CITY OF LONG BEACH

OFFICE OF THE CITY MANAGER

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GERALD R. MILLER
CITY MANAGER

August 19, 2005

Dave Maul
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California Energy Commission
1516 9th Street MS-48
Sacramento, CA. 95814

Dear Mr. Maul:

Thank you for the opportunity to provide comments on the Safety Advisory Report the Governor is preparing for the Federal Energy Regulatory Commission (FERC). As you are aware, there is a pending application for a Liquefied Natural Gas (LNG) facility at the Port of Long Beach. The following comments respond to the six issues identified in the recently approved Federal Energy Bill.

THE KIND AND USE OF THE FACILITY

Sound Energy Solutions (SES) proposes to construct and operate an LNG import, storage, and vaporization terminal on a 25-acre site on a portion of Pier T, designated Berth T-126, on Terminal Island within the Port of Long Beach, Los Angeles County, California. The import terminal would deliver an average of 700 million standard cubic feet per day (MMscfd) of natural gas with a peak capacity of 1 Bscfd to the existing SoCal Gas pipeline system via a new 2.3-mile-long, 36-inch-diameter natural gas pipeline that would be constructed and operated by SES. In addition, a portion of the LNG would be distributed via trailer trucks to LNG vehicle fueling stations throughout Southern California to fuel LNG-powered vehicles. Up to 10,000 million British thermal units (MMBtu) per day of C_2 recovered from the LNG would be vaporized and distributed via a new 4.6-mile-long, 10-inch-diameter pipeline that would be constructed and operated by ConocoPhillips. Power to the LNG terminal would be supplied via 0.8 mile of electric distribution lines and a new substation that would be constructed and operated by Southern California Edison (SCE). The proposed LNG terminal and associated facilities are described below:

The LNG terminal facilities would include:

- a 1,100-foot-long LNG ship berth and unloading facility with unloading arms, mooring and breasting dolphins, and a fendering system that would be capable of unloading one ship at a time;
- two LNG storage tanks, each with a gross volume of 160,000 cubic meters (1,006,000 barrels);
- 20 electric-powered booster pumps;
- four shell and tube vaporizers using a primary, closed-loop water system;

- three boil-off gas compressors, a condensing system, an NGL recovery system, and an export C_2 heater;
- an LNG trailer truck loading facility with a small LNG storage tank;
- a natural gas meter station and odorization system;
- utilities, buildings, and service facilities; and
- associated hazard detection, control, and prevention systems; cryogenic piping; and insulation, electrical, and instrumentation systems.

The proposed ship berth and unloading facility would be designed to handle ships with a capacity ranging from 75,000 cubic meters and an overall length of 844 feet to a capacity of 208,000 cubic meters and an overall length of 1,115 feet. The typical ship size would be between 125,000 and 165,000 cubic meters. LNG vessels of this size would typically have a total length of 950 to 1,000 feet, a beam (width) of about 150 feet, and a loaded draft of about 40 feet. The facility would be capable of mooring and unloading one LNG ship at a time. SES anticipates that up to 120 ships per year, or a tanker vessel every three days, would unload LNG at the proposed facility.

The ships would enter the area through Queens Gate, a 1,200-foot-wide opening into San Pedro Bay between the Long Beach and Middle breakwaters. To access Pier T, the vessels would travel northwest within the Long Beach Main Channel into the Middle Harbor. Pier T is located within the West Basin of the Middle Harbor.

SES' proposal includes on-board ship pumps running on LNG boil-off gas or residual fuel oil to deliver the LNG to the LNG storage tanks. However, the Port of Long Beach (POLB) would require SES to use an electrical shore side power source rather than on-board auxiliary engines while at the LNG ship berth (referred to as cold-ironing). A total of four marine unloading arms would be installed on the unloading platform, three for liquid delivery to the storage tanks and one for use in vapor return to the ship. Space would also be provided for potential future installation of a fifth arm, which would increase unloading capacity and flexibility. It would take approximately 12 hours to unload one LNG ship of typical size.

LNG Storage Tanks

LNG unloaded from the ships would be stored in two 160,000 cubic meter (1,006,000 barrel) full containment storage tanks at a normal pressure of 1 to 3 pounds per square inch gauge (psig). Each tank would have a primary 9 percent nickel-steel inner container and a secondary pre-stressed concrete outer container wall, a reinforced concrete outer container bottom, a reinforced concrete domed roof, and an aluminum insulated support deck suspended from the outer container roof over the inner container. The double-walled tanks are designed, and would be constructed, so that both the primary container and the secondary container could independently contain the stored LNG. The primary container would contain the cryogenic liquid under normal operating conditions. The secondary container is capable of containing the cryogenic liquid and of controlling vapor resulting from product release from the inner container. The diameter of the outer containers would be approximately 255 feet and the height to the top of the storage tank domes would be approximately 176 feet.

The space between the inner container and the outer container would be insulated to allow the LNG to be stored at a temperature of -260 °F while maintaining the outer container at near ambient temperature. The insulation under the inner container's bottom would consist of a cellular glass block. The outer concrete container above the approximately 15-foot-high

thermal corner protection system would be lined on the inside with carbon steel plates. This carbon steel liner would serve as a barrier to moisture migration from the atmosphere reaching the insulation inside the outer container. This liner also would form a barrier that prevents vapor from escaping from inside the tank during normal operations. All piping into and out of the tank would enter from the top of the tank (i.e., there would be no penetration through the side or bottom of the tank).

Natural gas is a mixture of hydrocarbon compounds, principally methane. It also contains small amounts of heavier hydrocarbons, such as propane, C2, and butane that have a higher heating value than methane. A portion of these components may need to be removed from the LNG that would be stored on the terminal site in order for the natural gas to meet the British thermal unit and gas quality specifications of SoCal Gas as well as the specifications for LNG vehicle fuel established by the California Air Resources Board. The components that are removed are called NGL. Accordingly, LNG that does not meet the required specifications would be routed through an NGL recovery unit. The NGL recovery facilities consist of a demethanizer extraction column to extract the heavier hydrocarbons from the methane and a deethanizer extraction column to separate the C2 and propane and heavier hydrocarbons (C3+). As originally proposed, the C2 and C3+ would be stored in two separate atmospheric storage tanks located within the LNG terminal site. The C2 and C3+ would then be pumped from the storage tanks to the truck loading facilities via export pumps for distribution to consumers via trucks.

SES reached an agreement with ConocoPhillips to route some of the NGL via a pipeline from the LNG terminal site to ConocoPhillips' Los Angeles Refinery at Carson. The C2 extracted from the LNG in the NGL recovery unit would be used as fuel gas within the terminal and/or vaporized and transported via the proposed C2 pipeline and subsequently used as fuel gas or feedstock. The amount of C2 available for send out would depend on the Btu content of the cargoes but would not exceed 10,000 MMBtb per day, which is the amount that can be handled at the LARC without requiring any new processing or storage facilities. The C3+ extracted from the LNG in the NGL recovery unit would be used as a fuel gas within the LNG terminal, primarily to fire the water heaters.

A portion of the LNG from the NGL recovery system would be sent to the LNG trailer truck loading facility where it would be further processed and recondensed to produce vehicle fuel grade LNG.

EXISTING AND PROJECTED POPULATION AND DEMOGRAPHIC CHARACTERISTICS OF THE LONG BEACH LOCATION

The proposed facility would be located in a highly dense urban area serving as a major tourist destination. As illustrated in Attachment A, within one mile of the proposed LNG terminal, there is no residential population, but there is an average daytime worker population of approximately 2,000 in addition to fully staffed public safety facilities operating 24 hours per day seven days a week. The Gerald Desmond Bridge, one of three bridges that allow access to Terminal Island, is also less than one mile from the site. The bridge carries approximately 53,000 vehicles per day.

A demographic profile of population within two, three and five miles follows and is illustrated in Attachment A.

2005 Demographic Profile of area within 2, 3 & 5 miles of proposed LNG terminal

	2 mile radius	3 mile radius	5 mile radius
Total Population	7,743	85,124	408,860
Total Households	3,033	29,246	136,051
Median Household Income	$26,547	$27,037	$37,150
Majority Ethnic Group	Hispanic 55.4%	Hispanic 65.2%	Hispanic 54.4%
Total Businesses	893	3,822	11,235
Total Employees	16,085	44,037	113,855

Sources: U.S. Census, ESRI, InfoUSA

As part of its ongoing redevelopment efforts, downtown Long Beach is currently experiencing a residential building boom. More than 3,000 new housing units have either been recently completed, are currently under construction, or are in the planning stages. These units plus others that are being proposed will likely add at least 8,000 new residents to the downtown area by 2010. All of this new development is approximately two miles from the proposed LNG site.

The area within three miles of the site contains all of the Port of Long Beach, more than half of the Port of Los Angeles, all of the greater downtown of Long Beach, and a large part of the City of Los Angeles neighborhood of Wilmington, in addition to extensive industrial, warehouse and transportation development and infrastructure. This area includes over 85,000 residents and at least 44,000 workers. A majority of residents within this area are Hispanic and tend to be low-income. Drawn to the relatively affordable housing in the area around the ports, these residents are already subjected to many of the adverse impacts associated with living near a major port complex, not the least of which is poor air quality.

More than 400,000 people live within five miles of the project site. This area contains a large proportion of the total population of Long Beach, and most of the communities of San Pedro, Wilmington, and Harbor City, all of which are districts of Los Angeles. In addition to containing the entire Ports of Los Angeles and Long Beach, this vast area includes a number of major oil refineries, chemical plants and rmillions of square feet of industrial and warehouse uses. Three major freeways and the Alameda rail corridor emanate from this area, which employs over 110,000 workers. In the next 20 years major increases in population, employment and cargo volume are predicted for this area.

EXISTING AND PROPOSED LAND USES NEAR THE LOCATION

The proposed LNG terminal site is located on the eastern end of Terminal Island, within the Port of Long Beach, in an area known as Pier T. The site was formerly occupied by part of the Long Beach Naval Shipyard, which was built on harbor fill around 1940. Currently, the immediately adjacent uses include terminals used by Fremont Forest Products, the Weyerhaeuser Company, Pacific Coast Recycling and BP Oil. Most of the rest of Pier T is occupied by the Hanjin Shipping Company megaterminal. Within one mile of the proposed site, there are several vulnerable facilities including: fire stations, Boeing Sea Launch, Maritime Preposition Ships, and the Defense Logistics Agency Fuel Facility, which provides jet fuel for all of the southwest area. Other uses within one mile are shown in Figure 1.

FIGURE 1


Pier B
Pier C
Pier A
L.G. Everist
Connolly Pacific
Long Beach Generating Station
Fire Boat #20
Pier D
Dow Chemical
Pier S Terminal (Under Development)
Gerald Desmond Bridge
California United Terminals
Weyerhaeuser Company
Foss Maritime Company
SERRF Energy Facility
Terminal Island
Pacific Coast Recycling
Pier E
Pier T
Baker Commodities
Hanjin Shipping Co. Container Terminal
BP Oil Terminal
Proposed LNG Terminal
Fremont Forest Products
Long Beach Container Terminal
Pier F
Chemoil Marine
Petroleum Coke Sheds
Morton Salt Co.
Fire Boat #15 Police Dock
MCC-Lucky Cement
Pilot Station
Long Beach Harbor Entrance
Maritime Administration Preposition Ships
Boeing SeaLaunch
Defense Logistics Agency Fuel Facility
1 mile radius
City of Long Beach
Proposed LNG Terminal
Vicinity Exisiting Uses
0 330 660 1,320 1,980 2,640 Feet
August 17, 2005
Advance Planning Division

The Port of Long Beach is a major transportation and trade center, providing shipping terminals for nearly one-third of the waterborne trade moving through the West Coast. Nearly $96 billion in trade moved through the Port of Long Beach in 2003, representing approximately 26% of the cargo containers moving through all West Coast ports. Trade through the port generates 1.4 million trade-related jobs throughout the nation; 320,000 jobs or one in 22 regional jobs in a five-county region consisting of Los Angeles, Orange, San Bernardino, Riverside and Ventura counties; and 30,000 Long Beach jobs or one in eight local jobs. These jobs are on the docks, in the shipping industry, in land and rail transportation, importing and exporting, manufacturing, distribution and sales, in addition to construction of terminals and port improvements.

The Port of Long Beach is one of the world's busiest seaports, a leading gateway for trade between the United States and Asia. To provide a perspective, Long Beach is the second busiest port in the United States, it is the world's 12th busiest container cargo port, and if combined, the ports of Long Beach and Los Angeles would be world's third busiest port complex, after Hong Kong and Singapore.

Almost all of the Port of Long Beach, including the H.M.S. Queen Mary tourist attraction, lies within the two-mile radius of the proposed facility. The Port of Long Beach is home to 4,445 public and private sector employees. The Queen Mary Seaport has about 2,500 visitors on weekdays and 4,000 on weekends. Adjacent to the Queen Mary is a Carnival Cruises terminal with 5,000 visitors when docked, and a terminal for Catalina Express boats that provide daily transportation to Catalina Island.

Located just northeast of the site is the Harbor Administration Building, which includes the Harbor Fire Department headquarters. The southwest corner of downtown Long Beach also falls within two miles of the proposed facility. This area of downtown includes the Greater Los Angeles World Trade Center, the Long Beach Federal Building, the Los Angeles County Courthouse, the City of Long Beach Public Safety Building (Police Headquarters) and City Hall, plus the tourist area of Rainbow Harbor including the Aquarium of the Pacific. Eighty high-rise office buildings in addition to hotels and the Long Beach convention center are also within this zone.

NATURAL AND PHYSICAL ASPECTS OF THE LOCATION

The Port of Long Beach is almost entirely manmade, from the deep-water channels to the immense landfills. Terminal Island is a landfill area with significant liquefaction potential and a surface elevation at or below sea level. According to the Soil Profile in the City's Seismic Safety Element, the entire Port area is characterized by predominately man-made fill areas consisting of hydraulic-fills, assorted man-made fills, and soils of questionable origin, generally composed of fine sand and silt. Terminal Island is also in a flood zone area (Zone AE, a special flood hazard area inundated by 100-year floods) with particular susceptibility to tsunamis and seismically induced flooding. The Newport-Inglewood Fault zone is located only a few miles northeast of this proposed LNG site. Furthermore, this entire Port area has historically experienced large-scale subsidence.

EMERGENCY RESPONSE CAPABILITIES NEAR THE FACILITY

The Long Beach City Council has taken the official position that public safety is the overriding consideration in any decision related to the proposed LNG facility. With that in mind, the

following provides the potential impacts to emergency services associated with an LNG facility.

FIRE RESPONSE

LNG vaporizes quickly as it absorbs heat from the environment and the resulting vapor is flammable when mixed in air at concentrations from 5 percent to 15 percent. Its fire-related properties are comparable to other light hydrocarbon fuels. The only significant difference is that its molecular weight is considerably less than air, so once it warms, it will become less dense than air and tend to rise and disperse more rapidly. However, LNG vapor is 1.5 times denser than air. Typically, LNG released into the atmosphere will remain negatively buoyant until after it disperses below its lower flammability limits. This condition causes the LNG to hug the ground until it disperses.

Pool Fire

If LNG spills near an ignition source, the evaporating gas in a combustible gas-air concentration will burn above the LNG pool. The resulting "pool fire" would spread as the LNG pool expanded away from its source and would continue to evaporate. A pool fire is intense, burning much hotter and more rapid than oil or gasoline fires. Because an LNG pool fire is so hot, its thermal radiation may injure people and damage property a considerable distance from the fire itself. Many experts agree that a large pool fire, especially on water, is the most serious LNG hazard.

Jet Fire

If compressed or liquefied gases are released from storage tanks or pipelines, the materials discharging through the hole will form a gas jet that entrains and mixes with the ambient air. If the material encounters an ignition source, such as a welder's torch, while it is in the flammable range, a jet fire may occur. Jet fires usually occur during unloading or transfer operations due to a pressure increase when pumping. Such fires could cause severe damage but will most likely affect the local area around the LNG facility.

Flash Fire

When LNG is released into the atmosphere, a vapor cloud forms and disperses. If the resultant vapor cloud is ignited before the cloud is diluted below its lower flammability level, a flash fire may occur. The combustion normally occurs within portions of the vapor cloud, rather than the entire cloud. A flash fire could potentially burn back to the release point resulting in a pool or jet fire. It is unlikely for a pool or jet fire to explode when unconfined because it is open to the air and can be dispersed.

Explosions

A flash fire can occur if LNG is released into the atmosphere and ignited. If ignited in open (unconfined) areas, pure methane is not known to explode. However, if some confinement of the vapor cloud is present, methane can produce damaging overpressures. Confinement can be provided by spaces within the ship or nearby structures, such as an onshore building or another ship. Areas congested with equipment and structures can also facilitate an explosion if a vapor cloud is ignited within such an area.

For example, if a vapor cloud infiltrates a chemical process plant in an area with various vessels, structures, and piping and the cloud ignites, the portion of the cloud within that congested area may generate an explosion.

Thermal Radiation Levels on Population and Structures

The extent to which people are injured by exposure to thermal radiation depends on both the incident heat flux and exposure time. A variety of data are available for estimating effects on people, including data from experiments with humans and animals and review of historical data.

Like effects of thermal radiation on people, effects on structures also depend on incident heat flux and the exposure time. With structures, effects also depend strongly on the materials of construction (e.g., wood, steel, concrete).

LNG Safety

A number of studies and reports have been published about LNG tanker safety, with varying conclusions regarding the likelihood and consequences of a large LNG marine spill. In order to provide the federal government and general public with a clearer picture of the risks associated with LNG tankers, the Department of Energy (DOE) tasked Sandia National Laboratories (SNL) to perform an independent review of these studies and reports and then develop their own conclusion about the risks associated with LNG tankers. SNL was also tasked with developing guidance on a risk-based approach to assess and quantify potential threats to a LNG ship, to review the potential hazards and consequences of a large spill from a LNG ship and review risk management strategies that could be implemented to reduce both the potential for, and the risks of, a LNG spillover on water.

The Sandia Report states that risk identification and risk management should be conducted in cooperation with appropriate stakeholders, including public safety officials and elected public officials. These considerations should include site-specific conditions, available intelligence, threat assessments, safety and security operations, and available resources. It also determines that this approach should be performance-based and includes identification of hazards and risks, protection required for public safety and property and risk prevention and mitigation strategies.

Resource Needs for Safety, Security and Response

It is important that identification of specific required capabilities on-site or in the local community, that are in place, or more importantly - not in place, be made to manage these consequences. Based on the sum of the above risk management scenarios, the Long Beach Fire Department has made a preliminary assessment of the resources needed to implement these strategies.

TRAINING

- Firefighting Training: According to Texas A & M University, the study committee identified that sending firefighters occasionally to train on LNG fires was inadequate. A scheduled allotment of individuals, who should attend throughout the year for the life of the terminal's existence, should be identified. LNG presents unique firefighting issues

the Fire service does not face routinely. Currently, the West Coast lacks any type of LNG training facilities.

- Dive Training: As in Everett, Massachusetts, a qualified dive team will need to "clear" the dock and surrounding structures as the ship arrives in Port. This staffing-intensive operation will require continued training of dive personnel and Dive Masters.

- Hazardous Material Training: Within the day-to-day operations of an LNG terminal, situations exist that go beyond the scope and expertise of a basic firefighter. It would be reasonable to expect the proprietors of the facility to provide consistent Hazardous Materials and Confined Space training.

EQUIPMENT

- Fireboats capable of mitigating a large LNG spill on water: Currently in the United States, tugboats, which are being used to maneuver the LNG tankers dockside, are being used jointly as fireboats. The Fire Department believes that tugboat operators lack the qualifications associated with professional firefighting. We also realize that in the event of a large LNG pool fire, the tugs may be tied to the tanker as the event takes place. Their usefulness as to firefighting will be called into question. Based on fire prediction models, close proximity firefighting in regards to the tanker will be prohibitive. Firefighting efforts will be directed at covering exposures from the radiated heat, thus mitigating the problem. Additionally, if the fireboats were utilized every time an LNG tanker came to Port, maintenance costs for the boats increased activity would need to be addressed.

- Dive Team: All equipment necessary to perform the operation of searching for explosive devices as necessary. This equipment would consist of normal diving equipment (e.g., dry suits, scuba gear, PPE, etc.) and the necessary tools to perform searches, such as communication systems, infrared systems, and any other ancillary equipment that would provide for a safe working condition.

- Dive Boat and station to house the boat: This includes dive personnel, and support staff.

- Dry Chemical: According to the book "Liquefied Natural Gas in California," water is ineffective in fighting LNG fire because it provides a heat source for vaporization. Therefore, an adequate supply of dry chemical is needed to extinguish the fire.

- Fire Apparatus: An agreed upon number of fire apparatus that are equipped with the appropriate dry chemical agent that would be put into service should there be a spill in the terminal. Though the terminal will have built-in fire-extinguishing systems, it is important to have back up equipment in case of a system failure.

- Suppression Material: A sufficient supply of dry chemical on scene to replenish any used product should it be put into use.

- Staffing: A full time Fire Prevention LNG Inspector and a full time Fire Prevention Plan Checker for the duration of the construction and build-out.

- Two (2) bricks and mortar Fire Stations: Levels as low as 4,000 Btu/hr/ft2 can cause buildings to ignite after prolonged exposure. It also states that levels as low as 7000 Btu/hr/ft2 can cause buildings to ignite after just a short exposure. In addition to that, it appears that the maximum exposure for firefighters to operate for long periods of time, even in personal protective gear, is approximately 2,500 Btu/hr/ft2. In this case, both Fire Stations 15 and 20 are in areas that would be exposed to radiant heat flux that exceed the levels above.

SECURITY RESPONSE

The following represents the potential security risks associated with bringing an LNG vessel into the Port of Long Beach as well as the risks associated with having an LNG facility located in the port complex. The threat from an LNG terminal or vessel is the breaching of a holding tank causing LNG to be released which could lead to a large fire and the resultant incineration of people and property in the surrounding area. The goal is to mitigate the risks up front to prevent any breaching of the LNG storage tanks either on land or on a ship in order to prevent a spill or possible resulting fire. The following are the potential risks in bringing an LNG Vessel into port.

Highjacking

As the LNG ship is brought into the port, it will be designated as a high-risk vessel by the United States Coast Guard (USCG). That designation will require the vessel to be anchored outside of the breakwater to await a possible boarding team from the USCG. During this time period the ship will be unescorted and will not have any armed guards, making it the most vulnerable to a possible highjacking either by individuals on the ship or possible terrorists approaching the ship from a small craft. The waiting time for the USCG could be a short duration of 20-30 minutes up to several hours long. If the ship were to be highjacked, it could be navigated into a highly populated zone in the city such as the Queen Mary complex and crashed into either the Carnival Cruise ship or the Queen Mary itself, causing an explosion or release of gas.

Small boat attack (USS Cole)

While the ship is in transit into the port as well as while it is docked at the terrminal, there is a constant risk of attack using a small boat filled with explosives to ram into the side of the ship to cause a release of gas and a fire. The risk to the ship increases during the transit from Queens Gate to the final berthing location due to the unregulated pleasure boat traffic in the area. The ship will also be moving very slowly (approximately 6 knots) and would make an easy and very large target to strike. In addition to the small boat attack, the highjacking of either the Carnival Cruise ship or a Catalina Express ferry to be used to crash into the LNG ship is a large risk when the ship is coming through Queens Gate because it would not be out of place for either of these vessels to be transiting through the gate in close proximity to the LNG ship. Additionally, this would meet the twin goals of a terrorist attack by causing a large event with mass casualties.

Rocket Propelled Grenade / Standoff Weapon Attack

The LNG ships, as well as the storage tanks at the terminal, are vulnerable to attack by a Rocket Propelled Grenada (RPG) or another type of standoff weapon that could be fired from either another vessel in the area, the breakwater or different locations on the land. An attack of this nature could cause a release of gas and could also possibly provide an ignition source for a pool fire caused by LNG spilling from the storage tanks.

Small Aircraft Attack

Because the take off route from the Long Beach Airport runs down the Los Angeles River and numerous flight schools use the area over the port and ocean to train student pilots, the risk of the ship or terminal coming under attack from a small aircraft is very high. Due to the response time required to scramble military aircraft to assist with an errant small plane, the Police Department would be required to attempt to mitigate that risk of attack by providing air coverage for the ship while it is in transit.

Underwater Diver / Mine Attack

A large ship underway would be difficult for a diver to approach and attach explosives with enough accuracy to do sufficient damage to the vessel due to the speed of the vessel as well as the amount of explosives required to breach the hull of the ship. The ship would be much more vulnerable to an attack by a diver while it is sitting at an anchorage outside of the breakwater waiting for a boarding party or while it is docked at the terminal. A mine attack is also possible while the ship is in transit. In order to mitigate these risks, the Police Department would provide divers to search the piers prior to the arrival of an LNG ship into the port as well as periodic searches of the hull of the LNG ship itself.

Sabotage

Due to an employee being a trusted agent of the ship and having free reign of the ship, an act of sabotage is also a risk to the ship. Because of the design of the ships, it would be very difficult for one person to be able to cause a release of LNG without being quickly discovered by other members of the ship's crew. Nonetheless, the most vulnerable point for the vessel is while it is sitting at the outer anchorage waiting for a boarding party from the USCG or as the vessel is transiting into the port.

Collision

The ship is also vulnerable to a collision with another ship while in the shipping lanes as it transits into the port, as well as a collision with the breakwater or another fixed object. This risk rises as the ship is being turned in the west basin to be docked. If the ship were to be struck by another large vessel or object, a large release of gas could also occur.

Resource Needs for Safety, Security and Response

As part of the risk assessment for a LNG terminal in the Port of Long Beach, it is important to identify the mitigation measures for each of the risks to the safety and security of an LNG terminal, ship and more importantly, the citizens of Long Beach. Based on the risks to the

security and safety involving an LNG ship and terminal in the City of Long Beach, the following resources have been identified by the Police Department:

EQUIPMENT

- Boats: The Police Department will require a minimum of three (3) boats capable of transiting rough seas in order to enforce a security zone around the LNG ships. One (1) boat is required to act as a command and control vessel. This boat would be capable of supporting a long-term critical incident. The additional two (2) boats would be required to act as fast interceptor boats capable of speeds over 65MPH in order to stop any small vessels from attempting to breach the security zone around the LNG vessel. Each of these boats will require radios and electronics packages for navigation and communication. Additionally, personnel to staff the boats and maintenance, operations and replacement costs must be considered.

- Dive Team: All equipment necessary to perform the operation of searching for explosive devices. This equipment would consist of normal diving equipment (e.g. dry suits, scuba gear, PPE, etc.) and the necessary tools to perform searches, such as communications systems, infrared systems, and any other ancillary equipment that would provide for a safe working condition. Training would also be required for dive team members.

- Staffing: Personnel, equipment and training costs to secure vulnerable points on land as well as monitor the breakwater. In addition, personnel may be needed to provide an armed boarding party for the LNG ship if requested or required to do so by the USCG. The exact number of police officers and security officers needed to do this task has not yet been determined.

- Helicopter: Replacement and maintenance costs associated with the use of the police helicopter and staffing required to provide air coverage for the LNG ship's transit into the port complex.

- Weapons: Weapons systems and training required by boat crews and helicopter crews to stop a small vessel containing terrorists intent on crashing into the LNG ship.

- Docking: Additional dock space for the Police Department boats as well as a possible launch ramp next to a Police Department Boathouse to allow the quick deployment and recovery of the interceptor boats when not being used to protect the LNG ships.

- Boathouse: Relocation of the Police Department Boathouse within the harbor, possibly to Pier J, in order to ensure the Police Department resources are not destroyed and staff not injured by an LNG incident at the terminal or as the ship transits within 50-100 feet of the current Police Department Boathouse and docks.

At this time, the resources outlined above are preliminary. In order to fully assess the emergency response capabilities and required resources, the owners of the proposed LNG facility should provide a comprehensive report which should include an analysis of "reasonable worst case scenarios" using risk and hazard analysis (including terrorist attacks). The consequences should be described in terms of impact on surrounding infrastructure,

communities and terminals. Each security risk should be weighed and any mitigation methods, as well as the resources necessary to carry out the mitigation methods, should be clearly identified. Gaps in resources must be identified and rectified in order to allow the police and fire departments to continue to provide protection to the Port of Long Beach as well as the LNG ships and terminal. While there are limitations in existing data and current-modeling capabilities for analyzing LNG spills over water, existing tools, if applied as identified in the guidance section of the Waterway Suitability Assessment, can be used to identify and mitigate hazards to protect both public life safety and property conservation.

Once that assessment is complete, the City of Long Beach would contract with an outside consultant to work with the Fire and Police Departments to establish standards of protection and implement the recommendations required to maintain the mitigation capability of any incident related to a LNG facility. In addition to identifying resources, the total fiscal impact to the City of Long Beach of any LNG facility should be identified and full reimbursement for all additional service, security and fire protection must be included in any model developed for the delivery of LNG in the proposed project.

NEED TO ENCOURAGE REMOTE SITING

At this time the Long Beach City Council has not formally adopted a position on the siting of the proposed LNG facility. The City Council is expected to take action on this issue on August 23, 2005. Until this action occurs, the following provides information for your consideration.

Advantages to Siting in Urban Areas like the Terminal Island Location

Close Proximity to Urban Infrastructure and Employment

The project applicant, SES, has stated that an industrial port is considered the proper place to site an LNG facility. The locational advantages involve convenient transportation of LNG fuel from the tankers to adjacent storage facilities throughout the Port and Wilmington areas as well as a readily available source of fuel for industrial vehicles and equipment.

The project applicant has projected Port employment from this LNG facility to be approximately 1,000 construction jobs over a 36-month period and 61 full time jobs for LNG operations (including 28 truck drivers). The vicinity of the proposed location also provides a significant pool of qualified workers thereby reducing the need for long commutes or relocation of workers from other areas.

LNG storage in a non-urban site could also increase transportation and storage costs. In addition, the infrastructure to support the operation, such as pipelines, and highways may need to be constructed adding to costs. Depending on the remote area, there could be significant environmental impacts due to the disruption and improvements necessary to support a new facility.

The availability of the fuel is also an advantage. With the inclusion of a fueling station, the fuel will be immediately accessible to users within the local area.

Disadvantages to Proposed Terminal Island Location and Reasons For Remote Siting

Catastrophic Accident Potential

The placement of an LNG facility should be evaluated in the full context of its potentially hazardous factors, both natural and man-made. City of Long Beach is potentially both a military and terrorist target due to the Port operations and oil production/storage facilities and national economic importance valued at over $1 billion a day.

Many experts agree that a pool fire, especially on the water due to thermal effects, is the most serious LNG hazard. Such pool fires are intense, burning far more hotly and rapidly than oil or gasoline fires. Pool fires cannot be extinguished. All LNG materials must be consumed before the pool fire goes out. Because LNG pool fires are so intensely hot, their thermal radiation may injure people and property a considerable distance from the actual fire location.

A major LNG incident at this proposed Port location could result in massive damage to both people and property over an area that could include downtown Long Beach as well as residential neighborhoods north of the Port. In the event of a major accident, deaths and serious injury could easily reach into the hundreds for Port employees and nearby residents. Both the Port and downtown Long Beach could sustain devastating and long-term national economic damage that would seriously cripple the nation's import capacity (at present, approximately 40 percent of all imports to this country enter through the Long Beach and Los Angeles Ports).

Terrorist Target

LNG facilities could be vulnerable to terrorist attack due to the large proportions and easy visibility of the storage infrastructure.

The following comes from LNG Facilities in Urban Areas, A Security Risk Management Analysis for Rhode Island Attorney General Patrick Lynch, Good Harbor Consulting LLC, May 2005

"While there is no adequate way in which to determine the probability of a terrorist attack on the proposed urban LNG facility and inland waterway transit routing, there is adequate grounds to judge that such an attack would be consistent with terrorists demonstrated intent and capability. There is also a basis to judge that likely enhanced security measures would not significantly reduce the risk. While there are some differences among experts about the conditions needed to generate a catastrophic explosion and about the precise extent of the resulting damage, there is [sic] significant grounds to conclude that a high risk exists of catastrophic damage from the types of attacks terrorists are capable of mounting. Those damage levels would overwhelm regional trauma, burn, and emergency medical capabilities."

In the event an LNG tanker is attacked, a one-mile blast radius would disrupt a significant amount of oil infrastructure in and near the Port. Damage to the infrastructure would affect production and injection facilities, but would be repairable in two – four years. The blast could cause fires, explosions, and secondary fires in the oil field from oil and gas production in and around pipelines and wells. The blast would be confined mostly to equipment and employees operated by Tidelands Oil Production Company, a contractor of the City of Long Beach. Net revenue loss for the State, Port of Long Beach, City of Long Beach and other individual working interest owners (not including any expenditure for repairs) would be between $120 million to $240 million. Tidelands Oil Production Company, contractor to the City of Long Beach, would possibly not choose to rebuild, increasing the net revenue loss to the

stakeholders into the billions. Additionally, though not a part of the oil operations, oil being shipped from ships to dock in the Port (BP terminal) would be destroyed causing fires and oil spills in the ocean.

In addition to waterside attacks, there is a land-side risk. The FBI recently issued a warning that terrorists may be targeting fuel trucks for attack. As reported in the Herald News, a south New England newspaper, Colonel Randy Larson, a CBS News consultant who is the director of the Homeland Security Institute, said on the network's "the Early Show," that the primary concern is LNG. Quoting from the August 16, 2005 Herald News article, "The Homeland Security Institute is a federally funded research and analysis center that works with the Department of Homeland Security to address issues that require scientific or technical expertise." The article quotes Mayor Edward M. Lambert, Jr. of Fall River, Massachusetts, a town where an LNG facility is proposed, "I have seen the (CBS) program and it points out what we have said all along: that these (LNG facilities) don't belong in populated areas. And more and more people are identifying what the potential hazard is, it could be a significant hazard, and now you have the national media pointing it out."

Siting an LNG storage facility in a non-urban setting would reduce the incentive for a terrorist attack. Terrorist targets are typically chosen by factors involving population density of an area and/or specific congregation points, as evidenced by the World Trade Center in New York and the public transportation facilities in Spain and Britain.

SUMMARY

Consideration of a LNG facility within the City of Long Beach is a complex issue requiring a detailed and thorough analysis. To date, that analysis has not been prepared. Placement of such a facility in a densely populated high impact area must not occur until a complete risk, economic, and fiscal impact assessment is complete. At a minimum, the assessment must address:

- Impacts to the surrounding population, economy, and transportation network in the event of a catastrophic event
- Impacts to existing Port operations and surrounding terminal operations during arrival and departure of LNG tanker vessels
- The ability of the Coast Guard to provide the required on water security, and if not funded to do so, the impact on local police and fire resources
- Impacts to air traffic within the flight path above the proposed LNG facility
- Reasonable worst-case scenarios using risk and hazard analyses (including terrorist attacks)
- A comprehensive waterborne, landside and air security plan developed in consultation with the City of Long Beach
- Standards for protection and the implementation of the recommendations by the Fire and Police Departments to mitigate any incident related to a LNG facility

- Identification of the complete fiscal impact to the City of Long Beach resulting from any LNG facility, including cost recovery

- Impacts to the Navy, Boeing, and the Defense Department resulting from the proposed LNG facility

- An assessment of the Homeland Security threat

Thank you for the opportunity to participate in preparing the Safety Advisory Report. I appreciate consideration of the issues presented in this letter and my staff is available to provide further assistance and answer any questions related to this matter.

Sincerely,

Christine F. Shippey

for Gerald R. Miller
City Manager

GRM/SF

Attachment

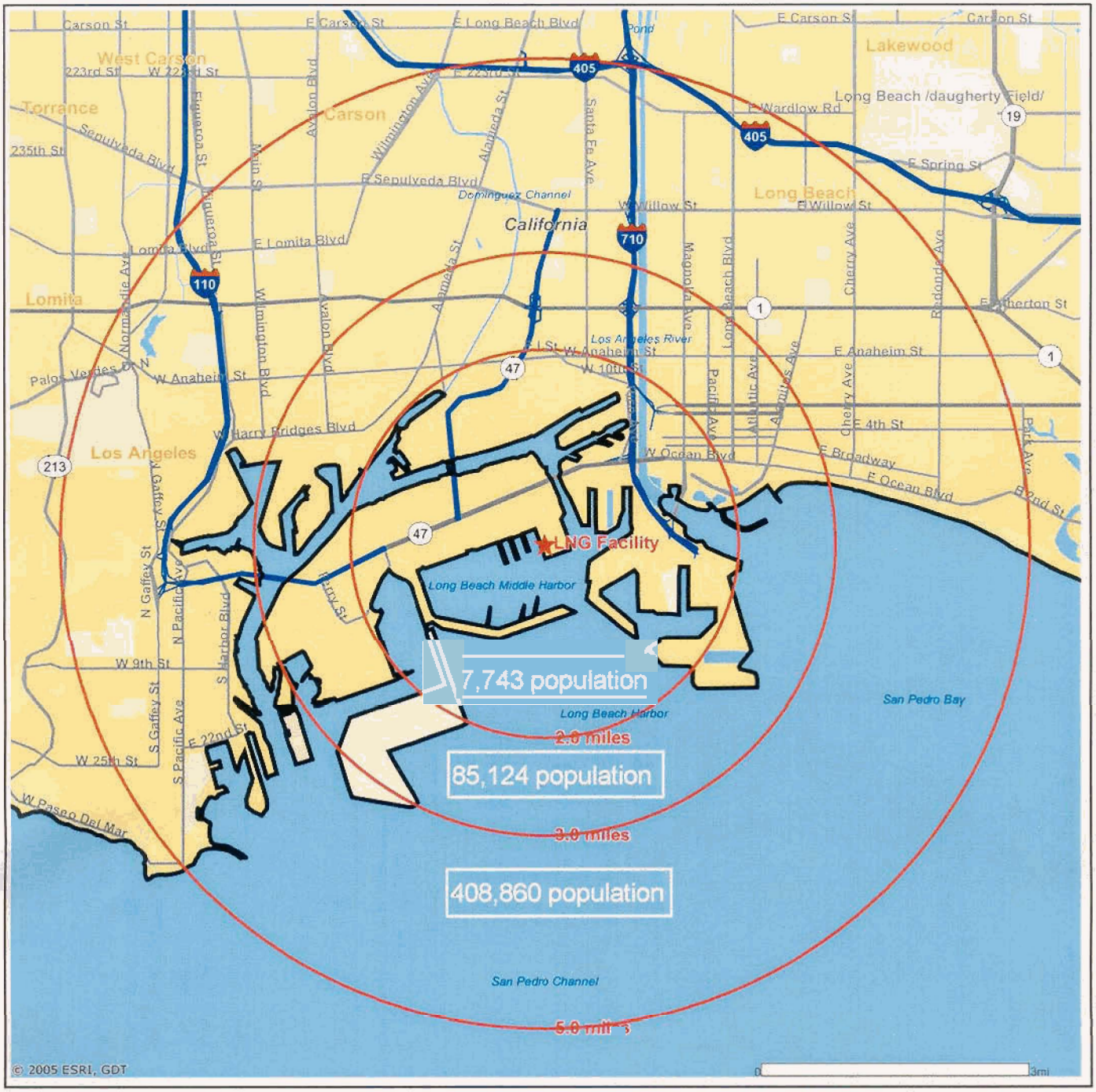
ATTACHMENT A

Proposed LNG Terminal Vicinity Map

Prepared by Advance Planning

August 17, 2005

Latitude: 33.7546
Longitude: -118.223



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