

APPENDIX A

HEALTH AND SAFETY PLAN

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CITY OF SAN DIEGO STREAM GAUGE STUDY

HEALTH AND SAFETY PLAN (HASP)

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1.0 INTRODUCTION

This Health and Safety Plan (HASP) addresses the health and safety concerns that relate to the fieldwork associated with the City of San Diego Stream Gauge Study. Field team members must be familiar with the contents of this document and site-specific safety concerns.

The project Health and Safety Officer (HSO) will be responsible for assuring that all members of the field team are familiar with the requirements of the HASP and have received appropriate training for their specific roles. The Field Sampling Manager will be responsible for enforcing site-specific health and safety protocols, including emergency response/contingency plans. The Project Manager and individual employees have the authority to suspend work, if necessary, due to health and safety concerns.

1.1 Field Activities

AMEC Environment & Infrastructure, Inc. (AMEC) is responsible for field activities associated with the City of San Diego Stream Gauge Study. The following sub-sections discuss these field activities.

1.1.1 Site Selection of Monitoring Sites

Site selection for this project will include physical exertion (walking) in extreme weather conditions (heat) for moderate periods over uneven surfaces.

1.1.2 Equipment Installation and Maintenance

Equipment installation and maintenance may include working with power tools in wet or damp environments and the operation of heavy equipment.

1.1.3 Travel

Travel to and from the selected monitoring sites will occur for equipment installation, data retrieval activities, and site maintenance.

Establishment of Work Zones and Traffic Control

Field crew will make efforts to locate equipment in safe work zones, far from high-traffic and high-use areas. If equipment location is adjacent to high-traffic and high-use zone, field crew will implement appropriate traffic control measures, as needed.

Removal and Replacement of Sample Containers

Composite sample containers will need to be removed and replaced immediately after each storm event and, perhaps, during storm events.

1.2 Traffic Safety

Working near roadways presents inherent risks, dominated by the possibility of errant vehicles. The motoring public is largely made up of conscientious drivers operating well-maintained equipment. However, some percentage of vehicles on the road at any given time may be marginally under control due to driving factors like distractions, fatigue, confusion, or inadequate training, as well as mechanical factors like vehicle age and condition. Any or all of these factors may contribute to a vehicle leaving the traveled lanes and entering the work site.

Traffic load, posted speed limits, and proximity to travel lanes all have a direct relation to the probability of worker exposure to errant vehicles. Work site selection can reduce the exposure potential relating to these factors. In all cases, the Field Sampling Manager will make the final evaluation of the appropriateness of performing work with the conditions present at a site.

Field teams will use signs, cones, and flashing amber lights when necessary, based on requirements of traffic control permits for sites within the roadway, to inform motorists of activities that may impact roadway travel conditions. To avoid shoulder and lane closures, field crew will attempt to pull vehicles off the road and perform work as far away from the edge of pavement as possible.

Field members will work in teams and utilize high-visibility, reflective (Class 2 ANSI/ISEA minimum) vests or clothing. Steel-toed boots and hard hats are required for the entrant during confined space entry, if overhead hazards exist, and/or if operating heavy equipment when working along roadsides.

When working on or near the shoulder, physical barriers will be employed whenever possible to protect workers from errant vehicles. Physical barriers include barrier vehicles, guardrails, fences, and other man-made or natural objects capable of slowing, stopping, or diverting an errant vehicle. Barrier vehicles are to be unoccupied, positioned upstream of the work zone, and parked so as not to roll into the work area or active travel lanes if struck by an errant vehicle. Workers not protected by a physical barrier should employ the use of a lookout whose sole responsibility is to watch traffic for signs of potential trouble and notify endangered workers to make use of a pre-planned escape route. The lookout must have an effective means of communicating with workers given the noise and visual condition present. Workers will conduct their work facing the traffic whenever feasible.

1.3 General Safety

In addition to traffic hazards, field teams may face a variety of potential dangers while maintaining the facilities, installing equipment, and performing environmental monitoring. Some of these dangers include:

- Slippery, wet, and/or icy conditions

- Lightning
- Unstable earth
- Slippery conditions
- Lightning
- Poor visibility, especially at night
- Fast moving water
- Flooding
- Walking on uneven surfaces
- Rip Currents, rogue waves, and tsunamis
- Dehydration
- Prolonged weather exposure
- Power tools and heavy equipment
- Lifting heavy objects
- Overhead dangers
- Elevated surfaces
- Electrical hazards posed by field equipment malfunctions
- Light to moderate carrying of field equipment and supplies
- Transients, Muggers, and criminals
- Sharp edges and broken glass
- Animals and other biological hazards

Field crews are trained to take the following safety while working in the field:

- Stay away from the edges of fast moving water and avoid areas of pooled water by roadways. These areas are usually slippery during rainy conditions.
- Watch your step while walking in and around rocks in and along stream banks. Wet rocks are usually sharp and slippery.
- If wading is required, check water conditions prior to entry. Enter water only if determined by field crew leader that it is safe to do so.
- Never work alone at night or during the day. Two people are required during each site visit. Stay within shouting distance of your partner at all times.

- Avoid leaving materials, tools, and equipment lying around where someone can trip over them.
- Always keep a charged cellular phone or other means of communication nearby.
- Do not use your back to lift heavy objects. Get help.
- Never use drugs or alcohol while working.
- Always wear an orange reflective vest during site visits, where necessary, and a hard hat when overhead dangers exist.
- Always wear appropriate footwear, including steel-toed boots and/or rain boots.
- Do not use power tools and equipment unless trained in the proper use and care of the specific tools.
- Always wear eye protection when working with tools or chemicals.
- Wear nitrile gloves when collecting samples.
- Wear waterproof gear.
- Take appropriate measures for protection from the elements including but not limited to sun, rain and wind.
- Seek shelter if lightning is observed. Do not sample, or stand in open areas or near or under cliffs
- Be aware of your surroundings. Watch for plants, animals, people, tripping hazards, and overhead dangers such as falling debris from cliffs.
- Clean up the work area before leaving.
- Always carry sufficient amounts of drinking water with you.
- Be aware of the nearest toilet and hand washing facilities.

Field crew will complete the following personal hygiene procedures:

- Toilet and hand washing facilities will not be located on site. An alternate sanitary facility and its specific location will be identified prior to beginning work activities.
- Personal protective equipment (PPE) shall be kept clean, in good repair, and on-site. Safety devices, including protective clothing worn by the employee, shall not be interchanged among the employees until properly cleaned.
- All equipment leaving the site will be free of gross hazardous and non-hazardous waste (i.e., mud and/or soil).

2.0 SITE-SPECIFIC HASP

This section provides information on unique hazards and necessary precautions for the types of sites included in this program. Appropriate emergency response numbers and routes to the nearest medical emergency facilities can be found at the end of this appendix. Field personnel will be responsible for adhering to the requirements of this plan and task-specific Activity Hazard Assessments (AHAs) for installation, maintenance, and wet weather monitoring. If additional measures are necessary due to unforeseen or temporary changes to the work environment, the on-site team leader will make the final judgment for any safety procedure changes.

2.1 Errant Vehicles

There is a limited to moderate exposure hazard from errant vehicles while accessing most sites. While personnel are stopped on the shoulder of the roadway, they should keep well back from the roadway lanes and face the approaching traffic. Field crew should always remain on the side of the vehicle furthest from the travel lane and employ the use of flashing amber lights. A lookout person is required if two or more field crew are engaged in exposed activity within 30 feet of the travel lane. Exposed activities may occur before, during, and after storm events.

2.2 Physical Hazards

Always be alert and use adequate protection to safeguard against the physical hazards associated with working at these sites. The most common hazard encountered is falling or tripping, potentially causing mechanical injury. The following are some other common hazards:

- Falling objects
- Sharp objects
- "Flash" flooding
- High water
- Strong waves and currents
- Electrical shock
- Grinding
- Chipping
- Moving vehicles
- Uneven walking surfaces

2.3 Biological Hazards

Beware of poison ivy, poison oak, and other plants that cause allergic reactions. Also, use protection against bacteria and other micro biota that could be present in the water and sediment. Be aware that mosquitoes and ticks are a common vector for human diseases. Use

caution when walking along waterways at remote sites, rattlesnakes commonly live in habitat adjacent to a freshwater source.

2.4 Drowning Hazards

Working in or near flowing water may expose field crews to potential drowning hazards. Do not enter the water if the field team leader determines the conditions to be unsafe.

2.5 Heat Stress

Heat stress is a major hazard, especially for workers wearing protective clothing. The same protective materials that shield the body from chemical exposure also limit the dissipation of body heat and moisture. In its early stages, heat stress can cause rashes, cramps, discomfort, and drowsiness, resulting in impaired functional ability that threatens the safety of both the individual and coworkers. Continued heat stress can lead to heat stroke and death. Avoiding overprotection, careful training and frequent monitoring of personnel who wear protective clothing, judicious scheduling of work and rest periods, and frequent replacement of fluids can protect against this hazard.

Heat stress is a possibility on this project during dry weather. Breaks in a shaded area will be taken if any worker exhibits or believes necessary to mitigate the symptoms of heat stress such as: excessive sweating, muscle spasms, thirst, dizziness, rapid/weak pulse, flushed skin, loss of consciousness, or convulsions. The breaks will last until symptoms are relieved and/or the pulse of the worker is less than 110 beats per minute. As a preventive measure, workers will be instructed to drink fluids to keep hydrated. For severe heat stress, workers will be examined by a health-care professional as soon as possible.

Additionally, during periods of hot weather or other potential heat stress conditions the following safe work practices must apply:

- Be on the alert to signs and symptoms of heat illness during periods of abnormally high heat.
- Know the symptoms of heat illness to watch for which includes excessive sweating, headache, poor concentration, muscle pain, headache, cramping, dizziness, and irritability, loss of coordination, vomiting, blurry vision, confusion, and lack of sweating, fainting, or seizures.
- Drink plenty of water throughout the day. Employees working in the heat need to drink 4 eight ounce glasses of water per hour, including at the start of the shift to replace the water lost to sweat. This is the minimum amount per person that should be brought into the field due to the remote location of the sites.
- Dress for conditions. Wear lightweight, light-colored, loose clothing. Wear a wide brimmed hat if possible.

- Wear sunscreen and sunglasses.
- Use cool compresses to stay cool. Placing cool compresses on the back of the neck lowers the body's core temperature.
- Take scheduled rest periods and spend them in the shade.
- Tell your supervisor immediately if you feel you may be getting sick from the heat.
- Know the locations of your closest drinking water supplies.
- Keep track of your coworkers. You all need to look out for each other.
- Know how to contact emergency services in the event of heat illness, how to effectively report the work location to 911, and the location of and the quickest route to the nearest hospital.

2.6 Cold Exposure

Storms can bring unusual cold weather to the area. Cold injury (frostbite and hypothermia) and impaired ability to work are dangers at low temperatures and wet conditions. To guard against this hazard wear appropriate clothing, have warm shelter readily available, carefully schedule work and rest periods, and monitor workers' physical conditions. Employees beginning to feel the effects of cold injury should be removed from exposure to the elements in a manner that will not cause their condition to worsen or cause their body to go into shock.

2.7 Dehydration

Dehydration can occur during wet or dry weather, and in heat or in cold. High altitudes, limited shade, extreme temperatures, and physical exertion increase the rate of dehydration. Drink plenty of water throughout the day. Ensure sufficient amounts of water are brought to the site for each employee. Take water and rest breaks in shaded areas where possible and safe to do so.

2.8 Worker Safety

Only personnel trained in the use of the proper safety equipment will be allowed to complete the required tasks.

2.8.1 Personal Protective Equipment (PPE)

Personal protective equipment recommended includes hard hats, safety vests, work boots, gloves, and sturdy clothing. This equipment will not only help protect against numerous potential hazards but will also allow others to identify you as belonging to the work site..

The safety officer will select the Personal Protective Equipment (PPE) ensemble based on the potential hazards. **Each worker will be responsible for maintaining his or her own PPE.**

In general the following in Table 2-1 applies:

Table 2-1: Standard PPE for Non-Hazardous Work Zones

Activity	Head/Face/Ear	Foot	Hands	Respirator	Clothing
General Site Labor	Hard hat (Class B or E) ^(c) Safety glasses Hearing protection ^(b)	Steel-toed boots w/ puncture resistant insoles. ^(d)	Leather/Nitrile gloves as needed	None ^(a)	Shirt w/sleeves. Long pants. High-visibility reflective vest Personal Floatation Device
Supervision of Work	Hard hat (Class B or E) ^(c) Safety glasses Hearing protection ^(b)	Steel-toed boots w/ puncture resistant insoles. ^(d)	Leather/Nitrile gloves as needed	None ^(a)	Shirt w/sleeves. Long pants. High-visibility reflective vest Personal Floatation Device
Site Visitors	Hard hat (Class B or E) ^(c) Safety glasses Hearing protection ^(b)	Steel-toed boots w/ puncture resistant insoles. ^(d)	None	None ^(a)	Shirt w/sleeves. Long pants. High-visibility reflective vest Personal Floatation Device

(a) Voluntary use of respirators is authorized for nuisance dusts and exposures known to be below PEL levels. For nuisance dust use disposable N, R, or P95 or better (dispose of N or R types daily and P type weekly). For odors use half mask with OV or OV/P95 or better (change at start of week).

(b) Hearing protection with adequate noise reduction rating (if consistently exposed to greater than 85 decibels steady-state or 140 decibels impulse). Workers should use clean hands to insert earplugs. Ample supplies of disposable earplugs will be available onsite.

(c) Hard hats are required only when overhead dangers exist.

(d) Steel-toed boots are required at sites when site conditions pose a risk to foot injury from falling objects.

2.9 Data Downloading Safety

The following precautions will be taken while downloading data at the monitoring stations:

- Always wear protective gloves, a reflective vest, and a hard hat when overhead dangers exist.
- Keep a safe distance from the water body if deep water, rapid flow or flash flood conditions are present or imminent. Employees should avoid unstable banks, employ the use of a grab pole, and use a lifeline and a personal flotation device. If the determination is made by the Field Team Leader that the site is unsafe to download data even with proper precautions in place, postpone work until a later date.
- Do not eat or smoke while on the job site.

2.10 Installation Safety

The following precautions will be taken while installing the stream gauge monitoring stations:

- Install equipment under base flow conditions in waterways.
- Always wear protective gloves, a reflective vest, and a hard hat when overhead dangers exist.
- Do not eat or smoke while on the job site.

2.11 Medical Emergency Procedures

Even with full safety awareness and compliance by field teams, medical emergencies can and do occur. To handle minor injuries, field teams will have a basic first aid kit on-site at all times. In the event that medical attention is necessary beyond minor first aid, field teams should refer to Attachment A of the HASP which includes maps and directions to the closest medical center for each study site.

Table 2-2 is a list of site-specific emergency contacts.

Table 2-2: Emergency Contacts

Name	Phone	Comments
San Diego Police Department	911	From cell phone
Kristina Schneider, Project Manager	619-889-7752	From cell phone

Document all information related to the accident or incident that resulted in injury or damage and report it to the Consultant Safety Manager.

2.12 Tailgate Safety Training

The HSO or another designated Safety Officer will conduct tailgate safety training sessions regularly. These meetings will be held on-site prior to work operations. New personnel working on site will be required to attend a tailgate meeting prior to work operations. The purpose of the safety-training meeting is to ensure that field team members understand and will abide by all safety and potential emergency response measures that may be necessary for the well being of the field team.

The following items will be discussed at each safety meeting:

- Traffic safety
- Safe entering and exiting of the highway or roadway
- Use of personal protective clothing and equipment
- Potential chemical and physical hazards and how to deal with them
- Nearest hospital information

- Emergency response procedures
- Any other site-specific safety issues

Field team members must sign the tailgate safety training meeting form in acknowledgment of understanding all issues discussed. An example of a tailgate meeting form is included as Figure 2-2.

Figure 2-2: Tailgate Safety Meeting Form

Project No.: _____

Client: _____

Site Location: _____

Safety Topics Discussed
<p>1. Protective clothing and equipment: PPE – Use the PPE that has been provided to prevent injury, exposure to the cold and wet weather conditions, and exposure to storm water runoff containing diluted levels of chemical contaminants. Typical PPE may consist of a hard hat, rain gear, rubber rain boots, nitrile gloves, pants, long sleeved shirts, and layered clothing. Use and wear a PFD if working over water, on piers or quay walls. Equipment and tool use - Use proper equipment for the task in the prescribed manner to prevent injury.</p>
<p>2. Chemical hazards: Dermal/eye contact with water contaminants Food, drinks, or cigarettes will not be consumed while observing or sampling. Prior to handling food, drinks, or cigarettes, personnel will wash hands and face.</p>
<p>3. Physical hazards: Lifting - Use proper equipment and lifting and motion technique. Do not twist back, stay balanced and use your legs. Vehicle Hazards - Be aware of vehicle operations in your area. Make eye contact with vehicle operators on approaching equipment. Driving - Drive vehicle in accordance with company policy. Drive in right lane, use 3-second rule or extended distance from vehicle in front of you. Drive speed limit or slower depending on road conditions and visibility. Working over water - Exercise care and alertness when working around water.</p>
<p>4. Vehicle Hazards:</p> <ul style="list-style-type: none"> - Wear seat belt while vehicle is in motion. - Do not exceed the posted speed limit. - Reduce speed in adverse weather conditions. - Always drive with headlights on. <p>Drive vehicle in accordance with AMEC policy. Drive in the right lane and maintain an extended distance (3-second rule) from the vehicle in front of you.</p> <ul style="list-style-type: none"> - Drive defensively and follow traffic regulations. - Do not make sudden lane changes, weave through traffic, or cut off other drivers. - Do not use handheld or hands-free cell phones while driving. - Stop at intersections and give the right-of-way to other vehicles and pedestrians. - Check tires for proper inflation.

Safety Topics Discussed (continued)

5. Traffic Hazards:

- Be aware of vehicles in your area. Make eye contact with approaching vehicle operators.
- In dry weather, a reflective vest should be worn for maximum visibility in high-traffic areas.
- Use traffic cones around the work zone in high-traffic areas.
- At least two persons must be present to perform any work in high-traffic areas. One of these persons must monitor approaching traffic for any potential hazards.

Watch out for moving vehicles and equipment and equipment.

6. Environmental and biohazards:

Dangerous animals and insect bites and stings – Be aware of your surroundings and watch for dangerous animals and insects such as spiders and snakes. Wear appropriate clothing such as pants, long sleeved shirts, and steel toe boots.

Watch for Poison Oak.

7. Equipment hazards:

Pinch Points – Use proper equipment in the prescribed manner in conjunction with proper lifting techniques to avoid pinch points.

Wear leather or canvas gloves - to protect the hands when performing manual labor, such as moving manhole covers

8. Decontamination procedures:

- If an exposure or eye contact occurs, respond with appropriate first aid and immediately notify the supervisor.

9. Other:

- The supervisor will review any other significant safety matters specific to sampling and observation activities at this base.

10. Review of emergency procedures:

In case of emergency, immediately dial 911.

