

Before Your Site Screening

Before you visit a site, please make these preparations:

- Step 1:** Coordinate your site screening with your Country Coordinator to make sure your plans are consistent with the regional priorities, budget, and timeline. Discuss any potential health and safety issues at the site.
- Step 2:** Research your site. Look for sampling data from other research projects. Examine available maps, such as from Google Maps, Google Earth or government sources, to familiarize yourself with the area and key features such as the locations of roads, residential areas, industrial or mining areas and water bodies. Try to make sure the site is within the Toxic Site Identification Program scope of interest. The TSIP is primarily focused on legacy pollution and therefore does not normally include sites which involve ongoing operations and which should be controlled by the relevant Regulator. We are only interested in site that have:
- 1) toxic pollution (including heavy metals, POPs, radionuclides, dioxins, PCBs, POPs, VOCs, among others, not biological pollution such as from poor sewage treatment)
 - 2) in concentrations above the health standards
 - 3) from a “point source” (not cars and trucks, or multi-source contamination in an entire river system)
 - 4) with migration to areas occupied or used by people
 - 5) an with an exposure pathway to humans
- Step 3:** Identify a local contact or guide. Call local people to schedule interviews. Try to meet with:
- 1) Local authorities (mayor, environmental agency, health agency)
 - 2) Local organizations and community groups
 - 3) Local health professionals
 - 4) Local residents affected by the problem
- Step 4:** Prepare your equipment. You will need:
- 1) **A camera.** Please check your batteries and set your camera to take large, high-resolution photos.
 - 2) **Program Summary.** Bring information about the TSIP project to share with local officials and residents.
 - 3) **A notepad and pen.** Please take detailed notes.
 - 4) **A map** of the site (try printing from Google Earth or a local map)
 - 5) **GPS** device (if you have access to one)
 - 6) **Personal protective equipment.** Protective equipment is necessary if the investigator could be exposed to the pollutant. If you need to purchase protective equipment, please contact the Country Coordinator or Regional Director in New York. Safety is

very important. Please be careful and avoid potentially dangerous situations. See the Health and Safety section for further information.

Step 5: Identify Laboratories and Prepare for Sampling

- 1) Identify likely contaminants for which samples will be taken and analysis will be required.
- 2) Identify the laboratory to be used. In general, the Country Coordinator should advise investigators on laboratories that should be used. Where possible these will be certified laboratories. If no certified lab is available, the labs should be the best environmental lab readily available, which may be connected to government health or environmental departments or universities.
- 3) Obtain prices for sample analyses and alert the laboratory that they may be receiving samples. Confirm that they can do the desired analysis. Ask about and record the method they intend to use. When you receive the price quote from the lab, contact your Country Coordinator and Regional Director in New York to see if the price is acceptable.
- 4) Ask the laboratory about any specific requirements regarding sampling containers, quantities needed and sample preservation requirements. Also ask the laboratory about labeling or packaging requirements for the samples.
- 5) **Prepare Sampling equipment.** The equipment will depend on the pollutant and the type of sampling (soil, water, food, etc.). Follow the laboratory instructions. Generally, you will need:
 - i. Something to collect samples (shovel, spoon, bottle)
 - ii. A permanent pen to mark samples (like a Sharpie)
 - iii. Storage containers for samples (bags for soil, bottles for water)See the Sampling Protocol Guidance for further information.

If there are multiple sites in an area, plan to visit all of the sites in one trip to the extent possible.

During Your Site Screening

Please take lots of notes and pictures, and keep all receipts for expenses.

Step 1: Meet with local people that understand the site and may be aware of health impacts from the site or community health problems. Ask them about the source, the migration routes, pathways, and the points where people are exposed. These local people could be a Mayor, employees of environmental organizations, a local doctor or nurse, the owner of the site, local school officials or other residents.

Ask these locals if they have any reports, studies, maps, about the site. If they have these, make copies there. Upload these documents to the online database when you return.

Step 2: Walk around site to understand the source, the pollutant, the migration routes, the pathways and the impacts. Use appropriate personal protective equipment if necessary. Take lots of pictures (at least 10) of the pollution source, migration routes, and the contaminated areas (such as streams, storm runoff channels or off-site waste piles). If there are people in or near the impacted area, please take pictures to show that potential for contact between the pollution and people (ask their permission to be photographed). Define the areas that might be impacted by the pollution and which should be considered part of the “site” for our purpose.

Step 3: On your map, mark the location of the pollution source, the migration route, the local neighborhoods that are affected, and any other important landmarks or sites.

Step 4: If you have a GPS recording unit, record GPS coordinates for:

1. The pollution source
2. The center of the affected area (you will enter this coordinate into the second page of the online database in the GPS mapping field)
3. Locations of samples

Step 5: If there are no credible test results from other reports, please take samples (see the Sampling Guide in this handbook). Please record your sampling locations on your map and (if you have GPS) record the GPS coordinates for each sampling location.

Step 6: Explore the community to try to understand how many people could possibly be affected by the pollution. If the impacted area is a residential

area, count or estimate the number of dwellings and estimate the number of people per dwelling, using available maps, information for governments or community leaders and your own observation. If schools are present, ask about the number of students. If a contaminated water source (wells or surface water) is suspected, ask about and estimate the number of people using this water source. At the end of the screening you will enter the “estimated population at risk” based on the number of people that could possibly be exposed through the pollution migration pathways.

Remember to keep all of your receipts

Sampling Guidelines

SOIL SAMPLING PROTOCOL FOR METALS

HEALTH AND SAFETY

Follow health and safety guidelines detailed in the Investigator Handbook.

MATERIALS REQUIRED

- Clear, polypropylene bags (15)
- Metal spoon (1)
- Labels for bags (15)
- Permanent marker (preferably Sharpie®) (1)
- Notepad (1)

MAPPING

A map should be made of the site that properly indicates sampling locations and key features. Key features include schools, homes, and the pollution source. Electronic maps are preferable, though a scan or photograph of a hand-drawn map is perfectly acceptable.

INTERVIEWING

Interviews with local residents and community leaders are key to understanding the pathways present. Try to understand which areas are commonly used and which are rarely used. This will help guide how you divide sectors.

ESTIMATING POPULATION

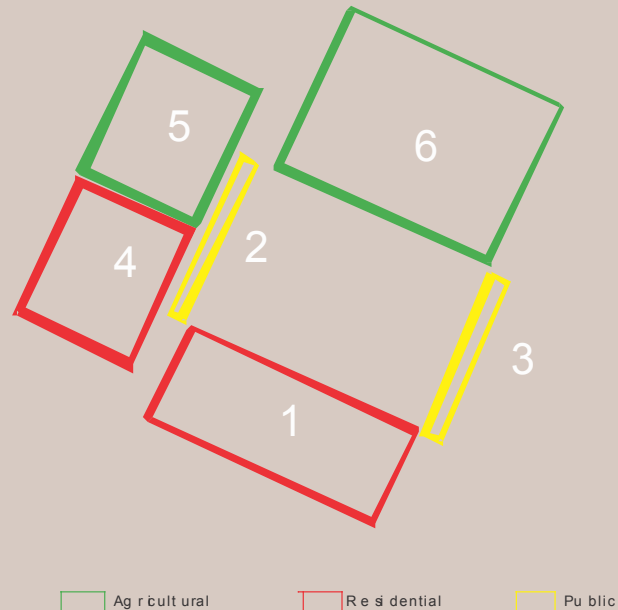
Estimate the approximate number of people coming into contact with the pollutant in each sector. When considering soil samples, the number should reflect only those coming into contact with soil. Make a note of the groups at risk (children, workers, etc.)

COMPOSITE SAMPLING

Divide the site into two to six 'sectors' based on use. The following categories are recommended: **agricultural**; **residential**; and **public**. Larger sites will require as many as 6 sectors, smaller sites may be covered in as few as 2.

Depending on sector size, collect from 3 to 10 samples of surface soil per sector evenly distributed. Note that larger sectors will require more samples. Each sample should be about one half teaspoon (2.5 cubic cm, 5 grams). Combine all the samples in the same bag and blend the material to form a 'composite.' Label according to Labeling Samples instructions on reverse. (See [Figure 2](#)).

*Note that Sampling in Figure 2 will result in 6 composite samples, one for each sector.



TARGETED SAMPLING

In addition to composite sampling, up to 4 target samples should be taken. Targeted samples should be individual surface soil samples of 25 to 30 grams and should be taken from suspected 'hot spots,' such as residential areas adjacent to a contamination source (See _____).



HUMAN EXPOSURE PATHWAY

Note that samples should only be taken from areas with a potential human exposure pathway. Samples should NOT be taken from areas without a human exposure pathway. For instance, the inside of a container is NOT an acceptable sampling location. Similarly, a secure area that is sufficiently fenced off with appropriate signage is NOT a suitable sampling location.

LABELLING SAMPLES

Each sample should be labelled in this order :

1. Site Name
2. Medium
3. Targeted or Composite
4. Description of Sample Location
5. Date
6. GPS Coordinates (if known)
7. Investigator Name

Example: _____

WATER SAMPLING PROTOCOL

When the event that watersamples are required, take 1-2 samples from a Human Exposure Pathway (e.g. a drinking water tap or a river used for fishing).

For Metals:

Use acid-washed, trace clean certified HDPE or LDPE plastic or glass bottles (250 or 500 mL).

For Semi-Volatile Organics:

Use amber glass solvent-cleaned certified bottles with the lined cap (250 or 500 mL).

STEPS:

1. Flush the tap
2. Rinse the bottle with water being sampled
3. Fill bottle to the brim
4. Cover with seal
5. Transfer to a lab within 2 days (keep cool if possible)

After Your Site Screening

- Step 1: Enter your notes and data into the online database as soon as possible once you return. It is best to enter you screening into the database on the same day you return. We do not want you to forget any details about the site.
- Step 2: Upload your photos, notes from interviews, maps, reports, and any other documents into the online database.
- Step 3: If you took samples, contact the laboratory previously identified for use, and inform them of the number of samples collected and the contaminants for which the samples are to be analyzed. Bring or ship the samples to the laboratory according to their instructions. Confirm the cost for the analysis and how long it will take to get results. Be clear and specific as to whom the results should be sent and how (such as a specific name and email address.) Follow up with the laboratory if results are not received when expected.
- Step 4: Once your site screening is entered into the online database, mark “ISS Complete” in the online site screening and tell the Regional Coordinator and Regional Director that your site is complete.
- Step 5: At the end of each month, create a financial report showing the number of full days you worked, the number of travel days (for per diem payment), and your expenses. Number your receipts (#1, #2, #3, etc.) so we can tell which expense goes with which receipt.

MAP THE SITE

Draw or copy a map of the site that shows the pollution source, the pathways to humans, the location of your samples and any pollution hotspots, neighborhoods that might be affected, and any other relevant landmarks or sites.

A digital map is preferable, though hand-drawn maps are acceptable.

DIGITAL MAPS

Digital maps can be drawn using [bing](http://www.bing.com/maps/) (<http://www.bing.com/maps/>), Google Earth or a number of other free software applications.

Bing Maps (Figure 1)

1. Right Click on location > "Add a Pushpin" Name and Save the Pushpin
2. Mark area of contamination using area tool in "My Places Editor"
3. Actions > Export > KML

Google Earth

1. Use Path tool to draw area.
2. Save Path
3. Right Click Path in Places Menu > Save Place As > KML

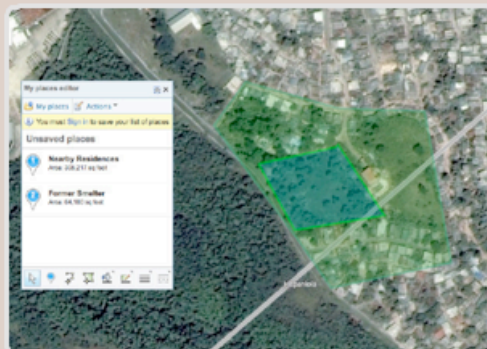


Fig. 1. Created in Bing Maps and exported to KML. This simple map sufficiently demonstrates the pollution source and affected area.

Samples and Lab Data

In this program, we base our evaluation on whether health effects are likely to exist according to widely accepted and peer-reviewed literature. We do not undertake health studies, but look to existing studies, and assume similar health impacts.

We use international health standards as our baselines. The Blacksmith website has downloadable spreadsheets that list acceptable levels of pollutants found in air, water, and soil, as calculated by the World Health Organization, U.S. Environmental Protection Agency (EPA), the European Union, and others. The form can be downloaded here:
(<http://blacksmithinstitute.org/files/FileUpload/files/Maximum%20Recommended%20Levels.xls>)

Health studies conducted by local authorities at sites investigators visit are valuable to support our screening. These studies should always be copied, scanned and uploaded. However, we will not generally use these data to make decisions about site remediation. Instead, we will use credible and accurate sampling results, compared against international standards, as our basis for determining the existence of or potential for health risks associated with contamination at the site. Other local studies should be collected, scanned, and appended to the ISS if available as background information.

In many cases, a separate agency may have already carried out sampling at a site. When these samples are available and credible, the mean of all samples should be taken and entered into the Credible Test Results box. Individual sample results should be listed on the second page of the ISS in the Samples Taken box and uploaded as an attachment.

If no sampling data exists, Investigators should conduct sampling according to Blacksmith's guidelines. Each sample should come from a known or suspected human exposure area and should relate to an identifiable pathway. For examples, samples collected from a drinking water source are better than samples from an industrial effluent pipe. Similarly, samples from soil inside a community are better than sample from inside an industrial estate or workshop.

Once samples are collected, send them to a reliable and certified regional laboratory. Tell the laboratory which parameters/pollutants to test for based on which pollutants are most harmful to human health and your investigation of the pollution source. Try to be as specific as possible. For example, Total Volatile Organic Compounds (VOCs) is an acceptable parameter, however if the source of the pollution is petroleum production, it may be better to test for Toluene or Benzene because they are commonly associated with petroleum. Similarly, laboratories can be asked to analyze for all heavy metals, but it is far better to

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specify specific metals such as lead, mercury, cadmium or chromium (preferably for hexavalent chromium).

Enter composite test results in the Credible Test Results box, and enter any other test result details in the second page of the ISS in the Samples Taken box and upload the laboratory results as an attached document.