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VCP & Brownfields Site Characterization Template

This template is designed to assist participants and their consultants in meeting the site characterization requirements of the Oklahoma Voluntary Cleanup and Brownfields Redevelopment Program. Participants are not required to use this format, but are encouraged to do so. Whatever format is used, the Site Characterization must meet the requirements set forth by law and rule, and must provide enough information to support DEQ's decision-making. By following this template, you should be able to submit a site characterization report for either the VCP or a Brownfields Program.

This template is coded by color. The **red text** represents areas where the participant can fill in the necessary information, the **black text** is standard language, the **blue text** is instructional information.

Prior to beginning the Site Characterization several things should have already occurred.

- 1) a pre-application conference between the applicant and the DEQ
- 2) the signing of the **Memorandum of Agreement and Consent Order for Site Characterization (MACO)**, and
- 3) in most cases, an ASTM Phase I and a Phase II Site Assessment

Please note that assessments done for the transfer of Real Estate are helpful in Site Characterization but do not by themselves meet the requirements of a Site Characterization. Also, assessments and cleanups conducted for other State agencies and the federal government may be helpful in characterizing the site but cannot necessarily be relied on to meet all of DEQ's requirements for Site Characterization.

The participant must provide two copies of each applicable affidavit showing ownership and notice to owner of intent to characterize the site. DEQ has templates available for these various affidavits.

Prior to beginning fieldwork, the participant must submit a **Work Plan** to the DEQ that provides basic information about the site and contains a sampling and analysis plan, a quality assurance project plan, and a health and safety plan. The sampling and analysis plan must propose sample locations and provide specific information about what media is to be sampled, what types (grab or composite) of samples will be collected, what sampling and analytical methods will be implemented, and at what depths the samples will be taken. The information gathered during the Site Characterization must be of a quality and quantity to delineate wastes sources and the extent of contaminated media on site and off site. This Work Plan must be approved by the DEQ prior to the commencement of fieldwork. Often, work is completed in phases as results may indicate that the area of contamination is not wholly defined.

If the applicant has already conducted some cleanup, specific documentation of all activities conducted must be submitted to the DEQ for evaluation. DEQ in consultation with the applicant will determine what, if any, additional cleanup is needed.

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A **Site Characterization Report** must be submitted at the completion of the characterization. This template may be used for the Report.

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Site Characterization Report

for the

Site Name
Location/Address
City, County

Date Submitted

Participant/Applicant's Name
Mailing Address

Prepared By
Consultant's Name
Mailing Address

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1. Introduction

This environmental site characterization of **Name of Site** was performed by **Name of Consultant** for **Name of Participant**. **Describe the status of the ownership, i.e., who owns it? Are there partners? Is it in receivership? etc.** All assessment activities were performed in compliance with the Site Specific Work Plan submitted to the DEQ on **date work plan submitted to the DEQ** and approved by the DEQ on **date approved by the DEQ**. **If deviations were made from the Work Plan explain what they were and why they occurred and any subsequent DEQ approvals.**

The purpose of the investigation was to identify areas of potential environmental contamination and to accumulate enough data to perform a site-specific risk evaluation of the property.

2. Site Description and Operational History

The site is located at **Address**, which is in the **Legal Description**, in **Name of City and/or County**, Oklahoma, which is **Latitude and Longitude** (Figure 1). The site covers approximately **insert total acreage** acres. **Describe the physical improvements to the property and their locations (i.e., buildings, utilities, parking lots, tanks, impoundments, etc).** **Are there any wastes on site? If so, what type of waste, what is the estimated volume or areal extent of the waste? Is the waste contained, if so, describe the containment?**

Describe the current use of the site. Describe the past uses of the property. This should include all the activities that have occurred on the property back to its first development. Provide a complete operational history of the site, including the regulatory history of each operation. The title documents alone cannot give a clear picture of the operational history. Include information concerning past business operations, waste streams, and disposal practices. List any environmental permits associated with operations at the property. Is the facility in compliance with all its permits? Is the site listed on any environmental databases? Is the facility in compliance with all Local permits, codes, etc? Are there any local records of accidents

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or fires occurring at the site? Have violations of environmental laws occurred at the site?

3. Environmental Setting

3.1 General

Describe the climate, especially annual rainfall, estimated evaporation rate/runoff rate, the average high and low temperatures, and the seasonal prevailing wind direction. Describe the general area/neighborhood, i.e., land use (residential, commercial, agricultural, industrial, etc.). Are there schools, parks, or daycare facilities nearby? Are there wetlands, endangered species, or other sensitive environments associated with the site? If the site is in an urban area, provide maps showing all underground utilities. Are there underground storage tanks (UST) on the property? Have any USTs been removed from the property? Are there above ground storage tanks (AST) on the site? Have ASTs been removed from the site. Did the ASTs have secondary containment features? Is the secondary containment feature still on site? Describe the general direction of surface water runoff. If runoff flows to a storm sewer, provide a map of the storm drains in the area, the location of the storm sewer and its discharge point. Also provide locational information for sanitary sewers that transect or border the property. Is the site fenced? Does the property have a problem with vagrants/trespassers or children playing on site?

3.2 Topography

Describe the general slope of the land and drainage. Is the site in a flood plain? Are there any flooded subgradient areas (e.g., cellars or basements)? Has there been mining in the area? Are there any underground mines in the area. If so, are there any known mine shafts on the property? Are there any active or abandoned strip mines or quarries on the property? Are there abandoned or active oil or gas wells on the property? Are there oil and gas pipelines in the area? Are there dumps, landfills, or impoundments on the site? Are there active or abandoned rail lines on the property?

3.2 Geology

Describe the geology in the area including principal aquifers. Is the area karst? What is the depth to ground water? How is the ground water classified? In what direction does the shallow ground water flow and what is its velocity? Is there information available concerning the flow of the groundwater in the deeper formations? Provide information about potential aquitards and aquicludes beneath the site. Is the ground water confined or unconfined? Does the ground water flow vary with the season? Describe the soils and aquifer media in the area, including their permeability. Provide information as to whether the permeability provided was obtained through measurement or by literature review. Are there any water wells (municipal or private) on site or within a mile of the property? Please note that OWRB well logs cannot solely be relied upon for the identification of wells since many wells were drilled prior to reporting requirements. Provide ground water maps and tables of calculated values, measured data, or literature-derived ranges – showing any assumptions made.

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3.3 Hydrology

Describe any surface water on the property. Is it the result of site use? If surface water exists, does anyone fish in it, swim in it, drink it, or use it in any way? Describe the path and direction of surface water run-on/run-off. Are there any drinking water intakes within a mile of the property? Are there any conduits to surface or ground water on the property (i.e., wells, sumps, ditches, process sewers, sanitary sewers, storm sewers, utilities, pipelines, trenches, mineshafts, etc.). If so, provide a map indicating the location of each.

4. Pathway/Potential Receptor Assessment

In this section, you should list all the potential environmental pathways that could provide a means for contamination from the site to migrate and potentially impact people, sensitive environments (i.e. wetlands), wildlife, fisheries, agriculture, etc. Each pathway should be mentioned (air, surface water, ground water, soil exposure, ground water discharge to surface water, sediment exposure, and vapor intrusion) with a discussion of whether it is a complete pathway or not. If you claim that an exposure pathway is incomplete, you must provide sufficient information to support that claim. If it is a complete pathway, it must be considered in the Risk Evaluation. All potential receptors should be evaluated (i.e., current occupants, nearest resident, remedial workers, construction workers, future occupants, future construction workers, trespassers, as well as all environmental receptors). If some receptors that are traditionally considered in risk assessment methodology are left out of the site-specific risk assessment, justification must be provided and the omissions approved by the DEQ risk assessors, in advance. This approval must be explained and documented in the final report. Please note that if contaminants above screening levels have migrated off-site, the participant cannot control future risks, and some action will be required. Adjacent property owners should be notified that their property has impacted by the neighboring site.

5. Sampling Activities

In this section, you should summarize the sampling activities. When did sampling occur? What were the weather conditions at the time? Did anything unforeseen happen during the sampling event? Were decisions made in the field to deviate from the Work Plan? If so, explain. Provide a map of the sampling points as well as a table listing the samples numbers, depth of sample, matrix sampled, the type of sample (grab v. composite) collected, and the analyses requested.

6. Analytical Findings

Provide a table showing the sample points and the analytical results for all detected pollutants. Provide raw analytical data as well as the QA/QC validation report in the appendices. Provide specific information about samples where the analytical detection limit was above the risk-based screening level developed for that contaminant. Also provide all field screening data, such as Photoionization Detector (PID) readings from head space evaluation. Delineate the areas of waste and contamination on a map. Provide information about the location and volume of the waste and contaminated

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media. In the narrative, discuss the contaminants and provide information about the nature of each (i.e., how mobile is the contaminant in the various environmental media; is it volatile; is it denser than water; etc?) Discuss whether delineation is complete, i.e., is a groundwater plume stable? Have the contaminants moved offsite? Has the direction of the ground water flow been adequately defined for the depth of the plume? Has the leading edge of the plume been adequately defined?

7. Risk Evaluation

The DEQ has developed fact sheets for Risk Based Decision Making (available through the DEQ website www.deq.state.ok.us) and for an acceptable Methodology for Establishing Cleanup Levels for Contaminated Sites document (available by request). These documents may be followed to develop risk based cleanup numbers for the contaminants on site. Please be advised, if you wish to use a different model for Risk Assessment, the DEQ must approve the methodology/model prior to utilization and a complete, licensed copy of any unique software must be supplied to the DEQ for its use. The use of proprietary models is discouraged; all modeling information submitted to the DEQ becomes public information. The potential risk of exposure must be evaluated for all complete pathways and receptors. The DEQ review time may be extended in cases where other risk models are used. Please note that risk based cleanup levels are established for residual contamination left in environmental media and cannot be used for waste sources.

You must identify the future use of the property. If you are proposing that the redevelopment of the property will cut off an exposure pathway, you must provide specific development plans and rationale as to how the exposure pathway will be removed. If a restricted use is proposed, describe how those restrictions will be implemented and enforced.

Cleanup numbers must be developed for all chemicals of concern at the site, based on the future use of the property. The risk evaluation must consider the current and future use of the property.

If your risk evaluation relies upon ground water modeling, please be aware that the DEQ has a ground water modeling policy that should be followed. Model input data and assumptions must be approved by the DEQ ground water modeling team.

8. Remedial Option Evaluation

In this section, you should discuss the most appropriate alternatives to clean up the site. It is appropriate to discuss the benefits of a remedial effort as well as the costs to implement the remedy and maintain the remedy and any engineering and institutional controls. For each option identified, you must identify all applicable or relevant and appropriate standards, limitations, criteria, and requirements (ARARs). If the levels of contamination on site are below the risk based cleanup levels, you should state that fact and request a determination that no remedial action is necessary at the site.

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8.1 Remedial Action Objectives

This subsection should explain what the remedy should achieve. It should identify the objectives to be achieved during the cleanup, such as: to meet the risk based cleanup numbers; to ensure that the site is appropriate for the prescribed reuse; to meet Applicable or Relevant and Appropriate Standards, Limitations, Criteria, and Requirements (ARARs); to ensure that the remedy is as maintenance free as possible to limit long term maintenance costs and accountabilities; to limit the use of institutional controls; etc.

8.2 Remedial Action Alternatives

Based on the information gained during the evaluation of the site, you should be able to identify several ways of cleaning up the contamination. You should identify the best available technology, as well as alternative options and the no action alternative. For each alternative, briefly discuss the technical feasibility of implementing the option, the reliability of the option, and the economic feasibility of that option. Also, identify all institutional controls and engineering control that will be required to ensure the success of that option, the timeline for implementation of the controls, how they will be implemented, who is responsible for monitoring and maintaining the controls, and the annual cost of the controls, as well as, who is responsible to pay for the monitoring and maintenance.

If Monitored Natural Attenuation (MNA) is proposed as a remedial option, please be aware that the DEQ has a MNA policy that should be followed in the implementation of this remedial option.

8.3 No Action

The risk evaluation will show whether or not a cleanup is necessary at the site in question. If contaminants at the site are below the site specific cleanup numbers developed through a DEQ approved risk evaluation process, you may apply for a Brownfield Certificate of No Action Necessary or request a VCP closure letter.

You must prepare a Brownfield Application for No Action Necessary to receive the Brownfield Certificate. For a VCP closure letter, you must submit a Final Report documenting the actions at the site.

Sites where contaminated ground water has migrated off site (or threatens to migrate off site) at levels above EPA's Maximum Contaminant Levels (MCLs) are not eligible for a no action determination.

9. Remediation Plan for the Preferred Alternative

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Identify the preferred remedial option with a short narrative as to why you chose that option (e.g. comparative analysis). Explain how you will implement the preferred option. Evaluate all the State and federal laws, rules, and standards that will need to be observed during the remedial action.

If wastes or contamination above the risk based cleanup numbers will be left on site, explain the necessary actions that will be taken to ensure long-term success of the cleanup (e.g. institutional and engineering controls that will be needed to ensure that the remedy is not disturbed in the distant future). Explain who is responsible for long-term maintenance and how the activities will be funded.

Provide information concerning how confirmation sampling will be conducted.

10. DEQ Approval of Remediation Plan

The DEQ must approve the Remediation Plan prior to its implementation. Please note that some programs (e.g., Brownfields) require the opportunity for public participation and public comment in the decision process.

11. Final Site Characterization Report

Work completed during the site characterization must be compiled into a final report. A final report documenting all the assessment activities at the site must be submitted to the DEQ prior to any DEQ determination on the site. For Brownfield applications, the Site Characterization Report becomes a section of the overall application.

12. References Cited

If you are relying on existing information, research, or technologies to support your project, you should cite each reference within the document and provide a list of those citations.

13. Figures and Maps

You may provide all the necessary figures in a separate section or as appropriate throughout the document.

14. Appendices

Provide all necessary supporting documentation here, e.g., laboratory data, photos, etc.