

TABS ON CONTAMINATED SITES

Contaminated Sites Program - Federal Sites

This is one in a series of Technical Assistance Bulletins (TABs) prepared by Environment Canada-Ontario Region for Federal Facilities operating in Ontario.

TAB #7



Developing Terms of Reference For Contaminated Site Remediation

DESCRIPTION:

The Terms of Reference document outlines the scope of the services that are required from the consultant in order to carry out a site assessment/remediation. It is usually drafted by the site manager as part of a "Request for Proposals" and sent out to various consultants. The consultants then submit their proposals to the scientific authority, who selects the one which is deemed most appropriate. A well written "Terms of Reference" document will result in a more consistent set of consultants' proposals, and therefore a simpler consultant selection process.

The purpose of this TAB is to demonstrate the format of the Terms of Reference document, and to describe the content of each of its sections.

***Note:** The consultants' proposals and the assessment will only be as comprehensive as the information outlined in the Terms of Reference.*

Terms of Reference:

1. INTRODUCTION

In this section, a general overview of the site location and the nature of contamination is described. It should contain the following items:

- Location and size of the site.
- The site's land use.
- A brief summary of the nature and extent of contamination.

2. SITE DESCRIPTION

The site description should provide enough information to allow the consultant to fully

comprehend the status of the site. It should contain the following items (if known):

- Ownership of the property.
- The source of contamination.
- How the contamination occurred (originated).
- Summary of previous work to characterize the contamination (e.g. consultant reports).
- General site hydrogeology.
- Detailed description of the contamination.
- Surrounding land use (if applicable).
- A map of the site.

Any further available information that is pertinent to the characterization of the site and the contamination should be listed.

3. OBJECTIVES

The purpose of this section is to outline the scope of the work that is being requested. It is the quantifiable information required to properly assess the site. This section will be site-specific.

At the very least, the consultant should be requested to provide the following information:

- A description of the site's hydrogeology.
- Identification of the source of contamination.
- A characterization of the types and concentrations of contaminants.
- Definition and delineation of the horizontal and vertical extent of the contamination, and identification of the boundary of the contamination plume.
- The contaminant migration pattern and rate.
- An estimate of the volume of contaminated soil.
- A determination of the extent to which the groundwater has been contaminated. Include an estimate of the volume.
- The potential and existing health and environmental impacts of the site.
- An evaluation of the contaminant concentrations in relation to the CCME Interim Environmental Quality Criteria for Contaminated Sites.

Based on this information, the consultant should:

- Determine whether or not remediation is necessary.
- Identify possible cost-effective remedial options.
- Evaluate the remedial options with respect to cost, complexity, time and space requirements, and efficiency of remedial technology to meet CCME criteria.

4. STATEMENT OF WORK

The statement of work is the body of the Terms of Reference. It should specify the site assessment procedures that the consultant should follow in order to meet the above objectives. The consultant will use the statement of work to develop the requisite methodology.

TAB #2 contains a detailed description of the site assessment process and should be used in conjunction with this TAB when drafting the statement of work.

The following sections should be included in the statement of work:

(4a) Preliminary Meeting

The first step to be requested is a meeting between the scientific authority and the consultant

in order to outline the logistics of the work that the consultant will be performing. This meeting should be conducted using a team management approach, and should include all participating contractors and sub-contractors, and others as required. During the meeting, the following should be discussed.

- Work plans.
- Security clearances.
- Safety considerations.
- Scheduling of site visits, interviews, sampling and analytical programs, and future meetings.

Any additional information that may be required to initiate the consultant's work should also be discussed.

(4b) Preliminary Site Assessment

The purpose of the preliminary site assessment is to obtain initial information about the facility, the site, and the contamination. The following should be requested of the consultant:

- A full literature review should be conducted. Information as outlined in **TAB #2** should be reviewed.
- Interviews should be conducted with all persons that have knowledge pertaining to the site.
- The consultant should perform a site visit.

Other preliminary site assessment measures (e.g. well records, air-photos, etc.) may be needed in order to characterize the site.

At this stage, the consultant should complete the National Classification System (NCS) detailed evaluation form for contaminated sites, and append it to the site records. Even if the form has been filled out at an earlier date, it should be completed again in light of the new information that has been obtained.

(4c) Site Screening

The purpose of site screening is to characterize

REPORT: After the preliminary site assessment is complete, an interim report outlining the findings should be prepared and presented by the consultant.

the general extent of the contamination and to direct the sampling and analysis program into the areas of greatest contamination. Two types of site

screening methods are primarily used: geophysical surveys and soil gas surveys (refer to **TAB #1 & #3**).

The consultant should outline and justify the type of site-screening he/she has chosen. They should mention who is performing the survey as well as the size and location of the area being surveyed.

(4d) Sampling Program

The location and type of sampling is largely dependent upon the preliminary site assessment. The consultant should, however, be able to

REPORT: After the Site Screening process is complete, the consultant should prepare and present an interim report outlining the findings.

provide a rough estimation of the sampling program in the proposal. The following information may be requested in the Terms of Reference:

- Who is performing the sampling.
- QA/QC procedures that are to be followed.
- What type of excavation is to be performed (e.g. surface, test pit, and/or borehole and well installation, etc.).
- Approximate number of sample locations.

The proposed sampling program should be refined by the consultant after the preliminary site assessment, and should be approved before the program is initiated.

(4e) Analytical Program

The analytical program is a vital component of the site assessment work. To ensure the proper analysis of samples, it is recommended that the laboratory which will perform the analyses be certified by the Canadian Association for Environmental Analytical Laboratories (CAEAL). **TAB #4 & #5** contain a detailed list of the information that the laboratory should provide both before and after the sample analysis. This information should be requested of the consultant, along with the laboratory's QA/QC procedures.

(4f) Risk Assessment

The purpose of the risk assessment is twofold. Firstly, to determine whether or not remediation is necessary, and secondly, to determine the scope of remediation.

The consultant should be asked to use the CCME Interim Canadian Environmental Quality Criteria for Contaminated Sites as well as all relevant federal/provincial/municipal regulations to determine assessment and remediation criteria (refer to **TAB #9**).

(4g) Remedial Investigation/Feasibility Study (RI/FS)

The consultant should conduct an RI/FS in order to examine the various possible remedial measures that may be used at the site. The RI/FS should:

- List and evaluate possible remedial measures.
- Outline the cost and the safety of the remedial measures.
- Prioritize the remedial measures.

REPORT: After the site assessment work has been completed, the consultant should prepare and present a final report outlining the results. The report should provide all information outlined in the objectives.

5. PROJECT MANAGEMENT

This section should contain the management procedures that will ensure a functional working relationship with the consultant. It should state:

- who acts as a liaison with the consultant;
- the number of copies of the report that should be made available by the consultant;
- the format of the reports (e.g. a hard copy and/or a floppy disk);
- that changes to the costs and/or time outlined in the proposal will require approval;
- that changes to the procedures outlined in the proposal and additional work will require approval; and,
- the number of future meetings with the consultant, including when the meetings will be held (at what stage of the assessment) and the location(s).

It should be requested that the consultant's proposal include a company profile, as well as a listing of the company staff that will be assigned to the project, and their experience.

6. PROJECT SCHEDULE

In this section, a timetable and payment schedule should be provided, or it should be requested that the consultant do so.

7. PROPOSAL EVALUATION CRITERIA

The purpose of this section is to outline the manner in which the consultant's proposal will be reviewed. The following criteria may be used and weighted according to their importance:

- Capability to carry out work.
- Management of work.
- Methodology.
- Quality of proposal.
- Geographic location.
- Cost.

8. SPECIAL REQUIREMENTS

Any special requirements that you wish to impose upon the consultant's work should be clearly stated. These may include confidentiality, use of the metric system, security clearances, safety requirements, computer software to be used, etc.

9. INSURANCE

In order to absolve the site owner of liability, insurance measures should be clearly outlined. This may include stating that the consultant is liable for property damage, and/or that the site owner is not responsible for bodily injury caused to the consulting firm's employees.

10. SUBMITTAL OF PROPOSAL

In this section, a deadline for the submittal of the consultant's proposal should be stated. As well, it should include the name and address of the contact to which the consultant should forward the proposal.

SOURCES

Raven Beck Environmental Ltd. (1994). *National Contaminated Sites Remediation Program, Model Terms of Reference for an Assessment Study of a Contaminated Site.*

For further information please contact:

Environment Canada
Ontario Region - Environmental Protection Branch
Environmental Contaminants &
Nuclear Programs Division
4905 Dufferin Street
Downsview, ON M3H 5T4
Telephone: (416) 739-4826
Fax: (416) 739-4405

Our TABs can be found on the Internet at:

<http://www.on.ec.gc.ca/pollution/ecnprd/>