



Michelle Lujan Grisham
Governor

Howie C. Morales
Lt. Governor

**NEW MEXICO
ENVIRONMENT DEPARTMENT**

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6313
Phone (505) 476-6000 Fax (505) 476-6030
www.env.nm.gov



James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 2, 2020

Colonel David S. Miller
Base Commander
377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB, NM 87117

Lt. Colonel Wayne J. Acosta
Civil Engineer Office
377 Civil engineer Division
2050 Wyoming Blvd SE, Suite 116
Kirtland AFB, NM 87117

**RE: REPORTING REQUIREMENTS FOR ALL DOCUMENT SUBMITTALS
KIRTLAND AIR FORCE BASE, NEW MEXICO
EPA ID# NM6213820974
HWB-KAFB-20-MISC**

Dear Colonel Miller and Lt. Colonel Acosta:

In our discussions with Kirtland Air Force Base (KAFB or Permittee) staff, a concern was raised that New Mexico Environment Department (NMED) comments on specific submittals contained direction that more broadly applies to various activities conducted at KAFB. Your staff indicated that this creates difficulty for them in tracking directions provided by NMED. To respond to such concerns, NMED is providing the following compilation to clarify requirements for all documents submitted to NMED by the Permittee.

In general, many KAFB submittals to NMED consistently contain a substantial number of errors that should be identified during quality assurance and quality control reviews prior to submittal. In discussions with KAFB staff, NMED staff was assured that steps are being taken to review and enhance document quality control and address these recurring issues to assist NMED in expediting document reviews and to assist the public in better understanding the documents that are submitted by the Permittee.

- 1. Laboratory Deliverables:** Section 6.5.18.2, Laboratory Deliverables, of the KAFB Resource Conservation and Recovery Act (RCRA) Permit (KAFB Permit), states the requirements for analytical laboratory reporting. The section states, “[l]aboratory analytical data packages shall be prepared in accordance with EPA-established Level III or IV analytical support protocols.” The final paragraph of the permit section goes on to state, “[t]he Permittee shall present summary tables of these data and Level II QC results to the Department in reports or other documents prepared in accordance with Permit Section 6.2.4. Raw analytical data, including calibration curves, instrument calibration data, data calculation work sheets, and other laboratory supporting data for samples from this project, shall be compiled and kept on file at the Facility for reference. The Permittee shall make all data available to the Department upon request.” Therefore, for purposes of reporting, Level II QC results are necessary. Level III and IV data must be maintained by the Permittee to be made available upon request.
- 2. General Guidelines:** NMED has included an attachment titled *General Reporting Guidelines* that provides guidance regarding its expectations of submittals to the Hazardous Waste Bureau. The Permittee must consult the guidance during document preparation.
- 3. Document Scopes of Work:** In order to avoid confusion, all work plans must be written for one specific scope of work.
- 4. Document Titles vs. Content:** All future document titles on cover pages must include all major scope activities incorporated within that document, including those presented in appendices. The names of all future documents and scopes of work must not change during the RCRA corrective action process (i.e., work plans through reports).
- 5. Responses to NMED Comments:** Responses to NMED comments must be included as Appendix A of every document revision. Redline-strikeout versions must include all changes made to the corresponding revised document.
- 6. Field Methods:** All field methods for the project must be documented in the text of the document or an appendix. The documentation must be specific to each monitoring activity, such as soil vapor monitoring, groundwater monitoring, or operation and maintenance of the groundwater treatment system. References to quality assurance project plans (QAPPs), standard operating procedures (SOPs), previous work plans, or other documents are not acceptable. All deviations from approved work plans must be discussed and explained in a Deviations section.

- 7. Well Designations:** Wells must be consistently referred to by the same name/designation in all sections of the text, all tables, and all figures. The designation must also match that provided in the digital analytical data files.

- 8. Data Tables, Figures, and Appendices:**
 - a. Sampling data tables must be logically arranged, either chronologically or by investigation, to facilitate location of information.
 - b. Sampling data tables must include the practical quantitation limit (PQL) and reporting detection limit for each analysis. Method detection limits must also be provided for each analytical method.
 - c. Sampling data tables must include the appropriate screening levels for data comparison.
 - d. Analytical data tables in digital format must include a column that indicates which analytical data report the specific sample information can be found. This link must correspond to the analytical data report file name.
 - e. Data from analyses where the PQL (or LOQ) exceeds 20% of the screening level are data quality exceptions and must be identified as such in all tables and figures.
 - f. Analytical data provided in digital format such as Excel files must be provided in a sortable, searchable format that can be uploaded into a database. Previous reports have provided digital data in the same format as the tables in the text which are not sortable or searchable.
 - g. Data in tables and figures must be presented with a consistent and appropriate number of significant figures.
 - h. All points (wells), structures, infrastructure, roads, etc. depicted on figures must be labeled.
 - i. All tables, figures, and appendices must be appropriately numbered and titled.
 - j. All figures must include a scale and a north arrow.
 - k. Data tables and figures must undergo quality assurance and quality control review prior to submittal to NMED.

- 9. Document organization:** Every page of each submittal, including all pages within all sections and appendices, must be numbered either sequentially or in some other logical format.

Many of the issues listed above were discussed during a conference call between NMED and KAFB that was held on May 7, 2020; KAFB staff stated that they understood these issues and agreed to correct these problems. While NMED made every attempt to be comprehensive, other issues may arise. If NMED identifies further issues that occur in multiple submittals, NMED will contact KAFB staff informally to discuss the issues and follow up with further correspondence and direction.

Should you have any questions or wish to meet with us to discuss these comments, please contact me at (505) 476-6035 or your staff may contact Ben Wear at (505) 476-6041.

Sincerely,

Kevin M. Pierard, Chief
Hazardous Waste Bureau

Attachment

cc: D. Cobrain, NMED HWB
B. Wear, NMED HWB
L. Andress, NMED HWB
M. Suzuki, NMED HWB
R. Murphy, NMED HWB
L. King EPA Region 6 (GLCRRC)
C. Cash, KAFB
S. Kottkamp, KAFB
K. Lynnes, KAFB

File: KAFB 2020 Bulk Fuels Facility Spill and Reading

Attachment

GENERAL REPORTING GUIDELINES

1. Overview

The purpose of this guidance document is to provide the general requirements and formats for documents related to corrective action activities required under the Resource Conservation and Recovery Act (RCRA). This guidance is not intended to provide document requirements for every potential corrective action conducted at the facility. Therefore, the formats for all types of documents are not presented below. The formats described include the general reporting requirements and formats for site-specific investigation work plans, investigation reports, routine monitoring reports, risk assessment reports, and corrective measures evaluations. Permittees should generally consider the documents to be the equivalents of RCRA facility investigation (RFI) work plans, RFI reports, periodic monitoring reports, risk assessments, and corrective measures study (CMS) reports, respectively, for the purposes of RCRA compliance. Permittees must include detailed, site-specific requirements in all interim status unit, solid waste management unit (SWMU), and Area of Concern (AOC) investigation work plans, investigation reports, monitoring reports, and corrective measures evaluations. All plans and reports should be prepared with technical and regulatory input from the NMED. All work plans and reports must be submitted to the NMED in the form of two paper copies and an electronic copy.

The document requirements listed do not include all sections that may be necessary to complete each type of document listed. A permittee or the NMED may determine that additional sections are required to address additional site-specific issues or information collected during corrective action or monitoring activities not listed below. However, permittees must submit variations of the general report format and the formats for documents not listed in this guidance in outline form to the NMED for approval prior to submittal of the documents. The NMED will approve or disapprove, in writing, the proposed document outline after receipt of the outline. If the NMED disapproves the report outline, the NMED will notify the permittee, in writing, of the outline's deficiencies and will specify a date for submittal of a revised report outline. All documents submitted by the Permittee must follow the general approach and limitations for data presentation described in this guidance document. If in conflict with a facilities RCRA Permit, the Permit condition should be followed.

2. Investigation Work Plan

Permittees must fulfill the requirements for preparation of work plans for unit-specific or corrective action activities at the facility using the general outline below. The minimum requirements for describing proposed activities within each section are included. All research, locations, depths and methods of exploration, field procedures, analytical analyses, data collection methods, and schedules must be included in each work plan. In general, interpretation of data acquired during previous investigations must be presented only in the background sections of the work plans. The other text sections of the work plans must be reserved for presentation of anticipated site-specific activities and procedures relevant to the project. The general work plan outline is provided below.

2.1 Title Page

The title page must include the type of document, facility name and the unit, SWMU, or AOC name(s) and the submittal date. A signature block providing spaces for the name, title, and organization of the preparer and the responsible representative of the facility must be provided on the title page in accordance with the signature requirements in 40 CFR 270.11(b).

2.2 Executive Summary (Abstract)

The executive summary (or abstract) must provide a brief summary of the purpose and scope of the investigation to be conducted at the subject site. The facility, unit, SWMU, or AOC name, revision number if applicable, and location must be included in the executive summary.

2.3 Table of Contents

The table of contents must list all text sections and subsections, tables, figures, and appendices or attachments included in the work plan. The corresponding page numbers for the titles of each section of the work plan must be included in the table of contents.

2.4 Introduction

The introduction must include the facility name, unit name and location, and unit status (e.g., active operations, closed, corrective action). General information on the current site usage and status must be included in this section. A brief description of the purpose of the investigation and the type of site investigation to be conducted must be provided in this section.

2.5 Background

The background section must describe relevant background information. This section must briefly summarize historical site uses including the locations of current and former site structures and features. A labeled figure must be included in the document showing the locations of current and former site structures and features. The locations of pertinent subsurface features such as pipelines, underground tanks, utility lines, and other subsurface structures must be included in the background summary and labeled on the site plan.

This section must identify potential receptors, including groundwater, and include a brief summary of the type and characteristics of all waste and all contaminants, the known and possible sources of contamination, the history of releases or discharges of contamination, and the known extent of contamination. This section must include brief summaries of results of previous investigations, including references to pertinent figures, data summary tables, and text in previous reports. At a minimum, detections of contaminants encountered during previous investigations must be presented in table format, with an accompanying figure showing sample locations. References to previous reports must include page, table, and figure numbers for referenced information. Summary data tables and site plans showing relevant investigation locations must be included in the Tables and Figures sections of the document, respectively.

2.6 Site Conditions

2.6.1 Surface Conditions

A section on surface conditions must provide a detailed description of current site topography, features, and structures including a description of drainages, vegetation, erosional features, and a detailed description of current site uses and operations at the site. In addition, descriptions of features located in surrounding sites that may have an impact on the subject site regarding sediment transport, surface water runoff, or contaminant fate and transport must be included in this section.

2.6.2 Subsurface Conditions

A section on subsurface conditions must provide a brief, detailed description of the site conditions observed during previous subsurface investigations, including relevant soil horizons, stratigraphy, presence of vadose zone fluids and groundwater, and other relevant information. A site plan showing the locations of all borings and excavations advanced during previous investigations must be included in the Figures section of the work plan. A brief description of the anticipated stratigraphic units that may be encountered during the investigation may be included in this section, if no previous investigations have been conducted at the site.

2.7 Scope of Activities

A section on the scope of activities must briefly describe a list of all anticipated activities to be performed during the investigation, including background information research, health and safety requirements that may affect or limit the completion of tasks, drilling, test pit or other excavations, well construction, field data collection, survey data collection, chemical analytical testing, aquifer testing, and IDW storage, disposal, and reporting.

2.8 Investigation Methods

A section on investigation methods must provide a description of all anticipated locations and methods for conducting the activities to be performed during the investigation. This section must include, but is not limited to, research methods, health and safety practices that may affect the completion of tasks, drilling methods, test pit or other excavation methods, sampling intervals and methods, well construction methods, field data collection methods, geophysical and land survey methods, field screening methods, chemical analytical testing, materials testing, aquifer testing, pilot testing, and other proposed investigation and testing methods. This information may also be summarized in table format, if appropriate.

2.9 Monitoring and Sampling Program

A section on monitoring and sampling must describe the anticipated monitoring and sampling program to be implemented after the initial investigation activities are completed. This section must provide a description of the anticipated vadose zone fluids, groundwater, vadose zone vapor, vadose zone moisture, and other monitoring and sampling programs to be implemented at the unit.

2.10 Schedule

A section must provide the anticipated schedule for completion of field investigation, pilot testing, and monitoring/sampling activities. In addition, this section must provide a schedule for submittal of reports and data to the NMED, including a schedule for submitting status reports, preliminary data, and the final investigation report.

2.11 Tables

The following summary tables may be included in the investigation work plans if previous investigations have been conducted at the unit. Data presented in the tables must include information on dates of data collection, analytical methods, detection limits, and significant data quality exceptions. All data tables must include only detected analytes and data quality exceptions that could potentially mask detections. The following tables must be included in investigation work plans, as applicable;

- a. summaries of regulatory criteria, background, and applicable cleanup levels (may be included in the analytical data tables instead of as separate tables);
- b. summaries of historical field survey location data;
- c. summaries of historical field screening and field parameter measurements of soil, rock, sediments, groundwater, surface water, and air quality;
- d. summaries of historical soil, rock, or sediment laboratory analytical data must include the analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data;
- e. summaries of historical groundwater elevation and depth to groundwater data. The table must include the monitoring well depths, the screened intervals in each well, and the dates and times measurements were taken;
- f. summaries of historical groundwater laboratory analytical data. The analytical data tables must include the analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data;
- g. summary of historical surface water laboratory analytical data. The analytical data tables must include the analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data;
- h. summary of historical air sample screening and chemical analytical data. The data tables must include the screening instruments used, laboratory analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data; and

- i. summary of historical pilot test or other test data, if applicable, including units of measurement and types of instruments used to obtain measurements.

2.12 Figures

The following figures must be included with each investigation work plan for each site, including presentation of data where previous investigations have been conducted. All figures must include an accurate bar scale and a north arrow. An explanation must be included on each figure for all abbreviations, symbols, acronyms, and qualifiers. The following figures must be included in investigation work plans, as applicable:

- a. a vicinity map showing topography and the general location of the site relative to surrounding features and properties;
- b. a unit site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system locations and details; off-site well locations and other relevant features must be included on the site plan, if appropriate; additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;
- c. figures showing historical and proposed soil boring locations, excavation locations, and sampling locations;
- d. figures presenting historical soil sample field screening and laboratory analytical data;
- e. figures presenting the locations of all existing and proposed borings and vapor monitoring point locations,
- f. figures presenting historical vadose zone organic vapor data;
- g. figures showing all existing and proposed monitoring wells and piezometers;
- h. figures presenting historical groundwater and vadose zone fluid elevation data, and indicating groundwater and vadose zone fluid flow directions;
- i. figures presenting historical groundwater and vadose zone fluid laboratory analytical data, if applicable; the chemical analytical data corresponding to each sampling location can be presented in tabular form on the figure or as an isoconcentration map;
- j. figures presenting historical and proposed vadose zone fluid neutron probe access tube locations and field measurement data for soil moisture, if applicable;
- k. figures presenting historical surface water laboratory analytical data, if applicable;

- l. figures showing historical and proposed air sampling locations and presenting historical air quality data, if applicable;
- m. figures presenting historical pilot testing locations and data, where applicable, including site plans and graphic data presentation; and
- n. figures presenting geologic cross-sections based on outcrop and borehole data acquired during previous investigations, if applicable.

2.13 Appendices

An IDW management plan must be included as an appendix to the investigation work plan. Additional appendices may be necessary to present additional data or documentation not listed above.

3. Investigation Report

Permittees must prepare investigation reports at the facility using the general outline below. Investigation Reports are the reporting mechanism for presenting the results of completed Investigation Work Plans. This section describes the minimum requirements for reporting on site investigations. All data collected during each site investigation event in the reporting period must be included in the reports. In general, interpretation of data must be presented only in the background, conclusions, and recommendations sections of the reports. The other text sections of the reports must be reserved for presentation of facts and data without interpretation or qualifications. The general report outline is provided below.

3.1 Title Page

The title page must include the type of document and version number, the facility name, the unit, SWMU, or AOC, and the submittal date. A signature block providing spaces for the name, title, and organization of the preparer and the responsible facility representative must be provided on the title page in accordance with the signature requirements in 40 CFR 270.11(b).

3.2 Executive Summary

The executive summary must provide a brief summary of the purpose, scope, and results of the investigation conducted at the subject site during the reporting period. In addition, this section must include a brief summary of conclusions based on the investigation data collected and recommendations for future investigation, monitoring, remedial action, or site closure.

3.3 Table of Contents

The table of contents must list all text sections, subsections, tables, figures, and appendices or attachments included in the report. The corresponding page numbers for the titles of each section of the report must be included in the table of contents.

3.4 Introduction

The introduction section must include the facility name, unit name and location, and unit status (e.g., active operations, closed, corrective action). General information on the site usage and status must be included in this section. A brief description of the purpose of the investigation, the type of site investigation conducted, and the type of results presented in the report also must be provided in this section.

3.5 Background

The background section must describe relevant background information. This section must briefly summarize historical site uses including the locations of current and former site structures and features. A labeled figure must be included in the document showing the locations of current and former site structures and features. The locations of subsurface features such as pipelines, underground tanks, utility lines, and other subsurface structures must be included in the background summary and labeled on the figure. In addition, this section must include a brief summary of the possible sources of contamination, the history of releases or discharges of contamination, the known extent of contamination, and the results of previous investigations including references to previous reports. The references to previous reports must include page, table, and figure numbers for referenced information. A site plan showing relevant investigation locations and summary data tables must be included in the Figures and Tables sections of the document, respectively.

3.6 Scope of Activities

This section on the scope of activities must briefly describe all activities performed during the investigation event including background information research, implemented health and safety measures that affected or limited the completion of tasks, drilling, test pit or other excavation methods, well construction methods, field data collection, survey data collection, chemical analytical testing, aquifer testing, remediation system pilot testing, and IDW storage or disposal.

3.7 Field Investigation Results

A section must provide a summary of the procedures used and the results of all field investigation activities conducted at the site including, but not limited to, the dates that investigation activities were conducted, the type and purpose of field investigation activities performed, field screening measurements, logging and sampling results, pilot test results, construction details, and conditions observed. Field observations or conditions that altered the planned work or may have influenced the results of sampling, testing, and logging must be reported in this section. At a minimum, the following subsections must be included, where appropriate.

3.7.1 Surface Conditions

A section on surface conditions must describe current site topography, features, and structures including topographic drainages, man-made drainages, vegetation, and erosional features. It must also include a description of current site uses and any operations at the site. In addition, descriptions of features located in surrounding sites that may have an impact on the subject site

regarding sediment transport, surface water runoff, or contaminant transport must be included in this section.

3.7.2 Exploratory Drilling or Excavation Investigations

A section must describe the locations, methods, and depths of subsurface explorations. The description must include the types of equipment used, the logging procedures, exploration equipment, decontamination procedures, and conditions encountered that may have affected or limited the investigation. Samples obtained from all exploratory borings and excavations must be visually inspected and the soil or rock type classified in general accordance with ASTM D2487 (Unified Soil Classification System) and D2488, or AGI Methods for soil and rock classification. Detailed logs of each boring must be completed in the field by a qualified engineer or geologist.

A description of the site conditions observed during subsurface investigation activities must be included in this section, including soil horizon and stratigraphic information. Site plans showing the locations of all borings and excavations must be included in the Figures section of the report. Boring and test pit logs for all exploratory borings and test pits must be presented in an appendix or attachment to the report.

3.7.3 Subsurface Conditions

A section on subsurface conditions must describe known subsurface lithology and structures based on observations made during the current and previous subsurface investigations, including interpretation of geophysical logs and as-built drawings of man-made structures. A description of the known locations of pipelines, utility lines, and observed geologic structures must also be included in this section. A site plan showing boring and excavation locations and the locations of the site's above- and below-ground structures must be included in the Figures section of the report. In addition, cross-sections must be constructed, if appropriate, to provide additional visual presentation of site or regional subsurface conditions.

3.7.4 Monitoring Well Construction, Boring, or Excavation Abandonment

A section must describe the methods and details of monitoring well construction and the methods used to abandon or backfill exploratory borings and excavations. The description must include the dates of well construction, boring abandonment, or excavation backfilling. In addition, boring logs, test pit logs, and well construction diagrams must be included in an attachment or appendix. Well construction diagrams must be included with the associated boring logs for borings that are converted to monitoring wells.

3.7.5 Groundwater Conditions

A section must describe groundwater conditions observed beneath the subject site and relate local groundwater conditions to regional groundwater conditions. A description of the depths to water, aquifer thickness, and groundwater flow directions must be included in this section for alluvial groundwater, shallow perched groundwater, intermediate perched groundwater, and regional groundwater, as appropriate to the investigation. Figures showing well locations,

surrounding area, groundwater elevations, and flow directions for each hydrologic zone must be included in the Figures section of the report.

3.7.6 Surface Water Conditions

A section must describe surface water conditions and include a description of surface water runoff, surface water drainage, surface water sediment transport, and contaminant transport in surface water as suspended load and as a dissolved phase in surface water via natural and man-made drainages, if applicable. A description of contaminant fate and transport must be included, if appropriate.

3.7.7 Subsurface Air and Soil Moisture Conditions

A section must describe subsurface air monitoring and sampling methods used during the site investigation. It must also describe observations made during the site investigation regarding subsurface flow pathways and the subsurface air-flow regime.

3.7.8 Materials Testing Results

A section must discuss the materials testing results, such as core permeability testing, grain size analysis, or other materials testing results. Sample collection methods, locations, and depths must also be included. Corresponding summary tables must be included in the Tables section of the report.

3.7.9 Pilot Testing Results

A section must discuss the results of any pilot testing. Pilot testing is typically conducted after initial subsurface investigations are completed and the need for additional investigation or remediation has been evaluated. Pilot testing, including aquifer testing and remediation system pilot testing, must be addressed through separate pilot test work plans and reports. The format for pilot test work plans and reports must be approved by the NMED prior to submittal.

3.8 Regulatory Criteria

A section must set forth the applicable cleanup standards, screening levels, and risk-based cleanup goals for each pertinent medium at the subject site. The appropriate cleanup levels for each site must be included if site-specific levels have been established at separate facility sites or units. A table summarizing the applicable cleanup standards must be included as part of the document. Alternately, the report may include applicable cleanup standards as a column in the data tables. Risk-based evaluation procedures, if used to calculate cleanup levels, must be presented in a separate document or in an appendix to this report. If cleanup levels calculated in a risk evaluation are employed, the risk evaluation document must be referenced and must include pertinent page numbers for referenced information.

3.9 Site Contamination

A section must provide a description of sampling intervals and methods for detection of surface and subsurface contamination in soils, rock, sediments, groundwater, surface water, and as vapor-phase contamination. Only factual information must be included in this section. Interpretation of the data must be reserved for the summary and conclusions sections of the report. Tables summarizing all sampling, testing, and screening results for detected contaminants must be prepared in a format approved by the NMED. The tables must be presented in the Tables section of the report.

3.9.1 Soil, Rock, and Sediment Sampling

A section must describe the sampling of soil, rock and sediment. It must include the dates, locations, and methods of sample collection, sampling intervals, sample logging methods, screening sample selection methods, and laboratory sample selection methods including the collection depths for samples submitted for laboratory analyses. A site plan showing the sample locations must be included in the Figures section of the report.

3.9.2 Sample Field Screening Results

A section must describe the field screening methods used during the investigation and the field screening results. Field screening results also must be presented in summary tables in the Tables section of the document. The limitations of field screening instrumentation and any conditions that influenced the results of field screening must be discussed in this subsection.

3.9.3 Soil, Rock, and Sediment Sampling Chemical Analytical Results

A section must briefly summarize the laboratory analyses conducted, the analytical methods and results and provide a comparison of the data to cleanup standards or established cleanup levels for the site. The laboratory results also must be presented in summary tables in the Tables section of the document. Field conditions and sample collection methods that could potentially affect the analytical results must be described in this section. If appropriate, soil analytical data must be presented with sample locations on a site plan and included in the Figures section of the report.

3.9.4 Subsurface Vapor Sampling

A section must describe the air and subsurface vapor sampling. It must describe the dates, locations, methods of sample collection, methods for sample logging, and methods for laboratory sample selection. A site plan showing all air and subsurface vapor sampling locations must be provided in the Figures section of the report.

3.9.5 Subsurface Vapor Field Screening Results

A section must describe the subsurface vapor field screening results. It must describe the field screening methods used for ambient air and subsurface vapors during the investigation and the field screening results. Field screening results must also be presented in summary tables in the Tables section of the report. The locations of ambient air and subsurface vapor screening sample

collection must be presented on a site plan included in the Figures section of the report. The limitations of field screening instrumentation and any conditions that influenced the results of field screening must be discussed in this section.

3.9.6 Air and Subsurface Vapor Laboratory Analytical Results

This section must describe the results of air and subsurface vapor laboratory analyses. It must describe the air sampling laboratory analytical methods and results and provide a comparison of the data to applicable cleanup levels for the site. The rationale or purpose for altering or modifying the subsurface vapor sampling program outlined in the site investigation work plan also must be provided in this section. Field conditions that may have affected the analytical results during sample collection must be described in this section. Tables summarizing the air sample laboratory, field, and analytical QA/QC data; applicable cleanup levels; and modifications to the air sampling program must be provided in the Tables section of the report. Contaminant concentrations must be presented as data tables or as isoconcentration contours on a map included in the Figures section of the report.

3.10 Conclusions

A conclusions section must provide a brief summary of the investigation activities and a discussion of the conclusions of the investigation conducted at the site. In addition, this section must provide a comparison of the results to applicable cleanup levels, and to relevant historical investigation results and analytical data. Potential receptors, including groundwater, must be identified and discussed. An explanation must be provided with regard to data gaps. A risk assessment may be included as an appendix to the investigation report; however, the risk analysis must be presented in the risk assessment format described in Permit Section 6.5. References to the risk analysis must be presented only in the summary and conclusions sections of the Investigation Report.

3.11 Recommendations

A section must discuss the need for further investigation, corrective measures, risk assessment and monitoring, or recommendations for corrective action completed based on the conclusions provided in the Conclusions section. It must include explanations regarding additional sampling, monitoring, and site closure. A corresponding schedule for further action regarding the site must also be provided.

3.12 Tables

This section must provide the following summary tables. Data presented in the tables must include the current data, dates of data collection, analytical methods, detection limits, and significant data quality exceptions. All summary data tables must include only detected analytes and data quality exceptions that could potentially mask detections. The following tables must be included in investigation reports, as applicable:

- a. tables summarizing regulatory criteria, background levels, and applicable cleanup levels; this information may be included in the analytical data tables instead of as separate tables;

- b. tables summarizing field survey location data; separate tables must be prepared for well locations and individual medium sampling locations except where the locations are the same for more than one medium;
- c. tables summarizing field screening and field parameter measurements of soil, sediment, vadose zone fluid, vadose zone vapor, vadose zone moisture, and groundwater, surface water, and air quality;
- d. a table summarizing soil laboratory analytical data; it must include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
- e. a table summarizing the groundwater elevations and depth-to-water data; the table must include the monitoring well depths and the screened intervals in each well;
- f. a table summarizing the groundwater laboratory analytical data; the analytical data tables must include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
- g. a table summarizing the surface water laboratory analytical data; the analytical data tables must include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
- h. A table summarizing the air sample screening and laboratory analytical data; the data tables must include the screening instruments used, laboratory analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
- i. tables summarizing the pilot testing data, if applicable, including units of measurement and types of instruments used to obtain measurements; and
- j. a table summarizing the materials testing data, if applicable.

3.13 Figures

All figures must be included with each investigation report, as appropriate. All figures must include a scale and a north arrow. An explanation must be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. All maps must have a date. A section must provide the following figures:

- a. a vicinity map showing topography and the general location of the site relative to surrounding features and properties;

- b. a site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system locations and details; off-site well locations and other relevant features must be included on the site plan; additional site plans may be required to present the locations of relevant off-site well locations, structures and features;
- c. figures showing boring, excavation, and sampling locations;
- d. figures presenting soil sample field screening and laboratory analytical data;
- e. figures displaying the locations of all newly installed and existing wells and borings;
- f. figures presenting monitoring well locations, groundwater elevation data, and groundwater flow directions;
- g. figures presenting groundwater laboratory analytical data, including any past data requested by the NMED; the chemical analytical data corresponding to each sampling location may be presented in table form on the figure or as an isoconcentration map;
- h. figures presenting surface water sample locations and field measurement data including any past data requested by the NMED;
- i. figures presenting surface water laboratory analytical data including any past data, if applicable; the laboratory analytical data corresponding to each sampling location may be presented in tabular form on the figure;
- j. figures showing air and subsurface vapor sampling locations and presenting air and subsurface vapor quality data; the field screening or laboratory analytical data corresponding to each sampling location may be presented in tabular form on the figure or as an isoconcentration map;
- k. figures presenting geologic cross-sections based on outcrop and borehole data; and
- l. figures presenting pilot testing locations and data, where applicable, including site plans or graphic data presentation.

3.14 Appendices

Each investigation report must include the following appendices. Additional appendices may be necessary to present data or documentation not listed below.

3.14.1 Field Methods

An appendix must provide detailed descriptions of the methods used to acquire field measurements of each media that was surveyed or tested during the investigation. Methods must include, but are not limited to, exploratory drilling or excavation methods, the methods and types

of instruments used to obtain field screening, field analytical or field parameter measurements, instrument calibration procedures, sampling methods for each medium investigated, decontamination procedures, sample handling procedures, documentation procedures, and a description of field conditions that affected procedural or sample testing results. Methods of measuring and sampling during pilot testing must be reported in this appendix, if applicable. Copies of IDW disposal documentation must be provided in a separate appendix.

3.14.2 Boring/Test Pit Logs and Well Construction Diagrams

An appendix must provide boring logs, test pit or other excavation logs, and well construction details. In addition, a key to symbols and a soil or rock classification system must be included in this appendix. Geophysical logs must be provided in a separate section of this appendix.

3.14.3 Chemical Analytical Program

Chemical analytical methods, a summary of data quality objectives, and a summary of data quality review procedures must be reported in an appendix. A summary of data quality exceptions and their effect on the acceptability of the field and laboratory analytical data with regard to the investigation and the site status must be included in this appendix, along with references to case narratives provided in the laboratory reports.

3.14.4 Chemical Analytical Reports

A section must include all laboratory chemical analytical data generated for the reporting period. The reports must include all chain-of-custody records and QA/QC results provided by the laboratory. The laboratory reports may be provided electronically in a format approved by the NMED and must be in the form of a final laboratory report. Laboratory report data tables may be submitted in Microsoft Excel format. Hard (paper) copies of the chain-of-custody forms must be submitted with the reports regardless of whether the final laboratory report is submitted electronically or in hard copy.

3.14.5 Other Appendices

Other appendices containing additional information must be included as required by the NMED or as otherwise appropriate.

4. Periodic Monitoring Report

The Permittee must use the following guidance for preparing periodic monitoring reports. The reports must present the results of periodic groundwater, surface water, vapor, and remediation system monitoring at the facility. The following sections provide a general outline for monitoring reports and the minimum requirements for reporting of periodic monitoring conducted at the facility. All data collected during each monitoring or sampling event in the reporting period must be included in the reports. In general, interpretation of data must be presented only in the background, conclusions, and recommendations sections of the reports. The other text sections of the reports must be reserved for presentation of facts and data without interpretation or qualifications.

4.1 Title Page

The title page must include the type of document, revision number if applicable, the facility name, the unit, SWMU, or AOC name(s), and the submittal date. A signature block providing spaces for the name, title, and organization of the preparer and the responsible representative of the facility must be provided on the title page in accordance with the signature requirements in 40 CFR 270.11(b).

4.2 Executive Summary

The executive summary must provide a brief summary of the purpose, scope, and results of the monitoring conducted at the subject site during the reporting period. The facility, unit, SWMU, and AOC name(s) and location(s) must be included in the executive summary. In addition, this section must include a brief summary of conclusions based on the monitoring data collected.

4.3 Table of Contents

The table of contents must list all text sections, subsections, tables, figures, and appendices or attachments included in the report. The corresponding page numbers for the titles of each section of the report must be included in the table of contents.

4.4 Introduction

The introduction section must include the facility name and the unit name(s), location(s), and status (e.g. active operations, closed, corrective action). General information on the site usage and status must be included in this section. A brief description of the purpose of the monitoring, type of monitoring conducted, and the type of results presented in the report also must be provided in this section.

4.5 Scope of Activities

A section on the scope of activities must briefly describe all activities performed during the monitoring event or reporting period including field data collection, analytical testing, if applicable, and purge/decontamination water storage and disposal.

4.6 Regulatory Criteria

A section on regulatory criteria must provide information regarding applicable cleanup standards, risk-based screening levels, and risk-based cleanup goals for the site. A table summarizing the applicable cleanup standards, or inclusion of applicable cleanup standards as a column in the data tables, can be substituted for this section. The appropriate cleanup levels for each site must be included if site-specific levels have been established at separate sites. Risk-based evaluation procedures, if used to calculate cleanup levels, must either be included as an attachment or submitted as a separate document and referenced. The specific document and page numbers must be included for all referenced materials.

4.7 Monitoring Results

A section must provide a summary of the results of monitoring conducted at the site. This section must include the dates and times that monitoring was conducted, the measured depths to groundwater, directions of groundwater and vadose zone fluids flow, field air and water quality measurements, static pressures, field measurements, and a comparison to previous monitoring results. Field observations or conditions that may influence the results of monitoring must be reported in this section. Tables summarizing leachate and vapor-monitoring parameters, groundwater and vadose zone fluid elevations, depth-to-water measurements, and other field measurements may be substituted for this section. The tables must include all information required in Permit Section 6.4.11.

4.8 Chemical Analytical Data Results

A section must discuss the results of the chemical analyses. It must provide the dates of sampling and the analytical results. It must also provide a comparison of the data to previous results and to any cleanup standards or established cleanup levels for the site. The rationale or purpose for altering or modifying the sampling program must be provided in this section. A table summarizing the laboratory analytical data, QA/QC data, applicable cleanup levels, and modifications to the sampling program may be substituted for this section. The tables must include all information required in Permit Section 6.4.11.

4.9 Remediation System Monitoring

A section must discuss remediation system monitoring. It must summarize the remediation system's capabilities and performance. It must also provide monitoring data, treatment system discharge sampling requirements, and system influent and effluent sample analytical results. The dates of operation, system failures, and modifications made to the remediation system during the reporting period must also be included in this section. A summary table may be substituted for this section. The tables must include all information required in Permit Section 6.4.11.

4.10 Summary

A summary section must provide a discussion and conclusions of the monitoring conducted at the site. In addition, this section must provide a comparison of the results to applicable cleanup levels and to relevant historical monitoring and chemical analytical data. An explanation must be provided with regard to data gaps. A discussion of remediation system performance, monitoring results, modifications if applicable, and compliance with discharge requirements must be provided in this section. Recommendations and explanations regarding future monitoring, remedial actions, or site closure must also be included in this section.

4.11 Tables

A section must provide the following summary tables for the media sampled. With prior approval from the NMED, the Permittee may combine one or more of the tables. Data presented in the tables must include the current sampling and monitoring data, as well as data from the three previous monitoring events or, if data from less than three monitoring events is available, data

acquired during previous investigations. Remediation system monitoring data also must be presented. The dates of data collection must be included in the tables. Summary tables may be substituted for portions of the text. The analytical data tables must include only detected analytes and data quality exceptions that could potentially mask detections. The following tables must be included, as applicable:

- a. a table summarizing the regulatory criteria (a regulatory criteria text section may be substituted for this table or the applicable cleanup levels may be included in the analytical data tables);
- b. a table summarizing groundwater and vadose zone fluid elevations, and depths to water data; the table must include the monitoring well depths, casing elevations, the screened intervals in each well, and the dates and times of measurements;
- c. a table summarizing field measurements of surface water quality data, if applicable;
- d. a table summarizing field measurements of subsurface vapor monitoring and soil moisture data (including historical vapor monitoring data as described above);
- e. a table summarizing field measurements of groundwater and vadose zone fluid quality data (including historical water quality data as described above);
- f. a table summarizing subsurface vapors chemical analytical data, if applicable (including historical analytical data as described above);
- g. a table summarizing surface water chemical analytical data, if applicable (including historical surface water analytical data as described above);
- h. a table summarizing groundwater and vadose zone fluid chemical analytical data (including historical groundwater analytical data as described above); and
- i. a table summarizing remediation system monitoring data, if applicable (including historical remediation system monitoring data as described above).

4.12 Figures

A section must include the following figures. All figures must include a scale and north arrow. An explanation must be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. All figures must have a date. The following figures must be included, as applicable:

- a. a vicinity map showing topography and the general location of the site relative to surrounding features or properties;
- b. a facility site plan that presents pertinent site features and structures, well and piezometer

neutron probe access tubes locations and remediation system location(s) and features; off-site well locations and pertinent features must be included on the site plan, if practical; additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;

- c. figures presenting the locations of neutron probe access tubes, monitoring and other well locations, groundwater and vadose zone fluid elevation data, and groundwater and vadose zone fluid flow directions;
- d. figures presenting groundwater and vadose zone fluid analytical data for the current monitoring event; the analytical data corresponding to each sampling location may be presented in tabular form on the figure or as an isoconcentration map;
- e. figures presenting surface water sampling locations and analytical data for the current monitoring period;
- f. figures presenting vertical profiles of soil moisture content for neutron probe measurements for the current monitoring period;
- g. figures presenting subsurface vapor sampling locations and analytical data for the current monitoring event; the analytical data corresponding to each sampling location may be presented in table form on the figure or as an isoconcentration map; and
- h. figures presenting geologic cross-sections based on outcrop and borehole data, if applicable.

4.13 Appendices

Each monitoring report must include the following appendices. Additional appendices may be necessary to present data or documentation not listed below.

4.13.1 Field Methods

The report must include a section that outlines the methods used to acquire field measurements of groundwater and vadose zone fluid elevations, subsurface vapor, soil moisture, water quality data, subsurface vapor samples, vadose zone fluid samples, and groundwater samples. It must include the methods and types of instruments used to measure depths to water, air, headspace, or subsurface vapor parameters, soil moisture information, and water quality parameters. In addition, decontamination, well purging techniques, well sampling techniques, and sample handling procedures must be provided in this appendix. Methods of measuring and sampling remediation systems must be reported in this section, if applicable. Purge and decontamination water storage and disposal methods must also be presented in this appendix. Copies of purge and decontamination water disposal documentation must be provided in a separate appendix.

4.13.2 Chemical Analytical Program

An appendix must discuss the analytical program. It must include the analytical methods, a summary of data quality objectives, and data quality review procedures. A summary of data quality exceptions and their effect on the acceptability of the analytical data with regard to the monitoring event and the site status must be included in this appendix along with references to case narratives provided in the laboratory reports.

4.13.3 Chemical Analytical Reports

An appendix must include all laboratory chemical analytical data generated for the reporting period. The data may be submitted electronically on a compact disc in Microsoft Excel or other format acceptable to the NMED. The reports must include all chain-of-custody records and QA/QC results provided by the laboratory. Hard (paper) copies of all chain-of-custody records must be submitted as part of this appendix.

5. Risk Assessment Report

The Permittee must prepare risk assessment reports for sites requiring corrective action at the facility using the format described below. This section provides a general outline for risk assessments and also sets forth the minimum requirements for describing risk assessment elements. In general, interpretation of data must be presented only in the background, conceptual site model, and conclusions and recommendations sections of the reports. The other text sections of the risk assessment report must be reserved for presentation of sampling results from all investigations, conceptual and mathematical elements of the risk assessment, and presentations of toxicity information and screening values used in the risk assessment. The human health and ecological risk assessments must be presented in separate sections, but the general risk assessment outline applicable to both sections is provided below.

5.1 Title Page

The title page must include the type of document, revision number if applicable, the facility name, the unit, SWMU, or AOC name(s), and the submittal date. A signature block providing spaces for the name, title, and organization of the preparer and the responsible representative of the facility must be provided on the title page in accordance with the signature requirements in 40 CFR 270.11(b).

5.2 Executive Summary

The executive summary section must provide a brief summary of the purpose and scope of the risk assessment of the subject site. The executive summary must also briefly summarize the conclusions of the risk assessment. The facility, unit, SWMU, or AOC name(s) and location(s) must be included in the executive summary.

5.3 Table of Contents

The table of contents must list all text sections, subsections, tables, figures, and appendices or attachments included in the risk assessment. The corresponding page numbers for the titles of each unit of the report must be included in the table of contents.

5.4 Introduction

The introduction section must include the facility name, unit name(s) and location(s), and unit status (e.g., active operations, closed, corrective action). General information on the current site usage and status must be included in this section.

5.5 Background

The background section must describe relevant background information. This section must briefly summarize historical site uses including the locations of current and former site structures and features. A labeled figure must be included in the document showing the locations of current and former site structures and features.

5.5.1 Site Description

A section must provide a description of current site topography, features, and structures including a description of drainages, erosional features, current site uses, and other data relevant to assessing risk at the site. Depth to groundwater, vadose zone fluids, and directions of groundwater and vadose zone fluids flow must be included in this section. The presence and location of surface water bodies such as springs or wetlands must be noted in this section. Photos of the site may be incorporated into this section, if desired. Ecological features of the site must be described here, including type and amount of vegetative cover, observed and expected wildlife receptors, and level of disturbance of the site. A topographical map of the site and general vicinity of the site showing habitat types, boundaries of each habitat, and any surface water features must be included in the Figures section of the document.

5.5.2 Sampling Results

A section must include a summary of the history of releases of contaminants, known and possible sources of contamination, and the vertical and lateral extent of contamination present in each media. This section must include summaries of sampling results of all investigations, including site plans (included in the Figures section of the document), showing locations of detected contaminants. This section must reference pertinent figures, data summary tables, and citations for references to previous reports. References to previous reports must include page, table, and figure numbers for referenced information. Summaries of sampling data for each constituent must include the maximum value detected, the detection limit, the 95% UCL of the mean value detected (if applicable to the data set) and whether that 95% UCL of the mean was calculated based on a normal or lognormal distribution. Background values used for comparison to inorganic constituents at the site must be presented in this subsection. The table of background values must appear in the Tables section of the document and include actual values used as well as the origin

of the values (facility-wide, site-specific, UCL, UTL). This section must also include a discussion of how “non-detect” sample results were handled in the averaging of data.

5.6 Conceptual Site Model

A section must present the conceptual site model. It must include information on the expected fate and transport of contaminants detected at the site. This section must provide a list of all sources of contamination at the site. Sources that are no longer considered to be ongoing but represent the point of origination for contaminants transported to other locations must be included. The discussion of fate and transport must address potential migration of each contaminant in each medium, potential breakdown products and their migration, and anticipated pathways of exposure for human or ecological receptors. Diagrammatic representations of the conceptual site model must appear in the Figures section of the document.

For human health risk assessments, the conceptual site model must include residential land use as the future land use for all risk assessments. In addition, site-specific future land use may be included, provided that written approval to consider a site-specific future land use has been obtained from the NMED prior to inclusion in the risk assessment. If a site-specific future land use scenario appears in the risk assessment, all values for exposure parameters and the source of those values must be included in table format and presented in the Tables section of the document.

Conceptual site models presented for ecological risk assessments must identify assessment endpoints and measurement receptors for the site. The discussion of the model must explain how the measurement receptors for the site are protective of wildlife receptors.

5.7 Risk Screening Levels

A section must present the actual screening values used for each contaminant for comparison to all human health and ecological risk screening levels. A discussion of the methods used to calculate the screening levels in accordance with Permit Section 3.5 and any variances from those procedures must be included in this Section. If no valid toxicological studies exist for the receptor or contaminant, the contaminant and receptor combination must be addressed using qualitative methods. If an approved site-specific risk scenario is used for the human health risk assessment, this section must include all toxicity information and exposure assessment equations used for the site-specific scenario, as well as the sources for that information. Other regulatory levels applicable to screening the site, such as drinking water MCLs, must also be included in this section.

5.8 Risk Assessment Results

This section must present all risk values, Hazard Quotients (HQs), and Hazard Indices (HIs) for human health under projected future residential scenario and any site-specific scenarios. This section must also present the HQ and HI for each contaminant for each ecological receptor. IN

addition, this section must include discussion of qualitative, semi-quantitative, and quantitative uncertainty in the risk assessment and estimate the potential impact of the various uncertainties.

5.9 Conclusions and Recommendations

This section must include an interpretation of the results of the risk assessment and any recommendations for future disposition of the site. This section may include additional information and considerations that the Permittee believes are relevant to the analysis of the site.

5.10 Tables

Data presented in the summary tables must include information on detection limits and significant data quality exceptions. All data tables must include only detected analytes and data quality exceptions that could potentially mask detections. A section must provide the following summary tables, as appropriate. With prior approval from the NMED, the Permittee may combine one or more of the tables:

- a. a table presenting background values used for comparison to inorganic constituents at the site; the table must include actual values used as well as the origin of the values (facility-wide, site-specific, UCL, UTL, or maximum);
- b. a table summarizing sampling data must include, for each constituent, all detected values above background, the maximum value detected, the 95 percent UCL of the mean value detected (if applicable to the data set), and whether that 95 percent UCL of the mean was calculated based on a normal or lognormal distribution;
- c. a table of all screening values used and the sources of those values;
- d. a table presenting all risk values, HQs, and HIs under projected future residential scenario;
- e. a table presenting all risk values, HQs, and HIs under approved additional site-specific future land use scenario; and
- f. a table presenting the HQ and HI for each contaminant for each ecological receptor.

5.11 Figures

This section must present the following figures for each site, as appropriate. With prior approval from the NMED, the Permittee may combine one or more of the figures. All figures must include a scale and a north arrow. An explanation must be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. The following figures must be included, as applicable:

- a. a vicinity map showing topography and the general location of the site relative to surrounding features or properties;

- b. for human health risk assessments, a site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system locations and its details; off-site well locations and other relevant features must be included on the site plan if practical; additional site plans may be required to present the locations of relevant off-site wells, structures, and features;
- c. for ecological risk assessments, a topographical map of the site and general vicinity of the site showing habitat types, boundaries of each habitat, and any surface water features; and
- d. conceptual site model diagrams for both human health and ecological risk assessments.

5.12 Appendices

Appendices may be included to present additional relevant information for the risk analysis such as the results of statistical analyses of data sets and comparisons of data, ecological checklists for the site, full sets of results of all sampling investigations at the site, or other data as appropriate.

6. Corrective Measures Evaluation

The Permittee must prepare corrective measures evaluations for sites requiring corrective measures using the format described below. This section provides a general outline for corrective measures evaluations and sets forth the minimum requirements for describing corrective measures when preparing these documents. All investigation summaries, site condition descriptions, corrective action goals, corrective action options, remedial options selection criteria, and schedules must be included in the corrective measures evaluations. In general, interpretation of historical investigation data must be presented only in the background sections of the corrective measures evaluations. At a minimum, detections of contaminants encountered during previous site investigations must be presented in the corrective measures evaluations in table format with an accompanying site plan depicting sample locations. The other text sections of the corrective measures evaluations must be reserved for presentation of corrective action-related information regarding anticipated or potential site-specific corrective action options and methods relevant to the project. The general corrective measures evaluation outline is provided below.

6.1 Title Page

The title page must include the type of document, revision number if applicable, the facility name, the unit, SWMU, or AOC name(s), and the submittal date. A signature block providing spaces for the name, title, and organization of the preparer and the responsible facility representative must be provided on the title page in accordance with the signature requirements in 40 CFR 270.11(b).

6.2 Executive Summary

The executive summary must provide a brief summary of the purpose and scope of the corrective measures evaluation to be conducted at the site. The executive summary or abstract must also

briefly summarize the conclusions of the evaluation. The facility, unit, SWMU, or AOC name(s) and location(s) must be included in the executive summary.

6.3 Table of Contents

The table of contents must list all text sections, subsections, tables, figures, and appendices or attachments included in the corrective measures evaluation. The corresponding page numbers for the titles of each section of the report must be included in the table of contents.

6.4 Introduction

The introduction section must include the facility name, unit name(s) and location(s) and unit status (e.g., active operations, closed, corrective action). General information on the current site use and status must be included in this section. A brief description of the purpose of the corrective measures evaluation and the corrective action objectives for the project also must be provided in this section.

6.5 Background

The background section must describe the relevant background information. This section must briefly summarize historical site activities including the locations of current and former site structures and features. A labeled figure must be included in the document showing the locations of current and former site structures and features. The locations of subsurface features such as pipelines, underground tanks, utility lines, and other subsurface structures must be included in the background section and labeled on the site plan.

This section must include contaminant and waste characteristics, a brief summary of the history of contaminant releases, known and possible sources of contamination, and the vertical and lateral extent of contamination present in each medium. This section must include brief summaries of results of previous investigations, including references to pertinent figures, data summary tables, and text in previous reports. References to previous reports must include page, table, and figure numbers for referenced information. Summary tables and site plans showing relevant investigation locations must be referenced and included in the Tables and Figures sections of the document, respectively.

6.6 Site Conditions

6.6.1 Surface Conditions

A section on surface conditions must describe current and historic site topography, features, and structures, including a description of topographic drainages, man-made drainages, vegetation, and erosional features. It must also include a description of current uses of the site and any current operations at the site. This section must also include a description of those features that could potentially influence corrective action option selection or implementation such as archeological sites, wetlands, or other features that may affect remedial activities. In addition, descriptions of features located in surrounding sites that may have an effect on the subject site regarding sediment transport, surface water runoff, or contaminant transport must be included in

this section. A site plan displaying the locations of all pertinent surface features and structures must be included in the Figures section of the corrective measures evaluation.

6.6.2 Subsurface Conditions

A section on subsurface conditions must describe the site conditions observed during previous subsurface investigations. It must include relevant soil horizon and stratigraphic information, groundwater and vadose zone fluid conditions, fracture data, and subsurface vapor information. A site plan displaying the locations of all borings and excavations advanced during previous investigations must be included in the Figures section of the corrective measures evaluation.

6.7 Potential Receptors

6.7.1 Sources

A section must provide a list of all sources of contamination at the site where corrective measures are to be considered or are required. Sources that are no longer considered to be releasing contaminants at the site, but may be the point of origination for contaminants transported to other locations, must be included in this section.

6.7.2 Pathways

A section must describe potential migration pathways that could result in either acute or chronic exposures to contaminants. It must include such pathways as utility trenches, paleochannels, surface exposures, surface drainages, stratigraphic units, fractures, structures, and other features. The migration pathways for each contaminant and each medium must be tied to the potential receptors for each pathway. A discussion of contaminant characteristics relating to fate and transport of contaminants through each pathway must also be included in this section.

6.7.3 Receptors

A section must provide a listing and description of all anticipated potential receptors that could possibly be affected by the contamination present at the site. Potential receptors must include human and ecological receptors, groundwater, and other potential receptors. This section must identify relevant pathways, such as pathways that could divert or accelerate the transport of contamination to human receptors, ecological receptors, and/or groundwater.

6.8 Regulatory Criteria

A section must set forth the applicable cleanup standards, risk-based screening levels, and risk-based cleanup goals for each medium at the site. The appropriate cleanup levels for each site must be included, if site-specific levels have been established. A table summarizing the applicable cleanup standards must be included as part of the document. Alternately, the report may include applicable cleanup standards as a column in the data tables. If cleanup levels calculated in a risk evaluation are employed, the risk evaluation document must be referenced including pertinent page numbers for referenced information.

6.9 Identification of Corrective Measures Options

A section must identify and describe potential corrective measures for source, pathway, and receptor controls. Corrective measures options must include the range of available options including, but not limited to, a no action alternative, institutional controls, engineering controls, in-situ and onsite remediation alternatives, complete removal, and any combination of alternatives that would potentially achieve cleanup goals.

6.10 Evaluation of Corrective Measures Options

A section must provide an evaluation of the corrective measures options identified in Section 6.6.9 above. The evaluation must be based on the applicability, technical feasibility, effectiveness, implementability, impacts to human health and the environment, and cost of each option. A table summarizing the corrective measures alternatives and the criteria listed below must be included in the Tables section of this document. The general basis for evaluation of corrective measures options is described below.

6.10.1 Applicability

Applicability addresses the overall suitability for the corrective action option for containment or remediation of the contaminants in the relevant media with regard to protection of human health and the environment.

6.10.2 Technical Feasibility

Technical feasibility describes the uncertainty in designing, constructing, and operating a specific remedial alternative. The description must include an evaluation of historical applications of the remedial alternative including performance, reliability, and minimization of hazards.

6.10.3 Effectiveness

Effectiveness assesses the ability of the corrective measure to mitigate the measured or potential impact of contamination in a medium under the current and projected site conditions. The assessment also must include the anticipated duration for the technology to attain regulatory compliance. In general, all corrective measures described above will have the ability to mitigate the impacts of contamination at the site, but not all remedial options will be equally effective at achieving the desired cleanup goals to the degree and within the same time frame as other options. Each remedy must be evaluated for both short-term and long-term effectiveness.

6.10.4 Implementability

Implementability characterizes the degree of difficulty involved during the installation, construction, and operation of the corrective measure. Operation and maintenance of the alternative must be addressed in this section.

6.10.5 Human Health and Ecological Protectiveness

This category evaluates the short-term (remedy installation-related) and long-term (remedy operation-related) hazards to human health and the environment of implementing the corrective measure. The assessment must include whether the technology will create a hazard or increase existing hazards and the possible methods of hazard reduction.

6.10.6 Cost

A section must discuss the anticipated cost of implementing the corrective measure. The costs must be divided into: 1) capital costs associated with construction, installation, pilot testing, evaluation, permitting, and reporting of the effectiveness of the alternative; and 2) continuing costs associated with operating, maintaining, monitoring, testing, and reporting on the use and effectiveness of the technology.

6.11 Selection of Preferred Corrective Measure

The Permittee must propose the preferred corrective measures at the site and provide a justification for the selection in this section. The proposal must be based upon the ability of the remedial alternative to: 1) achieve cleanup standard objectives in a timely manner; 2) protect human and ecological receptors; 3) control or eliminate the sources of contamination; 4) control migration of released contaminants; and 5) manage remediation waste in accordance with State and Federal regulations. The justification must include the supporting rationale for the remedy selection, based on the factors listed in Permit Section 6.6.10, and a discussion of short- and long-term objectives for the site. The benefits and possible hazards of each potential corrective measure alternative must be included in this section.

6.12 Design Criteria to Meet Cleanup Objectives

The Permittee must present descriptions of the preliminary design for the selected corrective measures in this section. The description must include appropriate preliminary plans and specifications to effectively illustrate the technology and the anticipated implementation of the remedial option at the site. The preliminary design must discuss the design life of the alternative and provide engineering calculations for proposed remediation systems.

6.13 Schedule

A section must set forth a proposed schedule for completion of remedy-related activities such as bench testing, pilot testing, construction, installation, remedial excavation, cap construction, installation of monitoring points, and other remedial actions. The anticipated duration of corrective action operations and the schedule for conducting monitoring and sampling activities must also be presented. In addition, this section must provide a schedule for submittal of reports and data to the NMED, including a schedule for submitting all status reports and preliminary data.

6.14 Tables

A section must present the following summary tables, as appropriate. Data presented in the summary tables must include information on dates of sample collection, analytical methods, detection limits, and significant data quality exceptions. All data tables must include only detected analytes and data quality exceptions that could potentially mask detections. The following summary tables must be included in the corrective measures evaluations, as appropriate:

- a. a table summarizing regulatory criteria, background, and the applicable cleanup standards;
- b. a table summarizing historical field survey location data;
- c. tables summarizing historical field screening and field parameter measurements for each media;
- d. tables summarizing historical soil, rock, or sediment laboratory analytical data; the summary tables must include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
- e. a table summarizing historical groundwater elevation and depth to water data; the table must include the monitoring well depths and the screened intervals in each well;
- f. tables summarizing historical groundwater and vadose zone laboratory analytical data; the analytical data tables must include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
- g. tables summarizing historical surface water laboratory analytical data; the analytical data tables must include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
- h. tables summarizing historical air sample screening and analytical data; the data tables must include the screening instruments used, laboratory analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
- i. tables summarizing historical pilot or other testing data, if applicable, including units of measurement and types of instruments used to obtain measurements;
- j. a table summarizing the corrective measures alternatives and evaluation criteria; and
- k. a table presenting the schedule for installation, construction, implementation, and reporting of selected corrective measures.

6.15 Figures

This section must present the following figures for each site, as appropriate. All figures must include a scale. All plan view figures must include a north arrow. An explanation must be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. All figures must contain a date. The following figures must be included, as applicable:

- a. a vicinity map showing topography and the general location of the subject site relative to surrounding features or properties;
- b. a unit site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system locations and details; off-site well locations and other relevant features must be included on the site plan if practical; additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;
- c. figures showing historical soil boring locations, excavation locations, and sampling locations;
- d. figures presenting historical soil sample field screening and laboratory analytical data, if appropriate;
- e. figures showing all existing wells including vapor monitoring wells and piezometers; the figures must present historical groundwater elevation data and indicate groundwater flow directions;
- f. figures presenting historical groundwater laboratory analytical data including past data, if applicable; the analytical data corresponding to each sampling location may be presented as individual concentrations, in table form on the figure, or as an isoconcentration map;
- g. figures presenting historical surface water sample locations and analytical data including past data, if applicable; the laboratory analytical data corresponding to each sampling location may be presented as individual concentrations or in table form on the figure;
- h. figures presenting historical air sampling locations and presenting air quality data; the field screening or laboratory analytical data corresponding to each sampling location may be presented as individual concentrations, in table form on the figure or as an isoconcentration map;
- i. figures presenting historical pilot or other test locations and data, where applicable, including site plans or graphic data presentation;
- j. figures presenting geologic cross-sections based on outcrop and borehole data, if applicable;

- k. figures presenting the locations of existing and proposed remediation systems;
- l. figures presenting existing remedial system design and construction details; and
- m. figures presenting preliminary design and construction details for preferred corrective measures.

6.16 Appendices

Each corrective measures evaluation must include, as appropriate, as an appendix, the management plan for waste, including investigation derived waste, generated as a result of construction, installation, or operation of remedial systems or activities conducted. Each corrective measures evaluation must include additional appendices presenting relevant additional data, such as pilot or other test or investigation data, remediation system design specifications, system performance data, or cost analyses as necessary.