

FIELD GUIDELINES

The following guidelines are to be used only as a guide for fieldwork activities. For detailed requirements, appropriate EPA protocol(s) should be consulted.

All guidelines end with the phrase "**Unless directed to do otherwise by the OCC**", even when it is not written.

Any variance from OCC PSTD standards must be approved, in advance, by the Project Environmental Analyst (Hydro) managing the case. If that Hydro is not available, the Project Environmental Analyst Supervisor or PSTD Technical Manager must approve the change. A letter, fax, or e-mail copy must document any change. If it is not documented, and the change is questioned, it is possible the change will not be approved or reimbursed.

OCC PSTD requirements may defer, in certain situations, to other state agency requirements regarding activities regulated by that agency. For instance, the PSTD adheres to OWRB rules and regulations for the installation and plugging of monitoring wells. The PSTD also adheres to ODEQ's jurisdiction and regulation over commercial water wells.

However, OWRB and ODEQ standards are considered minimum. The PSTD can, and sometimes does, require practices that may be more stringent than other state agencies. As an example, the PSTD requires over-drilling as the acceptable method for plugging monitoring wells while the OWRB does not. In this instance, the consultant is not only required to meet OWRB minimum standards, but in addition, PSTD requirements as well.

It is the responsibility of the contracting consultant to see that proper protocols are followed in all activities. The consultant is also responsible to see that all necessary equipment is available at the site, and that it is used correctly.

The OCC/PSTD requires 48 hours - (two working days excluding weekends and holidays) written notification prior to commencing any field activity. Notification must be made to the PSTD staff member assigned to the case, the PEA Supervisor and the PSTD Technical Manager. The most convenient way to make this notification is to e-mail the PEA and copy the PEA Supervisor and Technical Manager on that e-mail. One of the PSTD recipients will respond to your e-mail during normal business hours to acknowledge receipt. The consultant should be sure to retain a copy of the notification and acknowledgement for their records. Failure to properly notify can result in field data not being accepted and the work costs not being reimbursed.

Soil Vapor Surveying, Sampling and Description

Organic Vapor Meter (OVM) Soil-Core Surveying

Previously accepted methods of taking soil vapor readings during site soil screening, such as readings from bagged cuttings, will no longer be approved. The following procedure should be implemented when obtaining soil vapor readings from any type continuous soil core:

- If the soil core is not already encased in a plastic sleeve, cover as soon as possible upon exposure to the air to minimize losses to volatilization. Use of heavy-duty aluminum foil is recommended.

- Mark the protective covering material in the middle of each foot of core (example: if core covers the 0 to 4' interval, mark it at 0.5', 1.5', 2.5' and 3.5').
- Utilizing a drill, or similar device, make a hole approximately 1-inch deep without fracturing the core. Consistency in hole size and depth is important. Cover the hole immediately with a gloved finger or rubber test tube stopper. If the core does split, attempt another hole six inches away.
- Take an OVM reading directly from the hole with an instrument protected by a hydrophobic filter. Record the reading two to three seconds after the first response is noted. It is recommended the reading be noted directly on the soil core covering then, transferred to field notes after completing the entire section.
- Clean the drill bit or boring device after each use. Allow instrument to return to background before completing the next hole.
- If denser screening data is necessary, vapor borings can be placed on six-inch spacings. Example: if the core contains only one anomalous "hot-spot" that is bracketed by three of four vapor borings registering zero, vapor data should be collected at locations six-inches on either side of the anomaly.
- Upon completion of the interval (usually 4 to 5 readings), determine whether any of the cored section of soil is missing. If so, adjust depths of readings to reflect the un-retrieved section(s) as necessary, record your data and decide whether to obtain a soil sample for laboratory analysis.

Soil Sampling for Gasoline Contamination Using Methanol Preservation

The immediate fixing of gasoline contaminated soil samples in methanol is a highly effective method to acquire much more accurate benzene and TPH concentration values. It's an efficient process to both reduce soil waste and time spent sampling. The following procedure is submitted as guidance for the collection and fixing of soil samples in methanol for laboratory analysis.

- Unless instructed otherwise, obtain from a certified DEQ analytical laboratory, at least two methanol prepared 40ml VOA vials per boring. These VOA's will have been pre-weighed by the lab and contain an exact volume of methanol (usually 10.00 ml). Each will come with a disposable HDPE coring device. Because sample weight is integral to the analysis, no additional labels should ever be added to the sample container. Transport all samples cold.
- After completing vapor screening on each separate section of core, determine whether or not sampling is warranted. If yes, take a VOA out of the cold container, place in a test tube rack or similar holder, and loosen the cap.
- At the place on the soil core you wish to sample, cut and/or peel back the protective sleeve or film encasing the core. Use a fine toothed saw (i.e., hacksaw) to cut open plastic sleeves. Scrape off a veneer of soil, 1/8" to 1/4" deep, and immediately plunge in the coring tool. Typically this will yield a 1cc to 2cc (maximum) plug of soil. Quickly lift the VOA cap, inject the plug into the methanol and close tightly (make sure no sand or silt is sticking to the sealing edge of the glass vial). Temporarily number the sample jar until all other sampling is completed.
- When all sampling of a boring has concluded, properly label all sample jars with an indelible marker, return vials to the cold carrier, fill-out a chain-of-custody and transport to the laboratory for analysis.

Monitoring Well Installation

Unless instructed otherwise by PSTD, all monitoring wells drilled for the ORBCA T1A investigation must be completed as 4-inch wells, and each well at least 20-feet deep. Any change in the diameter or depth, either shallower or deeper, must be approved by the managing Hydro.

Reasonable rates, as described in the Unit Cost Sheets, are based on all monitoring wells being 4-inches (4") in diameter. Depending on their projected use, the consultant may, at his/her discretion and risk, install two-inch (2") wells for monitoring wells other than the initial, four ORBCA wells. However, if it is subsequently determined that a 4" well would be more applicable at a specific 2" well's location, the replacement of the 2" well will be at the expense of the consultant.

- The OCC PSTD requires the installation of all monitoring wells and soil borings be conducted using hollow-stem augers with a split-spoon sampler that is a close-fit inside the hollow stem of the augers.

If, due to site-specific conditions, this method of well installation cannot be used, the consultant must contact the OCC/PSTD for instructions on how to proceed. The PSTD encourages the development of new technologies. Clear plastic sleeves for split spoons, similar to those used with Direct Push rigs, are now available. The PSTD will allow their use.

- A properly calibrated and working organic vapor-monitoring (OVM) device should be used to check all samples.

Vapor meters other than a photoionization detector (PID or HNU) must be pre-approved before use. Use of a probe other than 10.2eV must be noted on the logs.

- Monitoring wells must be drilled sufficiently deep to fully assess the site.

Well-screen lengths should be selected, if possible, to cover the entire smear-zone and water table fluctuations. In drilling a new area, it is often difficult to determine water table fluctuation. Normally, 5' above and below the smear-zone should be sufficient.

First water encountered may not be an appropriate guide when determining well-screen depth. After the first well is installed at a site, it should be possible to more accurately assess proper screen depth. Using a standardized screen length for all wells at a site should be avoided.

For most monitoring wells or soil borings, groundwater will be encountered within 20' of the surface. For sites where groundwater is deeper, refer to OCC guidelines on groundwater sampling. In cases where it appears that you will have to drill deep to find groundwater, do not drill past the pre-approved depth without first contacting the PSTD Hydro managing the case. If the Hydro cannot be reached, contact the PEA Supervisor or PSTD Technical Manager.

- Each newly installed monitoring well must have a permanent identifying number, such as MW-1, MW-2, etc., or other identifying character, placed in an assessable location on either the well protector or surface pad.

- A complete boring log with detailed lithology descriptions must be prepared for each monitoring well/soil boring.

The individual describing soil lithologies must have the proper training, experience and tools to complete the sample description and prepare the boring log. As a note, make sure that all

equipment batteries are charged, all tools are in working order and all supplies on hand before starting work. The PSTD will not reimburse costs for poorly performed work caused by faulty equipment, i.e., a lack of OVM readings because the instrument's battery would not hold a charge.

➤ In addition to sample descriptions and OVM readings, the soil-boring log should also contain the following data:

- ✓ Diameter of the borehole.
- ✓ Diameter of the casing.
- ✓ Top and bottom of the well screen.
- ✓ Method of drilling, e.g. hollow stem, solid stem etc.
- ✓ Depth to first encountered water.
- ✓ Total depth of the hole.
- ✓ Headspace vapor readings at a regular interval. The OCC PSTD recommends, at a minimum, 2'-intervals.
- ✓ Sample descriptions **must** include USCS Symbol, color, grading (sorting), moisture content, odor, and any other significant characteristic.
- ✓ Survey information for the location and elevation of the well (boring).
- ✓ Other data commonly included on a soil-boring log.

➤ While installing any monitoring well, soil boring, or push-pull probe, proper decontamination (decon) procedures must be followed.

- ✓ All drilling and sampling tools must be cleaned before arriving at the site. If auger-flights will be used repetitively, each flight must be deconned before reuse. Steam or high-pressure hot water is the preferable washing media. However, the OCC recognizes this is not always possible. Whatever method is used, the augers must be adequately deconned between uses.
- ✓ Sampling tools must be deconned prior to each use by washing in two, separate containers, each dedicated for the decontamination washing process. Wash water will contain a washing agent, such as Alconox or another environmentally safe agent, designed for that purpose. Dishwashing detergent is not acceptable. Sampling tools must then be rinsed in clear water, in a dedicated container used only for rinsing.
- ✓ The wash and rinse water must be changed between boreholes.
- ✓ All decon water should be collected, stored and disposed of in an appropriate manner (such as drummed with groundwater waste).

➤ A correctly filled-out and signed OWRB Monitoring Well Completion Report or Plugging Report for monitoring wells must be submitted after installation or plugging of any monitoring well, soil boring, or push-pull hole. A copy of this form(s) is to be included in the report generated for the installation activity.

➤ Overdrilling is required when plugging monitoring wells. Overdrilling refers to the casing in the well.

The same size auger used in the installation of the borehole shall be used to drill out the well. Using a smaller bit, or smaller diameter augers, is not acceptable.

Developing and Sampling Monitoring Wells

➤ All wells must be constructed according to OWRB rules.

➤ All wells should be developed before sampling.

The purpose of developing the well is to remove as many fines as possible from the filter pack and surrounding formation to assure that sampled groundwater is naturally occurring groundwater. The proper method of development depends on many variables but must involve surging the saturated zone. The well should be surged, and surge water removed, until produced water is reasonably clear and turbidity meter readings stabilize to less than a 10% variance between a minimum of four consecutive readings. Other groundwater parameters (temperature, pH, conductivity, DO, etc.) should have also similarly stabilized.

➤ Bailing or pumping three well-bore volumes is not an acceptable method of development, nor is bailing a 4"-well with a 2"-bailer.

➤ If doing low-flow sampling, the collection of temperature, conductivity and pH data are required for each well, and submitted in the report for each event.

➤ If circumstances require, well development, prior to adding the bentonite seal, will be allowed.

If it is impractical to re-deploy the drilling rig or another type of developmental rig to the site after the grout has had time to cure, it is permissible to develop the well after placement of the sand-pack. However, after such development, the top of the sand-pack MUST be re-tagged to assure its top is positioned at a proper depth.

➤ When recovery in a monitoring well is so slow that development might not be practical, please contact the PSTD for further help and direction.

➤ All wells should be purged, if possible, before groundwater samples are collected. The implementation of low-flow sampling is highly recommended for monitoring wells with low hydraulic conductivity.

Purging can be done with a clean new bailer, or it can be done with a down-hole pump. If a pump is used, it must be thoroughly decontaminated between wells. Pumping plain water through the pump is **not** proper decontamination.

➤ Do not use black electrical tape, duct tape, or anything similar, on down-hole equipment.

➤ The repetitive use of dedicated bailers is not allowed. Bailers may not be stored in a well.

Disposal

- Soil or groundwater wastes produced during corrective actions at a site must be sampled before it is removed from the site for disposal.
- ✓ Water generated by site activities may not be run through a filtration system and discharged without first being sampled and tested for levels of required chemicals of concern.
- ✓ A discharge permit from the appropriate agency must be obtained prior to any on-site discharge.
- ✓ Small volumes of soil generated during the installation of borings should be stored on-site, in approved steel drums.
- ✓ If soil wastes are to be spread on-site, pre-approval must be obtained from the PSTD.
- ✓ A completed, OCC PSTD Waste Disposal Form, including dates and original signatures, must be submitted for all disposed material. A copy of this form is available on the OCC website.
- ✓ All disposal, as well as disposal methods, must be pre-approved.

Construction Activities

Construction activities should be carried out in a safe and efficient manner. All state, federal (including OSHA) or local rules and regulations are to be followed.

The type of activity being performed, the type of site and the location of the site will determine activity requirements. As an example; if concrete is being replaced at a truck stop, requirements for replacement concrete will differ from replacement concrete at a convenience store that has, primarily, automobile traffic.

It is the consultant's responsibility to make sure all required activities are performed in a workmanlike manner. The consultant, or his/her representative, must have knowledge of site construction practices and is required to be immediately available at all times corrective action activities are taking place.

- Proper construction procedures are required at all OCC/PSTD sites.
- "Site Restoration" involves restoring a site to its original condition. Should a site owner wish to do something in conjunction with PSTD activities, those activities will be considered, and may be allowed. However, pre-approval by the PSTD is still required.
- At excavation projects, compaction of replaced soil is required. An independent company that regularly performs compaction testing on soils must conduct the testing.
- When replacing concrete, slump testing of every load is required. An independent company that regularly performs slump testing must conduct the testing. Costs incurred for slump testing will be reimbursed.
- Concrete that tests at more than a 6-inch slump should not be placed.

After conducting the initial slump test, **absolutely no** water should be added to the load without the load being re-slumped.
- After concrete is placed and cured, the PSTD may require cores be taken for strength testing.
 - ✓ If the PSTD requires coring and testing, reasonable costs for these activities will be reimbursed.
 - ✓ If the consultant orders the coring and testing, costs will not be reimbursed by the OCC/PSTD unless, as the result of that coring and testing, the concrete is shown to meet requirements.

- ✓ If, as a result of testing, the concrete is found to not meet standard strength requirements, costs associated with the placement of the concrete will **not** be reimbursed, and the consultant may be required to remove and replace the concrete at their expense.