Feasibility Study Checklist

Toxics Cleanup Program

May 2016

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Site Name/FSID:

Report Name:

Date Submitted:

Reviewed By:

Review Date:

Feasibility Study (FS) Checklist Guidance

The Model Toxics Control Act (MTCA) regulation Washington Administrative Code (WAC) 173-340-350(8) broadly describes the elements necessary to complete an FS. The purpose of an FS is to develop and evaluate cleanup action alternatives to enable a cleanup action to be selected for the site. At this point in the cleanup process, all remedial investigation (RI) work should be completed and the site should be fully characterized. When selecting cleanup alternatives, make sure remedies are not selected or dismissed prematurely; the FS process should be performed objectively without a preferred remedy in mind.

This FS checklist is considered guidance based on the MTCA cleanup regulation WAC 173-340. Cleanup project managers with the Washington State Department of Ecology (Ecology) have discretion when reviewing and accepting FS reports as site-specific circumstances dictate the necessary scope and breadth of each report.

Note: *This document assumes that an FS and disproportionate cost analysis (DCA) are necessary for the site. If concentrations of hazardous substances do not exceed the cleanup level at a standard point of compliance, no further action is necessary, and an FS is not required. If a potentially liable person (PLP) meets the eligibility criteria and appropriately follows the requirements for use of a model remedy, they are not required to conduct an FS or a DCA. If a PLP and Ecology agree on a permanent remedy a DCA is not required [WAC 173-340-360(3)(d)].*

In addition, there may be circumstances where selection of the appropriate remedy is straightforward or where a comprehensive remedial action will be implemented so that MTCA Method A cleanup levels are ultimately met throughout the site. If either of these situations apply, Ecology encourages PLPs to discuss their preferred approach with a cleanup project manager.

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Feasibility Study Report Body

I. Cover Letter

Include a letter describing the submittal and specifying the desired department action or response.

II. Introduction

For a stand-alone FS, the introduction should include a brief summary of the RI results and previous site investigations; this summary should include the following information, updated with the most recent data:

a. Brief background of the site, site investigations, and any interim actions.

b. Results of any additional investigations conducted since completion of the RI.

c. Conceptual Site Model (CSM). Describe the location, extents, estimated amount, and concentration distribution of contaminants of concern (COC) greater than proposed screening levels for each affected medium.

d. Preliminary cleanup levels for indicator hazardous substances in each medium.

e. Proposed point of compliance for each affected medium, if different from the standard.

f. Applicable local, state, and federal laws

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III. Alternatives

a. **Identify Remedial Action Objectives.** Describe the cleanup objectives and their compliance with MTCA.

b. **Identify a Reasonable Number and Type of Alternatives.** Include a brief description of each alternative. Ecology recommends evaluating at least **three** alternatives, taking into account the characteristics and complexity of the facility, including current site conditions and physical constraints. Include at least one permanent alternative, at least one alternative with a standard point of compliance, and a no action alternative if applicable (see WAC 197-11-440(5)). Do not include alternatives that clearly do not meet the minimum requirements per WAC 173-340-360, do not pass the DCA per WAC 173-340-360(3)(e), or are technically impossible to implement.

Note: *For sites conducting an FS under an order or decree, Ecology makes the final determination of which alternatives must be evaluated in detail in the FS.*

IV. Detailed Evaluation and Selection of Alternatives

a. **Threshold and Other Requirements** [see WAC 173-340-360(2)]. Describe in detail how each alternative meets the criteria outlined below. Alternatives must meet the threshold requirements and use permanent solutions to the maximum extent practicable. If an alternative does not meet these criteria, it should be eliminated from further consideration.

i. **Protect human health and the environment.** This is a critical requirement. Consider to what degree the alternative reduces risk, how much time it will take to meet cleanup standards, and any on-site or off-site risks related to implementing the cleanup. If necessary, evaluate residual threats posed by each alternative, and determine if remedies that are protective of human health are also protective of ecological receptors.

ii. **Comply with cleanup standards.** See WAC 173-340-700 through 173-340-760.

iii. **Comply with applicable state and federal laws.** See WAC 173-340-710.

iv. **Provide for compliance monitoring.** See WAC 173-340-410 and WAC 173-340-720 through 173-340-760.

v. **Reasonable Restoration Time Frame.** Describe the estimated restoration time frame for each alternative and the basis for this estimate. Discuss the reasonableness of this time frame using the criteria in WAC 173-340-360(4).

b. **DCA Ranking Criteria.** Compare and contrast each alternative for each of the following criterion [WAC 173-340-360(3)(f)]. Rank each alternative from most to least permanent, based on the evaluation of the criteria below.

i. **Protectiveness.** Overall protectiveness of human health and the environment.

ii. **Permanence.** The degree to which the alternative permanently reduces the toxicity, mobility, or volume of hazardous substances. Consider treatment capability, reduction of releases, management of the sources of release, degree of irreversibility of treatment, and the quantity and quality of treatment wastes.

iii. **Cost.** The cost to implement the alternative. Includes present capital costs, future capital costs, indirect costs, and operation and maintenance costs.

iv. **Effectiveness over the long-term.** Consider the degree of certainty for cleanup success, long-term reliability, magnitude of residual risk, management of treatment wastes, and management of wastes left untreated.

v. **Management of short-term risks.** Assess the risk to human health and the environment associated with the alternative during construction and implementation.

vi. **Technical and administrative implementability.** Ability to be implemented including consideration of whether the alternative is technically and administratively possible.

vii. **Consider public concerns.** Provide a narrative regarding whether the community has concerns regarding the alternative and, if so, the extent to which the alternative addresses those concerns.

V. Remedy Selection

Detail the rationale behind the selection of the preferred alternative. Detail how the alternative meets the expectations in WAC 173-340-370 and addresses public concerns.

Feasibility Study Figures

General – Figures should include a north arrow, scale, complete legend, measurement units, and annotated clarification as necessary. Figures should not be cluttered and must be legible and explicable. Document text must reference figures and draw conclusions consistent with information presented on figures. Consider using multiple figures when showing large amounts of information.

I. Vicinity Map(s)

a. Show property in relation to surrounding region. Area covered by Vicinity Map should be proportional to site size.

b. Show other applicable items including (but not limited to): surface topography, natural areas, surrounding land uses, location of groundwater supply and monitoring wells within a one mile radius.

II. Site Map(s)

a. Show overall site layout with site features and existing well, boring, and sampling locations labeled consistently with current and historical site data and sample names used in the report. If multiple names exist for a sampling location or area of the site indicate this.

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b. Include COC locations, concentrations, and estimated vertical and horizontal extent of contamination for site media, as applicable. Include any waste materials present on site as well as hazardous substance treatment, storage, or disposal areas (show current and applicable historical features).

c. Show geologic/hydrogeologic information including soil types, wells, screened intervals, and water levels (cross sections are useful for showing this information). Show groundwater flow direction and gradient.

d. Show other relevant information including (but not limited to): site and property boundaries, buildings/facilities on site, historical site features, underground storage tanks (USTs), previous excavation/interim action activity, etc.

III. Conceptual Site Model

Provide figures showing contaminant release(s), fate and transport, exposure pathways, and potential and/or actual receptors. The lateral and vertical extent of contamination, as currently understood, should be clearly conveyed.

Feasibility Study Tables

General - Tables should include detailed notes that explain any assumptions or references. All acronyms used in the table should be defined in a section of the notes even if they are defined in the body of the report so table information can be quickly understood.

I. **ARARs.** Include potentially applicable ARAR values, their sources, and whether or not they apply to each alternative.

II. **Evaluation of Remedial Alternatives.** Include description of each alternative, compliance with the MTCA threshold criteria, and alternative ranking for each DCA criteria.

III. **Cost/Quantity Summary.** Include any quantity or cost assumptions made for each alternative.

IV. **Cost Detail for Alternatives.** Itemize costs for each alternative, including (but not limited to) permitting, oversight, labor, disposal, transportation of materials, material costs, incidentals, operations and maintenance, and reporting costs, and provide a total cost for each alternative.

V. If additional site investigations were conducted after completion of the RI, include sampling information, laboratory methods, applicable cleanup levels, and analytical and field measured data. Group by media type. For larger data sets, consider making a summary table to exceedances. Tables should include cleanup or proposed cleanup levels with any contaminant exceedances clearly indicated using bold font or shading. Non-detecible levels should be noted as "U" with the numerical laboratory reporting limit (RL) provided rather than "ND".

Feasibility Study Appendices

General. Appendices should contain a description of content and explain how to interpret the information for use. Not all of the following suggestions will apply to all sites.

VI. Contractor bids or other documents showing how quantity and/or cost estimates were made.

VII. If additional site investigations were conducted after completion of the RI, include exploratory logs, well installation diagrams, field records, analytical laboratory reports, details of field and analytical methods, and any applicable Work Plans, Sampling and Analysis Plans, etc.

VIII. **Limitations.** Explain any limitations that apply to the work.

IX. Other documents that provide additional context or contribute to the understanding of the site or remedial alternatives; see suggested report format for additional information.

Miscellaneous Items

X. **Certification (Licensed Professional Stamp).** Engineering, geologic, and hydrogeologic work must be performed under the seal of an appropriately licensed professional, as required by RCW 18.43 and 18.220.

XI. **Environmental Information Management (EIM).** All sampling data must be uploaded into Ecology's EIM database. This allows Ecology to access data, check results, and/or perform additional analyses. For more information, reference: Submittal Data Requirements.

XII. Additional information may be requested by Ecology as required to fully assess remedial alternatives.

XIII. **Submittal Requirements:** Ecology requests three copies of reports submitted per WAC 173-340-850. Please contact the cleanup project manager for specific submittal requirements.

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To request ADA accommodation or materials in a format for the visually impaired, call Ecology at 509-454-7834, Relay Service 711, or TTY 877-833-6341.