safety Council. 300 pp.

Occupational Safety and Health Reporter (29 CFR Sec. 1910.1018, Appendix C). pp 161-168, 11-12-86.



<b>Name of Spill:</b>	<i>Santa Clara I—Baltimore</i>
<b>NOAA SSC:</b>	Gary Ott
<b>Date of Spill:</b>	01/05/92
<b>USCG District:</b>	5
<b>Location of Spill:</b>	Baltimore, Maryland
<b>Latitude:</b>	39°17' N
<b>Longitude:</b>	76°36' W
<b>Spilled Material:</b>	arsenic trioxide/magnesium phosphide
<b>Spilled Material Type:</b>	5
<b>Source of Spill:</b>	non-tank vessel
<b>Resources at Risk:</b>	none
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	none

#### **Incident Summary:**

On January 3, 1992, the container vessel *Santa Clara I* was damaged during a storm while transiting 30 miles off the New Jersey coast (see also *Santa Clara I*). Damage to the ship's bow was noticed when a pilot boarded her on January 4 to steer her to Baltimore, Maryland. An inspection in Baltimore revealed broken intermodal containers and arsenic trioxide spilled on the ship's deck, with a further 21 containers missing, including four hundred forty-one 375-pound arsenic trioxide drums.

The spilled chemical was partially removed during cleanup operations at the Dundalk Marine Terminal in Baltimore. Four damaged 55-gallon drums of unknown material were also removed from the vessel and stored on the facility. The material in the four damaged drums was magnesium phosphide, a material that releases highly toxic and flammable phosphine gas when wet.

The *Santa Clara I* departed Baltimore for Charleston (see *Santa Clara I—Charleston*) on January 6, 1992, after her release by the cargo surveyor when the removal of arsenic trioxide residue on the deck had been completed. The complete packaging and removal of all the materials in the four drums left on the Dundalk Marine Terminal was not completed until July 1992.

#### **NOAA Activities:**

NOAA was notified of the incident on January 5, 1992, by the U.S. Coast Guard (USCG) Marine Safety Office (MSO) Baltimore. MSO Baltimore asked NOAA to help evaluate the arsenic trioxide and the cleanup efforts of the owner's contractor.

The contractor for the cleanup had been reportedly using a lime material to neutralize the arsenic trioxide during cleanup operations. NOAA told MSO that, although the lime material would not neutralize the arsenic trioxide, it was an appropriate agent for collecting the arsenic trioxide and could be used during cleanup operations. NOAA provided MSO with health and safety information about arsenic trioxide.

**References:**

NOAA. 1990. CAMEO™ 3.0 Manual. Washington, D.C.: National Safety Council. 300 pp.

Virginia Institute of Marine Science. 1980. Sensitivity of coastal environments and wildlife to spilled oil, State of Maryland. Boulder, Colorado: Hazardous Materials Response Project, National Oceanic and Atmospheric Administration. 104 maps.

<b>Name of Spill:</b>	<i>Santa Clara I</i> —Charleston
<b>NOAA SSC:</b>	Gary Van Den Berg
<b>Date of Spill:</b>	01/08/92
<b>USCG District:</b>	5
<b>Location of Spill:</b>	Charleston, South Carolina
<b>Latitude:</b>	32° 47.8' N
<b>Longitude:</b>	79° 55.7' W
<b>Spilled Material:</b>	magnesium phosphide (UN No. 2011) arsenic trioxide (UN No. 1561)
<b>Spilled Material Type:</b>	5
<b>Amount:</b>	850 pounds of magnesium phosphide unknown amount of arsenic trioxide
<b>Source of Spill:</b>	container vessel
<b>Resources at Risk:</b>	N
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-Situ</i> Burning:</b>	N
<b>Other Special Interests:</b>	human health and safety, cargo hold visuals, wet deactivation
<b>Shoreline Types Impacted:</b>	N
<b>Keywords:</b>	none

#### Incident Summary:

On January 3, 1992, the container vessel *Santa Clara I* was damaged during a storm while transiting 30 miles off the New Jersey coast (see *Santa Clara I*). Damage to the ship's bow was noticed when a pilot boarded her on January 4 to steer her to Baltimore, Maryland (see *Santa Clara I*—Baltimore). An inspection in Baltimore revealed broken intermodal containers and arsenic trioxide spilled on the ship's deck, with a further 21 containers missing, including four hundred forty-one 375-pound arsenic trioxide drums.

During the short stop in Baltimore, several damaged containers, two of which also contained arsenic trioxide, were removed from an on-deck above-cargo hold. Other damaged cargo was removed from another cargo hold. The ship left Baltimore with instructions from U.S. Coast Guard (USCG) Marine Safety Office (MSO) Baltimore to wash the remaining arsenic trioxide off its upper deck at sea. The *Santa Clara I* arrived at the Columbus Street Terminal in Charleston, South Carolina on January 8. The weather in Charleston at that time was mild, clear skies, temperature 60°F, winds northwest one to two knots, with unlimited visibility.

Shortly after container and bulk cargo removal began, stevedores working near cargo hold #1 complained of respiratory irritation and were transported to a local hospital for treatment and observation; they were released a short time later. MSO personnel conducting an inspection aboard the *Santa Clara I* found magnesium phosphide in the #1 cargo hold upper tween compartment. The product was in a loose white powder form distributed among the cargo in the hold. It was assumed



that the product came from damaged drums that had been removed in Baltimore. The vessel's owner hired a local contractor (3R Inc.) to conduct the cleanup, but replaced it with OHM Inc. on January 11.

A command post was established on the grounds of the Columbus Street Terminal. The terminal was closed and a safety zone established around it that included Cooper River Town Creek Channel from the Highway 17 Bridge south to Red Buoy #2 at the south end of the terminal.

Policies and tactics for safely cleaning up the spilled chemicals were made at morning and evening operations meetings. Initially the primary focus of the response was to determine appropriate safety measures for dealing with magnesium phosphide. After an attempt to deactivate the material failed, the ship was moved to Anchorage A on January 10, 1992, with only a skeleton crew to maintain the required watch and contractor personnel to ensure proper ventilation and monitor phosphine gas concentrations, while allowing slow deactivation by ambient humidity to continue. All operations were conducted in level B protection and the air was continuously monitored at the exhaust vents. Anchorage A was designated a safety zone and a 24-hour live watch was maintained at the MSO. A tug boat with fire fighting capability and a small MSO boat remained on scene.

When the *Santa Clara I* was moved to Anchorage A, the command post was re-established at Fort Johnson to be nearer the ship. A portable weather station was also set up at the new command post to furnish real-time weather data through telemetry with ALOHA™ to help the On-Scene Coordinator (OSC) plan deactivation operations.

The *Santa Clara I* remained at anchor in Anchorage A for 25 days while cleanup operations continued. At 1800 on February 6, 1992, the *Santa Clara I* was given permission to move back to the Columbus Street Terminal.

An unknown amount of arsenic trioxide was washed from the *Santa Clara's* deck and approximately 865 pounds of magnesium phosphide were recovered from the hold. There was no environmental damage caused by this incident because the products were confined to the ship.

#### **Behavior of Spilled Material:**

Magnesium phosphide reacts violently with water producing phosphine gas and magnesium oxides. Phosphine gas is highly poisonous and flammable; consequently, no operations could be conducted on rainy or heavily overcast days. The extreme toxicity of phosphine gas restricted operations during winds less than 5 miles per hour; operations were stopped if the winds reached 15 miles per hour.

Arsenic trioxide is a highly poisonous metal oxide used as an insecticide, herbicide, and wood preservative. It is noncombustible, but will burn at high temperatures producing arsine gas, and is highly toxic by ingestion or inhalation. The lethal ingestion dosage for an adult is 5 mg/kg, a dose equal to two aspirin-size tablets.

There was a minimal risk of other chemicals in the hold combining with arsenic trioxide to produce highly toxic arsine gas. The hydrogen peroxide in hold #2 was a potential explosive hazard if it came in contact with arsenic trioxide the reaction would most likely produce an arsenic acid, but not arsine gas.

#### **Countermeasures and Mitigation:**

Arsenic trioxide removal operations involved scraping, sweeping, vacuuming, and high-pressure water washing. Product caught in cracks, crevices, or surface pits was loosened and then recovered using a vacuum cleaner. High-pressure water washing of the ship's deck removed any product remaining from the damaged containers on #2 hatch cover. The contaminated water was recovered and put in 55-gallon drums for disposal. All areas that required cleaning to ensure a safety zone were completed before magnesium phosphide removal operations began.

When weather permitted, dry deactivation operations on the magnesium phosphide were conducted at least twice daily. Dry deactivation consisted of raking and leveling the material followed by a two-hour wait. This wait allowed the chemical to slowly off-gas within the cargo hold. The cargo hold was continuously force ventilated and the air monitored at the exhausts for phosphine gas concentrations.

After two hours, wet deactivation was attempted by putting small amounts of the magnesium phosphide into a 55-gallon drum of fresh water. When one to two pounds of the product were introduced into the water, the material deactivated rigorously, including off-gassing, flames 10 to 15 feet high, and minor detonations. As a result, it was decided that no further wet deactivation would take place until an improved method could be developed.

When the product reached an acceptable level (determined by air monitoring and the color of the product), it was wet-deactivated in a special apparatus designed by OHM Inc. The product was put in pails in the cargo hold, lifted out, and lowered to a barge along side the *Santa Clara I*. Once it was on the barge, OHM Inc. personnel in level B protection introduced small quantities (one to three pounds) into the fresh water. It was then left to off-gas its maximum amount. When this process was completed, the product was removed to a second water tank (cold tank) and left for a considerable period to ensure complete deactivation.

Wet deactivation of the magnesium phosphide was completed at 1400 on February 6, 1992. Before the *Santa Clara I* could be moved, a comprehensive air monitoring was conducted in the cargo hold using Dräger tubes. The analysis revealed that no readings were over one part per million, an acceptable limit.

All container and cargo removal operations were completed by February 9, 1992. MSO Charleston terminated the safety zone around the vessel at 1800 that evening and the Captain of the Port cleared the *Santa Clara I* to depart the Port of Charleston on February 10, 1992.

**Other Special Interest Issues:**

Local EMS personnel provided a blood pressure check and an EKG for all Gulf Strike Team (GST) personnel before and after they entered the ship. Any sign of exposure resulted in personnel being taken to a local hospital for a more thorough examination. A stand-by medical team, provided by the local EMS unit, stood ready to evacuate any injured person.

USCG Public Information Assistance Team personnel fielded all local press inquiries and provided still photographs and video tapes of all operations to the local media.

**NOAA Activities:**

NOAA was notified of the incident on January 9, 1992, by MSO Charleston. NOAA supplied the OSC with specific information on magnesium phosphide, health and safety concerns, and levels of protection needed. The SSC reported on scene on January 13 to provide technical advice and data management support. During the response, NOAA provided the daily hotlines, twice-daily weather updates, and available technical information on all suspected manifested hazardous cargoes. NOAA prepared reports pertaining to manifested chemicals and their associated hazards. The OSC used these reports at presentations and briefings.

Cargo documentation was incomplete and the cargo survey was sketchy. On the basis of this review, cargo hold visuals were developed showing where the chemicals were located. Tables were furnished showing technical information for each manifested chemical and which piece of air monitoring equipment could be expected to best detect that chemical. These unique cargo hold visuals played a major role in the response effort and were heavily relied upon by all response participants. The chemical risk assessment was based on these visuals, the USCG Board of Inquiry came to depend on several of the visuals heavily, the OSC included the visuals in his briefing packages, the GST used them to construct site safety plans, and the contractor used them extensively to plan operations.

NOAA furnished specific information on the effects of magnesium phosphide on human safety and health as well as CAMEO™ chemical recommendations and information. The chemical's manufacturer, Degesch America Inc., recommended deactivation techniques.

NOAA also provided daily information to response personnel about the currents and tides in the area. This information was critical when positioning the ship to allow for the best wind direction for wet-deactivation operations.

NOAA was released by the USCG on February 10, 1992.

**References:**

NOAA. 1990. The CAMEO™ 3.0 Manual. Washington, D.C.: National Safety Council. 300 pp.

NOAA. 1990. The ALOHA™ 5.0 Manual. Washington, D.C.: National Safety Council. 300 pp.

NOAA Hotline 77, 113 reports



<b>Name of Spill:</b>	Stewart Petroleum
<b>NOAA SSC:</b>	Gary Ott
<b>Date of Spill:</b>	01/19/92
<b>USCG District:</b>	5
<b>Location of Spill:</b>	Anacostia River, Washington, D.C.
<b>Latitude:</b>	38°52' N
<b>Longitude:</b>	77°00' W
<b>Spilled Material:</b>	#4
<b>Spilled Material Type:</b>	3
<b>Barrels:</b>	83
<b>Source of Spill:</b>	facility
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	adversely cold weather
<b>Shoreline Types Impacted:</b>	riprap, seawalls, low banks with mixed sand/mud and rubble beaches
<b>Keywords:</b>	containment boom, sorbent boom

#### **Incident Summary:**

On January 19, 1992, a frozen valve at the Stewart Petroleum facility cracked and allowed 51,000 gallons of oil to flow into the facility's containment area. An open valve allowed approximately 3,500 gallons of product to drain from the containment area into an oil/water separator, into a storm drain, and into the Anacostia River. The weather was clear and cold, temperature 2°F. The U.S. Coast Guard (USCG) Marine Safety Office (MSO) Baltimore directed the spill response and cleanup conducted at Stewart Petroleum. The Federal Pollution Fund was opened.

#### **Behavior of Spilled Material:**

The estimated 3,500 gallons of heavy oils cut with #2 oil was initially reported as contained near the facility outfall within a redundant sorbent and containment boom structure. However, on the morning of January 20, the oil, now identified as a high quality #4, had flushed out of the riprap where it had been held by the wind, escaped the redundant boom structures, and moved upriver with the unusually high moon tide. Ice formations along the shoreline held much of the oil away from the shore. The evaporation of the lighter oil was expected to continue during the extreme cold weather. The remaining oil would become increasingly stiff, taking on the appearance of bunker C. However, it could still lift on a high tide from areas where it had settled.

#### **Countermeasures and Mitigation:**

Countermeasures included redundant sorbent and containment boom structures surrounding the outfall at the Stewart Petroleum facility. Oil contained in that area was removed by vacuum truck. Oil that had escaped this containment, or was released from

riprap, was collected using boom in collection areas established by emergency responders. Small boats were used to tow sorbent sweep as a device to collect small quantities of oil and oil sheen in the river. The use of pressure wash systems to clean oil from riprap areas was explored as the cleanup progressed.

**Other Special Interest Issues:**

Use of Elastol was considered but rejected as an aid in cleanup. The Regional Response Team (RRT) III checklist for dispersant use (Dispersant Employment Evaluation Plan) was used to discuss the potential use of this collecting agent. Conditions in the Anacostia River were not optimal for the use of a dispersant; however, conditions may be appropriate for the use of a collecting agent such as Elastol. The availability of the light oil and sheen that require viscoelastic-enhancing agent to improve collection efforts would decrease with time.

**NOAA Activities:**

NOAA was notified on January 19, 1992, by the 5th USCG District (m). At that time, the oil was identified as #2 and said to be contained by a series of booms. No assistance was requested of NOAA then. However, on January 20, MSO Baltimore requested information on the density of #4 oil and assistance on speculating on how the oil had escaped the redundant boom system. NOAA suggested that the oil did not sink under the boom due to low temperatures, and that the nighttime release of oil held by the wind within the riprap may have been impossible to prevent. The only possible alternative would have been to boom all the riprap shoreline and tend the boom systems the entire night. The significant currents on the Anacostia River during unusually high tides at night and during the extreme low temperature would have been a significant safety risk for response personnel.

**References:**

NOAA Hotline 82, 16 reports

RRT III. 1992. Dispersant Employment Evaluation Plan (DEEP). Dispersant use decision guidance, Criteria for monitoring dispersant use, Appendix 1, Streamlined dispersants checklist. Norfolk, VA: Regional Response Team.

<b>Name of Spill:</b>	C/V <i>Evergrace</i>
<b>NOAA SSC:</b>	Gary Ott
<b>Date of Spill:</b>	01/24/92
<b>USCG District:</b>	5
<b>Location of Spill:</b>	180 miles southwest of Cape Henry, Virginia
<b>Latitude:</b>	37°58' N
<b>Longitude:</b>	76°04' W
<b>Spilled Material:</b>	allyl alcohol
<b>Spilled Material Type:</b>	5
<b>Amount:</b>	potential for 127,139 pounds
<b>Source of Spill:</b>	container vessel
<b>Resources at Risk:</b>	none
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	risk evaluation
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	none

#### **Incident Summary:**

The container vessel *Evergrace*, on her way to Baltimore from Houston with a cargo of allyl alcohol was rerouted to the Port of Hampton Roads after ship personnel noticed a mustard-like odor near the #1 hatch portside during a general inspection. The *Evergrace* was carrying 57,670 kilograms (127,139 pounds) of allyl alcohol in three 20-foot containers and a 20-ton intermodal tank container. The U.S. Coast Guard (USCG) Marine Safety Office (MSO) Baltimore was notified of a possible leak on January 24, 1992. At the Port of Hampton Roads, a risk assessment was conducted to ascertain whether the vessel was safe to dock. After the vessel was allowed to dock, the suspect containers were carefully removed to a secure shoreside inspection area. Close inspection revealed no obvious leak or spill.

#### **Countermeasures and Mitigation:**

The USCG Captain of the Port (COTP) directed the vessel to anchor outside the Port of Hampton Roads, approximately three miles north of Cape Henry. A team of marine chemists, hired by the owners, investigated the potential chemical risk.

On January 25, 1992, the marine chemist team, using appropriate protective equipment, saw no visible damage to the vessel and detected no unusual readings. Based on this preliminary investigation, the COTP authorized the vessel to continue on to the pier at Norfolk International Terminal.

The ship's owner and chemical response team presented plans to ensure the safety of the public and workers during offloading and for investigating the chemical threat. Details were outlined concerning air and chemical monitoring, stop-work mechanisms



in the event of an emergency, finding the suspect containers that contained the allyl alcohol, and decontaminating the containers if necessary. The plans were approved by the COTP.

**NOAA Activities:**

NOAA was notified of the incident on January 24, 1992, by USCG MSO Hampton Roads who requested help in identifying the vessel's cargo and its toxicity threat. Concerns focused on the risks to the crew, the evaluation team, and the public after the vessel arrived in port.

By the end of January 25, the *Evergrace* had offloaded all containers except the suspect tank containing the allyl alcohol. After an initial inspection of this tank, it was placed on the pier for closer inspection and evaluation. The *Evergrace* departed Norfolk on the evening of January 25, 1992.

**References:**

NOAA. 1990. CAMEO™ 3.0 Manual. Washington, D.C.: National Safety Council. 300 pp.

NOAA Hotline 83, 6 reports

Research Planning Inc. 1990. Oil and hazardous substances pollution incidents, planning and response considerations, Hampton Roads, Virginia. Seattle: Hazardous Materials Response and Assessment Branch, National Oceanic and Atmospheric Administration. 79 pp.

Virginia Institute of Marine Science. 1980. Sensitivity of coastal environments and wildlife to spilled oil, State of Virginia. Boulder, Colorado: Hazardous Materials Response Project, National Oceanic and Atmospheric Administration. 104 maps.

**Name of Spill:** T/V *Canadian Liberty*  
**NOAA SSC:** Ed Levine  
**Date of Spill:** 07/04/92  
**USCG District:** 5  
**Location of Spill:** Fort Mifflin, Pennsylvania  
**Latitude:** 39°52.5' N  
**Longitude:** 75°12.6' E  
**Spilled Material:** BRC-17  
**Spilled Material Type:** 4  
**Barrels:** 50  
**Source of Spill:** tank vessel  
**Resources at Risk:** mustelids, rodents, intertidal feeding areas, waterfowl, shorebirds, wading birds, gulls, terns, foraging areas, anadromous and estuarine fish, terrapins, beaches, marinas, boat ramps, state parks  
**Dispersants:** N  
**Bioremediation:** N  
**In-situ Burning:** N  
**Other Special Interest:** documentation of vegetation growth in cut and uncut oiled areas  
**Shoreline Types Impacted:** brackish marshes, coarse-gravel beaches, coarse-sand beaches, coastal structures, consolidated seawalls, consolidated shores, freshwater marshes, fringing wetlands, mixed-sediment beaches, piers, riprap, sheltered marshes, vegetated riverbank  
**Keywords:** none

#### Incident Summary:

On July 4, 1992, the tank vessel *Canadian Liberty* (LI) was stripping tanks at the Sun Oil Refinery in Fort Mifflin, Pennsylvania when improper valve alignment and operator error caused a slop tank to be overfilled. The product (BRC-17) was discharged from ullage and into the Delaware River. Initially, eight miles of the river bank, two miles of Woodbury Creek, and small boats in the area were oiled.

The weather was overcast with building thunderheads, temperature 81°F, water temperature 67°F, winds from the west at seven to nine knots, and calm seas.

Terminal personnel were having difficulty deploying boom at Fort Mifflin dock, so the U.S. Coast Guard (USCG) sent personnel in a small boat to help. Cleanup contractors were hired and helped double boom the vessel at the scene. By July 5, cleanup of oil and vessels at the site continued and the contractor, Atlantic Strike Team, and USCG Marine Safety Office (MSO) personnel were cleaning up the New Jersey riverbank.

Impacts were also reported in Big Timber, Woodbury, and Manuta creeks. Snares and absorbent wipes were ineffective during nighttime deployment. Only 17 birds were

observed in slightly distressed condition from light oiling; however, they remained active and uncatchable.

The response lasted approximately one month.

**Behavior of Spilled Material:**

The initial description of the spill was a sheen on the water. The product was a heavy crude and clung to the vegetation, forming a six- to eight-inch bathtub ring at the high-tide mark on vegetation. It did not cling to hard surfaces, probably because they were wet and/or covered with organic slime.

During the major portions of this event, the winds were from the south with an easterly component. Therefore, no impacts were reported on the Pennsylvania shore where the spill occurred, but on the opposing New Jersey shoreline.

**Countermeasures and Mitigation:**

After some initial difficulty securing boom at the terminal, the vessel was double boomed, her hull steam cleaned, and then she was released.

A decision was made to cut vegetation selectively only in areas of heavy oiling with high concentrations of waterfowl. With the emphasis on limiting ecosystem degradation, impacted vegetation was removed to prevent oiling of waterfowl. Vegetation was surgically cut just below the area oiled and again above the oiling. The oiled part of the plant was placed in bags and sent for disposal; while the unoiled part was left in the marsh to naturally degrade. Shore-based vegetation removal proved to be more effective and efficient than cutting from jonboats.

**Other Special Interest Issues:**

The areas of oiled cut vegetation versus uncut oiled vegetation growth are to be measured and documented over the next year by NOAA.

**NOAA Activities:**

NOAA was notified of the incident on July 7, 1992, by the USCG Captain of the Port Philadelphia and asked for thoughts on cutting vegetation to protect birds from being oiled. NOAA recommended that waterfowl be observed to see if they were being affected by the oil before cutting because gross cutting of vegetation can result in loss of habitat. NOAA's suggestion was accepted and this course of action followed.

NOAA's Scientific Support Coordinator (SSC) arrived on scene July 7 and performed a shoreline survey by boat and photo-/video-documented areas of impact. The SSC was on scene for two days, then returned a week later to perform another survey.

**References:**

NOAA Hotline 94, 3 reports

Research Planning Institute. 1985. Sensitivity of coastal environments and wildlife to spilled oil: Delaware, New Jersey, and Pennsylvania An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 59 maps.



<b>Name of Spill:</b>	7-Up Bottling Plant
<b>NOAA SSC:</b>	Ed Levine
<b>Date of Spill:</b>	07/08/92
<b>USCG District:</b>	5
<b>Location of Spill:</b>	Bridgeton, New Jersey
<b>Latitude:</b>	39°25' N
<b>Longitude:</b>	75°14' W
<b>Spilled Material:</b>	#4 oil
<b>Spilled Material Type:</b>	3
<b>Barrels:</b>	4
<b>Source of Spill:</b>	facility drain pipe
<b>Resources at Risk:</b>	brackish marshes, vegetated river banks, mustelids, rodents, intertidal feeding areas, waterfowl, shorebirds, wading birds, raptors, foraging areas, anadromous fish, spawning streams, estuarine fish, oysters, mussels, clams, boat ramps, high-use recreational boating areas, high-use recreational fishing areas
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	well-developed emergency management organization
<b>Shoreline Types Impacted:</b>	brackish marshes, consolidated seawalls, consolidated shores, developed upland, piers, riprap, sheltered seawalls, sheltered tidal flats, supratidal marshes, vegetated riverbank
<b>Keywords:</b>	none

### **Incident Summary:**

On July 8, 1992, at approximately 0800, the U.S. Coast Guard (USCG) was notified of an oil spill on the Cohansey River in Bridgeton, New Jersey. Initially, this was thought to be in the U.S. Environmental Protection Agency's jurisdiction but further information determined that it was to be a USCG response. USCG Marine Safety Office (MSO) and Atlantic Strike Team (AST) personnel were dispatched to the scene to evaluate the situation. Surveys by boat and helicopter were performed and the degree and severity of the spill were ascertained. The spill was listed as a minor release of #4 oil from the 7-Up distribution facility. The responsible party initiated response actions. Booms and sorbents were placed in areas of pocketed oil. The Federal response was over by July 10.

### **Behavior of Oil:**

The initial report indicated that an estimated 2,000 gallons of #4 fuel oil had been released from the 7-Up Bottling Plant in Bridgeton New Jersey. The oil was not expected to reach Delaware Bay because this type of oil readily adheres to marsh

vegetation and little would remain after traveling 17 miles of meandering river to the bay.

The oil was present as sheen (rainbows to gray) with several areas of heavier concentrations of pocketed black oil. It moved upstream driven by prevalent winds from the south. Approximately 250 gallons of #4 oil were released.

**Other Special Interest Issues:**

Because of the presence of a nuclear generator in a neighboring community, Cumberland County, New Jersey has a well-developed emergency management organization. This organization established an Emergency Operations Center in the local fire house within an hour after a command post was requested by the USCG.

**NOAA Activities:**

NOAA was notified of the incident at approximately 1100 on July 8, 1992, by the USCG MSO. The NOAA Scientific Support Coordinator (SSC) went to the scene to perform an overflight and present information about natural resources at risk in the area.

Initially, the SSC participated in a helicopter overflight of the spill scene and mapped the extent and degree of oiling. The following day, the SSC, New Jersey State responders, wildlife personnel, and AST members surveyed the spill site by boat. The consensus of the survey group was that cutting of vegetation was not warranted. Recovery of pocketed oil would be undertaken and sorbents placed in areas of heavy sheens. NOAA remained on scene until July 10.

**References:**

NOAA Hotline 96, 3 reports

NOAA. 1980. Sensitivity of coastal environments and wildlife to spilled oil: State of Maryland. Boulder, Colorado: Hazardous Materials Response Project, National Oceanic and Atmospheric Administration. 104 maps.

<b>Name of Spill:</b>	Allied Barge ATC 114
<b>NOAA SSC:</b>	Gary Ott
<b>Date of Spill:</b>	08/04/92
<b>USCG District:</b>	5
<b>Location of Spill:</b>	Elizabeth River, Virginia
<b>Latitude:</b>	36°48' N
<b>Longitude:</b>	76°16.5' W
<b>Spilled Material:</b>	#6
<b>Spilled Material Type:</b>	4
<b>Barrels:</b>	36
<b>Source of Spill:</b>	facility
<b>Resources at Risk:</b>	Mallard ducks
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	propane noisemaker cannon
<b>Shoreline Types Impacted:</b>	riprap, seawalls, low banks with mixed sand/mud, and rubble beaches, marsh area
<b>Keywords:</b>	sorbent boom, containment boom

#### **Incident Summary:**

On August 4, 1992, during transfer operations between the Allied Towing Barge, ATC 114 and the BP Oil Company facility in Chesapeake, Virginia, a tank of #6 fuel oil was overfilled by approximately 1,680 gallons. About 150 gallons was contained on the deck within a redundant sorbent and containment boom structure, and, presumably, 1,530 gallons spilled into the southern branch of the Elizabeth River. Industrial Marine Services (IMS) was contracted to perform cleanup operations directed by the U.S. Coast Guard (USCG) Marine Safety Office (MSO) Hampton Roads. The spill response and cleanup were conducted by BP Oil Company and Allied Towing. The Federal pollution fund was opened.

#### **Behavior of Spilled Material:**

The Elizabeth River is a tidally influenced urban river system that flows through downtown Norfolk and Chesapeake, Virginia. Considerable lengths of the shoreline are riprap, seawalls, low banks with mixed sand/mud, and rubble beaches. There are industrial facilities and a small marsh area found on the eastern bank. The oil moved along the eastern branch of the Elizabeth River and impacted approximately one mile of urban shoreline and Jones Creek, a small marshy site within this large industrial area.

#### **Countermeasures and Mitigation:**

Redundant sorbent and containment boom structures surround the outfall at the BP Oil facility. Oil contained in that area was removed by vacuum truck. Oil that escaped or was released was collected using boom in collection areas established by emergency



responders. Small boats were used to tow sorbent sweeps to collect small quantities of oil and oil sheen in the river.

**Other Special Interest:**

Numerous waterfowl were in the area at the time of the incident. U.S. Fish and Wildlife Service (USF&WS) and State Game officials were contacted and participated in the spill response. IMS, in conjunction with USF&WS officials, used propane noisemaker cannon to scare birds away from the contaminated area.

**NOAA Activities:**

NOAA was notified of the incident on August 4, 1992, by the USCG MSO Hampton Roads. The MSO asked the Scientific Support Coordinator (SSC) to contact USF&WS and the Virginia State Department of Game and Inland Fisheries and to participate in wildlife protection discussions. USF&WS assessed the situation, established procedures with which to keep other birds away from the contaminated area, and delegated follow-up authority to the State officials. Only ten to fifteen oiled mallard ducks were seen, but could not be captured. However, the NOAA SSC and MSO Hampton Roads staff notified bird rehabilitation volunteer organizations.

**References:**

NOAA. 1980. Sensitivity of coastal environments and wildlife to spilled oil: State of Maryland. Boulder, Colorado: Hazardous Materials Response Project, National Oceanic and Atmospheric Administration. 104 maps.

## U.S. Coast Guard District 7

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**Name of Spill:** St. Eustatius Refinery Terminal  
**NOAA SSC:** Gary Van Den Berg  
**Date of Spill:** 03/15/92  
**USCG District:** 7  
**Location of Spill:** St. Eustatius Island in the Caribbean  
**Latitude:** 17°30' N  
**Longitude:** 063°00' W  
**Spilled Material:** #6  
**Spilled Material Type:** 4  
**Barrels:** 200 to 400  
**Source of Spill:** facility  
**Resources at Risk:** Diving coastal birds, waterfowl, shorebirds, raptors, foraging areas, nesting beaches, bridled tern, roseate tern, laughing gull, red-billed tropic bird, brown booby, least tern, sandwich tern, magnificent frigatebird, sooty tern, brown noddy, osprey, peregrine falcon, brown pelican (endangered), hawksbill and green sea turtles (endangered), leatherback turtles, snapper, grouper, grunt, spiny lobster, Queen conch, West Indian topshell, humpback and pilot whales, spinner and bottlenose dolphins, turtle beaches, bird nesting sites, mangrove forests  
**Dispersants:** Y  
**Bioremediation:** N  
**In-situ Burning:** N  
**Other Special Interest:** SAR buoy  
**Shoreline Types Impacted:** gravel beaches, rocky shores, mixed sand and gravel beaches, fine-grained sand beaches  
**Keywords:** Corexit™ 9517 (or 9527), Caribbean RRT, Jan Solv-60, deflection boom

**Incident Summary:**

On March 15, 1992, the U.S. Coast Guard (USCG) Marine Safety Office (MSO) San Juan received a report of a broken 24-inch diameter pipe at the oil terminal on The Netherlands-owned island of St. Eustatius. Except for a cold front coming through the spill area, the winds were normal trade winds. The flow rate at the time of rupture was 8,000 barrels per hour. Terminal personnel were able to secure the flow about two minutes after the two-foot long rupture occurred. The facility estimated that 200 to 400 barrels of #6 fuel oil had been released. Initial reports of the slick ranged from 9 to 20 nautical miles long and an unknown width. Dispersant operations were started immediately by applying Jan-Solv 60 from a tug.

Federal agencies conferring daily via conference call included: USCG, NOAA, Puerto Rico Department of Natural Resources, U.S. Virgin Islands Department of

Planning and Natural Resources, U.S. Department of the Interior, U.S. Environmental Protection Agency, and the Gulf Strike Team.

**Behavior of Spilled Material:**

The product spilled was #6 fuel oil with an API gravity of 10.1. From previous experience, it was known that there was a good chance the oil would not disperse easily and there was a potential for impacts of tarballs or tarmats on St. Croix and St. Thomas.

The initial trajectory estimate called for the oil to break into small tar patches and drift toward the west. Based on overflight observations of March 19, the trajectory called for the sheens and tarmats to move off the Saba Bank with the expectation that the oil would move in a northwesterly direction. Once the sheen began to approach St. Croix, the oil was expected to move in a more westerly direction. With continuing winds east-southeast, there was a chance that tarballs/tarmats could impact the island of St. Croix within the week. However, there were no documented impacts on St. Croix as of April 3, 1992.

Any oil stranded on the rocky shoreline would likely be very sticky and difficult to clean up: individual tarballs tend to melt into the crevices and irregular rock surfaces. Although the oil would not be toxic to water-column resources such as fish, shoreline accumulations could coat organisms and habitats. On sand beaches, the oil would be very easy to pick up manually, but special care should be used to minimize sediment removal and mixing of the oil into the subsurface. Because of the high amenity value of the beaches, it was advised that crews be ready daily to remove any beached oil immediately. Although the oil was not expected to reach the mangroves because of their sheltered locations, any effects could be severe: oil coating the roots combined with very little natural removal could smother the plants. Even small amounts of oil would cause stress; larger quantities would cause mortality.

**Countermeasures and Mitigation:**

The facility assumed full responsibility and initiated cleanup operations on the island of St. Eustatius. The facility applied 42 barrels of Jan-Solv 60 and 18 barrels of Corexit™ 9527 or 9517 dispersants by boat to the oil slick nearest the terminal.

Approximately 500 feet of deflection boom was deployed south of the facility in an attempt to keep the oil from impacting St. Eustatius. An investigation team from MSO San Juan collected oil samples from the facility for future damage assessments in case of significant U.S. shore impacts. (The nearest U.S. shore, St. Croix, is approximately 90 nautical miles west of the slick.) The team also photo-documented the pipe's rupture and assisted the facility manager as requested.

**Other Special Interest Issues:**

A Search and Rescue (SAR) buoy was dropped in the heaviest part of the oil slick at 1130 on March 17, 1992. On overflights over the next two days, the buoy could still be tracked by way of its distinct radio frequency. The buoy remained relatively close to the oil slick for 72 hours.

**NOAA Activities:**

NOAA was notified of the incident at 2100 on March 15, 1992, by MSO San Juan. The NOAA Scientific Support Coordinator (SSC) was in San Juan to participate in the MSO's annual training and was able to assist on scene. During the response, the SSC provided daily hotlines to the On-Scene Coordinator (OSC). Daily overflights were flown and maps generated and distributed to the response agencies. Weather updates were also provided.

NOAA supplied detailed resources at risk information and trajectory analyses to the response agencies

Oil samples (from the facility) and tarballs (from the shoreline of St. Croix) were analyzed and fingerprinted. Samples of the dispersants (Jan-Solv 60 and Corexit 9517) were tested for efficiency on the product.

NOAA was released by the OSC on March 21, 1992, but returned to complete shoreline surveys April 11 and 12.

**References:**

NOAA Hotline 89, 17 reports

Research Planning Institute. 1984. Sensitivity of coastal environments and wildlife to spilled oil: Puerto Rico. A coastal atlas. San Juan: Puerto Rico Department of Natural Resources. 35 maps.



<b>Name of Spill:</b>	<i>G. H. Vanderborgh Sr.</i>
<b>NOAA SSC:</b>	Gary Van Den Berg
<b>Date of Spill:</b>	03/26/92
<b>USCG District:</b>	7
<b>Location Of Spill:</b>	Miami River, Miami, Florida
<b>Latitude:</b>	25°46' N
<b>Longitude:</b>	080°13' W
<b>Spilled Material:</b>	calcium carbide (UN No. 1402)
<b>Spilled Material Type:</b>	5
<b>Source Of Spill:</b>	drums
<b>Resources At Risk:</b>	none
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-Situ Burning:</b>	N
<b>Other Special Interest:</b>	human health and safety
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	none

#### **Incident Summary:**

On the night of March 25, 1992, U.S. Customs agents boarded the motor vessel *G. H. Vanderborgh Sr.*, moored at a facility on the Miami River in Miami, Florida. They become dizzy after opening a 15-gallon drum marked "calcium carbide."

The next morning, U.S. Coast Guard (USCG) Marine Safety Office (MSO) Miami personnel boarded the vessel to evaluate the situation. They discovered approximately sixty 100-pound drums of calcium carbide in the forward peak tank of the *G. H. Vanderborgh Sr.* Another 340 drums were located in an aft peak tank. The container the customs agents had opened had calcium carbide on its lid and approximately two pounds of product was spilled on the floor around the drum. The Master of the vessel could not provide the boarding team with a "dangerous cargo manifest" or shipping papers for the cargo. The drums were improperly stowed and many had been dented during loading, the containers had been thrown into the holds on top of one another.

#### **Behavior of Spilled Material:**

Calcium carbide reacts with water to produce acetylene gas. The Customs agents tested the product's reactivity with water by pouring a cup of it into a puddle of water; it formed a small gas cloud. The product did not come in contact with water during the offloading procedure, however.

#### **Countermeasures and Mitigation:**

During the afternoon of March 26, a Dade County Hazardous Material Regional Response Team reported to the scene to evaluate the situation. After the air was



monitored and no toxic or flammable gasses were detected, the spilled product was removed and the lid was replaced on the opened drum.

MSO conferred with NOAA and the USCG Gulf Strike Team (GST) before allowing the vessel to offload. A recommendation was made that the drums not be offloaded until the situation was fully evaluated. The GST was dispatched from Mobile, Alabama, the NOAA Scientific Support Coordinator (SSC) reported on scene, and the vessel's owner hired a marine chemist to monitor the air in the holds. MSO established a 150- by 200-foot safety zone around the vessel.

After a level D entry by the GST, monitoring by the marine chemist revealed no toxic or flammable gases, and discussions with the SSC, permission was granted to offload the drums. However, certain safety precautions were in effect during the unloading:

- Level "D" protective clothing, gloves, and dust masks must be worn.
- Cargo holds must be well ventilated.
- Workers must be closely supervised in case they become extremely tired or suffer heat stress.
- Air must be monitored every 30 minutes.

Cargo offloading began at approximately 1700 on March 27, 1992. At one point, the oxygen content dropped below 20 percent and the hydrogen sulfide concentration jumped to 55 parts per million. The vessel was immediately evacuated and the force ventilation modified. There were no further difficulties and the offloading was completed at 1300 on March 28.

#### **NOAA Activities:**

NOAA was notified of the incident on the afternoon of March 26, 1992, by MSO Miami. The SSC provided CAMEO™ information, weather reports, and hazard analyses during the response.

The SSC was on scene when offloading operations began and continued to monitor the situation until it was finished. The MSO released the SSC on March 28, 1992.

#### **Reference:**

NOAA. 1990. The CAMEO™ 3.0 Manual. Washington, D.C.: National Safety Council. 300 pp.

NOAA Hotline 90, 3 reports

**Name of Spill:** *Katina P*  
**NOAA SSC:** Gary Van Den Berg  
**Date of Spill:** 04/19/92  
**Location of Spill:** 25 miles north of Maputo, Mozambique, 6 miles offshore  
**Latitude:** 25° 35' S  
**Longitude:** 032° 59' E  
**Spilled Material:** #6  
**Spilled Material Type:** 4  
**Source of Spill:** tank vessel  
**Amount of Spill:** 25,000 barrels.  
**Resources at Risk:** mangroves, coral reefs, diving coastal birds, wading birds, shorebirds, clams, shrimp, crabs, beaches, marinas, boat ramps, subsistence, commercial fisheries, power plant intakes, shrimp aquaculture  
**Dispersants:** N  
**Bioremediation:** N  
**In-Situ Burning:** N  
**Other Special Interests:** human health and safety, interaction with foreign authorities, tourism, recreation areas, personal property, commercial or recreational fishing areas and public lands closures  
**Shoreline Types Impacted:** coarse-sand beaches, exposed fine-sand beaches, exposed sea walls, exposed tidal flats (moderate biomass), fringing wetlands, mangroves, piers, tidal mudflat  
**Keywords:** contingency plan, manual removal, International Maritime Organization

#### Incident Summary:

On April 19, 1992, the master of the Greek-owned, Maltese-flagged vessel *Katina P* intentionally grounded the ship 25 miles north of Maputo, Mozambique. The vessel, en route from Venezuela to the Persian Gulf, had suffered structural damage during a storm. Two tanks were reported to be holed and an estimated 25,000 barrels of #6 fuel oil released. A Protection and Indemnity Club representative inspected the vessel the next day and estimated that the vessel would soon break up.

The Mozambique Foreign Minister requested spill response support from the United States through Ambassador Friedman. The go ahead to deploy a U.S. response team was given by the U.S. Coast Guard (USCG) COMDT G-MEP after the Ambassador made \$25,000 of disaster relief funds available and approval was received from the Department of State. The interagency team assigned the mission included: CDR Whipple, Commanding Officer USCG Atlantic Strike Team and designated team leader; LCDR Tom Leveille, Executive Officer, USCG Pacific Strike Team; CDR Gary Van Den Berg, National Oceanic and Atmospheric (NOAA) Scientific Support

Coordinator (SSC); Dr. Jacqueline Michel, NOAA scientist; and Mr. Allan Humphrey, U.S. Environmental Protection Agency (EPA) Emergency Response Team.

The U.S. team arrived in Johannesburg, South Africa at 1700 on April 21 and conducted its first overflight of the grounded tanker the next day. Oil could be seen coming from the vessel near the port bow and heavy patches of dark oil were observed surrounding the vessel. The vessel was listing approximately seven degrees to starboard with the deck edge approximately two to three feet above the water line. No one could be seen on the vessel and the tug *John Ross* was standing by to the northwest.

The team modeled its response on the oil spill response structure established under the National Oil and Hazardous Substances Pollution Contingency Plan with the USCG On-Scene Coordinator (OSC) acting as team leader, NOAA as the SSC, and EPA as technical advisor. Written job tasks facilitated excellent interagency coordination throughout the incident and assisted in the presentation of unified advice and recommendations. The team was able to coordinate operations effectively with the government agencies involved.

The U.S. team also worked very closely with oil spill experts from South Africa. This team was part of the South African Coast Guard, which, like the USCG, is responsible for coordinating federal oil spill responses. A joint overflight was conducted on April 26 using a South African Coast Guard aircraft. With the assistance of the U.S. Embassy and U.S. Agency for International Development (AID) Mission, the team helped the government organize an effective joint response task force comprised of government and cleanup organization representatives. By April 26, the Mozambique Government had been fully apprised of the decisions that needed to be made. Even unpopular issues, such as closing and reopening fishing, were developed by the task force. In addition, the Protection and Indemnity Club and cleanup contractor used this forum effectively to raise issues requiring governmental resolution.

#### **Behavior of Spilled Material:**

The oil spilled was a very heavy #6 fuel oil; the *Katina P* had to heat the oil for five days before beginning transfer operations. Because it was so heavy, there was no rainbow sheening (all sheen was a dull gray color) and little mousse formed. The principally northeast winds were fairly typical for the time of the year and river outflow was very low because of a prolonged drought. These factors, combined with a predominantly southerly current, moved the oil southeast from the ship-grounding location towards Maputo.

Although it was reported that the initial release was 3,500 metric tons, a significantly smaller amount was estimated to have remained in the water and impacted the shoreline. Except for a small amount of riprap, a majority of the impacted shoreline was made up of coarse- and fine-grained sand beaches. Three stands of mangroves were impacted.

The *Katina P* sank in the middle to eastern half of the strong and persistent Mozambique Current that has speeds of one to four knots to the south. Water in the area of the sinking is approximately 2,000 meters deep, with bottom water temperatures of approximately 3°C. Based on these conditions, the oil was not expected to remain on the surface or to bubble up from the sunken vessel to impact Mozambique coastlines. Oil remaining on the vessel would cool to water temperature and probably be below its pour point, making further leaking from the vessel unlikely. Although the heavy oil could persist for several months, the characteristically strong currents would carry it south of Mozambique. Strong, persistent southeast winds would push oil toward the Mozambique coast but it was considered doubtful that oil would impact the shoreline.

Moreover, it was considered unlikely that any oil from the vessel would impact South African coastlines under normal conditions. Studies, using drogues in the area where the vessel sank, indicated that spilled oil could take one of two courses: it could proceed down the coast to about 100 nautical miles off Durban within two months; or, it could be caught up in gyres off the Mozambique Ridge (located about 31° S 37° E) for several months before proceeding south.

Given the persistence of heavy #6 fuel oil, there was a small probability that the eastern coast of South Africa would receive scattered tarball impacts by mid-June with strong, persistent winds from the east and southeast.

#### **Countermeasures and Mitigation:**

During its five-day on-scene response, the U.S. team developed a contingency plan for the Government Task Force to address the consequences of oil spills along the Mozambique coast. Copies of the plan were provided to AID and the International Maritime Organization (IMO) representative, John McMurtrie, who had been asked by IMO to develop a national oil spill contingency plan. IMO will refine agency roles to establish a national oil spill response team.

Oil spill cleanup progressed slowly. Operations were initially delayed pending the establishment of the appropriate government agency with oversight responsibilities for cleanup, in addition to the time required to obtain cleanup equipment and locate workers. The civil unrest in Mozambique restricted movement to the immediate Maputo area, so beaches could not be surveyed on foot due to concern about the security of workers. Much of the impacted coastline and river systems to the north could only be surveyed by aircraft. The British Embassy obtained an agreement with RENAMO that British cleanup personnel would not be targets of military activities. Although the agreement allowed cleanup to begin to the north, the contractor chose to continue efforts to eliminate the free-floating oil in the Maputo harbor. When the U.S. team departed Maputo, free-floating oil remained in the harbor and approximately 250 cleanup personnel were working the shoreline. There were three stands of mangroves impacted by the oil. NOAA's Dr. Michel worked very closely with government agencies and other scientists to observe and monitor the damage and discuss appropriate cleanup techniques.

It had been the team's intent to place a Strike Team representative on the *Katina P* shortly after arriving in Mozambique to conduct a damage assessment of the vessel. However, five hours after the team's arrival, the tug *John Ross* began towing the *Katina P* stern first due east to prevent further oil impacts to the coastlines of Mozambique or South Africa if the ship's hull failed. The vessel was towed for three and a half days before the vessel folded in the middle; the bow and stern met as the vessel sank at position 25°04' S, 036°53.5' E, approximately 85 miles east of the Mozambique coastline in 1,500 fathoms of water. Heavy pollution was reported from an estimated release of approximately 95,000 barrels. Observers on a South African Coast Guard overflight on April 27 reported a substantial oil slick with oil still rising to the surface near the sinking. A subsequent overflight reported a significant reduction in the size of the slick and no new oil surfacing.

The interagency team departed Maputo on April 27. The dedicated assistance of the Embassy and the AID Mission were the cornerstones of the team's success. The Ambassador was heavily involved in the team's activities and personally assisted where necessary.

There was no containment at the ship and the only booms deployed were at the city marina and in the area of the power plant water intake. Mitigation was limited to manual shoreline cleanup to remove oil from the beaches. The oil became extremely viscous when it stranded on the beach, making it very easy to remove without taking much sand with it. The recovered oil was put into plastic bags and then into dumpsters. The initial plan for disposal was to put the oiled debris in the municipal landfill.

#### **Other Special Interest Issues:**

*Human health and fisheries issues:* Human health and fisheries were of great concern during the spill because subsistence and commercial fishing form a large part of the daily routine of the population of coastal Mozambique, particularly those near Maputo. For the first week after the incident, the oil slicks remained north of Maputo and outside the Incomati River. Northeast winds pushed the oil close to shore on both sides of Maputo, including areas heavily used for subsistence and commercial fishing. A ban against collection or selling seafood from Maputo Bay was announced jointly by the Ministry of Health and the Secretary of State for Fisheries. This ban was based on the assumption that oil observed in fishing areas posed a human health risk. Swimming and other recreational uses of the beaches were also banned. Restaurants were ordered not to serve local seafood from Maputo Bay.

In a joint meeting of all government agencies and personnel involved in the response and cleanup effort, the issue of fisheries was raised and NOAA offered to assist the government evaluate the human health risks posed by the oil. NOAA met with the Fisheries Research Institute, which manages the large-scale fisheries and provides technical recommendations to the Secretary of State for Fisheries. The composition and characterization of the oil and its environmental behavior and likely fate were

discussed in detail. Using data and results from the *Exxon Valdez* subsistence seafood monitoring program, NOAA explained the primary risks from the heavy fuel oil spill. An agreement was reached that finfish were not at risk of contamination because of their ability to metabolize the oil and excrete the by-products. The main concern would be contamination of nets and other fishing gear, which could lead to external contamination of the catch.

However, shellfish were considered to be potentially at risk. Several species of clams are harvested from the western part of the Bay, from the Incomati River to Costa do Sol—areas heavily impacted by the oil. Clams were likely to ingest and assimilate oil because they are filter feeders. Observations that the stranded oil was adhering to sand and not refloating with the tides was of particular concern with respect to bivalve contamination because the oil was likely to be transported to benthic habitats once it became incorporated with sand. Catembe, an area of intense shrimping, was the most heavily impacted area. Effects on shrimp and crab were of concern because of their benthic feeding behavior.

It was recommended that areas should be opened to finfishing as soon as they were determined to be clear of floating oil. Overflights would be used to make this determination, with ground truthing done by boat surveys. The U.S. and South African teams developed a plan to evaluate the human health risks. The Inhaca Island area, a commercially important fishing area, would be reopened as soon as the overflight maps and boat surveys confirmed the absence of oil. However, the ban would remain on shellfish, and a sampling strategy was devised to test for the presence of oil in shellfish. Clams, crab, and shrimp were to be collected from the most heavily oiled areas. Louisiana State University was contacted to provide a detailed procedure for tissue analysis using equipment available at the Ministry of Health (gas chromatograph flame ionization detector with packed columns). Splits of tissue samples were also to be sent to the Sea Fisheries Institute in South Africa for calibration and assistance.

NOAA and Fisheries staff attempted to collect shellfish from local markets and villages, but were unable to collect shrimp samples and obtained only two crabs and a small amount of clams because most fishermen were complying with the fishing ban. Some fish with small spots of oil on their skin were observed being sold on the roadside and a few oiled fishing nets were observed along the shoreline.

Technical staff from the Ministry of Health and Fisheries Research Institute prepared recommendations to partially reopen finfishing. On April 27, specific areas were reopened to fishing, including Inhaca Island (located to the east, outside the area impacted by the oil) and the central and southern bay.

*Katina P* oil was found in the two clam samples from Xefina Island, but, the samples from Inhaca Island were clean. There was a good match with the spilled oil pattern and the oil in the Xefina clam tissues. Measured concentrations were high, although there are no standards or published levels for health advisories. Based on the available data, it appeared that bivalves in the oiled areas had been contaminated to

levels that warranted advisories against consumption. The Ministry of Health has an ongoing program for collection and analysis of bivalves under a microbial monitoring study. NOAA recommended that they expand this program to include hydrocarbon testing.

**NOAA Activities:**

NOAA provided the governments of Mozambique and South Africa with a trajectory analysis following the sinking of the *Katina P*. These governments were concerned about coastline impacts from the additional release of oil. NOAA provided each government with wind, current, and trajectory information. NOAA scientists in Seattle, working with Dave Feit from the Satellite Marine Section of the National Weather Service; Mike Matson of the National Environmental Satellite, Data, and Information Service; and LT John Dimento of the Naval Oceanographic Office, passed this information to the U.S. team.

Each morning, the SSC conducted overflights of the slick and the impacted coastline using a fixed-wing overflight aircraft furnished by the AID Mission. Using raw data from the overflight, Genwest, NOAA's information management contractor, produced charts that were faxed back to Mozambique. These charts were provided to governmental agencies and eventually led the government to provide an observer for training purposes.

Because Maputo is heavily dependent upon fishing for food and commerce, the government was concerned about the health risk of consuming possibly tainted fish and closed Maputo Bay to fishing on April 22. NOAA assisted the Mozambique Ministry of Health Laboratory establish the basis for reopening fishing in areas that were not impacted. NOAA's advice on health risk and methods to establish a testing protocol for seafood analysis helped the Mozambique Government understand the nature of the threat posed by the spill.

**Reference:**

NOAA Hotline 91, 13 reports

## U.S. COAST GUARD DISTRICT 8

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<b>Name of Spill:</b>	Elf Exploration Rig
<b>NOAA SSC:</b>	Mike Barnhill
<b>Date of Spill:</b>	10/14/91
<b>USCG District</b>	8
<b>Location of Spill:</b>	South Timbalier Block 38
<b>Latitude:</b>	28°56.12' N
<b>Longitude:</b>	090°18.49' W
<b>Spilled Material:</b>	South Louisiana crude
<b>Spilled Material Type:</b>	3
<b>Barrels:</b>	300
<b>Source of Spill:</b>	platform
<b>Resources at Risk:</b>	waterfowl
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	none

#### **Incident Summary:**

At approximately 0730, on October 14, 1991, an offshore oil rig owned by ELF Exploration of Houston, Texas released approximately 300 barrels of South Louisiana crude into the Gulf of Mexico off Louisiana. This release was reportedly caused by a mechanical malfunction. A U.S. Coast Guard (USCG) overflight at 1330 observed a light rainbow sheen with some mousse covering a seven- by three-mile area. This sheen was located about four and a half miles south of the Barrier Islands on the Louisiana Coast. The patch appeared to be moving north at approximately 0.5 knots. The winds were out of the south at 10 to 15 knots, and forecast to swing to the north during the evening hours.

#### **Behavior of Spilled Material:**

During the evening, the winds increased and shifted to the north. Observers on an early morning overflight the next day found no oil on the water. It was assumed that the oil had evaporated and naturally mixed in the water column.

#### **NOAA Activities:**

NOAA was notified of the incident on October 14, 1991, by the USCG Marine Safety Office (MSO) Morgan City. NOAA provided trajectories of the spilled material and resources at risk information to the MSO. The NOAA Scientific Support Coordinator participated in the overflight on October 15, 1991.

**References:**

NOAA Hotline 64, 2 reports

Research Planning Institute. 1989. Sensitivity of coastal environments and wildlife to spilled oil: Louisiana. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 98 maps.

<b>Name of Spill:</b>	Neches River
<b>NOAA SSC:</b>	Mike Barnhill
<b>Date of Spill:</b>	10/15/91
<b>USCG District:</b>	8
<b>Location of Spill:</b>	Neches River, Beaumont, Texas
<b>Latitude:</b>	30°01' N
<b>Longitude:</b>	094°02' W
<b>Spilled Material:</b>	waste oil
<b>Spilled Material Type:</b>	3 and 4
<b>Barrels:</b>	50
<b>Source of Spill:</b>	unknown
<b>Resources at Risk:</b>	waterfowl
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	laboratory bioremediation
<b>Shoreline Types Impacted:</b>	marsh areas
<b>Keywords:</b>	none

#### **Incident Summary:**

On October 15, 1991, between 2000 and 2200 hours, approximately 2,100 gallons of waste oil was spilled in the Neches River. The spiller is as yet unknown, but is thought to be a vessel pumping her bilges. It is suspected that the waste oil was treated with bilge cleaner.

#### **Behavior of Spilled Material:**

The spilled oil initially impacted about two miles of the south bank of the Neches River in pockets along its banks. The oil also moderately impacted some marshy areas near the pockets of oil, but most of the oil was contained in a drainage ditch that empties into the river.

#### **Countermeasures and Mitigation:**

Successful mechanical cleanup by U.S. Coast Guard (USCG) Marine Safety Office (MSO) Port Arthur personnel proved to be a minor problem because most of the spilled oil was trapped in the drainage ditch.

#### **Other Special Interest Issues:**

The Texas General Land Office strongly recommended that USCG MSO Port Arthur use Oil Spill Eater (OSE) II, an enzyme advertised as a biological dispersant. The USCG MSO, State representatives, and Regional Response Team members wanted to bioremediate this spill on site. However, there was low probability that the oil could be contained long enough to complete the research. So, a quantity of the oil was taken

from the drainage ditch to a laboratory to conduct experiments involving OSE II. On the evening of October 17, a passing tanker caused a major portion of the spilled product to move out of the drainage ditch and into the Neches River, proving the hypothesis that the oil would not remain long enough to conduct the proposed experiment.

**NOAA Activities:**

NOAA was notified of the incident on October 15, 1991, by the USCG MSO Port Arthur. The MSO requested information on the use of OSE II. The Scientific Support Team conferred on the subject and recommended that the experiment not be conducted on site. A compromise was established and the experiment will be conducted in a laboratory. This incident has been closed, but the results of the laboratory experiments have not yet been received.

**References**

NOAA Hotline 65, 3 reports

<b>Name of Spill:</b>	Chevron Platform MP 67
<b>NOAA SSC:</b>	Mike Barnhill
<b>Date of Spill:</b>	10/18/91
<b>USCG District</b>	8
<b>Location of Spill:</b>	east of Delta National Wildlife Refuge, Louisiana
<b>Latitude:</b>	29°17' N
<b>Longitude:</b>	089°06' W
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	3
<b>Barrels:</b>	undetermined
<b>Source of Spill:</b>	platform
<b>Resources at Risk:</b>	waterfowl and brown pelicans
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	marsh grass
<b>Keywords:</b>	none

#### **Incident Summary:**

On October 18, 1992, at approximately 0800, Chevron reported a spill to the U.S. Coast Guard (USCG) Marine Safety Office (MSO) New Orleans. The spill was estimated to be 29 gallons of South Louisiana crude from a Chevron offshore oil rig. The Chevron Fast Response Team was activated initially, and when the slick impacted marsh areas of the Delta National Wildlife Refuge to the west of the Chevron platform, Chevron contracted Riedel-Peterson to handle further mechanical cleanup.

Chevron later changed their estimate from 5 to 15 barrels. USCG helicopter overflight observers estimated the slick to be 100 to 200 barrels. An overflight on October 20 revealed a slick of approximately 40 square miles, 2 to 5 miles offshore that appeared to be moving to the south. The slick was said to be 50 percent silver sheen and 50 percent first color trace.

#### **Behavior of Spilled Material:**

The slick initially moved from the oil rig to the west and lightly impacted the east shore of the Delta Wildlife Refuge. It then moved back to the east and then to the south spreading and thinning with time. The slick continued to the south but remained one to three miles east of the shoreline. The slick eventually weathered offshore. Some marsh areas adjacent to the Delta National Wildlife Refuge were lightly impacted.

### **Countermeasures and Mitigation:**

Chevron and its contracted cleanup company used small boats, boom, and light skimmers to clear as much of the oil as possible from the water. Marsh areas were left to weather naturally. Cleanup was completed October 23, 1991.

### **NOAA Activities:**

NOAA was notified of the incident on October 19, 1991, by the USCG MSO New Orleans. MSO asked the Scientific Support Coordinator (SSC) to make an overflight of the area the next day.

On the overflight, the SSC reported rainbow sheen in pockets in the marsh at the southeast end of Delta National Wildlife Refuge. NOAA thought a fish kill was unlikely, but suggested closely monitoring the area for the next few days. Several hundred pelicans seen wading were still able to fly, but U.S. Fish and Wildlife Service personnel were to participate in an overflight the following day and would be better able to judge the health of these birds. The SSC monitored the cleanup through the MSO New Orleans.

### **References:**

NOAA Hotline 67, 2 reports

Research Planning Institute. 1989. Sensitivity of coastal environments and wildlife to spilled oil: Louisiana. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 98 maps.

<b>Name of Spill:</b>	CONOCO Pipeline #1
<b>NOAA SSC:</b>	Mike Barnhill
<b>Date of Spill:</b>	12/12/91
<b>USCG District:</b>	8
<b>Location of Spill:</b>	7 miles west of Fouchon, Louisiana
<b>Latitude:</b>	28°59' N
<b>Longitude:</b>	090°01' W
<b>Spilled Material:</b>	South Louisiana crude
<b>Spilled Material Type:</b>	3
<b>Barrels:</b>	7-14
<b>Source of Spill:</b>	offshore pipeline
<b>Resources at Risk:</b>	birds, mangroves
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	Timbalier Island mangrove trees
<b>Shoreline Types Impacted:</b>	sand and vegetated low banks
<b>Keywords:</b>	skimmers, sorbent boom

#### **Incident Summary:**

On December 12, 1992, the United States Coast Guard (USCG) Marine Safety Office (MSO) Morgan City, Louisiana received a report from Chevron USA, through the National Response Center, that a sheen 10 by 0.5 nautical miles (nm) had been sighted by a commercial helicopter pilot at coordinates 29°01'N and 090°15'W. The vessel, *Pard I*, was near the release working on an underwater pipeline crack for CONOCO. The weather at the scene was calm, temperature 81°F, winds south-southwest 12 to 13 knots, seas 1 to 2 feet, with visibility 3 miles and decreasing due to fog.

The incident took place during the early-morning hours, but was not reported until late afternoon. The lateness of the report was probably caused by reduced visibility because of early-morning fog that restricted the ability of aircraft to spot the spill. MSO Morgan City reported that CONOCO personnel reported at 1600 that the spill was caused by a break in a CONOCO pipeline and estimated the amount of product spilled at five gallons. In actuality, the spill, based on initial overflight reports, was probably 300 to 600 gallons.

CONOCO brought in CONOCO response personnel, Clean Gulf, Riedel Peterson, and Petroleum Helicopter, Inc. (PHI). By the next morning, there were skimmers, one 25-foot pontoon boat, two 16-foot flat boats, one 21-foot response boat, 1,000 feet of six-inch sorbent boom, miscellaneous cleanup equipment, and PHI helicopters on scene or en route. The weather had become favorable to the cleanup effort in that the wind was out of the north at about 20 miles per hour with gusts to 25 miles per hour and seas at three to five feet. The cleanup operation was completed on December 13 when overflights confirmed that there was no visible sign of pollution in the water or on the shore.



### **Behavior of Spilled Material:**

The only shoreline impact noted was a one-mile stretch on Elmer's Island, approximately 15 miles northeast of East Timbalier Island and just southwest of Caminada Pass on the coastline. This impact was reported as very light sheen (mostly silver, some rainbow). The oil was pushed offshore by high winds and tides and apparently weathered naturally some distance offshore. The amount of oil recovered was insignificant.

### **Countermeasures and Mitigation:**

The forces of nature are responsible for cleaning up this spill. By the time equipment was on scene, the oil had become too thin and scattered to be picked up by the available equipment. If the winds had not shifted to the north and increased in velocity, there may have been significant impact on sensitive shorelines and bird populations in the area.

### **Other Special Interest Issues:**

Of most interest was the coastal area along East Timbalier Island. It has one of the main concentrations of mangrove trees in Louisiana and was considered likely to be impacted.

### **NOAA Activities:**

NOAA was notified on December 12, 1991, by USCG MSO, New Orleans. The NOAA Scientific Support Coordinator provided trajectories and resource at risk information to MSO New Orleans.

### **References:**

NOAA Hotline 71, three reports

Research Planning Institute. 1989. Sensitivity of coastal environments and wildlife to spilled oil: Louisiana. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 98 maps.

U.S. Fish and Wildlife Service. 1982. Gulf Coast Ecological Inventory Map 29090-A1-E1-250. New Orleans: U.S. Department of the Interior. 1:250 000-scale map of Gulf Coast Ecological Inventory.

<b>Name of Spill:</b>	<i>Aviva America</i> barge
<b>NOAA SSC:</b>	Mike Barnhill
<b>Date of Spill:</b>	12/22/91
<b>USCG District:</b>	8
<b>Location of Spill:</b>	Breton Islands in Breton Sound, Louisiana
<b>Latitude:</b>	29°32.3'N
<b>Longitude:</b>	089°16.1'W
<b>Spilled Material:</b>	South Louisiana crude
<b>Spilled Material Type:</b>	3
<b>Barrels:</b>	80-85
<b>Source of Spill:</b>	permanently moored barge
<b>Resources at Risk:</b>	waterfowl, brown pelicans, wading birds, and shorebirds
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	marsh area to the south of the barge
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	skimmers, lightering

#### **Incident Summary:**

On December 22, 1991, 80 to 85 barrels of South Louisiana crude oil leaked from the permanently moored *Aviva America* barge approximately eight nautical miles (nm) northwest of Breton Island, Louisiana. The barge held 4,700 barrels of product and could cause considerable damage if fully released, but the possibility of a full release was extremely low. Corrosion had caused structural failure to the barge. At the time of the spill, winds were initially out of the west at 10 to 15 knots but shifted to the north at 10 to 15 knots the next day. The U.S. Fish and Wildlife Service was notified of possible impact to the refuge areas on the Breton Islands, which they control, and the possibility of impacts to the northern section of the Delta National Wildlife Refuge. The response was completed by December 30, 1991.

#### **Behavior of Spilled Material:**

The U.S. Coast Guard (USCG) estimated that 80 to 85 barrels of South Louisiana crude had been released. From the spill site, the oil formed a slick of mainly sheen with patches of brown oil. The slick, eight to nine nm long and less than one nm wide, streamed from the spill site to a location between the Breton Islands and the Grand Gosier Islands. Skimmers were in the area but were unable to work because of three- to four-foot seas. The exact amount of crude oil spilled was never determined. The oil naturally dispersed into the water column with no reported impacts to shoreline or wildlife.

### **Countermeasures and Mitigation:**

By December 27, 1992, a lightering barge capable of pumping at a rate of 1,000 barrels per hour was on scene, but inadequate lighting caused a delay. The USCG approved the contractor's request to delay this operation until first light. A boom had previously been placed around the barge. Open-water recovery was not possible due to weather, shoreline cleanup was not needed, and no oiled debris was reported.

### **Other Special Interest Issues:**

During the initial response effort by the USCG, it was not possible to quickly determine the type of product because boats could not be put in the area rapidly and there is no system established to collect usable oil samples from USCG aircraft. This problem is being explored by the NOAA Scientific Support Coordinator and the USCG Air Station in New Orleans.

### **NOAA Activities:**

NOAA was notified of the incident on December 22, 1992, by the USCG Marine Safety Office (MSO), New Orleans. NOAA provided MSO with trajectories and resource at risk information by telephone.

### **References:**

NOAA. 1990. The CAMEO™ 3.0 Manual. Washington, D.C. National Safety Council. 300 pp.

NOAA Hotline 73, two reports

Research Planning Institute. 1989. Sensitivity of coastal environments and wildlife to spilled oil: Louisiana. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 98 maps.

<b>Name of Spill:</b>	CONOCO Pipeline #2
<b>NOAA SSC:</b>	Mike Barnhill
<b>Coast Guard District:</b>	8
<b>Date of Spill:</b>	01/04/92
<b>Location of Spill:</b>	Grand Isle Block 43, Louisiana
<b>Latitude:</b>	28°59.5' N
<b>Longitude:</b>	089°53.1' W
<b>Spilled Material:</b>	South Louisiana crude
<b>Spilled Material Type:</b>	2
<b>Barrels:</b>	190-285
<b>Source of Spill:</b>	pipeline breaks
<b>Resources at Risk:</b>	waterfowl, marshes, mangroves, shellfish, mammals, reptiles, and shorebirds
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	the oil surfaced as a mousse
<b>Shoreline Types Impacted:</b>	sandy beach, marsh
<b>Keywords:</b>	sorbent boom, containment boom, skimmers, Tri-State Bird Rescue

#### **Incident Summary:**

At 1142 January 6, 1992, U.S. Coast Guard (USCG) Marine Safety Office (MSO) Morgan City, Louisiana received a report from the National Response Center (NRC) that a 12-by 1-mile slick of unknown origin had been reported by the Louisiana Offshore Oil Port Facility (LOOP) Inc. helicopter in position 28°59'N, 089°52'W, Grand Isle Block 43. By 1400, Air Station New Orleans reported that a USCG helicopter had sighted a slick in the same area estimated to be 10 by 2.5 nautical miles (nm) that had broken up into patches with surrounding rainbow sheen for another 10 nm.

The USCG were told by CONOCO that the leak had been reported to the Mineral Management Service and that a report of a pipeline leak had been made to the NRC on January 4. At that time the leak was reported as having released 4.1 gallons with a slick size of one by seven nm with color barely visible. CONOCO's highest estimate, toward the end of the cleanup, was reported by the USCG as 150 barrels.

On June 7, CONOCO reported that the pipeline had a capacity of 1,500 barrels of crude. By 0715, CONOCO had two skimmers working offshore and 30,000 feet of containment boom, 6,000 feet of sorbent boom, 24 scare guns, and 80 response personnel on scene. CONOCO reported that all leaks in the pipeline had been secured and no product was leaking. The cleanup effort continued until late morning on January 10 when overflights confirmed that the shoreline was clean and there was no further danger of beach impact from oil drifting offshore.

Throughout the response only three oil-impacted birds were found, even though heavy impact on the bird population had been expected. CONOCO hired Tri-State Bird Rescue to treat impacted birds.

#### **Behavior of Spilled Material:**

The oil surfaced from the pipeline while under pressure from natural gas and had been forced through a 100-foot column of water. In the process, the oil became a mousse that tended to make it more persistent, less likely to weather in a short period, and more difficult to cleanup.

Winds out of the south pushed the moussed oil onto the beach at Grand Isle and Elmer's Island about 12 hours before such movement was anticipated. Once the oil was on the beach and in the marsh it did not remain long before the wind shifted to the north and the tidal action refloated it. Eventually most of the oil was pushed out to sea.

#### **Countermeasures and Mitigation:**

There was little that could be done about the product that found its way into the marsh areas. In areas where boats could reach, booms were used to try to reduce impact. The primary approach was to boom the inlets around Elmer's Island to keep the product out of the marsh areas. This was only partially successful as there was an entrainment problem that to some degree defeated the boom strategy. For the most part, it was the wind shift to the north that cleaned the beaches and kept most of the oil out of the marshes.

#### **NOAA Activities:**

NOAA was notified of the incident by MSO Morgan City at 1715 on January 6, 1992. NOAA was requested to provide a trajectory for the spilled oil, a resources at risk analysis, and an estimate of amount of oil on the water. Resources at risk information was reported to MSO New Orleans, and the NOAA Scientific Support Coordinator (SSC) made an overflight to estimate spill amount. The SSC and other NOAA personnel were on scene January 8. Samples of the spilled product were taken for chemical analysis by Louisiana State University. NOAA's response ended January 14, 1992.

#### **References:**

NOAA Hotline Report #79. 12 reports

Research Planning Institute. 1989. Sensitivity of coastal environments and wildlife to spilled oil: Louisiana. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 98 maps.

<b>Name of Spill:</b>	Barge Collision
<b>NOAA SSC:</b>	Mike Barnhill
<b>Date of Spill:</b>	1/26/92
<b>USCG District:</b>	8
<b>Location of Spill:</b>	Wax Lake Spillway, Louisiana
<b>Latitude:</b>	29°35.4' N
<b>Longitude:</b>	091°23.4' W
<b>Spilled Material:</b>	styrene monomer, inhibited
<b>Spilled Material Type:</b>	5
<b>Amount:</b>	87,374 gallons
<b>Source of Spill:</b>	tank barge
<b>Resources at Risk: ,</b>	bluegill, catfish, bass, crappie, drum, sunfish, shad, carp, crayfish, river otter, mink, nutria, beaver, raccoon, bald eagles, wading birds, waterfowl, diving birds, raptors, alligators, turtles, snakes
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	innovative cleanup techniques, FLIR
<b>Shoreline Types Impacted:</b>	bayous, man-made canal
<b>Keywords:</b>	none

#### Incident Summary:

On January 26, 1992, the tugs *De Lasalle* and *Scaup* reported a collision between their respective tows at mile marker (mm) 108 of the Intracoastal Waterway (ICWW). The collision caused a breach in the upper one-third of the #1 port cargo tank of the styrene barge being towed by *De Lasalle*. The breach in the styrene tank initially released an unknown quantity of styrene into the waterway. When the damaged barge was pushed to the embankment of the ICWW and released by the tug, the damaged tank dropped below the water and released a great deal more of the styrene. The tank was capable of holding 115,000 gallons, but was carrying only about 89,857 gallons.

The U. S. Coast Guard (USCG) promptly closed the ICWW from mm 105 to mm 110. Booms were deployed west (downcurrent) of the spill site, and later, to the east of the site to delay any possible incursion into the Wax Lake area.

For approximately ten days after the spill, the weather was overcast, with heavy to light rain, temperatures in the mid to low 50s, winds out of the northeast shifting to the north at 10 to 15 knots. This type of weather allowed the polymerization of the product to slow to the point where there was still appreciable styrene monomer on the water after eight or nine days.

### **Behavior of Spilled Material:**

Styrene is a clear, colorless, aromatic liquid used to make plastics, paints, synthetic rubber, and other chemicals. It has a flash point of 90°F and vapors that are irritating to the mucous membranes. If it becomes contaminated or is subjected to heat, it may polymerize. It is lighter than and insoluble in water, its vapors are heavier than air, and it weighs 7.6 pounds per gallon.

The styrene spread from the damaged tank to the water's surface very quickly. It spread completely across the ICWW and began moving downcurrent within minutes. The product gave off a strong odor making its presence obvious. With the rising tide, it found its way into the swamp areas to the south of the ICWW. The styrene soaked into the soil on the south embankment and contaminated it down two feet or more. The polymerized product encapsulated some of the liquid monomer that kept it from polymerizing, and the polymerized product also combined with silt and other solids in the water that caused some of it to sink. Later, some of the sunken polymer was washed up on to the bank by the wave action caused by passing vessels.

### **Countermeasures and Mitigation:**

Booming and mechanical pickup were the only reasonable alternatives available to the Federal On-scene Coordinator (FOSC). Vacuum trucks mounted on barges removed the majority of the product trapped in the booms and along the bank.

The contract personnel involved in the cleanup and the USCG Strike Team members wore level B gear for about eight days; then downgraded to level C. Having to work from boats in level B and/or level C gear complicated and impeded the response effort.

The contractor, Larco Environmental Services, initially attempted to pick up the styrene by using a belt skimmer with an oleophilic belt. After 20 to 30 minutes of operation, the belt was dissolved by the styrene. It was later found that by using peat moss on the styrene the oleophilic belt could be used for much longer periods without major damage to the belt. The peat moss may have helped to keep down the vapors and enhance the vacuuming process, although this was not proven.

The cleanup at a constantly downgrading level continued through the end of February.

Initially reported as 10,000 gallons, than as 50,000 gallons, the final determination was that 87,374 gallons had been discharged into the waterway. A final determination was made on the thirteenth day after a measurement was made of the styrene remaining in the barge. NOAA calculated that up to 90 to 95 percent of the product had been lost when the hole went underwater. In fact, the hole submerged within the first six hours of the event and 97 percent of the product had been released by that time.

**Other Special Interest Issues:**

The USCG proved that forward-looking infrared radar (FLIR) is able to detect the clear styrene monomer on the surface of water. This would have been an excellent tool to help in daily response planning.

In an event like this it is essential to set up area monitoring within minutes or hours. However, the response system is not equipped with either equipment or logistical support to establish this level of monitoring within such a short period of time. It took three days to establish an area monitoring plan.

**NOAA Activities:**

NOAA was notified of this incident on January 26, 1992, by MSO Morgan City who requested an immediate hazard analysis and resources at risk information. NOAA's Scientific Support Coordinator (SSC) responded by telephone and traveled to the spill site arriving at MSO Morgan City the next day. The SSC remained on scene until February 6.

**References:**

Association of American Railroads. 1991. Emergency Materials in Surface Transportation. Washington, D.C.: Bureau of Explosives.

NOAA Hotline 84, 31 reports





<b>Name of Spill:</b>	Pass Tante Phine
<b>NOAA SSC:</b>	Mike Barnhill
<b>Date of Spill:</b>	02/20/92
<b>Location of Spill:</b>	Pass Tante Phine, Louisiana
<b>Latitude:</b>	29°14' N
<b>Longitude:</b>	089°23' W
<b>Spilled Material:</b>	mineral oil
<b>Spilled Material Type:</b>	2, 4
<b>Barrels:</b>	150
<b>Source of Spill:</b>	berm failure
<b>Resources at Risk:</b>	birds, mammals, plants
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	other berm failures
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	none

#### **Incident Summary:**

At 1500, February 20, 1992, a commercial helicopter notified the U.S. Coast Guard (USCG) Marine Safety Office (MSO) New Orleans that a 2,000-yard slick in Pass Tante Phine, approximately four nautical miles southwest of Venice, Louisiana, was coming from an abandoned 525-barrel crude oil tank battery and waste oil pit. MSO personnel arrived on scene at 1545 and estimated that 100 barrels were in the water and around the tank battery. An unknown quantity remained in the sludge pit. Mechanical cleanup operations were initiated by MSO personnel.

There was no measurable evaporation taking place. The mineral oil product covered various areas up to five miles away from the tank battery. Mechanical cleanup was nearly impossible because the area was so shallow. The currents and tides moved the product out of the area and into the open Gulf very slowly.

Cleanup was not completed until April 16, 1992, because secondary leaks were detected in pipelines leading to the tank battery.

#### **Behavior of Spilled Material:**

Laboratory analysis at Louisiana State University (LSU) determined that the product was mineral oil, probably used in drilling mud that had been discarded into the open pit within the last five years. Also present was South Louisiana crude from the tank battery leaking from the feed lines.

Mineral oil biodegrades very slowly and kills organisms by smothering. It can affect mammals, birds, and reptiles; however, no bird or animal kills were reported during the response.

Because of water levels, there was little shoreline impacted. However, the upper levels of plants in the area were heavily contaminated by the mineral oil.

**Countermeasures and Mitigation:**

Little could be done about the product that had found its way into the marsh areas, but booms were used in areas reachable by boat to try to reduce impact. The primary approach was to boom the waste pit and tank battery to prevent further contamination of the local area. This was accomplished by mechanical pickup of the product in the boom and waste pit, and removal of the crude oil from the tank battery to eliminate the risk it posed by leaking from feed pipes. The Louisiana Department of Environmental Quality authorized removal and open-pit burning of contaminated lily pads in the area

**Other Special Interest Issues:**

Berm is used to hold the product in the sludge pits. When the berm fails, the resulting leak could cause damage to the surrounding area.

**NOAA Activities:**

On February 21, the On-Scene Coordinator (OSC) asked NOAA to make an overflight to assess the condition of the area affected by the spill. At the time of the overflight, the NOAA Scientific Support Coordinator (SSC) collected samples from the product in the water, the waste oil pit, and the shoreline. Analysis of these samples determined that the majority of the product was mineral oil. The SSC also provided trajectories and resource at risk information to MSO New Orleans.

**References:**

NOAA. 1990. The CAMEO™ 3.0 Manual. Washington, D.C. National Safety Council. 300 pp.

NOAA Hotline 85. one report

Research Planning Institute. 1989. Sensitivity of coastal environments and wildlife to spilled oil: Louisiana. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 98 maps.

<b>Name of Spill:</b>	Tugs <i>Walley Blessey</i> and <i>Lake Charles</i>
<b>NOAA SSC:</b>	Mike Barnhill
<b>Date of Spill:</b>	03/11/92
<b>USCG District:</b>	8
<b>Location of Spill:</b>	Sabine River, Orange County, Texas
<b>Latitude:</b>	30°03.5' N
<b>Longitude:</b>	093°43.0' W
<b>Spilled Material:</b>	toluene
<b>Spilled Material Type:</b>	5
<b>Barrels:</b>	50
<b>Source of Spill:</b>	tank barge
<b>Resources at Risk:</b>	human health, reptiles, mammals, birds
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	none

#### **Incident Summary:**

On March 11, 1992, at approximately 0200, U.S. Coast Guard (USCG) Marine Safety Office (MSO) Port Arthur received a report of a collision between two tugs pushing barges at about mile marker 266 of the Sabine River in Orange County, Texas. The tug *Walley Blessey* pushing two loaded toluene barges had been westbound, and the tug *Lake Charles* had been eastbound at the time of the collision. The crew of the *Walley Blessey* determined that toluene was pouring from a damaged cargo tank on one of the toluene barges. The crew of the tug boomed around the leaking barge until they were notified by the USCG not to boom because of the danger of an explosion. The Gulf Strike Team was called at 0330 to provide traffic control.

The tug's crew managed to plug the leak at 0245 by using a wooden plug wrapped in neoprene. The product was lost because the movement of the barge allowed it to slosh out of the six-inch hole near the top of the tank. The final estimate of product lost was something less than 50 barrels. The incident was closed on the same day.

#### **Behavior of Spilled Material:**

The initial concern was that Sabine Lake would be contaminated if the entire tank of toluene was released. NOAA confirmed that a little impact could be expected to the lake. The product would be expected to go toward the western shore and then move south to the outlet. However, by the time it reached the outlet, it would be nearly undetectable. The high evaporation rate of toluene would prohibit any major impact to the lake or the river.

Rapid evaporation and relatively high currents eliminated the hazard of the release.

**Countermeasures and Mitigation:**

The major factor in the response was the timely effort on the part of the crew to plug the leak in the Toluene barge. There is, however, the probability that the crewman who plugged the leak was not dressed appropriately to be working around the leaking toluene. That crewman was reported to have worn a half-mask with organic cartridge and butyl rubber rain gear with saranex wrap on top of it. The half-mask was inappropriate because of the tendency of such masks to break seal when the individual moves about. The crewman could have been exposed to levels approaching immediately dangerous to life or health while working around the damaged tank.

**NOAA Activities:**

NOAA was notified of the incident on March 11, 1992, by MSO Port Arthur who requested detailed chemical and hazard information.

**References:**

NOAA Hotline 87, six reports

<b>Name of Spill:</b>	M/V <i>Durdy Dudley</i> , and <i>Pat Salvaggio</i> , collision
<b>NOAA SSC:</b>	Mike Barnhill
<b>Date of Spill:</b>	5/15/92
<b>USCG District:</b>	8
<b>Location of Spill:</b>	Morgan City, Louisiana
<b>Latitude:</b>	29°42' N
<b>Longitude:</b>	091°31.5' W
<b>Spilled Material:</b>	crude oil condensate
<b>Spilled Material Type:</b>	1
<b>Barrels:</b>	310
<b>Source of Spill:</b>	non-tank vessel
<b>Resources at Risk:</b>	birds
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	hydrochloric acid spill
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	none

#### **Incident Summary:**

On May 15, 1992, the motor vessel *Durdy Dudley*, towing a 240-foot barge carrying 18,000 gallons of crude oil condensate, collided with the motor vessel *Pat Salvaggio*, towing a barge carrying propylene. The accident occurred at mile marker 115 of the Intracoastal Waterway west of Morgan City, Louisiana. The two vessels were traveling in opposite directions when they collided. The crude oil barge was damaged and lost approximately 13,000 gallons of its cargo. The propylene barge was also damaged but did not lose any product.

Initially, booms were placed around the barge to contain the still-leaking product. Because of the explosion hazard posed by the very light condensate, these booms were removed shortly after deployment to allow the product to disperse downstream.

#### **Behavior of Spilled Material:**

The crude oil condensate (API 47) rapidly spread across the surface of the water and quickly evaporated. After 36 hours, only about 20 gallons were found in the boom that had been placed downstream. The oil that did not evaporate readily dispersed into the water column.

#### **Other Special Interest:**

During the response to the oil condensate, a 1,200-gallon spill of hydrochloric acid occurred in Morgan City. The hydrochloric acid could have caused major damage, but it did not reach the water.

**NOAA Activities:**

NOAA was notified of the incident on May 15, 1992, by the U.S. Coast Guard Marine Safety Office (MSO) Morgan City. MSO needed trajectories and resource at risk information, which the Scientific Support Coordinator (SSC) provided. The SSC and a Louisiana State University (LSU) chemist went to the scene. On the morning of May 16, the SSC made an overflight and the LSU chemist made a boat survey of the scene.

**References:**

NOAA Hotline 92, 2 reports

NOAA. 1990. The CAMEO™ 3.0 Manual. Washington, D.C. National Safety Council. 300 pp.

<b>Name of Spill:</b>	Texaco Pipeline
<b>NOAA SSC:</b>	Mike Barnhill
<b>Date of Spill:</b>	8/31/92
<b>USCG District:</b>	8
<b>Location of Spill:</b>	Timbalier Island, Louisiana
<b>Latitude:</b>	28°56.5' N
<b>Longitude:</b>	090°36.4' W
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	2
<b>Barrels:</b>	300 to 500 barrels
<b>Source of Spill:</b>	pipeline
<b>Resources at Risk:</b>	waterfowl, brown pelicans, mangroves
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	sandy shoreline, marsh
<b>Keywords:</b>	none

#### **Incident Summary:**

At about 1300 on August 31, 1992, a Texaco 20-inch pipeline was severed by an oil rig that had broken loose during Hurricane Andrew. Texaco Inc. conducted an overflight of the area and sighted the slick at 1830 and reported the spill to the U.S. Coast Guard (USCG) at 1905.

USCG Marine Safety Office (MSO) New Orleans personnel conducted a forward-looking infrared radar (FLIR) overflight of the area and showed a copy of the radar image output to Texaco personnel early the next morning. By 0615, September 1, 1992, the slick had grown to approximately five by ten nautical miles (nm).

#### **Behavior of Spilled Material:**

The oil spread quickly from the site of the broken pipeline to the west-northwest and then tended to the west paralleling the beach one to three miles offshore. Although most of the oil weathered, 100 yards of mostly sandy shoreline was moderately impacted. Oil impacts to marshes and the Barrier Islands could not be conclusively identified as pipeline oil. There was so much oil in the water from other sources caused by Hurricane Andrew that it was difficult to ascertain which oil was from the Texaco pipeline spill.

#### **Countermeasures and Mitigation:**

Cleanup was mostly done using sea skimmers. Small marsh areas were dealt with using passive techniques to protect the marshes from unnecessary traffic. Some beach



areas near Whiskey Pass were protected with boom as a precaution. Cleanup efforts in small marsh areas continued through September 14.

**NOAA Activities:**

NOAA was notified of the incident on August 31, 1992, by MSO New Orleans. Texaco had established a command post at their offices in New Orleans. The NOAA Scientific Support Coordinator remained at the command post helping coordinate the cleanup effort.

**References:**

NOAA Hotline 102, 3 reports

Research Planning Institute. 1989. Sensitivity of coastal environments and wildlife to spilled oil: Louisiana. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 98 maps.

<b>Name of Spill:</b>	Greenhill Petroleum Corporation Well Blowout
<b>NOAA SSC:</b>	Mike Barnhill
<b>Date of Spill:</b>	9/29/92
<b>USCG District:</b>	8
<b>Location of Spill:</b>	Timbalier Bay, Louisiana
<b>Latitude:</b>	29°05'09" N
<b>Longitude:</b>	090°18'24" W
<b>Spilled Material:</b>	South Louisiana crude
<b>Oil Type:</b>	2
<b>Barrels:</b>	2,500-3,000 released to the water 13,000 burned in wellhead fire platform
<b>Source of Spill:</b>	platform
<b>Resources at Risk:</b>	birds, fish, shellfish
<b>Dispersants:</b>	considered
<b>Bioremediation:</b>	considered
<b><i>In-situ</i> Burning:</b>	considered
<b>Other Special Interest:</b>	tactical considerations, portable laboratory
<b>Shoreline Types Impacted:</b>	<i>spartina</i> marsh and mud flats
<b>Keywords:</b>	blowout, Boots And Coots, wellhead fire, booms, skimmers, rapid evaporation

#### Incident Summary:

On September 29, 1992, there was a blowout and fire on the Greenhill Petroleum Corporation oil rig located about two nautical miles (nm) north of East Timbalier Island in Timbalier Bay, Louisiana. The blowout was caused by 2.75-inch tubing inside the well that crimped when the blowout preventors were activated.

The blowout was reported to the U.S. Coast Guard (USCG) the next morning. Observers on a subsequent USCG overflight estimated that 880 barrels of oil were in the water, creating an oil slick 75 yards wide by 5 nm long with large expanses of sheen. Greenhill personnel visually estimated that oil was being released from the well at a rate of approximately 60 barrels per hour. Several days later, Minerals Management Service estimated that the release rate varied from 30 barrels per hour to 130 barrels per hour. Their estimate was based on flame analysis of the wellhead that began burning October 1, 1992.

Oil continued to be released to the water at a rate of 5 to 15 barrels per hour and to burn approximately 60 barrels per hour until the afternoon of October 11, 1992, when the well was capped by Boots and Coots contract personnel. The well was capped while still burning to reduce the amount of oil being released to the water.

The USCG response terminated on October 15, but passive collection using sorbent boom continued for a few more days.

### **Behavior of Spilled Material:**

The product spilled was a light crude (API 36) that evaporated very rapidly. The oil was mostly wind driven, but was also heavily influenced by the incoming tidal currents that apparently pushed the sheen north across the west end of Casse-Tete Island and Calumet Island, just to the south of Casse-Tete. In the first few days, relatively high winds out of the north caused the oil to disperse readily into the water column as it entered the Gulf of Mexico. Once in the Gulf of Mexico, the wave action caused the product to evaporate rapidly and disperse naturally.

This crude oil quickly spread out into large areas of silver to rainbow sheen as was expected. The areas of sheen were impossible to skim and very difficult to concentrate so that they could be skimmed. Samples of skimmed oil/water product were taken from two barges. These samples indicated that skimming collected approximately 10 percent of the oil. The influence of the winds and tidal currents appeared to make the product rapidly evaporate, spread, and form mousse.

### **Countermeasures and Mitigation:**

Until the wellhead was capped, the main response effort was to catch oil that reached the water as near to the wellhead as was operationally safe for the cleanup crews. This was done by placing 48-inch boom attached to pilings driven at five points around the wellhead. As long as the skimmers were able to take the oil from the booms quickly, this approach worked well; when the booms were torn apart by tugs trying to remove a workover barge that had been caught in the fire, oil again flowed into the bay.

Natural forces were the primary factor in mitigating the effects of this spill. The booming and skimming were both labor intensive and relatively ineffective. The inability to boom the product adequately could have been a major concern if the winds had pushed the product into the highly sensitive marshes north of Timbalier Bay. It is highly unlikely that mechanical means would have been capable of containing and retrieving the oil, but the wellhead caught fire and drastically reduced the amount of product reaching the water.

### **Other Special Interest Issues:**

NOAA's oil fate and effects software Automated Data Inquiry for Oil Spills (ADIOS 1.0a) was used to predict evaporation and dispersion rates of this product. Rough visual observation appeared to confirm the general accuracy of the ADIOS predictions.

A portable laboratory was used on scene to provide timely answers to questions concerning oil identification, how rapidly the oil weathered, quantity of water build up in the moussed oil, and how readily the oil was naturally biodegrading.

Bioremediation, *in-situ* burning, and dispersants were considered by the USCG On-Scene Coordinator and Louisiana State agencies but rejected for a number of reasons:

Bioremediation was rejected because the currents surrounding the spill area were expected to biodegrade the oil naturally, not allowing the bioremediation agent to stay in the area long enough to be effective.

In-situ burning was rejected for open-water use because of the large number of gas wellheads near the surface of the bay. Hurricane Andrew had shifted the sand from the barrier islands into the bay making boat operations very difficult, so pulling burn boom in the bay could have been very dangerous.

A marsh burn was considered but rejected because it was felt that the marsh would recover by spring, and that the remoteness of the area would make it difficult to do a safe and controlled burn.

Dispersants were rejected because of the shallowness of the water and the natural high dispersability of the product. Offshore the oil was dispersing naturally and was never in a large enough quantity to warrant chemical dispersion.

#### **Resources at Risk:**

The risk of impacting birds and shellfish was low, but high for fish in the short- and long-term because of the natural dispersability of the product. According to Louisiana Department of Wildlife and Fisheries personnel, the shellfish population in the area was not healthy before the spill and was not considered to be at risk. The product did not remain in the environment long enough to do any long-term damage to wildlife.

#### **NOAA Activities:**

NOAA was notified of the incident on September 30, 1992, by USCG Marine Safety Office Morgan City who requested trajectories for the oil and resource at risk information. The NOAA Scientific Support Coordinator (SSC) reported on scene with a team of oil spill experts from Louisiana State University (LSU), Hazardous Materials Response and Assessment Division Modeling and Simulation Support (MASS) Branch (NOAA), Research Planning Inc. (RPI), Genwest, and a NOAA Corps officer to act as assistant SSC. Overflights were made by MASS and boat surveys were made by LSU, RPI, and the assistant SSC on several days. NOAA spent approximately 12 days on scene during this incident.

#### **References:**

NOAA. 1990. The CAMEO™ 3.0 Manual. Washington, D.C. National Safety Council. 300 pp.

NOAA Hotline 103, 53 reports

NOAA. In press. ADIOS™ for Apple® Macintosh™. Seattle: Hazardous Materials Response and Assessment Division. 50 pp.



# U.S. Coast Guard District 11

<i>M/V Lavaux</i> .....	109
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UNOCAL 76 Tank Farm.....	113



<b>Name of Spill:</b>	<i>M/V Lavaux</i>
<b>NOAA SSC:</b>	Jim Morris
<b>Date of Spill:</b>	11/28/91
<b>USCG District:</b>	11
<b>Location of Spill:</b>	Long Beach, California
<b>Latitude:</b>	33° 41.3' N
<b>Longitude:</b>	118° 13.7'W
<b>Spilled Material:</b>	#2
<b>Spilled Material Type:</b>	2
<b>Barrels:</b>	30
<b>Source of Spill:</b>	non-tank vessel
<b>Resources at Risk:</b>	diving coastal birds, shorebirds, gulls, brown pelicans, mussels, lobster
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	riprap
<b>Keywords:</b>	adverse weather conditions, boom, California Department of Fish and Game, containment boom, evaporation, International Bird Rescue and Research Center, sorbent boom

### Incident Summary:

On the evening of November 28, 1991, the motor vessel *Lavaux* spilled approximately 30 barrels of #2 fuel oil into Long Beach Harbor during a bunkering operation. The vessel's Master contacted the U.S. Coast Guard (USCG) Marine Safety Office (MSO) Los Angeles/Long Beach. The Chief of Port Operations assumed the role of Federal On-Scene Coordinator (FOSC). The shipping agent contracted Ship's Services to mitigate the spill.

At the time of the spill winds were out of the east at 15 knots; seas, one to two feet.

Ship's Services installed containment boom around the *Lavaux*, the barge *Phoenix*, and the nearby breakwater that leads out into open water (Queen's Gate) during the evening of November 28, 1991, and the early morning of the next day. Overflight operations the morning of November 29 showed that there was a large slick of rainbow sheen around the riprap and that some of the oil had escaped the harbor and was drifting to the west. Cleanup operations continued throughout the day. A boom watch was deployed at dusk. During the evening of November 29, 35- to 45-knot winds out of the east and seas up to four feet forced the contractor to abandon operations. A small boat survey of the area on the morning of November 30 revealed no oil. Ship's Services was directed to recover and secure the boom that had been blown onto the riprap during the evening. The case was closed on November 30, 1991.



**Behavior of Spilled Material:**

Given the weather conditions and the relatively light oil, the sheen did not persist for more than 36 hours and moved according to the strength and direction of the wind. Sorbent boom was used to collect free floating oil with marginal success. The riprap proved to be permeable as the sheen moved through it with the change of the tides and the shifting of the winds.

**Countermeasures and Mitigation:**

Containment boom was used around the vessels, and sorbent booms and pads were used to recover floating oil. One skimming vessel was deployed. Approximately six barrels of oil were recovered with the sorbents and the skimmer.

**Other Special Interest Issues:**

Two oiled brown pelicans were rescued and taken to the International Bird Rescue and Research Center. Six other oiled pelicans were observed by California Department of Fish and Game's Office of Oil Spill Prevention and Response but were not recovered.

**NOAA Activities:**

NOAA was notified of the incident at 2300, November 28, 1991, by the USCG MSO Los Angeles/Long Beach. The NOAA Scientific Support Coordinator (SSC) was asked to participate in overflight operations the next morning. On November 29, a weathering model was run for the oil, using current weather conditions. This model showed that about 30 percent of the original amount of oil spilled would still be observable after the first 12 hours. An overflight on November 29, 1992, revealed much of the oil had dissipated.

The SSC was released by the FOSC on November 29, 1991.

**References:**

NOAA Hotline 70, 2 reports

<b>Name of Spill:</b>	<i>USS Kiska</i>
<b>NOAA SSC:</b>	Sharon Christopherson
<b>Date of Spill:</b>	01/10/92
<b>USCG District:</b>	11
<b>Location of Spill:</b>	15 miles southwest of the Farallons Islands
<b>Latitude:</b>	37°35.4' N
<b>Longitude:</b>	123°12.9 W
<b>Spilled Material:</b>	oil/oil-water mix
<b>Spilled Material Type:</b>	1
<b>Barrels:</b>	325 gallons oil 600 gallons oil/water mix
<b>Source of Spill:</b>	non-tank vessel
<b>Resources at Risk:</b>	none
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	Gulf of the Farallons National Marine Sanctuary

**Incident Summary:**

On January 10, 1992, the *USS Kiska*, a U. S. Navy (USN) ammunition ship, intentionally discharged 900 gallons of oily water waste and lubricating oil to avoid a fire hazard. The hazard was caused when a flange on a lubricating oil pump failed, spilling several hundred gallons of lube oil into the bilges. The accident occurred 15 nautical miles southwest of the Gulf of the Farallons National Marine Sanctuary. At the time of the spill, the winds were out of the northwest at 20 to 30 knots. The oil was not expected to reach land.

The USN contacted the National Response Center, which in turn contacted U.S. Coast Guard (USCG) Marine Safety Office (MSO) San Francisco. The USCG conducted overflight operations but observed no oil.

The case was closed on January 11, 1992.

**Behavior of Spilled Material:**

Dissipation was rapid because of the nature of the oil and the weather.

**NOAA Activities:**

NOAA was notified of the incident on January 10, 1992, by MSO San Francisco. The SSC provided MSO with the expected movement of the oil and suggested overflights of the spill site.



**Name of Spill:** UNOCAL 76 Tank Farm  
**NOAA SSC:** Jim Morris  
**Date of Spill:** 08/03/92  
**USCG District:** 11  
**Location of Spill:** Avila Beach, San Luis Obispo Bay, California  
**Latitude:** 35°10.5' N  
**Longitude:** 120°43.3' W  
**Spilled Material:** San Joaquin heavy crude  
**Spilled Material Type:** 4  
**Barrels:** 150  
**Source of Spill:** pipeline  
**Resources at Risk:** eelgrass beds, kelp, sea lions, sea otters, population concentration areas, diving coastal birds, shorebirds, wading birds, gulls, foraging areas, anadromous fish, beaches, marinas, diving areas, high-use recreational boating areas, high-use recreational fishing areas, officially designated harvest sites, fish aquaculture sites, archaeological sites, Native American lands.

**Dispersants:** N  
**Bioremediation:** N  
***In-situ* Burning:** N  
**Other Special Interest:** kelp cutting, steam cleaning, Indian burial ground, salmon hatchery

**Shoreline Types Impacted:** exposed bedrock bluffs, exposed fine-sand beaches, exposed rocky shores, mixed-sediment beaches, piers, sheltered tidal flats, vegetated riverbank, vertical rocky shores

**Keywords:** absorbent pads, boom, California Department of Fish and Game, Clean Seas Inc., containment boom, fog, high-pressure washing, high-pressure warm-water washing, International Bird Rescue and Research Center, low-pressure washing, oil snares, Pacific Strike Team, pompoms, shallow water recovery, skimmers, sorbent boom, sorbent pompoms, vegetation cutting, volunteers, weir/pump skimmer

### Incident Summary:

On the evening of August 3, 1992, a transfer pipeline at the UNOCAL Tank Farm in Avila Beach, California failed. A reported 150 barrels of San Joaquin heavy crude were pumped through a hole roughly 10 by 5 inches before pumping operations could be stopped. The crude oil flowed downhill through a gully and over a 30-foot bedrock cliff into the Pacific Ocean.

UNOCAL Oil Company reported the incident to the U.S. Coast Guard (USCG) Group Monterey, who in turn reported to USCG Marine Safety Office (MSO) San Francisco. UNOCAL assumed responsibility for the incident and called in the services of the local cooperative, Clean Seas, to mitigate the spill. The USCG Captain of the Port assumed the role of Federal On-Scene Coordinator (FOSC).

Much of the oil remained in the nearshore environment and became trapped in nearby kelp and eelgrass beds. The shallow water, boulders, and bedrock outcroppings in the intertidal zone made cleanup difficult. Containment boom was used to surround the spill site while small boats with sorbent boom, kelp cutters, divers, and skimmers worked to collect the floating oil and oily debris. Two pocket beaches were heavily oiled and cleanup teams were lowered by bucket and crane. Some of the oil moved to the west past Fossil Point and came ashore on recreational beaches, which had to be closed for about one week. The closures had a significant effect on this beach community because the spill happened at the height of the tourist season. UNOCAL established a local claims office and reimbursed local businesses for their losses.

The weather at the time of the incident and for most of the response was calm winds and seas with daytime temperatures around 90°F. A dense fog layer moved in every evening and usually did not lift until the late morning. This section of the coast, just east of Point San Luis, runs in an east-west direction and is quite sheltered from the predominant northwest weather characteristic of the coastal areas. This made predicting weather for the site very difficult. Moderate strength winds and seas were predicted for the open coast, just a few miles to the west of the spill site, but were not observed at San Luis Obispo Bay.

USCG personnel were drawn from Group Monterey, Pacific Strike Team, MSO San Francisco, reserve units, and the National Pollution Fund Center. The U.S. Fish and Wildlife Service sent several representatives to conduct damage assessment surveys and to help NOAA provide knowledgeable resource advice to the FOSC. NOAA's National Marine Fisheries Service was contacted by NOAA's Scientific Support Coordinator (SSC) to address marine mammal issues as they arose. California's Department of Fish and Game Office of Oil Spill Prevention and Response (OSPR) usually sent 15 to 20 people to the scene daily. A representative from OSPR represented the State in the Unified Command structure throughout most of the response. NOAA's Damage Assessment Center in Washington, D.C. advised UNOCAL and the resource trustees on how to conduct a damage assessment survey.

#### **Behavior of Spilled Material:**

San Joaquin crude, with an approximate API of 13 to 14, is a heavy oil. UNOCAL routinely pumps this oil at 135°F. Cleanup was difficult because the oil became trapped in the kelp and eelgrass beds and was a constant source of sheening. Tar balls were also deposited throughout San Luis Obispo Bay.

The recreational beaches that were closed were impacted by sheen and small tar balls (one to three centimeters). The most heavily oiled areas were the pocket beaches located directly at, and adjacent to, the point where the oil entered the water. These beaches, of little recreational value, are predominantly boulder/cobble situated at the base of exposed bedrock headlands. The oil coated these beaches fairly extensively and pooled around the cobbles and boulders, penetrating sediment about 18 inches. On the bedrock walls, the oil created a thick coat that hardened after a few days of exposure. Steam was necessary to clean the cliff's bedrock face.

#### Countermeasures and Mitigation:

Clean Seas deployed containment boom around the coastal area defined by Pirates Cove and Fossil Point. The western end of the boom, at Fossil Point often parted, allowing oil and oily debris to move toward Avila Beach. Various zones were established using containment boom to delineate "hot zones" from clean zones, and nearshore activities from offshore activities. Kepner and Expandi booms were used, but failed occasionally, causing breaches in the containment area. Sorbent boom was used by small boats to collect free floating oil in the shallow areas inaccessible to the skimmers. Fishing vessels (brought on scene as part of the Fishermen's Oil Response Team [FORT]) also towed sections of sorbent boom around the bay collecting any sheen and tar balls that escaped the containment area. Open-water recovery was conducted by Lori, Marco, and GT185 skimming systems.

The heavy oil became trapped in the thick giant kelp (*Macrocystis*) bed canopy. This area is a leased kelp bed and routinely commercially harvested. UNOCAL requested the use of kelp harvesters to cut the kelp fronds one foot below the water level to free the oil so that it might be collected by skimmers. *Macrocystis* is impervious to heavy oil and was not damaged. Cutting the kelp was not detrimental to the bed. Divers cut the kelp when the water depth became too shallow for the kelp harvesters.

The eelgrass beds (*Phyllospadix*) were heavily oiled. UNOCAL requested that they be allowed to send in divers to cut the eelgrass and remove the oiled blades, which they felt were a steady source of sheening. After consulting with representatives from OSPR, Research Planning Inc., and NOAA's Biological Assessment Team, it was decided to leave the eelgrass beds alone because:

- 1) As much as 80 percent of the biomass of a *Phyllospadix* bed is located below the sediment in the rhizome mass. The rhizome mass, used in reproduction, is a delicate structure and if treated improperly could destroy the bed altogether.
- 2) Destruction of the bed could lead to erosion.

- 3) Eelgrass beds are slow to recolonize once they have been removed.
- 4) Oiled blades of eelgrass would shortly die, slough off, and be regenerated within a few weeks.

Boom was placed at the entrance to San Luis Obispo Creek to prevent oil from going upstream. Wading birds and gulls were observed foraging in and around the mouth of the creek. No significant amount of oil reached the creek.

Shoreline cleanup was conducted by over 300 workers from UNOCAL and the California Conservation Corps. The recreational beaches were patrolled daily by the cleanup crews and any tar balls found were manually removed. The two pocket beaches near Fossil Point were the most heavily oiled and were very difficult to clean because they could only be accessed by crane and small boat. Cleanup crews were concentrated at these locations when the tide allowed. Poor tides and staging problems limited the workers to only a few hours of work a day. NOAA advised the use of cleanup techniques that included sorbent pads, sorbent boom, pompoms, and oil snare. Oil snare and pompoms were more effective on heavier oil than were the sorbent pads. Oil snare was anchored in the intertidal area and allowed to wash back and forth in the rising and falling tides. This technique was somewhat successful and proved to be a good way to maximize cleanup efforts because these beaches were not accessible during medium to high tides.

Steam cleaning was permitted on the steep bedrock face where the oil had cascaded from the ruptured pipe. Earlier attempts at washing with lower pressure and hot water proved ineffective. Steam cleaning was limited to the vertical face only and sorbent pads had to be used at the base to prevent loose oil from contaminating the intertidal area.

Small amounts of oiled cobble berm were either redeposited into the intertidal area or removed from the beach, cleaned, and replaced or simply removed and taken to a waste disposal site.

#### **Other Special Interest Issues:**

Beach surveys by U.S. Environmental Protection Agency, Marine Spill Response Corporation, and OSPR determined that no areas were suitable as a bioremediation test site.

Both commercial and recreational boats moored in the bay were given a free hull cleaning by UNOCAL when cleanup operations neared completion. Cleaning stations were erected near the municipal wharf.

Of the over 100 seabirds impacted by the spill; nearly 70 were brought to the cleaning stations dead. Representatives of the International Bird Rescue Center were on scene to assist in the wildlife recovery and rehabilitation. One dead sea lion was

recovered; however, necropsy proved that death was not oil related. Four sea otters and one harbor seal pup died as a result of the spill. One sea otter was taken to Monterey Bay Aquarium, rehabilitated, and released into Monterey Bay. Tens of thousands of sooty shearwaters migrated close to the spill site and rafted up for the night. There were no reports of oiled shearwaters.

King salmon pens, with 50,000 fish ready for release as part of the Central Coast Salmon Enhancement Project, were moored in San Luis Harbor. When the spill began, the pens were surrounded by sorbent boom that was inspected daily and changed as needed. Sorbent pads were floated on top of each pen and changed daily. Feeding was suspended because the food floated on the surface of the water and it was feared that young salmon might accidentally ingest oil. About eight days after the onset of the spill, the pen manager noted a substantial increase in mortality. Several hundred fish died in only a matter of days. Analysis of the dead fish showed that death had been caused by *Vibrio anguillarum*, a bacterium brought on by stress. Eventually the fish were released and UNOCAL paid damages to the Enhancement Project, although it is unclear how the oil spill may have caused the stress in the salmon.

The bluff that overlooked the spill site, which served as the staging area, is a Chumash Indian burial site. Representatives of the Chumash Indians came to the site and voiced their concerns to the FOSC and UNOCAL. Certain sensitive areas were designated as "off limits" to the work crews. No further movement of heavy equipment or grading was allowed without approval from the archaeologist contracted to oversee the operations. A ceremonial bead, estimated to be over 1,000 years old, was found and this discovery forced UNOCAL to shut down part of the staging area to prevent further destruction of the site. A priestess from the Chumash contingent was on hand every day during the response to perform burial ceremonies for any animals that died as a result of the spill.

Local media interest was relatively high because of the pronounced impact the spill had on this small coastal community. Two town meetings were held during the response at which citizens voiced their concern over lost revenues to local businesses and the effects of the spill on human health and the environment.

#### **NOAA Activities:**

NOAA was notified of the incident on August 3, 1992, by MSO San Francisco where the SSC was visiting. The SSC and a representative from Genwest who had also been visiting MSO, drove to Avila Beach on the evening of August 3. The SSC reported to the FOSC on the movement of the oil and provided daily overflight maps and resources at risk information. The SSC advised responders on issues such as kelp and eelgrass cutting, beach cleanup strategies, salmon pen mortalities, and archaeological sites after consulting with other members of the SSC Team. A Genwest representative remained on scene until August 20. NOAA was released by the FOSC on August 21.



**References:**

NOAA Hotline 97, 16 reports

Research Planning Institute. 1986. Sensitivity of coastal environments and wildlife to spilled oil: San Francisco Bay Area. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 23 maps.

## U.S. COAST GUARD DISTRICT 13

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<b>Name of Spill:</b>	M/V <i>President Madison</i>
<b>NOAA SSC:</b>	Sharon K. Christopherson
<b>Date of Spill:</b>	12/08/91
<b>USCG District:</b>	13
<b>Location of Spill:</b>	West Duwamish Waterway Seattle, Washington
<b>Latitude:</b>	47°35.0' N
<b>Longitude:</b>	122°21.7' N
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	4
<b>Barrels:</b>	12
<b>Source of Spill:</b>	non-tank vessel
<b>Resources at Risk:</b>	seabirds, waterfowl, anadromous fish
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	contamination of forage areas
<b>Shoreline Types Impacted:</b>	riprap, piers
<b>Keywords:</b>	containment boom, low-pressure washing, sorbent pompoms, vacuum trucks

#### Incident Summary:

At 1840 on December 8, 1991, the U.S. Coast Guard (USCG) Marine Safety Office (MSO) Puget Sound received a report of black oil in Elliott Bay coming from the motor vessel *President Madison*. Pollution investigators responded, but were unable to confirm the report in the dark. The following morning, recoverable oil was located along the west shore of the West Duwamish Waterway and a medium to heavy rainbow sheen extended out into Elliott Bay.

Investigation into the cause of the spill indicated that the *President Madison* began deballasting operations at 1600 on December 8 while tied up at Terminal 5 on the West Duwamish Waterway. Unknown to vessel personnel, bunker oil was in the ballast and an estimated 500 gallons was subsequently discharged into the waterway. Approximately one-quarter mile of shoreline, consisting mostly of concrete-block riprap and commercial piers, was impacted. A USCG contractor deployed 1,500 feet of containment boom along the impacted shoreline.

American President Lines, owner of the *President Madison*, accepted responsibility for the incident and cleanup of the impacted shoreline began at 1015 on December 9, continuing until December 31. Cleanup operations were monitored by MSO Puget Sound pollution investigators and the Washington Department of Ecology.

#### Behavior of Spilled Material:

The spilled bunker oil had an API of 10.7 and a specific gravity of .9951. Due to the low energy environment of the waterway, minimal emulsification was observed.

The heaviest shoreline impact was along a 1,000-foot section of concrete-block riprap and under a pier immediately downstream from the Terminal 5 berth.

Light southerly winds at the time of the spill carried some of the oil out into Elliott Bay. USCG personnel on an overflight the morning of December 9 observed a medium to heavy rainbow sheen 100 yards wide, extending 1.5 miles from the end of the waterway into the bay. A second light to medium sheen, 10 feet wide and 2 miles long, was present between piers 80 and 91 on the north side of Elliott Bay.

#### **Countermeasures and Mitigation:**

Sheens observed in Elliott Bay were unrecoverable, but dissipated naturally due to 25 knot winds and high wave action on the evening of December 10.

Black oil along the shoreline was contained by boom. Heavy concentrations were recovered from the shore using vacuum trucks. Snare booms of pompoms were deployed within the boomed area and worked well recovering oil that slowly leached out of the riprap over a three-week period. Low- to medium-pressure cold water was used to flush trapped oil out from under the pier for recovery.

#### **Other Special Interest Issues:**

Of special concern was the potential contamination of the soft mud under the piers and at the base of the riprap near the impacted area, which are active forage areas for juvenile fish and invertebrate species. Although only limited numbers of out-migrating juvenile salmon were in the area at the time of the spill, major migrations of Chinook and chum salmon occur later in the spring. Given the persistence of bunker in the environment, care was taken not to flush oil down into this area during cleanup activities on the shore. Rapid control of the sheen coming off the contaminated riprap was also important because herring spawning activities were just beginning in this part of Puget Sound and would increase significantly over the next few weeks.

#### **NOAA Activities:**

NOAA was notified of the incident on December 10, 1991, by MSO Puget Sound. The Scientific Support Coordinator (SSC) was requested to go on scene to evaluate potential environmental impact if low to moderate cold-water washing was used to flush out oil trapped under the pier near Terminal 5. It was decided that as long as the pressure was regulated to allow oil to flow off the rocks and piers without dispersing, environmental impacts should be minimal. Pressure was regulated by watching to see if oil flushed off the rocks re-coalesced on the water's surface within the containment boom. Flushing was discontinued at low tide when the mud substrate was exposed.

The NOAA National Weather Service provided marine forecasts in support of the first week's cleanup operations. At the request of the USCG, the SSC coordinated

environmental concerns with the National Marine Fisheries Service, U.S. Fish and Wildlife Service, and Washington's departments of Wildlife and Fisheries.

**References:**

Research Planning Institute. 1985. Sensitivity of coastal environments and wildlife to spilled oil: Central and Southern Puget Sound. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 44 maps.



<b>Name of Spill:</b>	M/V <i>Tai Chung</i>
<b>NOAA SSC:</b>	Sharon K. Christopherson
<b>Date of Spill:</b>	12/28/91
<b>USCG District:</b>	13
<b>Location of Spill:</b>	Willamette River, Portland, Oregon
<b>Latitude:</b>	45°32.9' N
<b>Longitude:</b>	122°42.0' W
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	3
<b>Barrels:</b>	190
<b>Source of Spill:</b>	non-tank vessel
<b>Resources at Risk:</b>	freshwater marshes, waterfowl, mammals, recreational fishing, state park
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	mud and cobble riprap river bank
<b>Keywords:</b>	containment boom, high-pressure, cold-water washing, skimmers, sorbent boom, vacuum trucks

#### Incident Summary:

At 0235 on December 28, 1991, the U. S. Coast Guard (USCG) Group Portland received a report of an oil spill at the Columbia Aluminum dock at river mile 10 on the Willamette River. Approximately 8,000 gallons of intermediate fuel oil was spilled by the motor vessel *Tai Chung*, a bulk aluminum oxide carrier, during bunkering operations from a fuel barge tied up next to it. The spill occurred during the ebb tide under calm wind conditions.

The vessel owner, Taiwan Navigation Company Limited, accepted responsibility for the cleanup. Boom was deployed around the vessel within the first three hours of the spill, and cleanup of the free-floating oil and oiled shoreline began on December 28, continuing until February 5. Cleanup operations were monitored by USCG Marine Safety Office (MSO) Portland pollution investigators and two members of the USCG Pacific Strike Team in close coordination with representatives from Oregon's departments of Environmental Quality and Fish and Game.

#### Behavior of Spilled Material:

The spill occurred during the ebb tide under calm wind conditions. Under these conditions and the low current along the shore, much of the oil was expected to hang up around the piers and pockets along the shoreline in the immediate vicinity of the vessel.



A USCG overflight on the morning of December 28 found patches of recoverable oil and sheen extending from approximately 200 yards upstream of the Columbia Aluminum dock to the St. Johns Bridge, five miles downriver. A significant quantity of black oil was contained within the boom around the *Tai Chung* and fuel barge, which were still tied up at the Columbia Aluminum pier. By the second day, only medium to heavy sheen was spotted from this area with the only recoverable oil inside the containment boom at Columbia Aluminum.

A beach survey on December 30 identified a three-foot wide strip of oiled cobble at the high-tide line along a one-mile stretch of mud and cobble river bank in McCarthy Park, directly downstream from the Columbia Aluminum pier. The coating of oil was relatively light, except for one 400-yard section of moderate oiling.

### Countermeasures and Mitigation:

On December 28, deflection booming was deployed across the mouths of Multnomah Channel (1,000-foot boom) and Columbia Slough (200-foot boom) to protect the freshwater marsh habitat and bird concentrations in those areas. Deflection boom for containment and recovery was deployed on the east side of the Willamette River just downstream from the vessel to trap escaping oil from the boom around the vessel and barge. Oil trapped in the deflection boom and recoverable patches of oil found downstream were recovered using Marco Class II skimmers.

Black oil trapped within the containment boom at the Columbia Aluminum dock was recovered using vacuum trucks and two Marco skimmers. Fire hoses were used to wash the oil off the dock pilings and adjacent riprap and herd it to the skimmers for recovery. These operations continued until January 1, 1992. With changes in river level, globules of oil continued to be intermittently released from the pilings and riprap over the next month. Containment booms were maintained and trapped oil was collected using sorbents.

Oily debris was collected from under the Columbia Aluminum dock and along the one-mile stretch of oiled shoreline in McCarthy Park. Two 600-foot sections of containment boom lined with absorbents were deployed at the north and south ends of the park. The 400 feet of moderately oiled cobble riprap was wiped down by hand. Strings of oil snares (pompoms) were then deployed for a two-week period along this section of cobble riprap to enhance the natural wave and current scrubbing action to remove the rest of the oil. Flushing with fire hoses to speed up the removal of oil from the cobble riprap was considered, but not implemented due to concern about erosion and the possibility of driving the oil down into the substrate.

Cleanup contractors estimate a total of 10,478 gallons of product was recovered from the water and 20 cubic yards of oily debris collected from the shoreline. Waste oil recovered was disposed of at Fuel Processors Inc., while oily debris was disposed of at the Hillsborough Landfill.

**Other Special Interest Issues:**

Due to the proximity of metropolitan Portland and impacts on a state park, a moderate level of local press interest was present during the first week of the spill. Questions as to the potential environmental impacts and why the shoreline was not being more aggressively cleaned were addressed jointly by Oregon and USCG representatives.

**NOAA Activities:**

The NOAA Scientific Support Coordinator (SSC) was notified of the incident at 1030 on December 28, 1991, by MSO Portland and asked for weather forecasts, resources of concern information, and a spill trajectory. NOAA recommended protecting the wetland areas drained by the Multnomah Channel and Columbia Slough. These areas, heavily used by wintering waterfowl, provide important bird and mammal habitat and are popular recreational fishing areas. Kelly Point State Park, located at the confluence with the Columbia River, also provides good habitat for birds, small mammals, and wintering waterfowl, but is more difficult to protect. The NOAA trajectory for this part of the Willamette River estimated the ebb tidal excursion to be around five miles, with a maximum flow rate a little over one knot.

The NOAA SSC participated in a joint shoreline survey with the USCG, Oregon Department of Environmental Quality and vessel Protection and Indemnity Club on January 4, 1992, to complete shoreline cleanup recommendations. The NOAA SSC also provided technical information to the MSO and the Oregon Department of Fish and Game that helped alleviate some misconceptions of the local press relative to the toxicity of the oil and cleanup techniques being used.

**References:**

NOAA Hotline Report 74, 1 report

Research Planning Institute. 1991. The sensitivity of coastal environments and wildlife to spilled oil in the Columbia River. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 26 maps.



<b>Name of Spill:</b>	Texaco Puget Sound Refinery
<b>NOAA SSC:</b>	Sharon K. Christopherson
<b>Date of Spill:</b>	03/25/92
<b>USCG District:</b>	13
<b>Location of Spill:</b>	Fidalgo Bay, Anacortes, Washington
<b>Latitude:</b>	48°29.3' N
<b>Longitude:</b>	122°34.6' W
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	2
<b>Barrels:</b>	11.5
<b>Source of Spill:</b>	facility
<b>Resources at Risk:</b>	migratory waterfowl, shorebirds, fringing salt marsh
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	contaminated soil removal
<b>Shoreline Types Impacted:</b>	sheltered tidal flat, riprap, coarse-sand beach, salt marsh
<b>Keywords:</b>	fringing salt marsh, containment boom, sorbent pompoms, vacuum trucks

#### **Incident Summary:**

At 1918 on March 25, 1992, the U. S. Coast Guard (USCG) Marine Safety Office (MSO) Puget Sound was notified by the National Response Center that an unknown amount of waste oil had leaked into Fidalgo Bay from a septic tank. The failure of two ball-check valves, one on each end of a septic discharge line connected to the plant's waste oil line, had allowed waste oil to back up into the septic system in the employees' recreational vehicle park. A broken plastic tube in the pressure control valve for the septic system allowed approximately eleven and a half barrels of oil to escape over an unknown period of time. An estimated six and a half barrels soaked into the ground, while five barrels entered the water through a drainage ditch. Containment boom was deployed across the small tidal flat embayment next to the recreational vehicle park.

Texaco accepted responsibility for the cleanup. Cleanup began on March 25, but was not completed until June 11, when core samples from the contaminated shoreline were analyzed for toxicity and no further leaching of oil into the water was observed.

#### **Behavior of Spilled Material:**

The oil entered the water in a small sheltered tidal mudflat lying between two spits of land. The spill occurred at high tide during a slack tidal current and calm wind conditions. Containment boom was deployed across the back third of this mudflat

before the maximum ebb tidal current. A secondary containment boom was deployed between the two spits, effectively isolating the impacted area from the rest of Fidalgo Bay. An overflight at 0700 on March 26, 1992, found the majority of the oil in the water contained within a 100- by 75-foot area near the drainage ditch where the oil had entered the water. Only a small amount of unrecoverable sheen was observed outside the primary containment boom, with no contamination at all observed outside the secondary containment boom.

An area 60 by 20 feet along the drainage ditch running from the septic sump to the mudflat was saturated with waste oil approximately six inches down to a clay layer.

Approximately 1,000 feet of shoreline along the back third of the mudflat was impacted by oil floating on the water, with the heaviest contamination along the 100 feet closest to the drainage ditch. Shorelines impacted included a fringing *Salicornia* marsh and a sand beach backed by riprap supporting one of the facility roads. Oil did not appear to penetrate the mudflat itself due to the high clay content of the sediments. Several times over the course of the cleanup, lightly oiled kelp and other floating debris was stranded at the high-tide line on the Crandal spit, a coarse-sand and gravel spit making up the northern boundary of the small mudflat.

#### **Countermeasures and Mitigation:**

Free-floating oil within the containment boom was recovered using vacuum trucks and sorbent booms. Texaco claims to have recovered two barrels of oil from the water. Snare booms of pompoms were deployed along the contaminated shoreline to recover the light sheens leaching out of the marsh and riprap. The contaminated riprap was wiped down by hand to remove as much oil as possible. Oily debris on the shoreline was collected and removed.

Snare boom was deployed along the fringing marsh contaminated by oil to control the sheening. Except for one low-lying swale area, surface contamination of the marsh was light. Core samples collected on March 9 indicated small pockets of subsurface oil in the marsh; however, no further efforts were made to clean the marsh in an attempt to minimize mechanical damage.

The 60- by 20-foot area of oil-saturated soil along the drainage ditch was excavated down to the clay layer. A four-foot buffer of *Salicornia* marsh was left undisturbed along the perimeter of the mudflat to minimize erosion and sedimentation. Saltwater was pumped into the excavated area and allowed to naturally migrate to the mudflat in an attempt to speed up leaching of any remaining subsurface pockets of oil. The resulting sheening in the mudflat was controlled using snare booms. The excavation was then filled in and contoured to minimize siltation.

#### **NOAA Activities:**

NOAA was notified of the incident at 1930 on March 25, 1992, by MSO Puget Sound who requested the Scientific Support Coordinator (SSC) report on scene. The SSC

provided resources at risk information and recommendations for shoreline cleanup. NOAA also coordinated environmental concerns with the Washington departments of Ecology and Natural Resources.

**References:**

Research Planning Institute. 1986. Sensitivity of coastal environments and wildlife to spilled oil: Strait of Juan de Fuca and Northern Puget Sound. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 36 maps.



# U.S. COAST GUARD DISTRICT 14

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<b>Name of Spill:</b>	T/V <i>Yupex</i>
<b>NOAA SSC:</b>	Sharon K. Christopherson
<b>Date of Spill:</b>	11/20/91
<b>USCG District:</b>	14
<b>Location of Spill:</b>	Honolulu Harbor, Hawaii
<b>Latitude:</b>	21°19.0' N
<b>Longitude:</b>	157°52.5' W
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	2
<b>Barrels:</b>	595
<b>Source of Spill:</b>	tank vessel
<b>Resources at Risk:</b>	shorebirds, wading birds, sea turtles, coral reefs, reef fish, estuarine fish
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	media interest
<b>Shoreline Types Impacted:</b>	man-made harbor structures (docks, riprap)
<b>Keywords:</b>	containment boom, endangered species, evaporation, sorbent boom, vacuum trucks, skimmers

#### **Incident Summary:**

At 0630 on November 20, 1991, the U. S. Coast Guard (USCG) Marine Safety Office (MSO) Honolulu received a report from the USCG Cutter *Sassafras* of a strong odor of diesel near their berth on Sand Island in Honolulu Harbor. USCG pollution investigators identified the tank vessel *Yupex*, as the source of the spill. The *Yupex* is a small Panamanian-flagged tanker owned by a Korean company that provides fuel to fishing fleets. While taking on fuel at the Pacific Resources Incorporated (PRI) terminal at pier 29, a valve was left partially open allowing diesel being loaded into the tanker's #1 ballast tanks to leak out into the harbor. The diesel continued to leak as the vessel transited to pier 35 where it docked to take on more cargo.

An independent marine surveyor gauged the tanks on board the *Yupex* and found 21,500 gallons less than what the vessel reported to have on board when it left pier 29. The *Yupex* had also filed a protest with the PRI terminal indicating that they received 5,000 gallons less diesel than the terminal claims they pumped. On the basis of this information, the USCG estimated that the volume of diesel spilled was about 25,000 gallons.

Cleanup was initiated at 0700 on November 20 by the USCG contractor Pacific Environmental Corporation (PENCO). The vessel's owners accepted responsibility for the cleanup later the same day. Cleanup was completed at 0900 on November 23, 1991.

### **Behavior of Spilled Material:**

The spill began during a flood tide and continued through part of the next ebb tide before it was discovered and the source secured. Honolulu Harbor is a U-shaped body of water separating Sand Island from the main Oahu coast. During a flood tide, water flows into the harbor through the main harbor channel on the east and Kalihi Channel on the west. The spill originated between piers 29 and 35 in the central portion of the harbor in an apparent null area where tidal currents are very weak and variable. The five-knot trade winds pushed the majority of the oil to the southeast and southwest along the north shore of Sand Island and then along the shoreline toward the main channel and Kalihi Channel. Due to the weak tidal currents, a significant quantity of diesel was trapped under piers and in the riprap along the *Yupex*'s transit line.

Observers on road surveys and an overflight the morning of November 20 reported heavy rainbow sheen extending from pier 35 out toward Kalihi Channel at least as far as channel marker 16. The sheen followed the deeper part of the Kalihi Channel and did not spread out over the tidal reef flats on either side of the channel. A small area of sheen was also observed 200 yards offshore to the east of the main harbor channel. The quantity of sheen diminished by the afternoon, but continued to be seen in the harbor over the next two days as trapped product was flushed out from underneath the piers for recovery.

### **Countermeasures and Mitigation:**

Approximately 6,000 gallons of diesel trapped under the piers was contained by harbor booms and recovered using shore-side vacuum trucks, small portable skimmers, and absorbent pads. Contamination remaining on the docks, bulkheads, and riprap revetments was flushed away by normal tidal action once the free-floating accumulations were recovered.

### **Other Special Interest Issues:**

This spill excited a high level of local media interest due to its proximity to metropolitan Honolulu and the early lack of cooperation from the vessel's Master in determining how much product was lost. The original estimate of 3,000 gallons was increased to 25,000 gallons once the vessel's owners brought in an independent marine surveyor to gauge the *Yupex*'s tanks.

### **NOAA Activities:**

NOAA was notified of the spill at 0900 on November 20, 1992, by MSO Honolulu who requested assistance on scene for the first two days of the cleanup. The NOAA Scientific Support Coordinator (SSC) was in Honolulu attending meetings with local resource agencies when the spill occurred.

NOAA provided technical information on the spill trajectory, diesel evaporation rates, and tides and tidal currents. The SSC coordinated weather forecasts for cleanup operations with the Honolulu National Weather Forecast Office and developed a summary of the resources at risk for the MSO.

The SSC and the National Marine Fisheries Service (NMFS) representative conducted an initial shoreline survey to identify the impacted area and resources at risk. The shoreline in the immediate area of the spill consists primarily of man-made harbor structures including docks, bulkheads, and riprap revetments. Fine-grained sand beaches are found on the northwest end of Sand Island and on two small sand islands, Mokauea and Kahakaaulana, located on either side of the Kalihi Channel. The resources of most concern were the shallow reef flats found in Mamala Bay and bordering Kalihi Channel. Honolulu Harbor was experiencing spring tides at the time of the spill. If the reef flats were exposed to high concentrations of diesel during the minus low tides, there could be impacts to the resident infauna clams and polychaetes. Bleaching and death of some of the corals could result also. Shoreline impacts during the survey were observed only along the man-made harbor structures. Sheen extended down the center of Kalihi Channel, but was not being spread out over the shallow area of the reef flat.

To more closely inspect the reef flats along the Kalihi Channel, a second boat survey was done later in the day with representatives from NOAA, the USCG, and the U. S. Fish and Wildlife Service. The Hawaiian stilt, a wading bird found in the shallow intertidal areas along the Kalihi Channel, was of special concern because it is listed as an endangered species and found only in the Hawaiian Islands. No birds were observed near the spill and there was no evidence of residual contamination on the reef flats or the fine-grained sand beaches.

Shoreline surveys to assess the effectiveness of cleanup operations and identify any new shoreline impacts were conducted the morning of the second day by NOAA, USCG, and NMFS representatives. Small pockets of product along the north shore of Sand Island were still being worked by the contractors, but residual sheering within the harbor was significantly reduced and no new shoreline impact areas were noted.

#### **References:**

Bathen, Karl H. 1978. Circulation Atlas for Oahu, Hawaii. UNIH-SEAGRANT-MR-78-05. Honolulu: University of Hawaii Sea Grant.

NOAA Hotline 69, 5 reports

Research Planning Institute. 1986. Sensitivity of coastal environments and wildlife to spilled oil: Hawaii. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 86 maps.



**Name of Spill:** F/V *Eijyu Maru*  
**NOAA SSC:** Sharon K. Christopherson  
**Date of Spill :** 12/01/91  
**USCG District:** 14  
**Location of Spill:** Ngarapalas Island, Kayangel Islands Group,  
 Republic of Palau  
**Latitude:** 08°02' N  
**Longitude:** 134°42' E  
**Spilled Material:** oil  
**Spilled Material Type:** 2  
**Barrels:** 119  
**Source of Spill:** non-tank vessel  
**Resources at Risk:** sand and gravel (coral rubble) beach, submerged  
 aquatic vegetation, sea grass beds, coral reefs,  
 dugong, sea birds, shorebirds, nesting beaches,  
 reef fish, sea turtles, salt water crocodile,  
 subsistence gathering  
**Dispersants:** N  
**Bioremediation:** N  
**In-situ Burning:** N  
**Other Special Interest:** logistical problems, *in-situ* burning, interaction  
 with native groups, salvage difficulties, effects to  
 human health and safety, potential impacts from  
 introduced species (rats)  
**Shoreline Types Impacted:** none observed  
**Keywords:** Centers for Disease Control, endangered species,  
*in-situ* burning, salvage

### Incident Summary:

On December 1, 1991, the 65-foot fishing vessel *Eijyu Maru No. 1* ran aground on a reef, 100 to 200 yards off Ngarapalas Island, the southeast end of the Kayangel Islands Group in the Republic of Palau. The vessel was carrying 5,000 gallons of diesel, 165 gallons of lubrication oil, and 25 tons of fish. The *Eijyu Maru* was said to be lying on her port side on the reef with three quarters of her hull submerged and waves breaking over her. A six-foot hole was reported in the engine room hull and diesel sheen was observed in the water around the vessel. On-scene weather was 20-knot winds and six- to eight-foot seas.

### Behavior of Spilled Material:

A total of 650 gallons of diesel were removed from the *Eijyu Maru* and an estimated 4,500 gallons of diesel were released into the water. The diesel released into the water was naturally dispersed by the strong wind and high surf present throughout the salvage operations.

### **Countermeasures and Mitigation:**

On December 4, the Government of Palau determined that the Japanese owner was unable to remove the fuel on board the vessel and officially requested U. S. Coast Guard (USCG) assistance. USCG personnel from the Marine Safety Office (MSO) in Guam arrived on scene December 5 to survey the damage and arrange for the transportation of salvage equipment to Palau. Communications between Guam and Palau were very difficult because of limited telephone lines into Palau. The Pacific Strike Team with additional equipment, including INMARSAT communication equipment, were deployed to the scene on December 8 to assist MSO Guam personnel. Between December 5 and December 12 a number of different salvage plans were considered and discarded because of rough surf conditions on scene, instability of the vessel, and lack of salvage equipment in Palau.

On December 12, the USCG identified a 200-foot landing craft, the M/V *Dragon I*, to off load the fuel from the *Eijyu Maru*. On December 14, the landing craft successfully transferred the remaining 650 gallons of diesel from the *Eijyu Maru*, but then ran aground while maneuvering near the disabled vessel and was unable to work free. In addition to the 650 gallons removed from the *Eijyu Maru*, the *Dragon I* had 15,000 gallons of diesel on board. A Salvage Master representing the landing craft owner arrived in Palau on December 17, surveyed the *Dragon I*, and found no hull damage. A salvage tug was dispatched from Japan and the *Dragon I* was successfully refloated and towed to Koror on December 29 with no pollution. No oil remains on the *Eijyu Maru* and the vessel remains wrecked on the reef.

### **Other Special Interest Issues:**

As is often the case when dealing with spills in the South Pacific, the logistical problems associated with the remote location and stranding of a vessel in a high-energy surf zone significantly increased the duration and expense of this response. No response equipment was staged in the Republic of Palau. All equipment and personnel had to come from Guam, Hawaii, California, and Japan. Ngarapalas Island is located 50 miles north of Koror, can be reached only by boat, and is uninhabited. There is a small native village on a nearby island. The remoteness of the area resulted in time delays in assessing the situation, transporting equipment, and carrying out the response. The remote location and lack of support facilities also limited access on scene. Video tapes taken by personnel on scene were provided to assist key resource agency personnel make recommendations on proposed response operations and assess the potential threat to the environment. The six- to eight-foot surf breaking over the vessel made it impossible to get anything but the smallest equipment out to the *Eijyu Maru*, and raised concern for the safety of response personnel trying to work on her. Several different response plans were proposed, only to be discarded because of logistical problems or safety issues. It took more than a week to locate a suitable craft to serve as a platform for lightering the *Eijyu Maru*, only to have the landing craft go aground and pose an even greater pollution threat to the environment.

During the salvage, the 25 tons of rotting fish in the *Eijyu Maru's* holds raised two more concerns. First, could the methane given off by the rotting fish pose an explosion hazard to responders? Discussions with responders on scene indicated that this was unlikely due to adequate ventilation supplied by the numerous holes in the ship's hull. Second, what were the possible human or environmental effects of the rotting fish cargo? The Centers for Disease Control recommended that the natives be warned against eating any of the fish. Bacterial activity in the decomposing fish should be rapidly diluted by surrounding water and should pose no additional threat to the environment. The responders were also warned that the fish cargo could draw sharks into the area.

Another concern raised by the U. S. Fish and Wildlife Service was whether rats swimming ashore from the grounded vessel could threaten birds nesting on Ngarapalas Island. No rats were observed during the salvage operations.

#### NOAA Activities:

NOAA was notified of the incident on December 6, 1991, by MSO Guam. The NOAA Scientific Support Coordinator (SSC) provided oil spill trajectories for instantaneous releases of 5,000 gallons and 15,000 gallons of diesel, resources at risk information, and toxicity of diesel. The SSC coordinated input from Federal resource agencies on a number of environmental issues, including identification of federally listed endangered and threatened species at risk in the area, the potential for impact on resident birds by human salvage activity, and the potential threat of rats on the *Eijyu Maru* reaching the shore and impacting bird nesting. The SSC helped develop a consensus recommendation on several response plans being considered including the deliberate controlled discharge of the *Eijyu Maru's* cargo into the water or transferring the cargo to 55-gallon drums for transport and burning on Ngarapalas Island.

The SSC also coordinated with the Centers for Disease Control in Atlanta to procure information on human health threats from the rotting fish cargo on board the *Eijyu Maru*.





<b>Name of Spill:</b>	Mystery Spill, Tarague Beach, Guam
<b>NOAA SSC:</b>	Sharon K. Christopherson
<b>Date of Spill:</b>	02/29/92
<b>USCG District:</b>	14
<b>Location of Spill:</b>	Anderson Air Force Base, Guam
<b>Latitude:</b>	13°38.3' N
<b>Longitude:</b>	145°57.0' E
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	4
<b>Barrels:</b>	1
<b>Source of Spill:</b>	unknown
<b>Resources at Risk:</b>	sea turtles
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	green sea turtle impacts
<b>Shoreline Types Impacted:</b>	coarse-sand beach
<b>Keywords:</b>	endangered species

#### **Incident Summary:**

On the morning of February 29, 1992, small patches of heavy, viscous black oil were found on Tarague Beach and several adjacent beaches on Anderson Air Force Base in Guam. The U.S. Coast Guard (USCG) Marine Safety Office (MSO) Guam was notified of the spill by the Anderson Air Force Base Environmental Coordinator at 1200 on February 29. USCG personnel collected tarball samples from all impacted beaches, samples of oil from impacted wildlife (turtles), and cargo samples from the few identified vessels that had transited the general vicinity. These samples were sent to the USCG Central Oil Identification Laboratory for analysis.

#### **Behavior of Spilled Material:**

The oil floated in over the extensive reef flat along the north and northeast shores of Guam for less than one mile, impacting several coarse-sand beaches with discrete tarballs one to eight inches in diameter and one-inch thick. The oil did not penetrate the sand. Oil on turtles and in the tarballs had a black, glossy appearance and behaved as partially weathered #6 fuel oil with a pour point above 70°F.

NOAA and USCG Computer Assisted Search Planning (CASP) hindcasts indicated the source of oil to be offshore east-northeast of Guam. Due to the persistence of #6 fuel oil, it was not possible to determine how far offshore the source could have been—anywhere from a few miles to several hundred miles. Overflights of the area failed to find any sign of oil. However, once #6 fuel oil has weathered to tarballs such slicks are almost impossible to spot from the air because they lack sheen.

### **Countermeasures and Mitigation:**

Impacted beaches were manually cleaned by air force personnel. Given the viscosity of the oil and limited quantities that came ashore, no impacts to the coral reef flat fronting the impacted beaches were expected. It was estimated that less than one barrel of oil came ashore.

### **Other Special Interest Issues:**

Three green sea turtles covered in oil were washed ashore on beaches on the north and east side of Guam. Green sea turtles are a federally listed endangered species for the Pacific region. The turtles were one to two years old, approximately eight inches long, and covered in black, glossy oil. Turtles of this age typically feed in the open ocean and could have been any distance offshore when they were impacted. One turtle found alive was cleaned and returned to the sea. The two dead turtles were given to the Government of Guam Division of Aquatic and Wild Life for analysis. There, biologists speculated that the turtles mistook the oil for a floating algal mat and surfaced in it. One of the turtles had ingested oil and was probably asphyxiated when its nasal openings became clogged with oil.

### **NOAA Activities:**

NOAA was notified of the incident at 1930 on March 3, 1992, by MSO Guam and requested to provide a hindcast trajectory for the spill. NOAA was also asked to contact the Anderson Air Force Base Environmental Coordinator and discuss recommendations for cleanup and potential impacts to the coral reef flat. NOAA's Scientific Support Coordinator also coordinated with the National Marine Fisheries Service to provide technical information to the Division of Aquatic and Wild Life on the toxicity of oil to turtles and recommended rehabilitation procedures for oiled turtles.

### **References:**

Defense Mapping Agency. 1985. Sailing Directions (Enroute) for the Pacific Islands. Second Edition, Publication 126. Washington, D.C.

## U.S. COAST GUARD DISTRICT 17

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<b>Name of Spill:</b>	<i>Hyundai</i> #12
<b>NOAA SSC:</b>	John W. Whitney
<b>Date of Spill:</b>	10/2/91
<b>USCG District</b>	17
<b>Location of Spill:</b>	Shumagin Islands, Alaska
<b>Latitude:</b>	54°57.4' N
<b>Longitude:</b>	159°21.5' W
<b>Spilled Material:</b>	IFO-180, diesel
<b>Spilled Material Type:</b>	4, 2
<b>Barrels:</b>	4150 IFO-180; 500 diesel
<b>Source of Spill:</b>	cargo vessel
<b>Resources at Risk:</b>	seabirds, sea otters, sea lions, salmon streams
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	cargo of wheat
<b>Keywords:</b>	none

#### **Incident Summary:**

On October 2, 1991, the motor vessel *Hyundai* #12, a 512-foot Korean cargo vessel, ran aground in Twelve Fathom Strait. The vessel had taken shelter from a storm in the Shumagin Islands, part of the Alaska Maritime National Wildlife Refuge. Twelve Fathom Strait is along the north side of Simeonof Island, a wilderness area. The vessel was carrying 23,000 tons of wheat, 174,000 gallons of IFO-180 fuel, and approximately 21,000 gallons of diesel. One bottom fuel tank was breached; however, no oil leak occurred because a hydrostatic head of water held the fuel in the tank.

The owner took full responsibility for the salvage and response. Only minor sheening was reported during this incident.

#### **Countermeasures and Mitigation:**

With the potential for a large release, the Federal On-Scene Coordinator (FOSC) pre-staged as much mechanical, burning, and dispersant equipment as possible. The initial report on the oils' properties indicated that they were dispersible and burnable. Later reports disproved this and equipment for these types of responses was never used.

Several fishing vessels, several thousand feet of boom, a large salvage vessel, and a barge from Dutch Harbor in which to pump the fuel were called into action. U.S. Coast Guard (USCG) Pacific Strike Team personnel used pumps to offload the oil. In addition, two 40-ton-per-hour grain pumps were used to pump the wheat overboard to lighten the vessel. After approximately 112,000 gallons of IFC and 1,000 tons of wheat were removed, the vessel floated free on the evening high tide of

October 12, 1991. Under its own power, it maneuvered to Sand Point about 60 miles away for hull surveys and temporary repairs.

**Other Special Interest Issues:**

The main concern of the U.S. Fish and Wildlife Service (USFWS), manager of the wildlife refuge, was the possibility of rats from the *Hyundai* reaching Simeonof Island and decimating the bird population.

**NOAA Activities:**

NOAA was notified of the incident on October 2, 1992, by the USCG Marine Safety Office Anchorage. The SSC notified the USFWS, National Marine Fisheries Service, and Alaska Department of Fish and Game.

**Reference:**

NOAA Hotline 63, 6 reports

<b>Name of Spill:</b>	F/V <i>Windrunner</i>
<b>NOAA SSC:</b>	John W. Whitney
<b>Date of Spill:</b>	11/24/91
<b>USCG District:</b>	17
<b>Location of Spill:</b>	Womans Bay, Kodiak, Alaska
<b>Latitude:</b>	57°42' N
<b>Longitude:</b>	152°32' W
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	2
<b>Barrels:</b>	20
<b>Source of Spill:</b>	fishing vessel
<b>Resources at Risk:</b>	overwintering birds and sea otters
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	rocky shoreline
<b>Keywords:</b>	containment boom, sorbent boom

#### **Incident Summary:**

On November 24, 1991, personnel at the U.S. Coast Guard (USCG) Kodiak Air Station reported a large oil sheen emanating from the fishing vessel *Windrunner*, which had been derelict and abandoned for more than a year. Investigators reported that the vessel was lying on its port side leaking fuel. A helicopter flight reported several large pockets of sheen scattered in Womans Bay and that the shoreline had been slightly impacted from Brun Point to Blodgett Island.

#### **Behavior of Spilled Material:**

The oil acted in typical fashion for diesel, sheening and rapidly dispersing and dissipating

#### **Countermeasures and Mitigation:**

The USCG Marine Safety Office (MSO) Anchorage hired a contractor who boomed off the vessel using sorbent and hard containment booms. Free-floating fuel was recovered using absorbent pads. Approximately 20 barrels of contaminated fuel oil were pumped from the vessel and the vents were pulled. The job was completed on November 27.

#### **NOAA Activities:**

NOAA was notified of the incident on November 24, 1991, by USCG MSO Anchorage. The Scientific Support Coordinator notified resource agencies and supplied weather forecasts to the responders on scene.





**Name of Spill:** Kenai Pipeline East Forelands  
**NOAA SSC:** John W. Whitney  
**Date of Spill:** 01/04/92  
**USCG District:** 17  
**Location of Spill:** Nikiski, Alaska  
**Latitude:** 60°41' N  
**Longitude:** 151°24' W  
**Spilled Material:** oil  
**Spilled Material Type:** 1  
**Barrels:** 31  
**Source of Spill:** pipeline  
**Resources at Risk:** none  
**Dispersants:** Y  
**Bioremediation:** N  
**In-situ Burning:** N  
**Other Special Interest:** safety of responders  
**Shoreline Types Impacted:** none  
**Keywords:** Corexit 9527, dispersant

#### Incident Summary:

At 0030, January 4, 1992, an oily water ballast mixture was being transferred between tanks at the Kenai Pipeline dock at Nikiski, Alaska when the pipeline burst and released the mixture into Cook Inlet. Failing heat tape on the pipeline caused the accident at the facility owned jointly by Chevron and ARCO. The owners immediately accepted full responsibility for the accident. Cook Inlet Spill Prevention and Response Incorporated (CISPRI) had a foxtail skimmer on the slick within 45 minutes and a second one on scene by daybreak. After the four-day response, no further oil was sighted in Cook Inlet. The weather at the time of the incident was temperature 20 to 25°F with light to strong winds from the northeast and intermittent low cloud banks.

#### Behavior of Spilled Material:

The oil slick was immediately caught in the Cook Inlet "rip" zones and followed a very predictable pattern of 10- to 15-mile north-south tidal excursions with a gradual westward movement across the inlet. This spill occurred under conditions nearly identical to a 1987 spill; therefore, predicting its movement was fairly routine. Of the 31 barrels spilled, 16 were removed by skimming, nearly all of that on the first day. Only limited black oil pancakes (one to four feet across) in heavy sheen were found the second day, and by the fourth day, the energetics of Cook Inlet had incorporated nearly all the oil. NOAA prepared the following oil budget for the Federal On-Scene Coordinator and responsible parties:

Loss due to natural processes (evaporation and dissolution)	20 - 30%
Loss due to sedimentation	1 - 5%

Oil recovered as of 1/7/92	40%
Oil widely dispersed over 600 square miles	15 - 25%
Oil remaining in rip zones as tar balls, mousse, oiled debris, etc.	5 - 10%
Oil on the beach	<2%

### **Countermeasures and Mitigation:**

As soon as the spill was discovered, the source was secured. As a precaution, boom pallets were made for Swamp and Packers creeks on the east side of Kalgin Island, but were not needed or deployed. All the recovery was accomplished with open-water skimming using a foxtail skimmer suspended over the side of a large, mudboat-sized vessel. No shoreline impact occurred.

### **Other Special Interest Issues:**

The use of dispersant Corexit 9527 was unsuccessfully attempted. The product proved to be too viscous to flow through spill spray helo bucket application equipment in the 25°F temperature. This development was unforeseen and is being fully investigated by CISPRI and Exxon Chemical.

A major issue of this spill was the safety of field and overflight personnel responding in the winter conditions of Alaska. Everyone wore Mustang suits, which are flotation suits but not survival suits. A topic of discussion at follow-up meetings will be the amount of risk to be taken when responding to spills in wintertime Alaska.

### **NOAA Activities:**

NOAA was notified of the incident on January 4, 1992, by the U.S. Coast Guard Marine Safety Office Anchorage and traveled to the on-scene command post in Nikiski. NOAA prepared a trajectory of the oil and helped plan the dispersant application. CAMEO-derived shoreline maps were used as the standard for marking overflight observations. NOAA monitored the weather regularly and contacted the resource agencies to determine which resources might be at risk. In addition, NOAA's Scientific Support Coordinator (SSC) went on all overflights to judge the efficacy of the dispersant operation and attended all command-level meetings to help determine strategies and objectives. To support the State's desire to examine shorelines for possible oiling, NOAA obtained information on key collection areas. The SSC was released on January 7, 1992.

### **References:**

NOAA. 1990. The CAMEO™ 3.0 Manual. Washington, D.C. National Safety Council. 300 pp.

NOAA Hotline 76, 5 reports

Research Planning Institute. 1985. Sensitivity of coastal environments and wildlife to spilled oil: Cook Inlet/Kenai Peninsula: An atlas of coastal resources. Seattle: Office of Oceanography and Marine Assessment, National Oceanic and Atmospheric Administration. 55 maps.



<b>Name of Spill:</b>	Soldotna Sewage Treatment Plant
<b>NOAA SSC:</b>	John W. Whitney
<b>Date of Spill:</b>	01/30/92
<b>USCG District</b>	17
<b>Location of Spill:</b>	Kenai Peninsula, Alaska
<b>Latitude:</b>	60°28' N
<b>Longitude:</b>	151°08' W
<b>Spilled Material:</b>	chlorine gas
<b>Spilled Material Type:</b>	5
<b>Amount:</b>	25 pounds
<b>Source of Spill:</b>	facility
<b>Resources at Risk:</b>	human health
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b><i>In-situ</i> Burning:</b>	N
<b>Other Special Interest:</b>	very stable, windless atmospheric conditions and extremely cold temperatures
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	none

#### **Incident Summary:**

In the early morning hours of January 30, 1992, a chlorine leak developed at the Soldotna Sewage Treatment Plant located eight miles upstream from the mouth of Kenai River on the Kenai Peninsula. A chlorine cloud formed and the cold temperatures (0°F) and very stable, windless atmospheric conditions resulted in limited dispersion of this cloud. This cloud followed the river channel downstream five to eight miles before it dissipated. Alaska Department of Environmental Conservation (ADEC) personnel evacuated about 500 residents from both sides of the river downstream. These residents were allowed to return to their homes about 1500 the same day.

The original estimate of chlorine released was 100 to 1,500 pounds; later, this estimate was reduced to 25 pounds.

#### **NOAA Activities:**

NOAA was notified of the incident at 0600, January 30, 1992, by ADEC who requested running NOAA's dispersion model, ALOHA™. NOAA served in a scientific advisory capacity advising ADEC that ALOHA use was inappropriate because movement of the chlorine cloud was under the control of terrain effects. NOAA also told ADEC that the leak would probably freeze over because chlorine is stored as a super-cooled liquid.



<b>Name of Spill:</b>	<i>Venture Luna</i>
<b>NOAA SSC:</b>	John W. Whitney
<b>Date of Spill:</b>	03/21/92
<b>USCG District</b>	17
<b>Location of Spill:</b>	Captains Bay, Unalaska Island, Alaska
<b>Latitude:</b>	53°55' N
<b>Longitude:</b>	166°35' W
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	3
<b>Source of Spill:</b>	non-tank vessel
<b>Resources at Risk:</b>	none
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	N
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	none

#### **Incident Summary:**

The *Venture Luna* incident occurred early on the morning of March 21, 1992, at Captains Bay, Dutch Harbor, Unalaska Island, Alaska. As the result of 50- to 60-knot winds, the vessel drug anchor causing it to go aground and damage a tank containing 7,000 gallons of an IFO. Sheening was noticeable around the vessel; however, due to high winds, this rapidly dispersed and dissipated. It was estimated that less than 50 gallons of an oily-water mixture was released before the source was secured. The vessel's owner immediately assumed responsibility and conducted all control and cleanup. The case was closed on March 25.

#### **Behavior of Spilled Material:**

Only a sheen resulted for a short period immediately around the vessel. No shoreline was impacted, although personnel from the U.S. Coast Guard (USCG) and Alaska Department of Environmental Conservation inspected along the shoreline for this possibility

#### **Countermeasures and Mitigation:**

The vessel was pulled off ground a few hours later. Calming winds on March 22 allowed a boom to be placed around the vessel. No oil was observed within the boom.

#### **NOAA Activities:**

NOAA was notified of the incident on March 21, 1992, by the USCG Marine Safety Office Anchorage. NOAA provided weather updates throughout the incident and kept current on response activities by close contact with the USCG.





<b>Name of Spill:</b>	F/V <i>Silver Star</i>
<b>NOAA SSC:</b>	John W. Whitney
<b>Date of Spill:</b>	03/26/92
<b>USCG District:</b>	17
<b>Location of Spill:</b>	Whale Pass between Afognak Island and Kodiak Island, Alaska
<b>Latitude:</b>	57°58.1' N
<b>Longitude:</b>	152°52.7' W
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	2
<b>Barrels:</b>	less than one
<b>Source of Spill:</b>	non-tank vessel
<b>Resources at Risk:</b>	none
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	none

#### **Incident Summary:**

On March 26, 1992, the fishing vessel *Silver Star* ran aground in Whale Pass, Kodiak Island, Alaska, in rough, windy weather. The vessel released from its grounding shortly thereafter, and for a day or so it remained submerged with approximately four feet of the stern sticking out of the water, as it drifted westward in the Kupreanof Strait. A contractor vessel on scene reported that light sheening was emanating from the fuel vents, but, it was believed that the fuel tanks were of high integrity and not likely to rupture. A day later the vessel sank in eight fathoms of water just a few miles northwest of Whale Island. Light sheening continued to be observed. The U.S. Coast Guard (USCG) called in the Strike Team and a contractor was hired to pump off the remaining fuel. The incident lasted until March 31 when the contractor completed the offloading of approximately 1,100 gallons of diesel.

#### **Behavior of Spilled Material:**

Only light sheening occurred.

#### **Countermeasures and Mitigation:**

The diesel was offloaded onto a nearby vessel. No open-water recovery operations were necessary and no shorelines were impacted.

**NOAA Activities:**

NOAA was notified of this incident on February 25, 1992, by the USCG Marine Safety Office Anchorage. NOAA provided weather information and notified all the resource agencies of the incident. Resources at risk information was compiled for the area of the sinking, although there was nothing particularly sensitive near the sunken vessel.

**References:**

Research Planning Institute. 1985. Sensitivity of coastal environments and wildlife to spilled oil: Cook Inlet/Kenai Peninsula: An atlas of coastal resources. Seattle: Office of Oceanography and Marine Assessment, National Oceanic and Atmospheric Administration. 55 maps.

<b>Name of Spill:</b>	ARCO King Salmon Platform
<b>NOAA SSC:</b>	John W. Whitney
<b>Date of Spill:</b>	04/25/92
<b>USCG District:</b>	17
<b>Location of Spill:</b>	MacArthur River Field, Alaska
<b>Latitude:</b>	60°53' N
<b>Longitude:</b>	151°37' W
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	3
<b>Barrels:</b>	8-10
<b>Source of Spill:</b>	platform
<b>Resources at Risk:</b>	beluga whales, shorebirds, gulls, foraging areas, migration stopover areas
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	study of currents in Cook Inlet
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	skimmers, sorbent boom

#### **Incident Summary:**

A release of Cook Inlet crude occurred from the ARCO King Salmon Platform about 0845 on April 25, 1992. Apparently, the King Salmon Platform was draining its production separator and failed to equalize pressure, causing a skimmer tank to fill too quickly, thus resulting in a tank overflow of 8 to 10 barrels of crude oil. The overflow created a black slick approximately 400 by 100 feet. At the time of the incident, the weather was clear, the seas calm, and the winds light to nonexistent. Within an hour the Cook Inlet Spill Prevention and Response Inc. (CISPRI) was on the scene. The response ended on the evening of April 27.

#### **Behavior of Spilled Material:**

The spill occurred during the peak neap tide with virtually no wind influence. Because of this lack of wind throughout the response, shoreline areas were not impacted.

#### **Countermeasures and Mitigation:**

A foxtail skimming system with a side-tow boom was used to concentrate the oil. Recovery was roughly 90 percent efficient by the end of the first day. Heavy to light sheen remained for the next two days and collection was mostly through sorbent booms towed by six contracted fishing vessels. Although there were many beluga whales nearby and even more birds on shore, no signs or reports of oiled or distressed waterfowl or wildlife occurred throughout the response.

**Other Special Interest Issues:**

A hindcast evaluation of the oil's movement showed that its north-south movement was essentially what tidal current charts predicted. The slick moved parallel to Trading Bay and westward into Trading Bay to within a mile of the shoreline confirming that oceanographic currents do not carry oil onshore.

**NOAA Activities:**

NOAA was not called on scene during this response. Instead, support was provided to the U.S. Coast Guard by way of phone and fax machine. After the response was complete, the NOAA Scientific Support Coordinator compiled all the overflight information to better understand the circulation of this part of Cook Inlet.

<b>Name of Spill:</b>	F/V <i>Loon</i>
<b>NOAA SSC:</b>	John W. Whitney
<b>Date of Spill:</b>	August 28, 1992
<b>US Coast Guard District:</b>	17
<b>Location of Spill:</b>	Nuka Bay, East Arm, southwest corner of Kenai Fjords National Park, Alaska
<b>Latitude:</b>	59°29.15' N
<b>Longitude:</b>	150°24.77' W
<b>Spilled Material:</b>	oil
<b>Spilled Material Type:</b>	2
<b>Barrels:</b>	35
<b>Source of Spill:</b>	non-tank vessel
<b>Resources at Risk:</b>	marine mammals, lagoonal habitats
<b>Dispersants:</b>	N
<b>Bioremediation:</b>	N
<b>In-situ Burning:</b>	N
<b>Other Special Interest:</b>	none
<b>Shoreline Types Impacted:</b>	none
<b>Keywords:</b>	none

#### **Incident Summary:**

On August 27, 1992, the fishing vessel *Loon* struck a submerged object near Naked Island in Prince William Sound, Alaska. Several hours after the collision, the vessel sank off the Kenai Fjords National Park in about 600 feet of water with 1,500 gallons of diesel on board. The oil was released from the sunken vessel's position during the next 24 hours, but north to northeast winds 10 to 25 knots carried it south and away from any shorelines. At times the slick was about 5 miles long and 100 yards wide. The crew of the *Loon*, suffering from severe hypothermia, was rescued by a U.S. Coast Guard (USCG) helicopter. The USCG and the National Park Service each flew over the incident on two separate occasions. The last overflight was flown on August 31, 1992.

#### **Behavior of Spilled Material:**

The oil slick was carried southward from the vessel's position and quickly dispersed in 15- to 25-knot winds. Within two days the entire slick had dispersed without impacting shorelines or resources.

#### **NOAA Activities:**

NOAA was notified of the incident on August 28, 1992, by USCG Marine Safety Office Anchorage. NOAA's Scientific Support Coordinator (SSC) informed the U.S. Fish and Wildlife Service, Alaska Department of Fish and Game, National Marine Fisheries Service, and the Kenai Fjords National Park superintendent of the incident.

The SSC advised all parties that the diesel would probably disperse within a few days and that no response was necessary.

**References:**

Research Planning Institute. 1985. Sensitivity of coastal environments and wildlife to spilled oil: Cook Inlet/Kenai Peninsula: An atlas of coastal resources. Seattle: Office of Oceanography and Marine Assessment, National Oceanic and Atmospheric Administration. 55 maps.