COOK INLET
SUBAREA CONTINGENCY PLAN

HAZMAT
SECTION

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HAZMAT: PART ONE – HAZMAT RESPONSE

A. INITIAL NOTIFICATION OF RESPONSE AGENCIES

All hazardous material releases in excess of the reportable quantity (RQ) must be reported by the responsible party to the National Response Center. Any release regardless of the amount is required to be reported to the State of Alaska, Department of Environmental Conservation (ADEC). Upon notification of a release, the NRC shall promptly notify the appropriate FOSC. The FOSC shall contact the ADEC. If the state receives notification first, the state shall notify the FOSC promptly. An emergency notification list is provided at the front of the Response Section to this plan. The FOSC and the SOSC (ADEC) will relay the notification to local communities, resource agencies, medical facilities, and others as necessary.

The local government on-scene commander is in command and control until he or she determines that there is no longer an imminent threat to public safety. The LOSC can at any time request higher authority to assume command and control of an incident. Local emergency plans should be consulted for any specific directions or guidelines.

B. RECOGNITION

The recognition of chemical or physical hazards is essential to dealing with a release safely. Chemical and physical hazards may be confronted by emergency response personnel when responding to a hazardous material incident. Chemical hazards include biological, radioactive, toxic, flammable, and reactive hazards. Physical hazards include slips, trips and falls, compressed gases, materials handling, thermal, electrical and noise hazards, and confined spaces.

Once a hazardous material has been identified it is important to determine the hazards and properties. Thousands of substances exhibit one or more characteristics of flammability, radioactivity, corrosiveness, toxicity, or other properties which classify them as hazardous. For any particular hazardous category, the degree of hazard varies depending on the substance.

The degree of hazard is a relative measure of how hazardous a substance is. For example, the Immediately Dangerous to Life and Health (IDLH) concentration of butyl acetate in air is 10,000 parts per million (ppm); the IDLH for tetrachloroethane is 150 ppm. Tetrachloroethane is therefore far more toxic (has a higher degree of hazard) when inhaled in low concentration than butyl acetate. Vapors from butyl acetate, however, have a higher degree of explosive hazard than tetrachloroethane vapors which are not explosive.

Once the substance(s) has been identified, the hazardous properties and degree of hazard can be determined using reference materials. Chemical properties and the health hazards associated with the various materials transported in the Cook Inlet Subarea can be found in the USCG CHRIS Manual, the DOT Hazardous Materials Guide, and CAMEO (Computer-Aided Management of Emergency Operations) computer programs. Industry experts can be consulted as well. An excellent resource is the CHEMTREC 24-hour information number, 800-424-9300, supported by the Chemical Manufacturers Association. Additional references are provided below.

Although appropriate references give information about a substance's environmental behavior, additional field data will likely be required. Most frequently, air monitoring and sampling are needed to verify and identify the presence of hazardous materials, to calculate concentrations, and to confirm dispersion patterns.

Available references for HAZMAT and response organization information:

- The Unified Plan, which addresses the Unified Command Structure in Annex B, Appendix II.
- Commandant Instruction #16465.30
- National Contingency Plan (40 CFR part 300)
- The Alaska Incident Management System (AIMS) Guide (November 2002 Revision 1)
- Coastal Sensitivity Atlas
- USCG CHRIS Manual
- DOT Emergency Response Guidebook
- CHEMTREC, Chemical/Hazardous Substance information, 800-424-9300
- SAX - Dangerous Properties of Hazardous Materials
- IMDC Codes
- NFPA Fire Protection Guide On Hazardous Materials
- NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. Also, the NIOSH/OSHA Pocket Guide Book
- TOMES (available through ADEC)
- HartCrowser, Inc., 1999. 1998 Statewide Hazardous Material Inventory. Prepared for Alaska Department of Environmental Conservation, Division of Spill Prevention and Response.
- HartCrowser, Inc., 1999. Alaska Level A and B Hazardous Material Response Resources. Prepared for Alaska Department of Environmental Conservation, Division of Spill Prevention and Response.
- HartCrowser, 2000. Evaluation of Chemical Threats to the Alaska Public. Prepared for Alaska Department of Environmental Conservation, Division of Spill Prevention and Response.
- State of Alaska Tier Two Reporting Data (available through ADEC). The tier two data can be reviewed using the CAMEO program.
- Oil and Chemical Response Reference Library at the Marine Safety Office in Anchorage. This library consists of a Macintosh Computer System with CAMEO, plus all of the publications listed above. A complete library listing is maintained and updated as new/revised publications/programs are received. Many of the above publications/programs can also be found at ADEC offices and with the local fire departments.

C. EVALUATION

To properly evaluate a hazardous materials release, the incident must be characterized. Incident characterization is the process of positively identifying the substance(s) involved and evaluating the actual or potential public health and environmental impacts. Characterizing a hazardous substance incident is generally a two-phase process, an initial characterization followed by a more comprehensive characterization.

1. Initial Characterization: The initial characterization is based on information that is readily available or can be obtained fairly rapidly to determine what hazards exist and if immediate protective measures are necessary. During this initial phase, a number of key decisions must be made regarding:

- Imminent or potential threat to public health.
- Imminent or potential threat to the environment.
- Immediate need for protective actions to prevent or reduce the impact.
- Protection of the health and safety of response personnel.

If the incident is not immediately dangerous to human life or sensitive environments, more time is available to evaluate the hazards, to design plans for cleanup, and to establish safety requirements for response personnel. Information for characterizing the hazards can be obtained from on-scene intelligence (records, placards, eye witnesses, etc.), direct-reading of instruments, and sampling. Depending on the nature of the incident and the amount of time available, various combinations of this information gathering process are used. The following outline describes an approach to collecting data needed to evaluate the impact of a hazardous materials incident.

♦ An attempt should be made to gather as much information as possible, such as:

  - Description and exact location of the incident.
  - Date and time of occurrence.
  - Hazmats involved and their physical/chemical properties.
  - Present status of incident.
  - Potential pathways of dispersion.
  - Habitation - population at risk.
  - Environmentally sensitive areas - endangered species, delicate ecosystems.
  - Economically sensitive areas - industrial, agricultural.
  - Accessibility by air, roads and waterways.
  - Current weather and forecast (next 24 to 48 hours).
  - Aerial photographs/video when possible.
  - A general layout and mapping of the site.
  - Available communications.

♦ Off-site reconnaissance (that can be conducted in Level D) should be the primary inspection for initial site characterization when the hazards are largely unknown or there is no urgent need to go on-site. Off-site reconnaissance consists of visual observations and monitoring for atmospheric hazards near the site. Collecting of off-site samples may identify substance migration or indicate on-site conditions.

Off-site reconnaissance would include:

- Monitoring ambient air with direct-reading instruments for:
  - Organic and inorganic vapors, gases, and particulates
  - Oxygen deficiency
  - Specific materials, if known
  - Combustible gases and radiation
- Identifying placards, labels, or markings on containers or vehicles.
- Noting the configuration of containers, tank cars, and trailers.
- Noting the types and numbers of containers, tank cars, trailers, buildings, and impoundments.
- Identifying any leachate or runoff.
- Looking for biological indicators - dead vegetation, animals, insects or fish.
- Noting any unusual odors or conditions.
- Observing any vapors, clouds, or suspicious substances.
- Taking off-site samples of air, surface water, ground water (wells), drinking water, site runoff, and soil.
- Reviewing the Dangerous Cargo Manifest.
- Conducting interviews with workers, witnesses, observers, or inhabitants.

♦ An on-site survey (conducted in a minimum of Level B protection until hazards can be determined) may be necessary if a more thorough evaluation of hazards is required. On-site surveys require personnel to enter the restricted or hot zone of the site. Prior to any personnel conducting an on-site survey, an entry plan addressing what will be initially accomplished and prescribing the procedures to protect the health and safety of response personnel will be developed. On-site inspection and information gathering would include:

- Monitoring ambient air with direct-reading instruments for:
  - Organic and inorganic vapors, gases, and particulates
  - Oxygen deficiency
  - Specific materials, if known
  - Combustible gases and radiation
- Observing containers, impoundments, or other storage systems and noting:
  - Numbers, types, and quantities of materials.
  - Condition of storage systems (state of repair, deterioration, etc.)
  - Container configuration or shape of tank cars, trailers, etc.
  - Labels, marking, identification tags, or other indicators of material
  - Leaks or discharges from containers, tanks, ponds, vehicles, etc.
- Noting physical condition of material:
  - Solids, liquids, gases
  - Color
  - Behavior (foaming, vaporizing, corroding, etc.)
- Determining potential pathways of dispersion - air, surface water, ground water, land surface, biological routes
- Taking on-site samples of storage containers, air, surface water, ground water (wells), drinking water, site runoff, and soil.

2. Comprehensive Characterization: Comprehensive characterization is the second phase, a phase which may not be needed in all responses. It is a more methodical investigation to enhance, refine, and enlarge the information base obtained during the initial characterization. This phase provides more complete information for characterizing the hazards associated with an incident. As a continuously operating program, the second phase also reflects environmental changes resulting from any response activities

Information obtained off-site and during the initial site entries can be sufficient to thoroughly identify and assess the human and environmental effects of an incident. But if it is not, an environmental surveillance program needs to be implemented. Most of the same type of information collected during the preliminary inspection is needed, but more detailed and extensive. Instead of one or two groundwater samples being collected, for instance, a broad and intensive groundwater survey may be needed over a long period of time.

Results from preliminary inspections provide a screening mechanism for a more complete environmental surveillance program to determine the full extent of contamination. Since mitigation and remedial measures may cause changes in the original conditions, a continual surveillance program can be used to identify and track fluctuations or ramifications.

D. EVACUATION

Neither the Coast Guard nor the EPA has the authority to order an evacuation of facilities or communities in the event of a release; this authority lies with local or state entities. However, evacuation should be strongly recommended to local civil authorities (police, fire departments, etc.) whenever a hazardous release poses a threat to surrounding personnel. With a release of hazardous materials, the area should be isolated for at least 100 meters in all directions until the material is identified. Only trained and properly equipped personnel should be allowed access.

Quick evacuation tables are located in the back of the DOT Emergency Response Guidebook. Evacuation should always begin with people in downwind and in low-lying areas. Continual reassessment is necessary to account for changes in weather wind, rate of release, etc. CAMEO should be used to provide an air plume trajectory model for downwind toxic plume distances. Again, constant reassessment will be required.

Issues concerning disaster assistance should be referred to DMVA's Division of Emergency Services.

E. DIRECTION AND SITE/ENTRY CONTROL

The purpose of site control is to minimize potential contamination of emergency response personnel, protect the public from any hazards, and prevent unlawful entry onto the site which may result in an additional release of material, destruction of evidence, or prolong the cleanup effort. The degree of site control necessary depends on site characteristics, site size, and the surrounding community.

Several site control procedures should be implemented to reduce potential exposure and to ensure that an effective, rapid cleanup is conducted:

Secure site, and establish entry control points.
Compile a site map.
Prepare the site for subsequent activities.
Establish work zones.
Use the buddy system when entering.
Establish and strictly enforce decontamination procedures.
Establish site security measures.
Set up communications networks.
Enforce safe work practices.

For complete guidance on Direction and Site Entry/Control, refer to the NIOSH/OSHA/USCG/EPA Occupational Safety & Health Guidance Manual for Hazardous Waste Site Activities (Publication No. 85-115).

F. COMMAND AND CONTROL

The local government on-scene commander is in command and control until he or she determines that there is no longer an imminent threat to public safety. The LOSC can at any time request higher authority to assume command and control of an incident. All applicable local emergency plans should be consulted. After the LOSC has determined that public safety is not at risk, then the Unified Command response organization will assume command and control of the incident.

Government response organization in the State of Alaska is based on the Unified Command structure of the Incident Command System (ICS), which is outlined in the Alaska Incident Management System (AIMS) Guide. The Unified Command brings together the FOSC, the SOSC, and the Responsible Party's Incident Commander (along with the LOSC if participation is warranted and available) into one governing unit. The ICS and the Unified Command structure are discussed in further detail in the **Unified Plan, Annex B,** and in the **AIMS Guide**.

G. COMMUNICATIONS

A communications plan for all sections of the ICS will be established by the Incident Commander. At this time, a pre-established generic communications plan accounting for the various police, fire, federal, state, and local frequencies has not been established. State and federal communications resources are listed in **the Unified Plan, Annex E, Appendix V** and above in the Resources Section of this plan.

H. WARNING SYSTEMS & EMERGENCY PUBLIC NOTIFICATION

For FOSC/SOSC access to emergency broadcast systems refer to the **Unified Plan, Annex E, Appendix III, Tab V.** For a listing of radio, newspaper, and television contacts refer to the Information Directory in the Resources Section of this Plan. Public Information/Community Relations guidelines and information are provided in the **Unified Plan, Annex I.**

I. HEALTH AND MEDICAL SERVICES

For hospital and clinic information refer to the Resources Section of this plan.

HAZMAT: PART TWO – RESPONSIBLE PARTY HAZMAT ACTION

A. DISCOVERY AND NOTIFICATION

Any person in charge of a vessel or a facility shall report releases of hazardous materials in excess of the reportable quantity (RQ) as defined in Table 1 of 49 CFR 172.101 to the National Response Center (NRC) 24-hour telephone number, 800-424-8802, in accordance with the National Contingency Plan. Any release regardless of the amount is required to be reported to the State of Alaska. Notification of the State can be done by contacting the Department of Environmental Conservation, either at the local office or through the 24-hour telephone number, 800-478-9300.

If direct reporting to the NRC is not immediately practicable, reports will be made to the Captain of the Port (COTP) Western Alaska (the USCG FOSC for the Cook Inlet Subarea, 907-271-6700). The Environmental Protection Agency's predesignated FOSC may also be contacted through the regional 24-hour response telephone number (206-553-1263). All such reports shall be promptly relayed to the NRC.

In any event, ***the person in charge of the vessel or facility involved in a hazardous material release shall notify the NRC and the State of Alaska as soon as possible.***

As much information as possible shall be reported. This will include, but is not limited to, the following:

- Location of the release
- Type(s) of material(s) released
- An estimate of the quantity of material released
- Possible source of the release
- Date and time of the release.

B. REMOVAL ACTION

The responsible party shall, to the fullest extent possible, perform promptly the necessary removal action to the satisfaction of the predesignated FOSC and SOSC.

Regardless of whether or not a cleanup will be conducted, the responsible party shall cooperate fully with all federal, state, and local agencies to ensure that the incident is handled in a safe, proper manner.

HAZMAT: PART THREE – STATE HAZMAT ACTION

A. AUTHORITY

The Alaska Department of Environmental Conservation is mandated by statute to respond promptly to a discharge of oil or a hazardous substance (AS 46.80.130). Additionally, the ADEC may contract with a person or municipality in order to meet response requirements, or establish and maintain a containment and cleanup capability (i.e., personnel, equipment and supplies) (AS 46.09.040).

B. RESPONSE POLICY

The ADEC is currently operating in accordance with an August 1992 policy decision which precludes ADEC personnel from responding to situations which require Level A/B protection. A reduction in FY 93 funding resulting in corresponding decreases in the level of equipment, training, and overall readiness. ADEC personnel are prohibited from responding with or using personal protective equipment beyond the Level C protection category (as defined in EPA standards).

For additional information regarding the State's general response policy, refer to the **Unified Plan, Annex A, Appendix VI, Tab C.**

C. STATE RESPONSE CAPABILITIES

The ADEC has entered into local response agreements with the Fairbanks North Star Borough (FNSB) and the Municipality of Anchorage (MOA). In the event of a hazmat release requiring immediate response, the ADEC pre-designated SOSC may request support from the FNSB and MOA Hazmat Response Teams. Both teams maintain a Level A entry capability and can respond beyond their jurisdictional boundaries at the request of the SOSC. The teams are to be used strictly for emergency response operations. Once the immediate hazard is dealt with, the teams will be released to return to their home station. Post-response recovery operations will be handled by the responsible party (if known) or through ADEC response term contractors.

ADEC currently maintains several term contracts for hazmat assessment, contaminated sites and hazmat/unknowns response, and oil spill response. These term contractors are listed in the **Unified Plan (Annex E, Appendix III, Tab X)**. Several of these term contractors possess limited hazmat response capability.

Another state asset is the 103rd Civil Support Team (CST), based at Fort Richardson, Alaska. The 103rd CST can be requested through the Alaska Division of Emergency Services. The primary focus of the team is weapons of mass destruction (WMD), including chemical and biological warfare agents and toxic industrial chemicals. The 103rd CST maintains Level A entry capability and a wide variety of detection instruments and support equipment. The 103rd CST can be utilized in an advisory role for hazard modeling or medical assessment and in an assist mode to perform entries alone or in conjunction with other first responders.

D. RESPONSIBILITIES

State agency roles and responsibilities are clearly defined in the **Unified Plan, Annex A**. During a hazmat incident, the State On-Scene Coordinator's anticipated and prioritized response objectives are as indicated below:

- Safety: Ensure the safety of persons involved, responding or exposed from the immediate effects of the incident.

- Public Health: Ensure protection of public health and welfare from the direct or indirect effects of contamination on drinking water, air and food.

- Source Mitigation: Ensure actions are taken to stop or reduce the release at the source to reduce/eliminate further danger to public health and the environment.

- Environment: Ensure protection of the environment, natural and cultural resources, and biota from the direct or indirect effects of contamination.

- Cleanup: Ensure adequate containment, control, cleanup and disposal by the responsible party or take over when cleanup is inadequate.

- Restoration: Ensure assessment of contamination and damage and restoration of property, natural resources and the environment.

- Cost Recovery: Ensure recovery of costs and penalties to the Oil and Hazardous Substance Release Fund for response containment, removal, remedial actions, or damage.

HAZMAT: PART FOUR – FEDERAL HAZMAT ACTION

A. AUTHORITY

Section 311 of the Federal Water Pollution Control Act (FWPCA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 are the principal authorities for federal response to discharges of oil and releases of hazardous substances. The procedures and standards for conducting responses are contained in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 300). Under the NCP and the Unified Plan, each Coast Guard COTP for coastal zones, or EPA representatives for inland zones, coordinates federal activities on-scene as either the predesignated FOSC or as the first federal official in the absence of the predesignated FOSC. The FOSC objective is to ensure rapid, efficient mitigation of actual or threatened pollution releases or discharges.

B. JURISDICTION

The NCP identifies the Coast Guard COTP for Western Alaska (Commanding Officer, MSO Anchorage) as the predesignated federal OSC (FOSC) for the coastal zone. The FOSC will respond to hazardous substance releases, or threats of release, occurring in the coastal zone and not involving DOD vessels or DOD facilities, which originate from:

- Vessels
- Facilities, other than hazardous waste management facilities, when the release requires immediate action to prevent risk of harm to human life, health, or the environment.
- Hazardous waste management facilities, or illegal disposal areas, when the FOSC determines emergency containment or other immediate removal actions are necessary prior to the arrival of the EPA OSC.

For all shoreside incidents in the coastal zone, once the immediate threat to human life, health, or the environment has been abated and the character of the response changes to a long-term cleanup or site remediation, the FOSC responsibilities will be transferred from the USCG COTP to a designated EPA official.

Note: The Local On-Scene Coordinator (LOSC) would be the person in charge as long as there is an immediate threat to public health or safety. The LOSC may defer to the FOSC or SOSC (per the Unified Plan, Annex B).

C. RESPONSE POLICY

The USCG will follow the policy guidance contained in COMDTINST M16465.30, "Policy Guidance for Response to Hazardous Chemical Releases", and the Marine Safety Manual, Volume VI, Chapter 7 when responding to a hazardous chemical release.

The USCG and other federal agencies in Alaska will maintain a "conservative" Level D response

capability level. "Conservative" response consists of recommending evacuating the affected area and maintaining a safe perimeter while attempting to positively identify the pollutant and outlining a clear course of action. Federal personnel, with the exception of specialized teams (e.g., the National Strike Force and the Pacific Strike Team), will not enter a hazardous environment. This response posture is appropriate due to insufficient numbers of trained or equipped personnel to allow a safe and proper entry into a hazardous environment and the low risk of a chemical release in the area. Refer to the **Unified Plan** for a description of the National Strike Force and other special forces.

Level D protection is primarily work uniform/coveralls, safety boots, safety goggles and a hard hat. This provides minimal protection. Level D must not be worn for "entry" into any hazardous materials situation. It does NOT provide protection from chemicals. Level D protection strictly applies to non-hazardous environments (i.e., Command Post, Cold Zone, etc.).

In situations requiring an entry into a hazardous environment, federal agencies will rely on the capabilities of the USCG Pacific Strike Team, EPA Emergency Response Teams (ERTs), state and local hazmat response teams, if available, and industry or commercial resources.

In implementing this conservative response posture, the COTP Western Alaska will carry out all the FOSC functions not requiring entry of unit personnel into a hazardous environment. These functions include:

- Conducting preliminary assessment of the incident.
- Carrying out COTP measures such as restricting access to affected areas, controlling marine traffic (safety zones), notifying affected agencies, coordinating with state and local agencies, and assisting as resources permit.
- Conducting local contingency planning.
- Identifying responsible parties, and informing them of their liability for removal costs.
- Carrying out "first aid" mitigation if the situation warrants and capability exists.
- Monitoring cleanup activities.

The CAMEO (Computer-Aided Management of Emergency Operations) computer programs will be an important part of any chemical release incident. The CAMEO chemical database with Codebreaker and Response Information Data Sheets modules provide a rapid means of identifying chemicals and their associated hazards. The ALOHA air modeling program, part of CAMEO, provides a rapid means of developing a downwind hazard evaluation. MSO Anchorage Port Operations Department personnel and/or the NOAA SSC will be responsible for operating the CAMEO programs during a hazardous chemical release for the FOSC. ADEC and EPA also maintain CAMEO to assist in their response efforts. Programs for the ALOHA model need to be frequently updated to account for changing wind and weather conditions, source strength, and other variable conditions.

HAZMAT: PART FIVE – SUBAREA HAZMAT RISK ASSESSMENT

A. GENERAL

The Cook Inlet Subarea includes the Municipality of Anchorage, the Matanuska-Susitna Borough, and the Kenai Borough (which includes the area of the Kenai Peninsula). The region is characterized by several medium and large municipalities, and numerous smaller communities, including isolated coastal communities on the Kenai Peninsula, and some communities located along interior rivers in the Matanuska-Susitna Borough. This subarea has the highest concentration of industrial activity in the state.

Numerous facilities within the subarea store and utilize chemicals categorized as extremely hazardous substances. Large quantities of flammable petroleum products, such as propane and gasoline, also are stored at many facilities within the subarea. Some facilities store and utilize compressed gasses. This section provides general information on the location of extremely hazardous substances within the Cook Inlet Subarea.

1. Chemical Inventory: Based on tier two reports contained in the CAMEO database, the most prevalent extremely hazardous substances in the region are:

- anhydrous ammonia
- sulfuric acid
- chlorine
- sulfur dioxide

Extremely hazardous substances are generally transported into the subarea from southern ports via water and delivered either direct to facilities or transported to facilities by rail or by truck over local road systems. Some substances may be shipped by air or come into the area aboard fishing-industry vessels.

2. Chemical Risks: This subsection identifies the hazards associated with the most common extremely hazardous substances present within the subarea in amounts greater than the federally-mandated threshold planning quantities. The properties of each substance and how they affect humans are discussed below. Of the extremely hazardous substances known to be present, ammonia poses the greatest threat.

Anhydrous ammonia is a colorless gas with a characteristic odor. The term "anhydrous" is used to distinguish the pure form of the compound from solutions of ammonia in water. Like chlorine, anhydrous ammonia is neither explosive nor flammable, but will support combustion. It readily dissolves in water to form an aqua ammonia solution. Anhydrous ammonia is considerably lighter than air and will rise in absolutely dry air. As a practical matter, however, anhydrous ammonia immediately reacts with any humidity in the air and will often behave as a heavier gas. The chemical reacts with and corrodes copper, zinc and many alloys.

Anhydrous ammonia affects the body in much the same way as chlorine gas. Like chlorine, anhydrous ammonia gas is primarily a respiratory toxicant. In sufficient concentrations, the gas affects the mucous membranes, the respiratory system and the skin. In high concentrations it can cause convulsive coughing, difficult and painful breathing, and death. Anhydrous ammonia will cause burns if it comes in contact with skin or eyes.

Sulfuric acid is a dense, colorless, oily liquid. It is highly reactive with a large number of other substances and is readily soluble in water with release of heat. Fumes are released from the liquid through evaporation, and heat as a result of fire or other chemical reaction can significantly increase emissions. Both the liquid and its solutions will cause burns if allowed to come in contact with skin or eyes. Fumes are highly toxic, and reaction of the acid with a variety of substances can produce other toxic gases.

Chlorine is a greenish-yellow gas with a characteristic odor. It is neither explosive nor flammable, but is a strong oxidizing agent and will support combustion. It is only slightly soluble in water. At about two and one-half times the density of air, it will spread as a dense gas flowing downhill under the influence of gravity. The chemical has a strong affinity for many substances and will usually produce heat on reacting. While dry chlorine is non-corrosive at ordinary temperatures, it becomes extremely corrosive in the presence of moisture. Chlorine gas is primarily a respiratory toxicant. In sufficient concentrations, the gas affects the mucous membranes, the respiratory system and the skin. In high concentrations it can permanently damage the lungs and can cause death by suffocation. Liquid chlorine will cause burns if it comes in contact with skin or eyes.

Sulfur dioxide is a colorless gas with a characteristic irritating pungent odor. It is a nonflammable gas. It is soluble in water and reacts with water to form sulfurous acid. Sulfur dioxide is primarily a respiratory toxicant.

3. Response Capability: The Anchorage Fire Department has equipped and trained to the Hazmat Technician level a 45-member Hazardous Materials (Hazmat) Response Team for response to chemical releases and spills. In the event of a hazardous substance release outside of the Municipality of Anchorage, the ADEC can request support from the Anchorage Hazmat Response Team through their agreement with the Municipality of Anchorage. This valuable agreement allows ADEC to request a Level A Hazmat team to respond to an event anywhere in the state, as long as the Anchorage Fire Department can spare the services of the equipment and trained personnel.

In addition, several of the larger industrial facilities within the Municipality of Anchorage and Kenai Peninsula Borough are required to have Risk Management Plans (RMPs) for chemicals exceeding threshold quantities under 40 CFR Part 68 regulations. The RMPs contain emergency response plans for mitigating facility releases. Large bulk fuel production and storage facilities within the subarea also are required to maintain Facility Response Plans and specific levels of response equipment to mitigate oil releases in accordance 40 CFR Part 112.20 regulations.

The Municipality of Anchorage and Kenai Peninsula Borough have developed and maintain local emergency management plans, or all-hazard plans, to respond to a variety of emergencies including hazardous substance releases. The Matanuska-Susitna Borough's emergency operations plan (EOP) predates the formation of the LEPC. The inception of ICS and changes in emergency management philosophy indicate a need to completely rewrite this EOP. The Matanuska-Susitna Borough LEPC has initially focused on oil and hazardous substance release response preparedness to create an all-hazards plan.

B. FACILITIES

Table C-1 identifies communities with industrial facilities that store and utilize extremely hazardous substances in significant quantities. Table C-2 identifies communities with industrial facilities that store, utilize, or produce significant quantities of petroleum products. Emergency responders should refer to the CAMEO database program to determine specific chemical hazards at a particular facility, based on Tier Two reporting requirements.

Table C-1: Extremely Hazardous Substances in the Cook Inlet Subarea [1,2]

Community	Chemical Name	CAS Number	EHS TQ [LBS]
Anchorage	Ammonia	7664-41-7	500
	Ammonia (Anhydrous)	7664-41-7	500
	Chlorine	7782-50-5	100
	Hydrogen Fluoride (Anhydrous)	7664-39-3	100
	Sodium Cyanide	143-33-9	100
	Sulfur Dioxide	7446-09-5	500
	Sulfuric Acid	7664-93-9	1,000
Chugiak	Sulfuric Acid	7664-93-9	1,000
Eagle River	Chlorine	7782-50-5	100
	Sulfur Dioxide	7446-09-5	500
	Sulfuric Acid	7664-93-9	1,000
Eklutna	Chlorine	7782-50-5	100
Elmendorf AFB	Chlorine	7782-50-5	100
	Sulfuric Acid	7664-93-9	1,000
Fort Richardson	Chlorine	7782-50-5	100
	Sulfuric Acid	7664-93-9	1,000
Girdwood	Chlorine	7782-50-5	100
	Sulfur Dioxide	7446-09-5	500
Kenai	Ammonia	7664-41-7	500
	Ammonia (Anhydrous)	7664-41-7	500
	Chlorine	7782-50-5	100
	Hydrogen Sulfide	7783-06-4	500
	Sulfur Dioxide	7446-09-5	500
	Sulfuric Acid	7664-93-9	1,000
Nikiski	Ammonia (Anhydrous)	7664-41-7	500
Seward	Ammonia (Anhydrous)	7664-41-7	500

Note:

1. The above table summarizes the most common extremely hazardous substances (EHS) present above the associated threshold quantities (TQ) as reported by facilities in the Cook Inlet Subarea on year 2001 tier two forms. Facilities in other communities within the subarea may have these and other extremely hazardous substances at quantities below the EHS TQ.
2. Consult the CAMEO database for information on all chemicals reported by facilities within the Cook Inlet Subarea.

Table C-2: Petroleum Products in the Cook Inlet Subarea [1,2]	
Community	**Petroleum Product**
Anchorage	Diesel Fuel, Aviation Fuel, Gasoline, Insulating Oil, Jet Fuel, Kerosene, Propane
Cook Inlet	Crude Oil, Diesel Fuel
Crown Point	Propane
Elmendorf AFB	Aviation Gas
Fort Richardson	Diesel Fuel, Propane
Girdwood	Diesel Fuel
Homer	Propane
Kenai	Crude Oil, Diesel Fuel, Gasoline, Jet Fuel, Propane
Nikiski	Crude Oil
Soldotna	Propane
Wasilla	Propane

Note:

1. The above table identifies communities where large quantities of petroleum products are present as reported by facilities in the Cook Inlet Subarea on year 2001 Tier Two forms.
2. Consult the CAMEO database for additional information on the quantities and specific locations of petroleum products at facilities within the Cook Inlet Subarea.

C. TRANSPORTATION

Four extremely hazardous substances (chlorine, ammonia, sulfuric acid, and sulfur dioxide) are known to be transported to communities within the planning district, occasionally in amounts exceeding threshold planning quantities. The properties and health effects of these four extremely hazardous substances were discussed previously.

Extremely hazardous substances are normally delivered via air, water, road, and rail to various facilities within the subarea, though no specific data are available. Hazard analyses have been performed by the Anchorage, Kenai Peninsula Borough, and Matanuska-Susitna Borough LEPCs.

The Anchorage LEPC hazard analysis has concluded high risk for multiple hazards, including hazardous substances. Anhydrous ammonia, chlorine gas, sulfur dioxide, and sulfuric acid solution are present in amounts greater than threshold planning quantities. Unknown quantities of these and other extremely hazardous substances are transshipped within, and transit the district via ship, truck and the Alaska Railroad.

The Kenai Peninsula Borough LEPC has identified twelve high risk hazards. Two of these high risk hazards are transportation accidents and hazardous materials releases.

The hazard analysis conducted in the mid-1990s for the Matanuska-Susitna Borough indicated a moderate risk for hazardous substance releases. At that time, chlorine gas was the only extremely hazardous substance present in fixed facilities in amounts greater than the threshold planning quantity. However, ammonia and chlorine are routinely transported to and through the borough by truck, and formaldehyde is shipped through by rail to Fairbanks. Also, the mining industry's need for extremely hazardous substances suggests other hazardous chemicals may also transit the district by rail and truck, bound for interior Alaska and Canada.

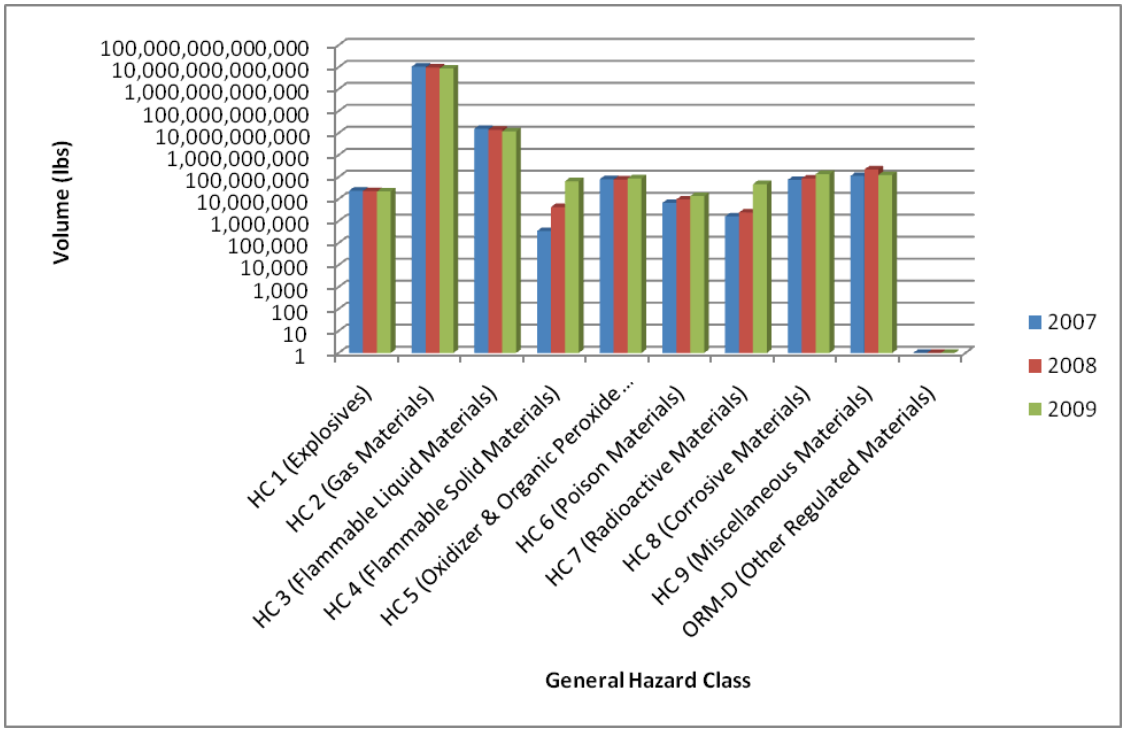
The following pages contain information from the Statewide Hazmat Commodity Flow Study conducted in 2010. The information provided is specific to the Cook Inlet subarea.

http://www.dec.state.ak.us/spar/perp/hazmat/study.html

5.3 Cook Inlet

The transportation of hazardous materials through the Cook Inlet Subarea (CI) includes all modes of transportation. Not surprisingly due to the transportation infrastructure availability and the strategic positioning of this region as an ultimate receiver or transshipment point within the State, this Subarea has the highest total number of shipments and covers the entire spectrum of hazardous materials commodities to be shipped. The volumes transported are largely dominated by those volumes reported for shipment by pipeline (HC 3.0: Petroleum products, and HC 2.1: Natural Gas). The breakdown of hazardous materials volumes from year to year by Hazard Class is depicted in Figure 5-11 below.

Figure 5-11. Volumes of Hazardous Materials Shipped into CI presented on a log scale



Because HC 2.0 (Gas Materials) and 3.0 (Flammable Liquid Materials), specifically natural gas and petroleum products, make up 99.8% of the total volume shipped, the breakdown of volumes of Hazard Class shipments (inclusive of all hazard classes) as a percentage of subarea-wide volume does not provide any meaningful insight. However, excluding those two hazard classes provides a general breakdown of the remaining hazard classes by percentage of the total remaining volume. Figures 5-12, 5-13 and 5-14 depict the breakdown of hazardous material shipments within the Cook Inlet Subarea by a percentage of total remaining volume shipped. HC 8 (Corrosive Materials), HC 9 (Miscellaneous Materials) and HC 5 (Oxidizer & Organic Peroxide Materials) consistently dominate the volume of hazardous materials shipped from year to year.

Figure 5-12. CI Hazardous Materials Percentage of Total Volume by Hazard Class for 2007

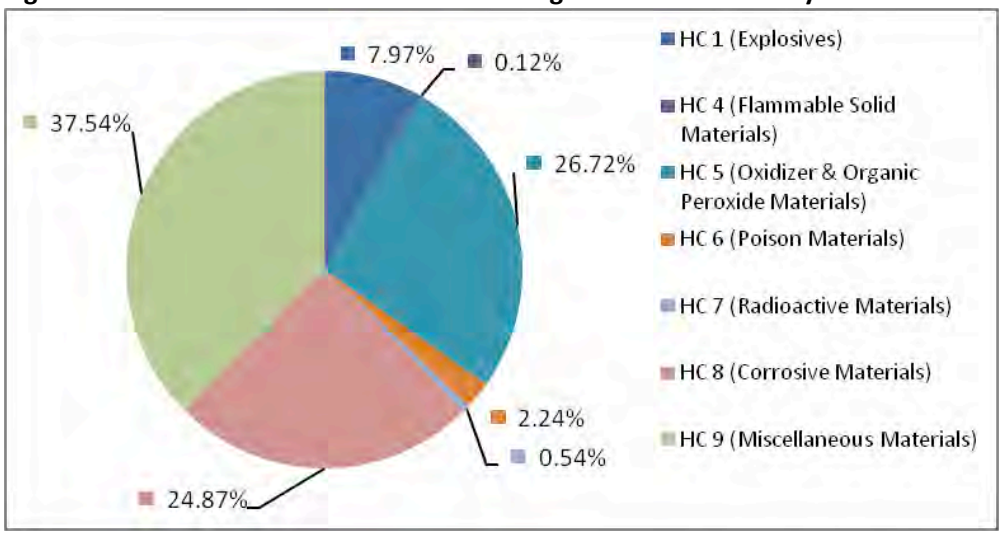


Figure 5-13. CI Hazardous Materials Percentage of Total Volume by Hazard Class for 2008

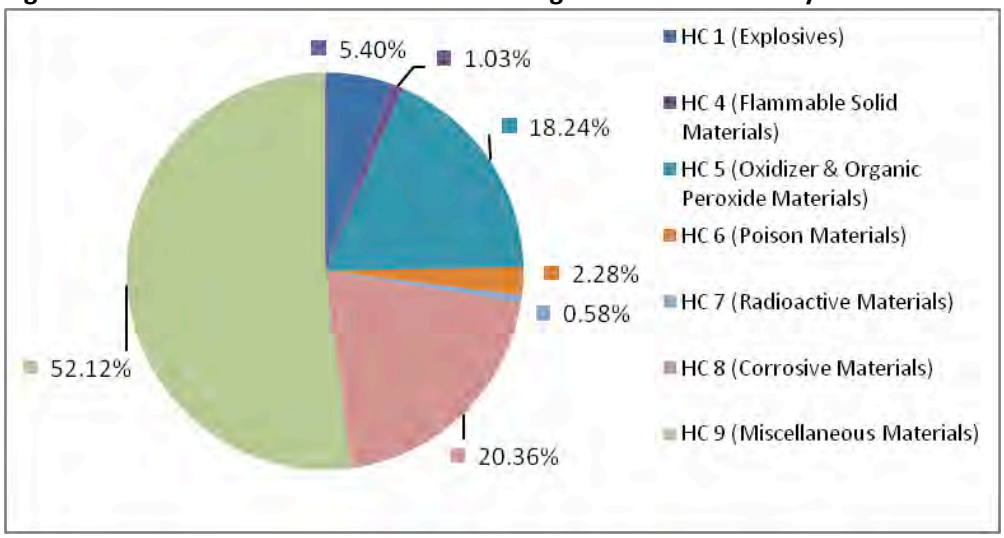
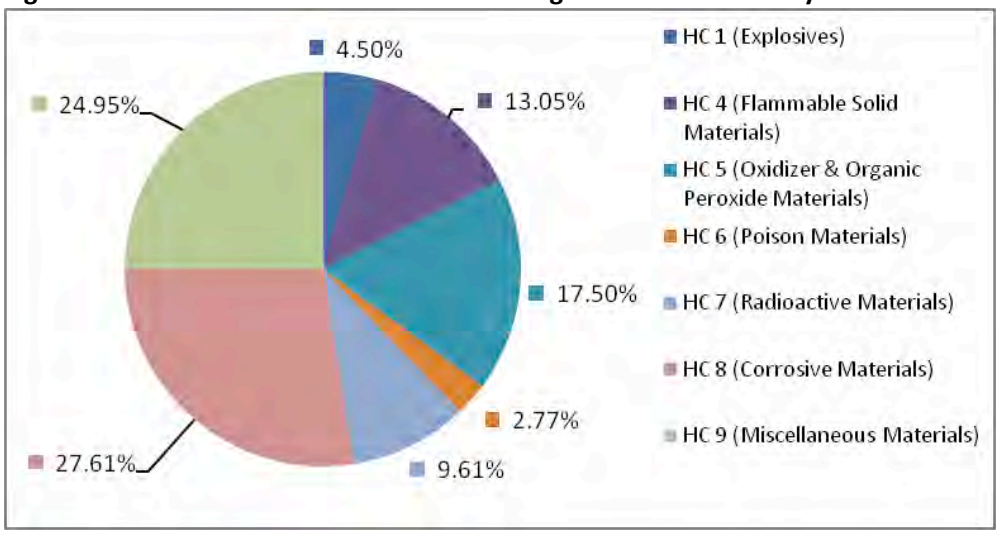


Figure 5-14. CI Hazardous Materials Percentage of Total Volume by Hazard Class for 2009



In general, HC 2 commodities (Gas Materials), specifically Natural Gas, dominated the volume of hazardous materials shipped in the Cook Inlet Subarea by over two (2) orders of magnitude.

This observation is consistent with the fact that Natural Gas is transported via the Cook Inlet Pipeline. The total volumes of hazardous materials shipped within the Cook Inlet subarea, by hazard class, for each calendar year evaluated for this study are listed in Table 5-17.

Table 5-17. Volumes of Hazard Class Transported within CI Subarea by Calendar Year

Hazard Class	2007 (Total Volume in lbs)	2008 (Total Volume in lbs)	2009 (Total Volume in lbs)
HC 1 (Explosives)	23,777,943	22,750,090	22,278,874
HC 2 (Gas Materials)	10,492,451,607,239	9,533,783,569,273	8,652,326,419,057
HC 3 (Flammable Liquid Materials)	15,576,027,730	14,088,937,179	11,874,523,207
HC 4 (Flammable Solid Materials)	351,462	4,324,312	64,618,509
HC 5 (Oxidizer & Organic Peroxide Materials)	79,702,456	76,897,232	86,639,264
HC 6 (Poison Materials)	6,679,978	9,603,623	13,722,201
HC 7 (Radioactive Materials)	1,619,968	2,449,819	47,584,991
HC 8 (Corrosive Materials)	74,181,289	85,837,452	136,681,823
HC 9 (Miscellaneous Materials)	111,969,641	219,711,495	123,510,058
ORM-D (Other Regulated Materials)	-	-	-

A more detailed evaluation of each hazard class is provided below. For the Cook Inlet Subarea, the volume cutoff for more detailed analysis was set at 100,000 lbs due to the higher numbers of hazmat commodities shipped in this region.

HC 1 Explosives: The primary explosives that were transported through the Cook Inlet Subarea in 2007, 2008 and 2009 were 1.0 (unspecified hazard class), 1.1, 1.2, 1.3, 1.4 and 1.5. Shipment volumes were very consistent from year to year. Table 5-18 lists the primary HC 1 commodities shipped within the Cook Inlet Subarea.

Table 5-18. Primary Hazard Class 1 Commodities Shipped within the CI Subarea

Hazard Class	Hazardous Material Description (Greater than 100,000 lbs Shipped)	UN ID Number
1.1	Explosive Material (Military Shipments)	Unspecified
1.2	Explosive Material (Military Shipments)	Unspecified
1.3	Explosive Material (Military Shipments)	Unspecified
1.4	Explosive Material (Military Shipments)	Unspecified
1.5	Explosive, Blasting, Type B or Agent Blasting, Type B	0331

HC 2 Gas Materials: HCs 2.0, 2.1, 2.2 and 2.3 were shipped in the Cook Inlet Subarea. The most significant volume shipped within Cook Inlet was Natural Gas, HC 2.1, which was transported via the Cook Inlet Pipeline. The shipments of HC 2.0 were primarily the gas materials commodities transported via the Alaska Railroad from year to year that

did not have a specified hazard class, UN ID number or detailed hazardous materials description. Table 5-19 lists the primary HC 2 commodities shipped within the Cook Inlet Subarea.

Table 5-19. Primary Hazard Class 2 Commodities Shipped within the CI Subarea

Hazard Class	Hazardous Material Description (Greater than 100,000 lbs Shipped)	UN ID Number
2.1	Natural Gas (Methane)	1971
	Petroleum Gases, Liquefied or Liquefied Petroleum Gas	1075
	Methane, Refrigerated Liquid or Natural Gas, Refrigerated Liquid	1972
2.2	Oxygen, Compressed	1072
	Compressed Gas, N.O.S.	1956
	Fire Extinguishers	1044
2.3	Chlorine	1017

HC 2.2 were the only grouping of gas material commodities to display an increase in volume from year to year. The primary source of shipment into this subarea was via the marine mode as the commodity was shipped from Tacoma, WA.

HC 3 Flammable Liquid Materials: HC 3.0 commodities are transported in the Cook Inlet Subarea by all five (5) modes of transportation that were evaluated in this study. The volumes transported decreased consistently from year to year between 2007 and 2009. The decrease appears to follow the changes in throughput of the regional pipelines during this time period. Table 5-20 lists the primary HC 3 commodities shipped within the Cook Inlet Subarea.

Table 5-20. Primary Hazard Class 3 Commodities Shipped within the CI Subarea

Hazard Class	Hazardous Material Description (Greater than 100,000 lbs Shipped)	UN ID Number
3.0	Paint	1263
	Petroleum Crude Oil	1267
	Jet Fuel	1863
	Diesel, Flammable Liquids	1993
	Petroleum Distillates, N.O.S. or Petroleum Products, N.O.S.	1268
	Diesel Fuel; Fuel Oil; Gas Oil or Heating Oil Light	1202
	Flammable Liquids	Unspecified

HC 4 Flammable Solid Materials: HCs 4.0 (unspecified hazard class), 4.1, 4.2 and 4.3 were shipped within the Cook Inlet Subarea. Volumes and HC varied from year to year and no discernible trends were noted. It appears that there may have been an entry

error by the data provider for the volume of a single 2008 shipment of HC 4.1. The volume of HC 4.1 shipped in 2008 is two orders of magnitude higher than either 2007 or 2009. Table 5-21 lists the primary HC 4 commodities shipped within the Cook Inlet Subarea.

Table 5-21. Primary Hazard Class 4 Commodities Shipped within the CI Subarea

Hazard Class	Hazardous Material Description (Greater than 100,000 lbs Shipped)	UN ID Number
4.0	Flammable Solid Material	Unspecified
4.1	Sulfur	1350

There were no HC 4.2 or 4.3 commodities shipped that exceeded 100,000 lbs.

HC 5 Oxidizer and Organic Peroxide Materials: HC 5.1 and 5.2 were transported in this Subarea each year. HC 5.1 shipped within the Cook Inlet Subarea represented the largest volume of HC 5.1 transported within the State. The volume showed no discernible trend. HC 5.2 increased approximately 35% between 2007 and 2008, and then increased an order of magnitude between 2008 and 2009. Table 5-22 lists the primary HC 5 commodities shipped within the Cook Inlet Subarea.

Table 5-22. Primary Hazard Class 5 Commodities Shipped within the CI Subarea

Hazard Class	Hazardous Material Description (Greater than 100,000 lbs Shipped)	UN ID Number
5.1	Ammonium Nitrate	3375

There were no HC 5.2 commodities shipped that exceeded 100,000 lbs.

HC 6 Poisons: HC 6.1 and 6.2 were shipped within the Cook Inlet Subarea. The volume of HC 6.1 shipped was primarily dominated by the Alaska Railroad shipments of Sodium Cyanide and consistently increased from year to year. HC 6.2 commodities were primarily regulated medical waste products and consistently decreased from year to year. Table 5-23 lists the primary HC 6 commodities shipped within the Cook Inlet Subarea.

Table 5-23. Primary Hazard Class 6 Commodities Shipped within the CI Subarea

Hazard Class	Hazardous Material Description (Greater than 100,000 lbs Shipped)	UN ID Number
6.1	Sodium Cyanide	1689

There were no HC 6.2 commodities shipped that exceeded 100,000 lbs.

HC 7 Radioactive Materials: HC 7.0 was transported within the Cook Inlet Subarea from year to year. The volume increased each year seeing a substantial order of magnitude

increase between 2008 and 2009. Table 5-24 lists the primary HC 7 commodities shipped within the Cook Inlet Subarea.

Table 5-24. Primary Hazard Class 7 Commodities Shipped within the CI Subarea

Hazard Class	Hazardous Material Description (Greater than 100,000 lbs Shipped)	UN ID Number
7.0	Radioactive Materials	Unspecified

HC 8 Corrosive Materials: HC 8.0 commodities shipped within the Cook Inlet Subarea also increased from year to year. Volumes shipped increased by approximately 15% between 2007 and 2008, and by approximately 38% between 2008 and 2009. Table 5-25 lists the primary HC 8 commodities shipped within the Cook Inlet Subarea.

Table 5-25. Primary Hazard Class 8 Commodities Shipped within the CI Subarea

Hazard Class	Hazardous Material Description (Greater than 100,000 lbs Shipped)	UN ID Number
8.0	Corrosive Cleaning Supplies	1760
	Batteries, Wet, Filled with Acid	2794
	Paint	3066
	Corrosive Liquid, Basic, Inorganic, N.O.S.	3266
	Corrosive Materials	Unspecified

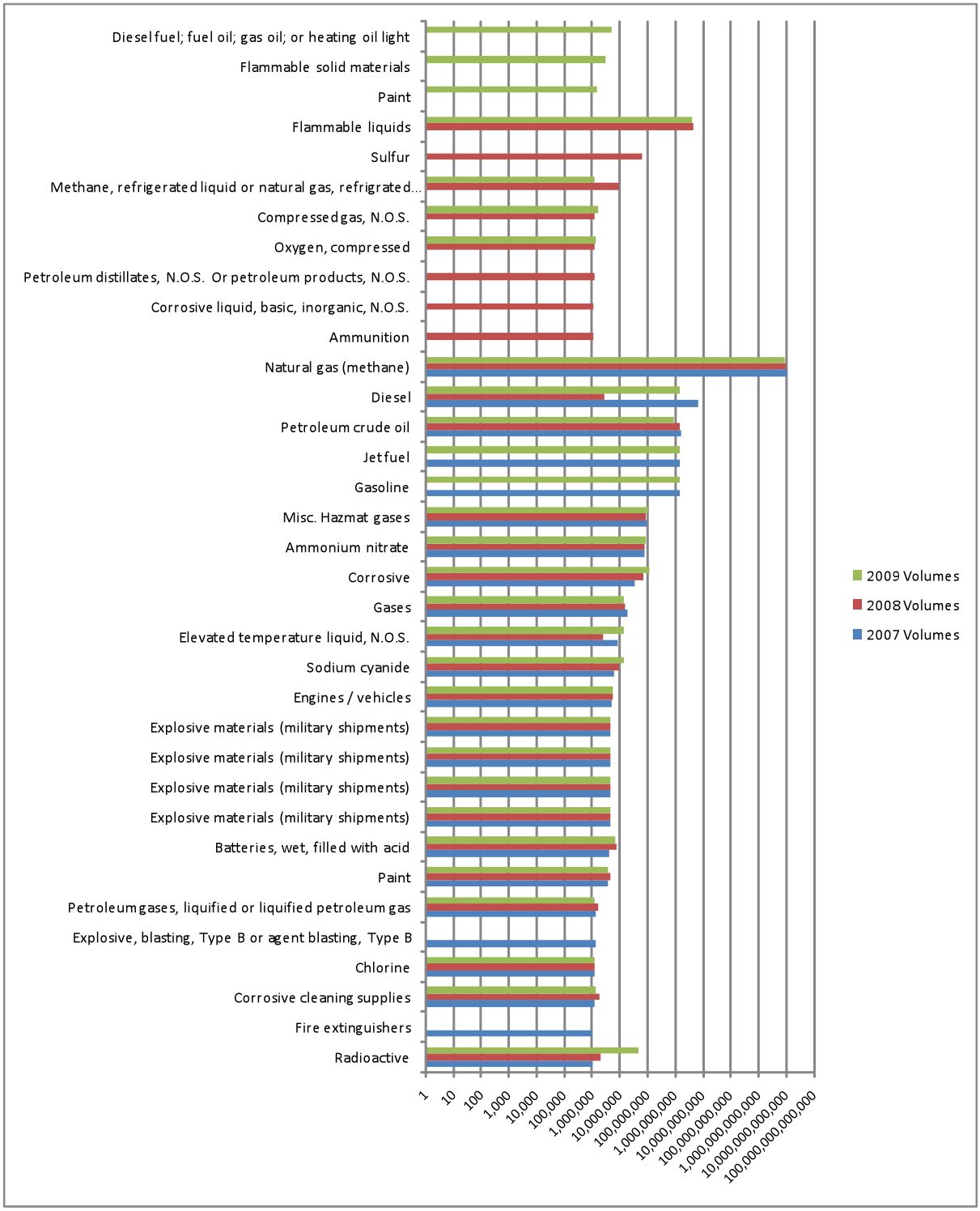
HC 9 Miscellaneous Materials: The volume of HC 9.0 commodities shipped within the Cook Inlet Subarea saw a dramatic increase between 2007 and 2008, nearly doubling, and then dropped but remained higher than 2007 levels in 2009. The sharp increase in 2008 could be attributable to the increase in the Alaska Permanent Fund Dividend checks during this timeframe. Table 5-26 lists the primary HC 9 commodities shipped within the Cook Inlet Subarea.

Table 5-26. Primary Hazard Class 9 Commodities Shipped within the CI Subarea

Hazard Class	Hazardous Material Description (Greater than 100,000 lbs Shipped)	UN ID Number
9.0	Engines / Vehicles	3166
	Elevated Temperature Liquid, N.O.S.	3257
	Hazardous Waste	Unspecified
	Miscellaneous Hazardous Material Gases	Unspecified

Figure 5-15 depicts the volume of hazardous materials shipped each year within Cook Inlet by Hazardous Material Name for volumes exceeding 100,000 pounds.

Figure 5-15. 2007 hazardous materials Commodity by Hazardous Material Name (Greater than 100,000 lbs) for CI



D. PLANNING PRIORITIES

The results of hazard analyses indicate that the relative risks associated with extremely hazardous substances are moderate to high in the Cook Inlet Subarea. Consequently, priorities for emergency planning in the subarea might include the following:

- a release of ammonia, chlorine, or other extremely hazardous substance from a facility;
- a release of extremely hazardous substances resulting from a transportation-related accident.

E. REFERENCES

Alaska Federal/State Preparedness Plan for Response to Oil & Hazardous Substance Discharges/Releases (Unified Plan) May 1994, Alaska Regional Response Team, 1994. (as amended).

1998 Statewide Hazardous Material Inventory, HartCrowser, 1999. Prepared for Alaska Department of Environmental Conservation, Division of Spill Prevention and Response.

Alaska Level A and B Hazardous Material Response Resources, HartCrowser, 1999. Prepared for Alaska Department of Environmental Conservation, Division of Spill Prevention and Response.

Evaluation of Chemical Threats to the Alaska Public, HartCrowser, 2000. Prepared for Alaska Department of Environmental Conservation, Division of Spill Prevention and Response.

Alaska Statewide Oil and Hazardous Substance Inventory for Reporting Year 2008, Ecology and Environment. Prepared for U.S. Environmental Protection Agency, Region 10.

Statewide Hazardous Materials Commodity Flow Study, Nuka Research and Planning Group, 2010. Prepared for the Alaska Department of Environmental Conservation and the Alaska Department of Military and Veterans Affairs.

HAZMAT: PART SIX – RADIOLOGICAL AND BIOLOGICAL ISSUES

Procedures for radiological response are included in the **Unified Plan, Annex J.**

Presently, a biological response is not addressed, and procedures are not under development for biological issues.

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