Health and Safety Plan
Remedial Investigation/Feasibility Study
North Boeing Field/Georgetown Steam Plant
Seattle, WA

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Prepared for

The Boeing Company
City of Seattle

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HEALTH AND SAFETY PLAN SUMMARY

SITE NAME:	North Boeing Field (NBF) and the Georgetown Steam Plant (GTSP)
LOCATION:	NBF and GTSP are located east of East Marginal Way South adjacent to the King County International Airport (KCIA)
CLIENT:	The Boeing Company (Boeing); the City of Seattle (City)
PROPOSED DATES OF ACTIVITIES:	Starting in January 2015, to be completed in 2016
TYPE OF FACILITY:	Industrial/Aerospace Manufacturer; Former Steam Plant
LAND USE OF AREA NEAR FACILITY:	Industrial, Commercial, and Residential
SITE ACTIVITIES:	Remedial Investigation/Feasibility Study (RI/FS) field work, including: - Initial survey of potential sampling locations to focus the sampling activities - Groundwater monitoring well installation and soil boring completion - Phase I sampling, including soil, groundwater, soil vapor, storm drain solids, and surface debris - Phase II sampling, based on Phase I results, including soil, groundwater, soil vapor, surface debris, and anthropogenic media - Management of work-derived wastes.
POTENTIAL SITE HAZARDS:	Dermal exposure, incidental ingestion, and/or inhalation of contaminants; heat stress; slips, trips, and falls; work near heavy equipment and machinery; noise; storms; and potentially explosive vapors.
POTENTIAL SITE CONTAMINANTS:	Polychlorinated biphenyls (PCBs), dioxins/furans, metals, total petroleum hydrocarbons (TPH), semivolatile organic compounds (SVOCs), and volatile organic compounds (VOCs).
ROUTES OF ENTRY:	Skin contact with or incidental ingestion of potentially contaminated soil, groundwater, solids, or anthropogenic media; and inhalation of airborne droplets, dusts, or vapors.
PROTECTIVE MEASURES:	Protective clothing (including hard hat, steel-toed boots, safety glasses, nitrile gloves, coveralls); (stand-by) air purifying respirators, tyvek suits; dust control; and ambient air monitoring.
MONITORING EQUIPMENT:	Field detectors including: - Photoionization detector (PID) - Dust Meter

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1.0 INTRODUCTION

This site-specific Health and Safety Plan (HASP) presents the procedures and protocols that will be followed to provide worker safety during field and sampling activities to be conducted during implementation of the Remedial Investigation/Feasibility Study (RI/FS) at the North Boeing Field (NBF) and the Georgetown Steam Plant (GTSP) sites in Seattle, Washington. The RI sampling activities include installation of groundwater monitoring wells; completion of soil borings; and sampling of soil, groundwater, soil vapor, storm drain solids, surface debris, and anthropogenic media. This HASP presents the project health and safety organization, safety rules and procedures, potential site hazards, description of levels of personal protection and required equipment, emergency response information, training requirements, and requirements for routine health care and health monitoring. This HASP is based on the most current knowledge of site conditions.

1.1 APPLICABILITY AND ADHERENCE

This HASP will apply to all individuals involved in intrusive field activities on this project, and is focused on activities typically performed by Landau Associates' personnel, including sampling of potentially contaminated media and observation of groundwater monitoring well installation and soil boring completion activities. Individuals performing these activities at NBF and GTSP must read, understand, and comply with this HASP prior to participating in these activities. If any information presented in this HASP is unclear, the reader should contact the Landau Associates' Corporate Health & Safety Officer or the Landau Associates' Health and Safety Manager for clarification prior to participating in any site activity. After the information has been read and understood, the individual must sign the Acknowledgement form (Form 1), and the Boeing Safety Promise (Form 2) which will then be placed in the project file.

Activities conducted as part of the RI field work will be conducted in a manner to minimize health and safety risks for nearby workers and the public. All onsite personnel will be attentive to the potential for release of contaminated materials associated with site activities and will immediately bring all such matters to the attention of the Landau Associates' Health and Safety Manager. Decontamination procedures and other elements of the planned monitoring well installation, soil boring completion, and sampling activities (e.g., access to/from work areas by heavy equipment) have been developed to be protective of both worker and public health and safety.

Health and safety procedures associated with the Contractor's work and operation of heavy equipment are not specifically addressed herein. The Contractor will be required to prepare and implement its own site-specific HASP to address the Work under the Contract to be performed by its

workers and by its subcontractors, and to promote the health and protection of all onsite personnel and the environment. Landau Associates will provide health and safety site monitoring for contaminants and will inform the Contractor on contaminant levels and subsequent upgrades to required Personal Protective Equipment (PPE).

1.2 PURPOSE AND REGULATORY COMPLIANCE

This HASP addresses procedures to be followed to minimize the risk of chemical exposures and physical accidents to onsite workers and the public, and to minimize the risk of environmental contamination. This HASP complies with, but does not replace, Washington State Health and Safety Regulations as set forth in Washington Administrative Code (WAC) 296-62 Part P. Requirements outlined in this HASP are considered the minimum health and safety requirements for PCBs, dioxins/furans, metals, TPH, SVOCs, and VOCs sampling activities. All monitoring well installation, soil boring completion, and sampling activities will be performed in accordance with this HASP and the Occupational Safety and Health Administration (OSHA) Standard 29 Code of Federal Register (CFR) 1910.120, which regulates hazardous waste site operations.

This HASP is flexible and allows unanticipated site-specific problems to be addressed, while providing adequate and suitable worker protection. This HASP may be modified at any time, based on the judgment of the Landau Associates' Corporate Health & Safety Officer, as appropriate. Minor modifications to this HASP regarding day-to-day activities may be made by the Landau Associates' Health and Safety Manager. Substantive changes to procedures (e.g., changes in action levels) must receive the concurrence of both the Boeing and City Project Managers and the Landau Associates' Corporate Health & Safety Officer. Modifications will be discussed with the onsite team during a safety briefing and posted in a designated area using the attached HASP modification form (Form 3).

1.3 RESPONSIBLE INDIVIDUALS

Safety monitoring during monitoring well installation, soil boring completion, and sampling activities will be the responsibility of the Boeing and City Project Managers, and the designated Landau Associates' Health and Safety Manager. The Landau Associates' Health and Safety Manager, or equivalent designee, will be present at the site at all times during intrusive site activities related to the monitoring well installation, soil boring completion, and sampling activities. The Boeing and City Project Managers are identified in Table 3 and Table 4, respectively. The Landau Associates' Health and Safety Manager will be identified prior to the initiation of site activities.

1.4 SITE SECURITY

Monitoring well installation, soil boring completion, and sampling activities will be occurring in a restricted-access industrial area. All personnel will need to be in possession of the appropriate access badge issued by Boeing while performing work on the NBF site. All personnel performing work on the GTSP site will be escorted by the City or its representatives. Work areas will be partitioned off with traffic safety cones to prevent non-trained personnel from entering the immediate vicinity where work is taking place.

2.0 SAFETY RULES AND PROCEDURES

Safety is the responsibility of every individual involved in project activities. Whether in the office or on the site, properly followed procedures are essential for personal safety and to minimize injuries or accidents involving equipment. Potential hazards while working at the site include, but are not limited to:

- Exposure to toxic and/or hazardous chemicals
- Physical hazards associated with drilling machinery
- Physical hazards associated with working conditions (e.g., heat stress, hypothermia).

2.1 SAFETY RULES

All personnel working at the site will follow the rules and procedures listed below:

- All personnel will conduct themselves in a professional manner at all times.
- No personnel will be admitted into an operational exclusion zone without safety equipment in proper working condition and requisite training.
- All personnel must comply with the established safety procedures. Anyone working onsite for or under contract with Boeing and/or the City who does not comply with this HASP or other approved HASP may be immediately dismissed from the site.
- Working while under the influence of intoxicants, narcotics, or controlled substances is prohibited. Personnel should not take prescription drugs if the potential for contact with toxic substances exists, unless approved in writing by a physician.
- Firearms, ammunition, fireworks, and explosives are prohibited.
- Climbing or standing on machinery (other than service trucks) or equipment is prohibited unless authorized by the Landau Associates' Health and Safety Manager or their designee.
- Long hair must be contained inside a hard hat or tied back and tucked under clothing. Facial hair that interferes with proper operation and fit of respiratory protection gear is not allowed.
- Eating, drinking, chewing gum, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in an exclusion zone. Facilities are considered tobacco free areas, no tobacco smoking or chewing is allowed on the premises.
- Electronic devices, including phones and laptops, will be operated only in designated site-specific Safety Zones that will be identified prior to the start of field activities. All non-moving vehicles have been universally identified as a Safety Zone. Temporary Safety Zones may be established where there are no Safety Zones in the vicinity of the work area; temporary Safety Zones will be clearly marked and signage will be removed at the end of each work day.
- Disposable clothing will be used whenever necessary and appropriate to minimize the risk of cross-contamination.
- The number of personnel and the amount of equipment in contaminated areas will be minimized to allow for efficient site operations.

- Only trained and authorized personnel will perform well installation, soil boring completion, and sampling activities.
- Contact with contaminated or potentially contaminated material should be avoided. Efforts will be made to stage site activity upwind of equipment, activities, and materials if dust is present.
- Proper decontamination procedures must be followed before leaving the sampling area and the site, unless medical emergencies dictate otherwise (Section 2.2.1.1). All decontamination residual materials, and any other potentially contaminated materials, will be handled properly and kept onsite or at a designated secure area.
- Only approved work clothes or equipment will be allowed within the sampling areas.
- Exchange of PPE will not be allowed.

2.2 SAFETY PROCEDURES

Site personnel are required to follow certain safety procedures when performing well installation, soil boring completion, and sampling activities. These safety procedures are described below:

- All activities performed in the exclusion zone will be conducted at a minimum of Level D (modified) (see Section 4.0).
- Whenever possible, personnel will be stationed upwind of site activities capable of creating airborne contamination.
- If any physical discomfort is experienced (e.g., abnormalities, nausea, lightheadedness), immediately stop work, tell the other team members, and leave the area.
- If any PPE fails, immediately leave the area.

2.2.1 DECONTAMINATION

2.2.1.1 Emergency Decontamination

In case of an emergency, decontamination procedures will be speedily implemented, if possible. If a life-threatening injury occurs and the injured person cannot undergo decontamination procedures without incurring additional injuries or risk, he or she will be transported wrapped in plastic sheeting if time allows and if consistent with the injury. The medical facility will be: 1) informed that the injured person has not been decontaminated, and 2) given information regarding the most probable contaminants.

2.2.1.2 Equipment Decontamination

Decontamination of drilling equipment or other sampling equipment will occur in the immediate work area or another area designated for decontamination of equipment. Equipment decontamination will follow the procedures described in Section 6.0 of this HASP.

2.2.2 MANAGEMENT OF WORK-DERIVED WASTES

Equipment and materials used for decontamination or personal protection will be cleaned or collected for appropriate disposal. Non-disposable equipment will be decontaminated onsite. Disposables will be containerized. Investigation-derived wastewater will be collected and stored in accordance with this HASP.

2.2.3 HOUSEKEEPING

Work areas will be kept as clean and orderly as possible at all times. Ordinary refuse and lightly soiled disposable protective clothing will be placed in suitable rubbish bins or trash containers at the site. The storage or introduction of extraneous materials will be minimized in the work areas to minimize the decontamination load and reduce possibilities for cross-contamination.

2.2.4 VISITORS

Authorized visitors will only be allowed under escort by Boeing or the City, and must obey all instructions of the Landau Associates' Health and Safety Manager and/or Boeing or the City's representative.

3.0 POTENTIAL SITE HAZARDS, RISKS, AND PROTECTIVE MEASURES

For well installation, soil boring completion, and sampling activities, two types of hazard categories exist. These categories are:

- Chemical
- Physical.

The risks associated with each type of hazard and the protective measures to be implemented to minimize the risks are discussed below.

3.1 CHEMICAL

Several contaminants of potential concern (COPCs) are identified in Section 3.1.1 of the 2013 *North Boeing Field/Georgetown Steam Plant Site Remedial Investigation/Feasibility Study Work Plan*, including PCBs, dioxins/furans, metals, TPH, SVOCs, and VOCs. The COPCs that will be analyzed are summarized by sample media below:

Target Chemical Classes for Analysis by Media

Chemical Class	Soil	Groundwater	Soil Vapor	Storm Drain Solids	Surface Debris	Anthropogenic Media
PCBs	●	●		●	●	●
Dioxins/Furans	●			●	●	●
Metals	●	●		●	●	●
TPH	●	●				
SVOCs	●	●	●	●	●	●
VOCs	●	●	●			

Notes:
- SVOCs include the full EPA 8270 analytical suite for soil and groundwater. However, for storm drain solids, surface debris, and anthromedia, they only include PAHs, phthalates, and phenols.
- Groundwater samples will be analyzed for both total and dissolved metals.
- All PCB analyses are for aroclors (EPA 8082).

3.1.1 RISKS

Based on previous information and knowledge of the types of activities conducted at the site, the following chemicals may be present: PCBs, dioxins/furans, metals, TPH, SVOCs, and VOCs. Human health hazards of these chemicals are summarized in Table 1. The information provided in this table covers potential toxic effects that might occur if relatively significant acute and/or chronic exposure occurred. However, this information does not indicate that such effects are likely to occur from the planned site activities. The chemicals that may be encountered at this site are not expected to be present at concentrations that could cause significant health hazards from short-term exposures. The types of

planned work activities and use of monitoring procedures and protective measures will further limit potential exposures at this site.

Health standards in Table 1 are presented using the following abbreviations:

- TWA – Time-weighted average exposure limit for any 10-hour work shift
- IDLH – Immediately Dangerous to Life or Health.

3.1.2 PROTECTIVE MEASURES

Measures that will be implemented to avoid the risks associated with the chemical hazards include:

- Don appropriate PPE (described in Section 4.0).
- Wash hands and face before eating or drinking.
- Avoid contact with potentially contaminated substances.
- Work from clean areas to more contaminated areas (if known) to prevent cross contamination.
- Prevent splashing of contaminated liquids.

3.2 PHYSICAL

The planned activities will involve potential physical hazards inherent with working outside and in the presence of heavy equipment. Each potential hazard, the associated risk, and protective measures to be implemented to minimize each risk are as described below:

- **Drilling Machinery:** Drilling machinery may be equipped with various winches, motors, booms, and other machines. These present a general physical hazard from moving parts. Personnel will stand clear of machinery at all times unless specific instructions are given by the rig operator or other person in authority. Personnel will stand clear of the swing ratios and avoid pinch points between equipment. Personnel will stand in areas where the rig operator can make eye contact, whenever possible. Hard hats, steel-toed shoes/boots, and a yellow high-visibility safety vest will be worn at all times in the exclusion zone. When possible, appropriate guards will be in place during equipment use. Lifting equipment used to raise and lower sampling equipment may also present a physical hazard. Field personnel should be careful to keep loose clothing, hands, and feet away from winches and capstones.
- **Vehicular Traffic:** The presence of vehicular traffic associated with Boeing's daily work activities at the NBF facility is considered a potential hazard. Yellow high-visibility safety vests worn by each worker and the attentiveness of each worker will be used as protective measures to minimize the risks associated with vehicular traffic. Safety devices (e.g., safety cones, caution tape, barrier) will be installed to separate the work area from the flow of traffic.
- **Slips, Trips, and Falls:** Caution will be exercised to prevent slips on wet surfaces, stepping on sharp objects, etc. Work should not be performed on elevated platforms without fall protection. Recognize and avoid areas with low traction (e.g., muddy areas or slick metal surfaces), ground surface obstructions, or unguarded areas elevated above ground surface.

- **Confined Spaces:** Confined space entry may be required for this project. Personnel will not enter any confined space without certified training and completion of Boeing's required confined space entry notification forms and specific approval from the Boeing Project Manager.
- **Noise:** Appropriate hearing protection [ear muffs or ear plugs with a noise reduction rating of at least 20 decibals(Accoustic) (dBA)] will be used if individuals work near high-noise generating equipment (>85 dBA).
- **Heat Stress:** See Section 8.2.2.
- **Cold Stress**: See Section 8.2.3.

4.0 PERSONAL SAFETY EQUIPMENT

PPE is required within work areas where there is a potential for exposure to hazardous substances and physical hazards. Descriptions of the levels of protection and the required safety equipment for each level are provided in the following sections.

4.1 LEVELS OF PROTECTION

Levels of protection have been defined by the U.S. Environmental Protection Agency (EPA) in the EPA *Standard Operating Guide* (1984):

- Level A requires a fully encapsulating suit and full-face self-contained breathing apparatus (SCBA) with a 5-minute supplied air escape pack for the highest level of respiratory, skin, and eye protection. Level A is not anticipated at NBF or GTSP and, therefore, is not discussed further.
- Level B requires maximum respiratory protection by the use of supplied air or a positive pressure SCBA. A 5-minute supplied air escape pack is required while in Level B. Dermal protection is selected on the basis of anticipated hazards. Level B is not anticipated at NBF or GTSP and, therefore, is not discussed further.
- Level C requires an air-purifying respirator that is specific to the contaminants of concern. The degree of dermal protection depends on anticipated hazards.
- Level D is the basic work uniform, modified for RI field work activities at NBF and GTSP, as described in Section 4.2.

4.2 REQUIRED EQUIPMENT

The level of protection designated Level D is recommended for all RI field work activities. However, the PPE required has been modified based on the tasks that are being performed. Required upgrades to PPE due to elevated concentrations of compounds in the air are discussed in Section 4.4 below. When sampling activities are occurring in areas where PCBs have been detected at concentrations greater than or equal to 50 milligrams per kilogram (mg/kg), the following PPE are required:

- One-piece disposable Tyvek suits
- Half- or full-faced respirator with HEPA/OV cartridges. Cartridges will be replaced daily, at a minimum, and should be changed more frequently if chemical vapors are detected inside the respirator or other symptoms of breakthrough are noted (irritation, dizziness, breathing difficulty, etc.).
- Nitrile inner-disposable gloves.
- Leather, neoprene, and/or nitrile outer gloves when performing hand work.
- Neoprene steel-toed and steel-shank, chemically resistant, impermeable outer boots or disposable boot covers.
- Safety glasses (or face shield when performing tasks where liquid splashes or sprays are to be encountered).

- Yellow high-visibility safety vest.
- Ear protection when operating noisy equipment.

The minimum PPE to be worn during all other RI field work activities includes:

- Hard hat when working in the vicinity of heavy machinery or drilling equipment
- Safety glasses with side shields
- Steel-toed boots
- Ear protection in the vicinity of noisy equipment
- Work gloves and/or chemical-resistant gloves
- Yellow high-visibility safety vest.

4.3 SAFETY EQUIPMENT

The following safety equipment must be available onsite during RI field work activities:

- First aid kit
- Eye wash kit
- Fire Extinguisher
- Mobile telephone.

4.4 AIR MONITORING

Direct-reading instruments give immediate, real time readings of contaminant levels. Reliable direct-reading instruments, such as the combustible gas indicator, photoionization detector (PID), flame ionization detector, dust meter, and colorimetric tubes, are available for situations commonly encountered at hazardous and contaminated substance sites. The appropriate type of monitoring equipment depends on the suspected type and concentration of chemical contaminants. The primary limitation of direct-reading instruments is that most do not quantify specific chemical compounds.

Air monitoring for contaminants of concern will be conducted during drilling or other intrusive activities. A PID will be used to monitor for VOCs and TPH and air monitoring for dust will be conducted using a SKC HAZ-DUST 1 (or equivalent) particulate meter (see Table 2). The instruments will be calibrated prior to each day's activity according to manufacturer's instructions. Calibration will be recorded in the health and safety logbook or field notes. Readings will be entered into the logbook at a minimum of 30-minute intervals.

Table 2 identifies the air monitoring strategy to be used during field activities.

5.0 TRAINING REQUIREMENTS

Personnel conducting intrusive field activities during well installation, soil boring completion, and sampling events will maintain appropriate training and approval for environmental field work. Records describing their training will be kept in Landau Associates' project files. Training will include, as appropriate, the following:

- Current medical approval to conduct environmental field work and wear a respirator
- Current fit test approval for respirator use; fit test must be conducted every 12 months
- Completion of training as required by Title 29 CFR 1910.120
  - 40 hours of health and safety at hazardous waste site training
  - Subsequent to the 40-hour training, a yearly 8-hour hazardous waste site refresher training
- CPR training refreshed yearly and First Aid training refreshed every 3 years.

6.0 DECONTAMINATION

Decontamination is necessary to limit the migration of contaminants from sampling areas into the surrounding environment. Equipment and personnel decontamination are discussed in the following sections, and the following types of equipment will be available to perform these activities:

- Glove wash bucket and rinse bucket
- Scrub brushes - long handled
- Spray rinse applicator
- Plastic garbage bags
- 5-gallon container with soap solution.

Proper decontamination procedures will be employed to ensure that contaminated materials do not contact individuals and are not spread around or from the site. These procedures will also ensure that contaminated materials generated during site RI field work activities and during decontamination are managed appropriately. All nondisposable equipment will be decontaminated in the sampling area.

Personnel will perform limited decontamination prior to changing respirator cartridges (if worn), taking rest breaks, drinking liquids, etc. They will decontaminate fully before eating lunch or leaving the site. The following describes the procedures for limited and full decontamination activities.

6.1 LIMITED DECONTAMINATION PROCEDURE FOR PERSONNEL

1. Outer gloves, if worn, will be washed and rinsed in portable buckets.
2. If a protective outer suit is worn, it will be inspected for severe contamination, rips, or tears.
3. If a protective outer suit is highly contaminated or damaged, full decontamination as outlined in Section 6.2 will be performed.
4. If a respirator is worn, it will be removed and cleaned using pre-moistened towelettes. Used cartridges will be placed in a plastic bag.
5. Cartridges and outer gloves will be replaced and the employee will return to work.

6.2 FULL DECONTAMINATION PROCEDURE FOR PERSONNEL

1. Outer gloves, rain gear, and boots will be washed and rinsed within the sampling area.
2. Disposable protective suits will be removed and deposited in a labeled container for disposal.
3. Respirators will be removed and placed in bags for offsite cleaning with warm soapy water and disinfectant.
4. Inner gloves will be removed and discarded into a labeled container for disposal.
5. Personnel should shower as soon after the work shift as possible.

6.3 DECONTAMINATION PROCEDURES FOR SAMPLING EQUIPMENT

- Disposable sampling equipment will be deposited in a labeled container for disposal.
- Non-disposable sampling equipment will be decontaminated between sampling intervals by a tap water and alconox soap mixture wash, followed by a tap water rinse and a final distilled water rinse.
- If contamination is still observed, the process will be repeated.
- All generated decontamination water will be stored in a labeled container for disposal or treatment processing.

6.4 DISPOSAL OF CONTAMINATED MATERIALS

All disposable sampling equipment and PPE will be rinsed to remove gross contamination and placed inside of a 10 milliliter polyethylene bag or other appropriate containers. These disposable supplies and containers will be contained onsite and disposed of by Boeing or the City, or removed from the site and disposed at an appropriate upland landfill facility by Landau Associates or the Contractor, unless visibly contaminated with hazardous substances. In such cases, the Boeing or City Project Manager will determine the need for special handling and disposal, according to applicable regulations.

7.0 SPILL CONTAINMENT

It is not anticipated that bulk chemicals subject to spillage will be used by Landau Associates' or Contractor personnel on this project. Accordingly, spill containment provisions are not included as part of this HASP.

8.0 EMERGENCY RESPONSE PLAN

This emergency response plan outlines the steps necessary for appropriate response to emergency situations. The following summarizes the key emergency response plan procedures for this project. Each Contractor vehicle associated with well installation and soil boring activities will be provided with a Boeing-supplied Dash-Board Safety Card (Table 3), or equivalent emergency information for work performed at GTSP (Table 4), which will summarize the emergency procedures described below.

8.1 NOTIFICATION AND REPORTING

The Landau Associates' Health and Safety Manager is to be notified immediately of any emergency situation. If the situation is life-threatening and notification of the Landau Associates' Health and Safety Manager would delay emergency response, site personnel may initiate the appropriate emergency contacts as noted below prior to notifying the Landau Associates' Health and Safety Manager. The Landau Associates' Health and Safety Manager will initiate contacts as follows:

NBF

1. Call Boeing Emergency Dispatch (Table 3) and provide the following information:
   - Name and location of person reporting
   - Location of accident/incident
   - Name and affiliation of injured party
   - Description of injuries
   - Status of medical aid effort
   - Details of any chemicals involved
   - Summary of the accident, including the suspected cause and the time it occurred
   - Temporary control measures taken to minimize further risk.

   Note: This information is not to be released to parties other than the Landau Associates' Health and Safety Manager, Boeing and City personnel, Contractor personnel, and bona fide emergency response team members.
2. Call the Boeing Project Manager and provide information noted in Item 1 above.
3. Call Landau Associates' Corporate Health and Safety Manager and the Landau Associates' Project Manager with information in Item 1 above.
4. The Landau Associates' Health and Safety Manager will complete a written accident/incident report, using Form 4, within 24 hours, sending copies to Boeing's Project Manager.

Resources to be used in cases of emergency include:

- List of Emergency Contacts: Table 3 includes both the appropriate emergency services and the appropriate project contacts.
- Nearest Phone: Telephones are located inside buildings. Boeing and Landau Associates' site personnel also possess cellular phones.

- Onsite Emergency Equipment: An industrial first-aid kit, a 20-lb type ABC portable fire extinguisher, and an eyewash kit accompany each site vehicle operated by Landau Associates.
- Offsite Emergency Services: Phone numbers for offsite emergency services are listed in Table 3. Copies of this table must be located in each vehicle.
- Hospital Route: To Harborview Medical Center:
  - Northwest on East Marginal Way South toward South 81st Place
  - Turn right onto Corson Ave South
  - Turn right onto South Bailey Street
  - Merge onto 1-5 North
  - Take Exit 164A (the Dearborn Street/James Street/I-90 East/Madison Street exit)
  - Turn right onto James Street
  - Turn right onto 9th Avenue. Hospital is at 9th Avenue and Jefferson Street.

GTSP

1. Call 911 (Table 4) and provide the following information:
   - Name and location of person reporting
   - Location of accident/incident
   - Name and affiliation of injured party
   - Description of injuries
   - Status of medical aid effort
   - Details of any chemicals involved
   - Summary of the accident, including the suspected cause and the time it occurred
   - Temporary control measures taken to minimize further risk.

   Note: This information is not to be released to parties other than the Landau Associates' Health and Safety Manager, City and Boeing personnel, Contractor personnel, and bona fide emergency response team members.
2. Call the City Project Manager and provide information noted in Item 1 above.
3. Call Landau Associates' Corporate Health and Safety Manager and the Landau Associates' Project Manager with information in Item 1 above.
4. The Landau Associates' Health and Safety Manager will complete a written accident/incident report, using Form 4, within 24 hours, sending copies to the City's Project Manager.

Resources to be used in cases of emergency include:

- List of Emergency Contacts: Table 4 includes both the appropriate emergency services and the appropriate project contacts.
- Nearest Phone: City and Landau Associates' site personnel possess cellular phones.
- Onsite Emergency Equipment: An industrial first-aid kit, a 20-lb type ABC portable fire extinguisher, and an eyewash kit accompany each site vehicle operated by Landau Associates.

- Offsite Emergency Services: Phone numbers for offsite emergency services are listed in Table 4. Copies of this table must be located in each vehicle.
- Hospital Route: To Harborview Medical Center:
  - North on 13th Avenue South
  - Turn left onto South Hardy Street
  - Turn right onto South Albro Place
  - Turn right onto Swift Avenue South
  - Merge onto I-5 North
  - Take Exit 164A (the Dearborn Street/James Street/I-90 East/Madison Street exit)
  - Turn right onto James Street
  - Turn right onto 9th Avenue. Hospital is at 9th Avenue and Jefferson Street.

8.2 EMERGENCY SITUATIONS AND PROCEDURES

Emergency procedures to be used in emergency situations for injuries and heat and cold stress are described in the following sections.

8.2.1 INJURIES

In emergency situations for injuries that are not life-threatening (e.g., a broken leg), normal decontamination procedures should be followed when possible. However, decontamination procedures may be modified according to the specific circumstances. Outer protective clothing should be removed if doing so would not cause delays or aggravate the injury.

Bodily injuries that occur as a result of an accident during operations at NBF will be handled in the following manner:

- The victim will be administered to by an individual who holds current first-aid and/or CPR certification, as necessary.
- The local first-aid squad/rescue unit and the local hospital will be notified, as appropriate, depending on the nature of the emergency.

8.2.2 HEAT STRESS

Heat stress can occur at any time when impermeable protective clothing is worn. The degree of risk associated with working in these garments is directly related to numerous factors: ambient temperature, length of time in the suits, availability of shade, acclimatization of personnel, adequate fluids intake by workers, and length of rest periods. Workers wearing semi-permeable or impermeable encapsulating clothing should have their heart rate (pulse rate) monitored prior to and throughout any work period that includes sustained moderate to heavy work in protective clothing when the temperature in the work area is above approximately 70°F. If such conditions exist, the following procedures will be carried out to reduce heat stress:

- Acclimatization
- Work/rest cycles
- Heat stress monitoring
- Liquids that replace electrolytes/salty foods available during rest
- Use of buddy system.

Each employee should check his/her pulse rate at the beginning of each break period. The pulse rate should be taken at the wrist for 30 seconds, and multiplied by 2. If the pulse rate exceeds 110 beats per minute, the length of the next work period should be reduced by one-third (the rest period need not be lengthened). A pulse rate in excess of 150 beats per minute may indicate heat exhaustion, although this rate will vary among workers. All personnel will know what their baseline pulse rate is before working in elevated temperatures, so as to monitor themselves. Personnel should follow appropriate guidelines if any personnel exhibit these symptoms:

- Heat Rash – Redness of skin. Frequent rest and change of clothing.
- Heat Cramps – Painful muscle spasms in hands, feet, and/or abdomen. Administer lightly-salted water by mouth, unless there are medical restrictions.
- Heat Exhaustion – Clammy, moist, pale skin, along with dizziness, nausea, rapid pulse, fainting. Remove to cooler area and administer fluids.
- Heat Stroke – Hot dry skin; red, spotted, or bluish; high body temperature of 104^{o} F; mental confusion; loss of consciousness; convulsions; or coma. Immediately cool victim by immersion in cool water. Wrap with wet sheet while fanning; sponge with cool liquid while fanning; treat for shock. DO NOT DELAY TREATMENT. COOL BODY WHILE AWAITING AMBULANCE.

The Landau Associates' Health and Safety Manager will be trained in monitoring, treating, and recognizing the signs of heat stress. If heat stress occurs, decontamination should be minimized and treatment begun immediately.

8.2.3 COLD STRESS

It is anticipated that RI field work activities will occur in the winter months when site personnel may be subject to low temperatures, rain, and winds; therefore, proper protective clothing must be worn.

Cold stress can be manifested as both hypothermia and frostbite:

- Hypothermia is a cold-induced decrease in the core body temperature that can increase the safety hazards associated with field work activities that require maximum attentiveness and manual dexterity. Hypothermia produces shivering, numbness, drowsiness, muscular weakness, and, if severe enough, death.

- Frostbite results from the constriction of blood vessels in the extremities, and decreasing the supply of warming blood to these areas. This drop in blood supply may result in the formation of ice crystals in the tissues, causing tissue damage. The symptoms of frostbite are white or grayish skin, blisters, or numbness.

Site personnel should review the information provided in their first-aid training for response to cold-stress problems.

8.3 FIRE

Fire extinguishers (ABC-type) will be kept in each site vehicle. In the event of major fires, explosions, or fire/explosion hazard conditions, all personnel will immediately evacuate the area. The Landau Associates' Health and Safety Manager will evaluate the need for further evacuation and/or emergency services.

8.4 SITE EVALUATION AND EVACUATION

The Landau Associates' Health and Safety Manager will be responsible for determining if circumstances exist that require further evaluation and/or evacuation. The Landau Associates' Health and Safety Manager should always assume worst-case conditions until proven otherwise.

* * * * * * * *

This document has been prepared under the supervision and direction of the following key staff.

LANDAU ASSOCIATES, INC.

Colette M. Gaona, E.I.T.
Senior Project Engineer

Rosemary W. Trimmer
Senior Staff Environmental Specialist

Christine B. Kimmel, L.G.
Associate

CMG/RWT/CBK/tam

FORM 1
ACKNOWLEDGMENT

I have read the attached Health and Safety Plan for the Remedial Investigation/Feasibility Study fieldwork at North Boeing Field and the Georgetown Steam Plant in Seattle, Washington. I have discussed any questions that I have regarding these materials with my supervisor, and I understand the requirements of the health and safety plan.

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

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Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Employee _____ Date _____

Site Safety Officer _____ Date _____

BOEING

Safety Promise

I promise to do my job safely so I can return home every day as healthy as I left. I will do this for the sake of my family, my teammates and myself. Every decision I make affects me, my teammates and my family.

I Promise:

I will increase my awareness of potential hazards involved with everyday work.

I will not do work, or ask others to do work, that is unsafe.

I will speak up and ensure action is taken when I see an unsafe condition.

I will be open, listen and take action when others point out that I am doing something that is not safe.

I expect Boeing to create an environment where I am as safe working on Boeing products as I am using them, and I am part of that environment.

With my signature, I commit to put safety first each and every day:

Together, we will
Go for Zero – One Day at a Time.

GO4ZERO
One Day at a Time.

FORM 3
MODIFICATION TO HEALTH AND SAFETY PLAN

DATE ___/___/___

Modification: _____

_____

_____

_____

Reasons for Modification: _____

_____

_____

_____

Site Personnel Briefed:

Name: _____ Date: _____

Name: _____ Date: _____

Name: _____ Date: _____

Name: _____ Date: _____

Name: _____ Date: _____

Name: _____ Date: _____

Name: _____ Date: _____

Approvals:

Site Safety Officer: _____

Manager: _____

Others: _____

FORM 4
EMPLOYEE EXPOSURE/INJURY INCIDENT REPORT

(Use additional page if necessary)

Date:_____ Time:_____

Name:_____ Employer:_____

Site Name and Location:_____

Site Weather (clear, rain, snow, etc.):_____

Nature of Illness/Injury:_____

_____

Symptoms:_____

Action Taken: Rest:_____ First Aid:_____ Medical_____

Transported by:_____

Witnessed by:_____

Hospital's Name:_____

Treatment:_____

Comments:_____

_____

What was the person doing at the time of the accident/incident?_____

_____

Personal Protective Equipment Worn:_____

_____

Cause of Accident/Incident:_____

_____

What immediate action was taken to prevent recurrence?_____

_____

Additional comments

Employee's Signature/Date:

_____

Supervisor's Signature/Date

_____

Site Safety Representative's Signature/Date

_____

TABLE 1
HUMAN HEALTH INFORMATION FOR CONTAMINANTS OF CONCERN

Contaminant	TWA	IDLH	Route of Exposure	Symptoms of Acute Exposure	Instruments Used to Monitor Contaminant
Trichloroethylene	50 ppm	1,000 ppm	Inhalation, absorption, ingestion, dermal contact	Irritated eyes and skin, dizziness, tremors, drowsiness, nausea, vomiting (carcinogen)	PID
1,2-Dichloroethylene	200 ppm	1,000 ppm	Inhalation, ingestion, dermal contact	Irritated eyes, depression of central nervous system and respiratory system	PID
Vinyl Chloride	1 ppm	Unknown	Inhalation, ingestion, dermal contact	Weakness, abdominal pain (carcinogen)	PID
Semivolatile Organic Carbons (protective to Naphthalene)	10 ppm	250 ppm	Inhalation, absorption, ingestion, dermal contact	Irritated eyes, headache, confusion, nausea, vomiting, abdominal pain, irritated bladder, profuse sweating, jaundice, renal shutdown, optical neuritis, cornea damage	PID
Total petroleum hydrocarbons	100 ppm	400 ppm	Absorption, ingestion, inhalation	Irritated eyes, nose, throat; dizziness, nausea; chemical pneumonia	PID
Carcinogenic Polycyclic Aromatic Hydrocarbons (protective to Benzo(a)pyrene)	0.2 mg/m^3	10 mg/m^3	Inhalation, ingestion, dermal and eye contact	Nausea, vomiting, low blood pressure, abdominal pain, convulsions, and coma (carcinogen)	Dust Meter
Total Metals (protective to Arsenic)	0.002 mg/m^3	5.0 mg/m^3	Inhalation, eye contact, dermal contact	Skin and mucous membrane irritation; respiration irritation (potential occupational carcinogen)	Dust Meter
PCBs	0.2 mg/m^3	10 mg/m^3	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritated eyes; chloracne; liver damage; reproductive effects	Dust Meter
Dioxins/Furans (protective to 2,3,7,8-Tetrachloro-dibenzo-p-dioxin)	Unknown	unknown	Inhalation, absorption, ingestion, dermal contact	Irritated eyes, chloracne, porphyria, reproductive effects (carcinogen)	Dust Meter

TWA = Time-weighted average.
IDLH = Immediately dangerous to life and health [National Institute for Occupational Safety and Health (NIOSH)].

TABLE 2
AIR MONITORING STRATEGY

EXPOSURE	METHOD	MONITORING DESCRIPTION	ACTION LEVEL (a)	ACTION
Total Volatile Organics	Photoionization Detector (PID)	Periodically, or when odors are noted	<25 parts per million (ppm) 25-75 ppm >75 ppm	Level D Protection Level C Protection Shut Down; Contact Corp. Health & Safety Officer; Implement Engineering Controls
Particulate Contaminants	Dust Meter	Handling samples/ Continuously	<0.001 milligrams per cubic meter ($mg/m^{3)}$ >0.002 mg/m^3	Level D Protection Implement Engineering Controls; Upgrade to Level C in Interim

(a) For ambient air monitoring.

TABLE 3

NORTH BOEING FIELD
7755 East Marginal Way South, Seattle, WA 98108

STANDARD WORK PRACTICES

Health and Safety is **EVERYONE'S** responsibility and **NUMBER ONE PRIORITY**

- Regulatory compliance is **MANDATORY** – No work will begin and/or work will immediately stop unless the answer to the following question is a positive **"YES"** – AM I IN COMPLIANCE WITH ALL REGULATORY, FACILITY, PROJECT, AND HEALTH AND SAFETY REQUIREMENTS?

- All incidents and regulatory inspections must be reported immediately

    - **Incident definition**: Any event condition, or action (including near misses) that affects the safety of personnel, does not follow rules and guidelines for work implementation and regulatory compliance onsite
- Incident examples:
    - Spilled liquid in an uncontrolled environment
    - Working without correct/complete permit in place
    - Performing hot works without a "Hot Works Permit"

Before starting work, **HAVE YOU?** :

1. Reviewed the Health and Safety Plan prior to performing work?
2. Performed a Health and Safety "Tail Gate Meeting" and filled out the sign-in form prior to starting work?
3. Reviewed scope of work documents, permits, and other related items prior to performing work?
4. Provided correct Personal Protective Equipment (PPE) for the work to be performed?
5. Followed Lock Out/Tag Out Procedures for equipment?

IF YOU ARE UNSURE OF SAFETY PRACTICES FOR THE PARTICULAR WORK INVOLVED – GET CLARIFICATION PRIOR TO STARTING WORK

Working with subcontractors:

- Review Health and Safety Plan with subcontractor
- Review site "Incident Reporting Procedures"
- Perform "Tail Gate Safety Meeting" with subcontractor

SAFETY AND REGULATORY COMPLIANCE IS MY PRIORITY AND I MUST TAKE THE NECESSARY STEPS TO PROVIDE THIS SERVICE

I AM RESPONSIBLE AND I HAVE THE AUTHORITY TO STOP WORK IF THE TASK DOES NOT MEET THE SAFETY AND REGULATORY REQUIREMENTS

SAFETY DASHBOARD CARD

EMERGENCY AND INCIDENT REPORTING PROCEDURES

EMERGENCY PHONE NUMBER:
(206) 655-2222 Fire, Ambulance, Police, Spill Reporting

If using a cell phone be prepared to include the site and work location address

SITE ADDRESS:
WORK LOCATION:
7755 East Marginal Way South, Seattle, WA – North Boeing Field

AN EMERGENCY IS AN UNCONTROLLED SITUATION, AN INJURY THAT IS MAJOR OR LIFE THREATENING, FIRE, OR ANYTHING THAT REQUIRES IMMEDIATE ASSISTANCE.

EMERGENCY REPORTING:
1. Contact the Emergency Response (fire, ambulance, police) at **(206) 655-2222** Follow Incident Reporting procedures listed below

INCIDENT REPORTING:
Respond to the incident and get it under control. Contact the following by e-mail and brief phone message (**MUST DO BOTH**):

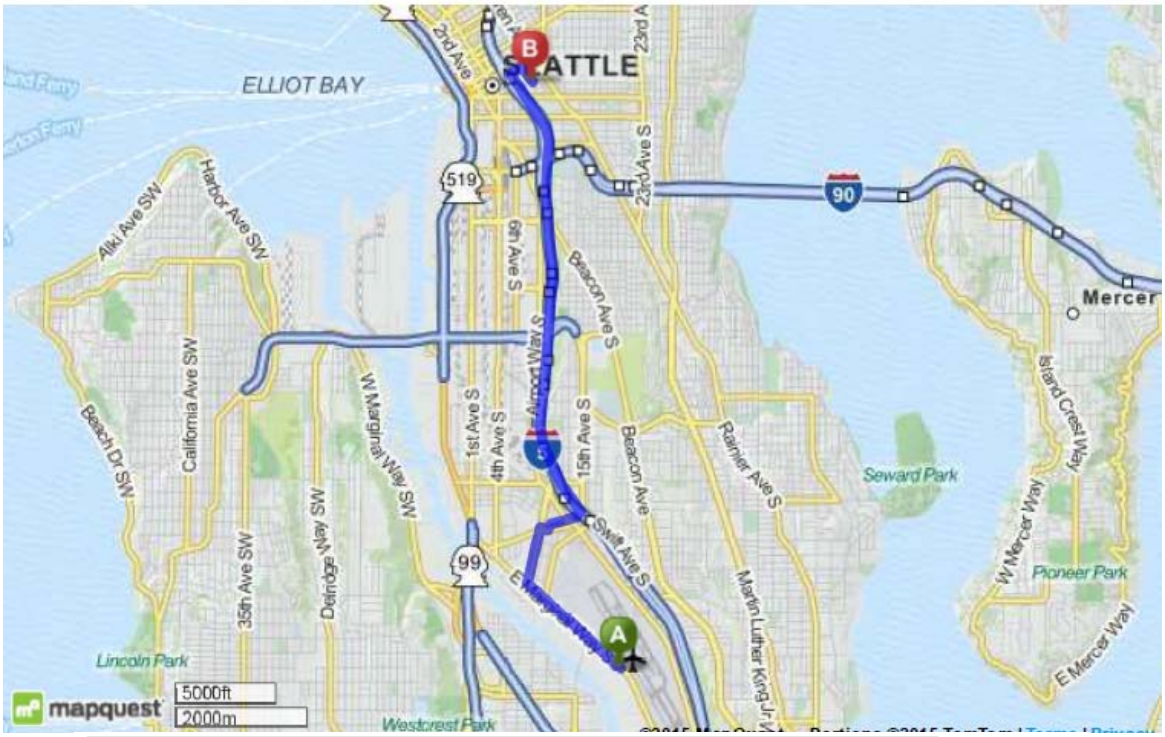
Name	Email Address	Phone Number	Position
Jen Parsons	jennifer.a.parsons@boeing.com	206-715-7981	Boeing Field Engineer
Fred Wallace	fred.j.wallace@boeing.com	206-930-0461	Boeing Field Engineer
Carl Bach	carl.m.bach@boeing.com	206-898-0438	Boeing Project Manager
Kris Hendrickson	khendrickson@landauinc.com	425-778-0907	Consultant Contact

When leaving the voice message or email state the following:
1. **Date:** The date the incident occurred
2. **Time:** The approximate time the incident occurred
3. **Location:** Where the incident occurred, i.e.; Admin Compound…

After the incident is under control, the sequence of events will be recorded, including probable cause, people who responded to the incident, the extents of the incident, and relevant dates and times

ROUTE TO HOSPITAL

Route to Harborview Medical Center Hospital



	1. Start out going **northwest** on **E Marginal Way S** toward **S 81st Pl**. Map	**1.1 Mi** *1.1 Mi Total*
	2. Turn **right** onto **Corson Ave S**. Map *Corson Ave S is just past Carleton Ave S* *Calozzi's is on the right* *If you are on E Marginal Way S and reach S Willow St you've gone a little too far*	**0.5 Mi** *1.6 Mi Total*
	3. Turn **right** onto **S Bailey St**. Map *S Bailey St is 0.1 miles past S Eddy St* *SHELL is on the right* *If you reach S Harney St you've gone a little too far*	**0.06 Mi** *1.7 Mi Total*
NORTH 5	4. Merge onto **I-5 N** via the ramp on the **left** toward **Vancouver B C**. Map *If you reach Flora Ave S you've gone a little too far*	**3.1 Mi** *4.8 Mi Total*
164A EXIT	5. Take the **I-90 E** exit, **EXIT 164A**, toward **James St / Dearborn St / Madison St / Spokane**. Map	**0.2 Mi** *5.0 Mi Total*
RAMP	6. Keep **left** to take the **James St / Dearborn St** ramp toward **Madison St / HOSPITAL**. Map	**0.3 Mi** *5.3 Mi Total*
	7. Keep **left** at the fork in the ramp. Map	**0.5 Mi** *5.8 Mi Total*
RAMP	8. Keep **right** to take the **James St** ramp. Map	**0.3 Mi** *6.1 Mi Total*
	9. Turn **right** onto **James St**. Map *If you are on 7th Ave and reach Cherry St you've gone a little too far*	**0.1 Mi** *6.2 Mi Total*
	10. Take the 1st **right** onto **9th Ave**. Map *9th Ave is just past 8th Ave* *UNION 76 is on the corner* *If you reach Terry Ave you've gone a little too far*	**0.2 Mi** *6.4 Mi Total*
	11. **325 9TH AVE** is on the **right**. Map *Your destination is 0.1 miles past Jefferson St* *If you reach Alder St you've gone a little too far*	
B	**325 9th Ave**, Seattle, WA 98104-2420	

TABLE 4

EMERGENCY INFORMATION FOR GEORGETOWN STEAM PLANT

HOSPITAL - Harborview Medical Center Hospital
325 9th Avenue
Seattle, WA 98104

Information: (206) 744-3000

Directions from Georgetown Steam Plan (6605 13th Ave S, Seattle, WA 98108)

1. Start out going **north** on **13th Ave S** toward **S Hardy St**. Map	**0.1 Mi** *0.1 Mi Total*
2. Turn **left** onto **S Hardy St** (Gate access required). Map	**0.03 Mi** *0.2 Mi Total*
3. Turn **right** onto **S Albro Pl**. Map	**0.3 Mi** *0.5 Mi Total*
4. Turn **right** onto **Swift Ave S**. Map	**0.2 Mi** *0.7 Mi Total*
5. Merge onto **I-5 N** toward **Vancouver BC**. Map *If you reach S Eddy St you've gone about 0.1 miles too far*	**3.0 Mi** *3.7 Mi Total*
6. Take the **I-90 E** exit, **EXIT 164A**, toward **James St / Dearborn St / Madison St / Spokane**. Map	**0.2 Mi** *3.9 Mi Total*
7. Keep **left** to take the **James St / Dearborn St** ramp toward **Madison St / HOSPITAL**. Map	**0.3 Mi** *4.2 Mi Total*
8. Keep **left** at the fork in the ramp. Map	**0.5 Mi** *4.7 Mi Total*
9. Keep **right** to take the **James St** ramp. Map	**0.3 Mi** *5.0 Mi Total*
10. Turn **right** onto **James St**. Map *If you are on 7th Ave and reach Cherry St you've gone a little too far*	**0.1 Mi** *5.2 Mi Total*
11. Take the 1st **right** onto **9th Ave**. Map *9th Ave is just past 8th Ave* *UNION 76 is on the corner* *If you reach Terry Ave you've gone a little too far*	**0.2 Mi** *5.3 Mi Total*
12. **325 9TH AVE** is on the **right**. Map *Your destination is 0.1 miles past Jefferson St* *If you reach Alder St you've gone a little too far*	
325 9th Ave, Seattle, WA 98104-2420	

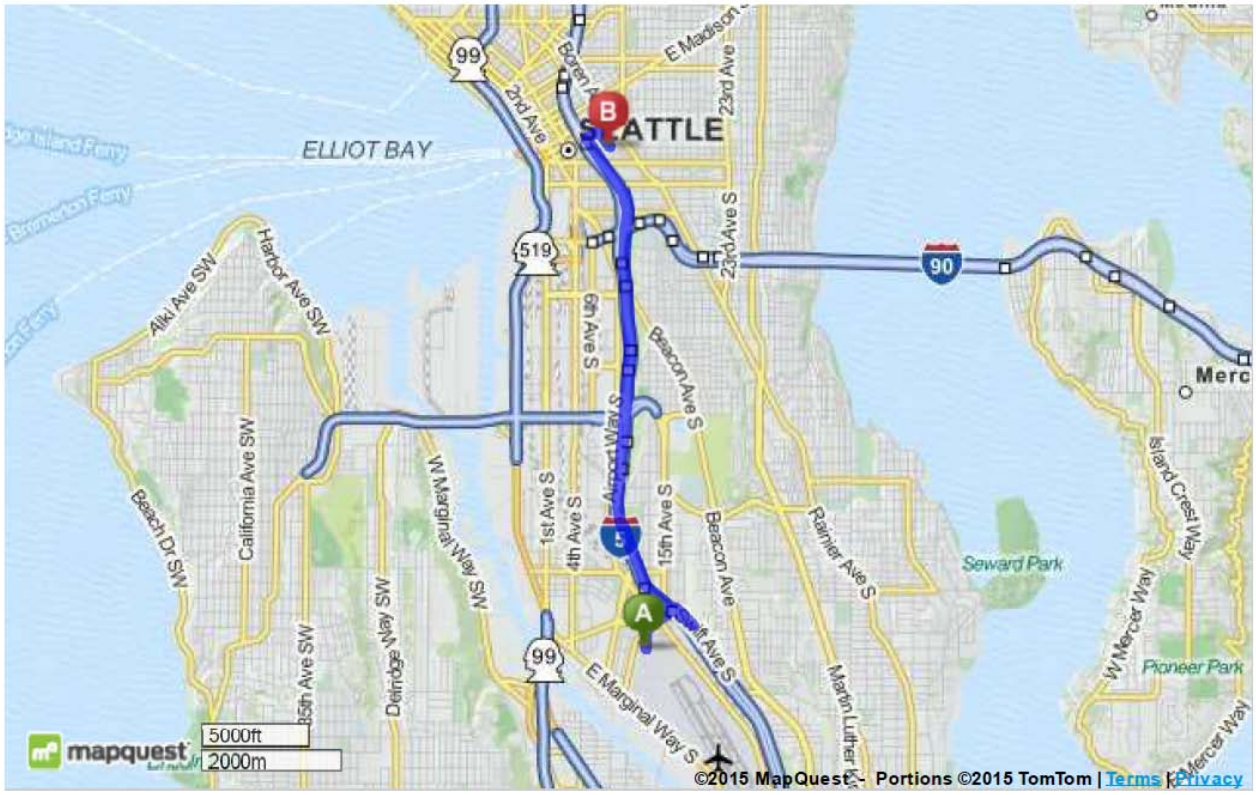
In the event of an emergency on land, call for help as soon as possible.

Dial 911 and give the following information:

- WHERE the emergency is - use cross streets or landmarks
- PHONE NUMBER you are calling from
- WHAT HAPPENED - type of injury
- HOW MANY persons need help
- WHAT is being done for the victim(s)
- YOU HANG UP LAST - let the person you called hang up first.

EMERGENCY ROUTE

Total Travel Estimate: **5.32 miles - about 9 minutes**



TELEPHONE - Cellular telephones to be carried by each team on.

EMERGENCY (Fire, Police, Ambulance) -**911**

EMERGENCY ROUTES - Map (see above)

EMERGENCY CONTACTS -

City of Seattle:

Project Manager – Allison Crowley	(206) 684-3167

Landau Associates:

Project Manager – Kris Hendrickson	(425) 778-0907, cell (206) 910-1378
Corporate H&S Manager – Chris Kimmel	(425) 778-0907, cell (206) 786-3801

Other:

Poison Control Center	(206) 526-2121
National Response Center	(800) 424-8802
WA Div. of Emergency Management	(800) 258-5990