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MEMORANDUM

TO: File (Triassic Park – Red)

FROM: Steve Pullen

SUBJECT: CORRECTIVE ACTION TECHNICAL SUPPORTING DOCUMENT

DATE: January 8, 2001

This memorandum explains the presence of the Corrective Action Technical Supporting Document (CATSD) within the Triassic Park Red File. The CATSD explains the statutory and regulatory justification for the corrective action conditions for Solid Waste Management Units (SWUMs) and Regulated Units within the Triassic Park Draft Permit, and provides a detailed discussion of the corrective action process, including key definitions, concepts, and components of the process. The CATSD is referred to by the Triassic Park Fact Sheet presented by the Department during the draft permit public notice period.

CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

I. INTRODUCTION

In Permit Part 10 of the draft Triassic Park Permit, the New Mexico Environment Department (NMED) determined to impose conditions for the implementation of corrective action for Solid Waste Management Units (SWMUs). Permit Part 9 imposes more unit specific corrective action conditions for Regulated Units. This testimony explains the statutory and regulatory justification for those conditions, and provides a detailed discussion of the corrective action process, including key definitions, concepts, and components of the process. Key definitions and concepts include: (1) the definition of release; (2) the nature and extent of contamination; (3) data quality objectives; and (4) use of existing data. Key components include: (1) RCRA Facility Assessment; (2) Release Assessment; (3) RCRA Facility Investigation; (4) Interim/Stabilization Measures; (5) Corrective Measures Study; and (6) Corrective Measures Implementation.

II. DISCUSSION

A. STATUTORY AND REGULATORY BACKGROUND

NMED's determination to impose corrective action requirements at Triassic Park is based upon clear and express statutory and regulatory support. Specific corrective action requirements for regulated units are, in addition to the following regulations, based upon the agency's conditional approval of the groundwater monitoring waiver request as discussed further below. The Resource Conservation and Recovery Act (RCRA) requires permits issued after 1984 to contain corrective action requirements for releases of hazardous wastes or constituents from a SWMU, regardless of when the waste was placed in the SWMU, as necessary to protect human health and the environment. [See RCRA Sections 3004(u) and 3004(v), as amended by Public Law 98-616 (November 8, 1984)].

The New Mexico Hazardous Waste Act (HWA) and NMED regulations at 20.4.1.500 NMAC (incorporating 40 CFR §264.101) impose the same requirement on permits issued after April 8, 1987. [NMSA 1978, Sections 74-4-4.A.5.h and 74-4-4.2.C (Repl. Pamp. 1993)]. The HWA Section 74-4-4.A.5.i and 20.4.1.500 NMAC (incorporating 40 CFR §264.101(c)) require corrective action beyond the facility's boundary where necessary to protect human health and the environment, unless the facility owner or operator demonstrates to the Environment Secretary's satisfaction that, despite the owner's or operator's best efforts, the owner or operator could not obtain permission to undertake such action.

Finally, NMED is authorized to impose terms and conditions in a permit as deemed necessary to protect human health and the environment. HWA Section 74-4-4.2.C; 20.4.1.900 NMAC (incorporating 40 CFR §270.32(b)(1)). Permit Part 10 is based on the EPA Region 6 Model Hazardous and Solid Waste Amendments (HSWA) Permit.

1. BACKGROUND

The history of RCRA corrective action began with the 1984 Hazardous and Solid Waste Amendments (HSWA) to RCRA. HSWA directed EPA to require corrective action for all releases of hazardous waste and hazardous constituents from SWMUs at any facility seeking a RCRA permit (e.g., Treatment, Storage or Disposal Facilities or TSDFs,) regardless of when the waste was placed in the units. When corrective action could not be completed prior to permit issuance, HSWA directed the EPA to establish corrective action schedules for compliance and financial assurance. In addition, HSWA contained an omnibus provision directing EPA to ensure that every permit contained terms and conditions deemed necessary to protect human health and the environment. [RCRA Section 3004 (u) and (v)].

In July 1985, the EPA codified the corrective action requirements at 40 CFR 264.90(a)(2) and 264.101, and the omnibus provision at 40 CFR 270.32(b)(2). [See 50 FR 28702 (July 15, 1985)]. These regulations reiterated the statutory language of RCRA Section 3004(u), by requiring facility owners and operators seeking RCRA permits to institute corrective action to protect human health and the environment, or when such action could not be completed prior to permit issuance, to implement schedules for compliance and financial assurance.

In December 1987, EPA codified additional corrective action requirements at 40 CFR 264.101(c). [See 52 FR 45788 (December 1, 1987)]. These regulations reiterated the statutory language of RCRA Section 3004(v), by requiring corrective action for releases beyond the facility boundary. These regulations also established permit application requirements to implement the corrective action regulations.

On July 27, 1990, EPA proposed detailed regulations to implement the RCRA corrective action program. [See 55 FR 30798 (July 27, 1990)]. The proposal was designed to be the analogue to the CERCLA program's National Oil and Hazardous Substances Pollution Contingency Plan). As such, the RCRA corrective action program addressed both technical (e.g., cleanup levels, remedy selection, points of compliance) and procedural (e.g., definitions, permitting, reporting) issues. The proposal emphasized the need for site-specific flexibility in cleanup programs, stating:

> Because of the wide variety of sites likely to be subject to corrective action, EPA believes that a flexible approach, based on site-specific analyses is necessary. No two cleanups will follow exactly the same course, and therefore, the program has to allow significant latitude to the decision maker in structuring the process, selecting the remedy, and setting cleanup standards appropriate to the specifics of the situation. 55 FR 30802. The proposal generated significant public comment. As a result, the EPA has finalized only a few sections, but the bulk of the proposal is used as guidance for corrective actions by the EPA and NMED.

2. STATE PRIMACY FOR CORRECTIVE ACTION

On January 2, 1996 the State of New Mexico received final authorization from the EPA to administer, implement, and enforce corrective action requirements under RCRA and HSWA. As a result, New Mexico now assumes primary responsibility for implementing the provisions of the RCRA, including the corrective action program.

3. EPA NOTICE OF ADVANCE RULEMAKING

On May 1, 1996, EPA published an Advance Notice of Proposed Rulemaking (ANPR) to introduce its proposed strategy for promulgating corrective action regulations, and to request public comment on a variety of concepts and issues regarding corrective action. [See 61 FR 19432 (May 1, 1996)]. Because EPA's philosophy and strategies had evolved since 1990, the ANPR included a general status report on the corrective action program, and provided guidance on a number of topics not fully addressed in 1990.

a. Refinement of Definitions

The EPA's 1990 proposed corrective action program included definitions for several terms important to defining the applicability of RCRA corrective action. The EPA and NMED generally have interpreted these terms as proposed in 1990, except as clarified by the ANPR, which refined several definitions, including solid waste management unit, hazardous waste, and hazardous constituent. The ANPR confirmed that a one-time spill of solid waste containing hazardous constituents, which had not been adequately cleaned up, would not constitute a SWMU. [See 61 FR 19443]

The 1990 proposal defined SWMU as "any discernable unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released." [55 FR 30874]. The definition of SWMU is based upon the statutory and legislative support interpreting Sections 1004(28) and 3004(u) of RCRA. In addition, NMED considers regulated units, as defined at 20.4.1 NMAC (incorporating 40 CFR §264.90(a)(2)), a subset of SWMUs.

Regulated units (RUs), being a subset of SWMUs, have corrective action regulatory requirements specified at §264.101 in addition to the groundwater specific requirements specified at 264.90 through 264.100. Section 264.100 requires sufficient corrective action to ensure that RUs are in compliance with a ground water protection standard. Ground water monitoring was waived at the Triassic Park Waste Disposal Facility for reasons disussed at Permit Attachment H, *Ground water Monitoring Waiver Request and Approval.* The corrective action requirements for the RUs in the Permit are in part a condition of the ground water monitoring waiver approval.

The ANPR also introduced the term Area of Concern (AOC) to address the spill scenario, and generally refers to releases that warrant investigation or remediation under the "omnibus authority" (regardless of whether the releases are associated with a specific SWMU). NMED considers an AOC to be any discernable area at the facility, or area off-site, determined by the

Secretary to be impacted by migration of contamination from the facility, where hazardous waste or hazardous constituent(s) are present, or are suspected to be present, as a result of a release from the facility, and that pose a current or potential threat to human health or the environment. An AOC may require investigation and remedial action under the omnibus authority of Section 74-4-4.2.B of the HWA and 20.4.1.900 NMAC (incorporating 40 CFR 270.32(b)(2)).

Also of interest for the Triassic Park RCRA Permit are the definitions of hazardous waste and hazardous constituents. RCRA Section 3004(u) and HWA Section 74-4-4.2.B require corrective action for releases of "hazardous wastes or constituents". EPA and NMED interpret "hazardous waste" as any waste that is hazardous within the meaning of RCRA Section 1004(5). This definition is broader than wastes listed or identified under RCRA Section 3001. EPA and NMED consider the reference to "constituents" to be significant, because it indicates that the corrective action program was intended to extend to hazardous constituents regardless of whether they satisfy the definition of "hazardous waste" or were derived from "hazardous waste". Under this interpretation, the corrective action program applies to hazardous constituents derived from nonhazardous solid waste. Accordingly, the revised draft permit defines "hazardous constituents" as any constituent identified in 20.4.1.200 NMAC (incorporating 40 CFR 261 Appendix VIII), any constituent identified in 20.4.1.500 NMAC (incorporating 40 CFR 264 Appendix IX), any constituent identified in a hazardous waste listed in 20.4.1.200 NMAC (incorporating 40 CFR 261 Subpart D), or any constituent identified in a toxicity characteristic waste in 20.4.1.200 NMAC (incorporating 40 CFR 261.24, Table 1).

B. KEY CONCEPTS

1. DEFINITION OF RELEASE

The term "release" is a key concept for RCRA corrective action. The EPA defines "release" as "any spilling leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment". [50 FR 28713 (July 15, 1985)] In the 1990 proposal, the EPA added the following language to the definition: ". . . including abandonment or discarding of barrels, containers and other closed receptacles containing hazardous waste or hazardous constituents". [55 FR 30874] NMED has incorporated the regulatory definition and the additional language from the 1990 proposal into the revised draft permit.

For RCRA corrective action, NMED considers a release of hazardous waste or constituents to have occurred if; (1) a hazardous waste or a waste containing hazardous constituents was managed directly on or within the ground surface at a SWMU (e.g., an unlined landfill or surface impoundment); (2) it is known that hazardous constituents from a SWMU or AOC came into contact with any environmental medium (e.g., a leak or spill from a SWMU or AOC contacted soil, surface water, or ground water outside the unit); or (3) chemical analyses of samples of any environmental medium (e.g., soil, surface water, ground water, or air), collected within, adjacent to, or down gradient from a SWMU or AOC detect organic hazardous constituents above the method detection limit, or detect inorganic hazardous constituents above background concentrations.

For the purposes of the Triassic Park draft permit, the principal method of detecting a release from a regulated unit (i.e., the Landfill or the Surface Impoundment) is through the vadose zone monitoring system (VZMS). A release shall be considered to have occurred when fluids captured in the VZMS have; (1) leachate chemical constituents measured above the appropriate method detection limit, (2) non-leachate major ion and metal baseline chemical concentrations show a statistically significant change.

2. NATURE AND EXTENT OF CONTAMINATION

Once it has been established that hazardous constituents have been released from a SWMU or AOC, the owner or operator must characterize the nature and extent of contamination. Typically, this characterization is conducted during the RCRA Facility Investigation (RFI). Critically, this characterization must occur before the owner or operator assesses the necessary corrective measures.

The ANPR emphasized, "Before cleanup decisions can be made, some level of characterization is necessary to ascertain the nature and extent of contamination at a site and to gather information necessary to support selection and implementation of appropriate remedies". [61 FR 19444] The ANPR also noted that:

> Carefully designed and implemented RFIs are critical to accurately characterize the nature, extent, direction, rate, movement, and concentration of releases at a given facility. A successful RFI will identify the presence, movement, fate, and risks associated with environmental contamination at a site and will elucidate the chemical and physical properties of the site likely to influence contamination migration and cleanup.

The EPA and NMED regulations do not define the term "nature and extent of contamination". Rather, EPA and NMED define "nature and extent of contamination" on a site-specific basis which considers the potentially impacted media and unit-specific characteristics. For ground water, the extent of contamination typically is delineated to appropriate analytical method detection limits or to the first confining layer or hydrologic barrier. For surface water, contamination is measured against appropriate analytical detection limits. For soil, contamination is measured against the analytical detection limits for organic constituents and background concentrations for inorganic constituents.

3. DATA QUALITY OBJECTIVES

Data Quality Objectives are critical to decision-making under the RCRA corrective action program. The overall degree of data quality or uncertainty that a decision maker is willing to accept is called the Data Quality Objective (DQO) for a decision. All data gathering strategies should be tailored to the purpose for which the data will be used. DQOs are used to specify the quality of the data, usually in terms of precision, bias, representativeness, comparability and completeness. The DQO approach applies to the entire measurement system (e.g., sampling locations, methods of collection and handling, field analysis, etc.), not just to laboratory analytical operations. DQOs can and should be used to ensure that environmental data are

scientifically valid, defensible, and of an appropriate level of quality given the intended use for the data.

4. USE OF EXISTING DATA

A large body of data exists at Triassic Park regarding the environmental setting collected outside the RCRA corrective action process. As a general principle, there is no need to recollect non-time-dependent information, and in fact, EPA and NMED encourage the use of such information in the RCRA corrective action process. This information may be contained in reports or other formats not traditionally used for RCRA corrective action (e.g., engineering boring logs generated by local utility companies or during building construction). This information is acceptable provided the owner or operator converts the information into a usable format. Owners and operators who are conducting site characterization independently should document the quality of their information carefully. Thorough documentation increases the data's usefulness in the corrective action process. To determine whether existing data may be used in the corrective action process, NMED evaluates the nature and quality of the information in light of the goals of the corrective action investigation. If DQOs have been established, NMED can directly evaluate the data. For instance, the DQOs for a specific corrective action decision could be a minimum analytical detection limit considerably lower than used to generate the existing data. In this case, "non-detects" in the existing data could not be used to justify NFA, but could be used to identify "hot-spots", or to plan a second phase study using more sensitive analytical methods.

If NMED is aware of pertinent existing information at the time of issuance of a permit or order, NMED may reference the information in the facility investigation requirements, or if the data has sufficient quality and quantity, it may determine that the data satisfies site investigation needs.

C. CORRECTIVE ACTION PROCESS

As noted above, NMED relies on the EPA's proposed regulations (July 27, 1990) and ANPR (May 1, 1996) for guidance in implementing the RCRA corrective action program. EPA's proposed regulations structured the corrective action process around five (5) elements: (1) RCRA Facility Assessment (RFA); (2) RCRA Facility Investigation (RFI); (3) Interim/Stabilization Measures; (4) Corrective Measures Study (CMS); and (5) Corrective Measures Implementation (CMI). The ANPR discussed a sixth element, a Release Assessment (RA), which typically occurs between the RFA and RFI. These seven (7) elements occur, to one degree or another, at most sites subject to RCRA corrective action requirements, although the EPA emphasizes that the elements should be viewed as evaluations necessary to make good cleanup decisions, not prescribed steps for all corrective actions at all facilities.

1. RCRA FACILITY ASSESSMENT

a. Purpose

The RCRA Facility Assessment (RFA), the first element, is a mandatory requirement of the RCRA corrective action program. During a RFA, the regulatory agency compiles existing information on environmental conditions at the facility, including information to identify

SWMUs and AOCs, document releases and potential releases of hazardous waste or hazardous constituents from the SWMUs and AOCS, and determine potential pathways and receptors. This information is used to develop the initial site conceptual model and to identify SWMUs and AOCs that may of may not require corrective action in the RCRA permit.

b. Potential Outcomes

The typical outcome of a RFA is a report describing the SWMUs and AOCs at a facility. The RFA Report also may include conclusions regarding the need for further actions at each unit based on the potential occurrence of a release. The conclusions regarding the need for further actions may include NFA, confirmatory sampling, a RFI, or interim/stabilization measures.

For SWMUs and AOCs in which hazardous constituents were managed or from which there was no release of hazardous constituents (e.g., units with adequate engineered release controls), NMED typically concludes that no further action (NFA) is needed. For SWMUs and AOCs where historical or current evidence suggests the occurrence of a release, but for which there is no information regarding the presence of hazardous constituents, where the unit's condition suggests the occurrence of a release, but for which there is no direct evidence (e.g., heavy staining on a concrete outdoor waste container storage pad without curbing), or for which it is not possible to visually assess the occurrence of a release (e.g., underground industrial wastewater sewer lines or manholes), NMED typically concludes that confirmatory sampling is needed.

For SWMUs and AOCs with a documented release of hazardous constituents (e.g., visual observation during the RFA, file records, or records indicating direct contact of hazardous constituents with an environmental medium), NMED typically concludes that a RFI is needed.

For SWMUs and AOCs for which it was clear, from the RFA, that a release had occurred which require immediate attention to prevent or mitigate a threat to human health and the environment (e.g., contamination of a drinking water supply exceeding MCLs), NMED typically concludes that interim/stabilization measures are needed.

c. Permit Part Regarding Corrective Action for SWMUs

NMED uses the results of a RFA to identify and include SWMUs and AOCs requiring further investigation or remediation in the Part regarding corrective action for SWMUs of a RCRA permit issued under HWA Sections 74-4-4.A.5.h and 74-4-4.2. . NMED conducted a RFA at TP on April 9, 1995, and completed a Report on the subject on April 24 1995. SWMUs and AOCs identified during the RFA are listed on Table 10-1 of the Permit.

d. Site Conceptual Model

A RFA also is used to develop the initial site conceptual model for the facility, which is an important component for implementation of RCRA corrective action at many sites. A site conceptual model is a three-dimensional picture of site conditions that conveys what is known or suspected about the sources, releases, contaminant fate and transport, exposure pathways and potential receptors, and risks. The site conceptual model is based on the available information,

and evolves as more information is obtained. The site conceptual model may be used to present hypotheses that additional investigations could confirm or refute, to determine the need for interim measures, to support risk-based decision-making and to aid in identification and design of potential corrective measure alternatives. The site conceptual model is not a mathematical or computer model, but helps evaluate current information and predict future conditions. Because the site conceptual model is dynamic, it should be tested and refined from the beginning of corrective action to the completion of remediation.

2. RELEASE ASSESSMENTS

a. Purpose

A Release Assessment (RA) (also known as a Phase I RCRA Facility Investigation or Confirmation Sampling) is used to confirm or reduce uncertainty about SWMUs, AOCs, and potential releases identified during the RFA. Under the corrective action process as originally conceived, NMED, EPA, and the owner or operator typically moves directly from the RFA to full-scale site characterization under the RFI. However, as they gained experience, the agencies have found it advantageous in some cases to conduct a limited release assessment after the RFA, but before full-scale site characterization, in order to focus subsequent investigations or eliminate SWMUs and AOCs from further consideration. A RA can be especially helpful in cases where the RFA is old or where the regulatory agency and owner or operator disagree about the inclusion of one or more SWMUs or AOCs in the site characterization. Information collected during a RA can be used to focus site characterizations on the releases and exposure pathways that pose the greatest risk to human health and the environment, and to eliminate SWMUs and AOCs from full-scale site characterization. For example, a RA might identify an old waste pile as a SWMU. The owner or operator might present information demonstrating removal of the waste, but little or no information may be available to confirm that any release was remediated. During a RA, the owner or operator could conduct highly focused sampling to confirm that any release did not occur or was remediated.

b. Sampling Strategy

A RA should employ a focused sampling strategy that is biased toward locations and environmental media most likely to have received a release based on visual observation or knowledge of the SWMU or AOC. For large SWMUs and AOCs, this sampling could incorporate statistically valid grid sampling or sampling at specified intervals along sewer line paths. All sampling should be conducted in accordance with detailed sampling and quality assurance project plans. The quality of the collected data must be very high, because it will be used to make decisions regarding the need for further action. As a result, standard sampling techniques and laboratory analysis with low detection limits should be used.

c. Determination of Release Occurrence

The primary use of a RA is to determine whether a release of hazardous constituents has occurred from a SWMU. NMED and EPA consider that a release has occurred from a SWMU or AOC if hazardous constituents are found in an environmental medium in concentrations above

the method detection limit for organic constituents or background concentrations for inorganic constituents.

d. Action When No Release Has Occurred

If the RA indicates that a release has not occurred, and the unit the permit as requiring corrective action, the owner or operator may request a NFA determination for the SWMU or AOC by petitioning the NMED Secretary for a Class III Permit modification to terminate the RFI/CMS process for that unit. NMED reviews the relevant information, as well as any public comments. If NMED determines to grant the NFA petition, NMED removes the SWMU or AOC from the table of the permit of units requiring corrective action, to the table of units not requiring CA.

e. Action When Release Has Occurred

If the RA indicates that a release of hazardous waste or hazardous constituents has occurred from a SWMU or AOC, NMED evaluates the data to determine whether to require interim measures to prevent or mitigate threats to human health or the environment. If NMED determines not to require interim measures, the owner or operator must conduct a RFI to determine the nature and extent of the release. NMED uses the RFI to determine the need for corrective measures at the SWMU or AOC. In cases involving relatively simple delineation of the extent of contamination and the obvious need for corrective measures, NMED and the owner or operator may decide, based on the RA to skip the RFI and begin planning and implementation of corrective measures. In these cases, the owner or operator completes the delineation of the extent of contamination during the implementation of the corrective measures.

3. RCRA FACILITY INVESTIGATION

a. Purpose

The second major element is the RCRA Facility Investigation (RFI). A RFI is required if a release is known to have occurred at a SWMU. The purpose of a RFI is to collect data of adequate quantity and quality to determine the need for and type of corrective measures to mitigate the impact to human health and the environment and to remove contamination to below action levels. A RFI may be used to determine whether the release poses an immediate threat to human health or the environment requiring the implementation of interim/stabilization measures.

b. Delineation of Contamination

NMED and EPA require an accurate characterization of the nature and extent of releases at a facility. NMED requires sampling data produced by RFIs be designed to detect the highest concentrations of hazardous constituents released at a site and determine whether hazardous constituents might have migrated beyond the sampling area.

c. Flexible Processes

The EPA's 1990 proposed regulations described the types of information required during an RFI. These information requirements have been incorporated into the RFI Scope of Work Sections of the Model Permits adopted by several EPA regions, including EPA Region 6, to ensure that the

permits are applicable to a broad range of facilities. NMED and EPA recognize that these information requirements may not be necessary for all facilities, provided owners and operators gather sufficient information to support clean-up decisions. As a result, NMED and EPA believe that RFIs should be tailored to site-specific conditions.
Permit Attachment S specifies a detailed RFI Scope of Work. This degree of detail ensures that the Permittee consider the potential for a release to affect all environmental media, and that the permit language is sufficiently broad to address the most probable conditions at the facility.
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d. Plans and Performance

The RFI should be conducted in accordance with detailed sampling and quality assurance plans. To this end, the Corrective Action Permit Parts establish requirements for a Facility Work Plan (Permit Attachment R), which guides the RFI. The Facility Work Plan Outline includes plans for project management, data collection, management, and quality assurance, site safety and health, and community relations. An owner or operator can consult EPA guidance documents, such as the RCRA Facility Investigation Guidance Document, EPA 530/SW-89-031, Volumes I-IV, (May 1989) during the development of the Facility Work Plan.

The initial phase of a RFI could involve field screening site characterization technologies (e.g., direct push technologies for sampling soil gas, soil and/or ground water and on-site sample analysis) to crudely delineate the extent of contamination. This approach may be appropriate given the lower data quality levels typically associated with these techniques. Once the extent of contamination is crudely delineated, the owner or operator can employ standard sampling techniques and laboratory analyses with lower detection limits to collect high quality data confirming the crude delineation.

e. Data Evaluation

As discussed earlier, the primary purpose of a RFI is to collect data of adequate quantity and quality to assess the need for corrective measures.

4. INTERIM/STABILIZATION MEASURES

Interim/stabilization measures include a broad spectrum of institutional or physical corrective actions, conducted prior to the final remedy selection, to control or abate ongoing threats to human health or the environment, prevent or abate further releases from SWMUs and AOCs, or prevent and minimize the spread of contamination. An overriding goal of the RCRA corrective action program is the reduction of risk by implementing interim/stabilization measures at the earliest possible time. Interim/stabilization measures include source removal, installing ground water pump-and-treat systems to minimize off-site migration of ground water contamination plumes, and institutional controls (e.g., fencing and signs) to minimize direct contact.

As noted in Permit Condition 10.8.1.a, the decision to require interim/stabilization measures is site- and unit-specific, and is based on several factors, including the time necessary to develop and implement a final corrective measure, the actual and potential exposure to human and environmental receptors, the actual and potential contamination of drinking water supplies and

sensitive ecosystems, and the potential for further degradation of the environmental medium. NMED does not anticipate the necessity for interim/stabilization measures at TP.

5. CORRECTIVE MEASURES STUDY

a. Purpose

Upon significant exceedance of an action level as specified in Permit Condition 10.3, and after the Secretary has approved a RFI Final Report, the owner or operator must select and implement corrective measures. There is a broad universe of corrective measures for remediating contamination. Therefore, the owner or operator must prepare a Corrective Measure Study (CMS) to evaluate the range of potential corrective measures and their advantages and disadvantages for remediating a release in light of site-specific conditions and corrective action objectives.

b. Components

The primary elements of a CMS are the CMS plan, CMS performance, and the CMS report/summary. Permit Condition 10.9 describes each of these elements in detail. The CMS plan should include a description of the current situation, the establishment of corrective action objectives, a description of the CMS approach, and an implementation schedule. The key component of the CMS Plan is the owner or operator's proposal of site-specific corrective action objectives. In fact, this proposal, which derives from the prior establishment of site-specific clean-up levels, may have already been established.

The CMS performance includes the identification, screening, development, evaluation, and recommendation of potential corrective measures for removal, containment, and treatment of contamination. Permit Condition 10.9.1 specifies detailed requirements for CMS performance, including the requirement to identify all possible alternatives for the removal, containment, and treatment of contamination. The Corrective Action Module also specifies the criteria for screening the CMS's preliminary list of potential corrective measures to eliminate measures that are infeasible, rely on technologies that are unlikely to work, or that will not achieve the corrective action objectives within a reasonable time period. After applying these criteria, the Permittee must develop a workable number of corrective action alternatives that individually, or in combination, adequately address the contamination and corrective action objectives. The Permittee must conduct laboratory or bench-scale testing, as necessary, to evaluate the workability of specific corrective measures, evaluate any relevant technical, environmental, human health, and institutional issues, and prepare cost estimates.

The CMS report/summary presents the CMS results, as well as the Permittee's recommendations for selecting specific corrective measures, including the rationale, preliminary design, and expected performance. Once NMED approves the CMS report/summary, NMED initiates a proceeding to modify the permit to specify the corrective measures and an implementation schedule. The modification process ensures that the public has an opportunity to review and comment on the proposed corrective measures.

c. Streamlining the CMS Process

The CMS process often occurs for SWMUs involving the release of hazardous constituents which impact a large area or several environmental media, or which involve complex geologic or hydrogeologic conditions complicating remediation. However, NMED and EPA do not believe that the CMS process is warranted for the sole purpose of completing paperwork. At many facilities, a release may have impacted a relatively small area or a single environmental medium, or standard engineering solutions may be readily used. In these situations, the CMS process may not be necessary. Rather, the preferred corrective measure may be apparent early in the RCRA corrective action process (perhaps as early as the RFI). As a result, the analysis of potential corrective measures would be highly focused.

d. Implementation

Corrective Measures Implementation (CMI) involves the detailed design, construction, operation, maintenance, and monitoring of corrective measures. The CMI requirements may be specified in a modification to the Corrective Action Module (or a consent order issued in an enforcement action). Regardless where the CMI requirements are specified, they must include a description of the proposed corrective measures, the clean-up levels, compliance schedules and demonstration, and reporting requirements. The design portion of the CMI includes conceptual design, preliminary operation and maintenance plans, intermediate design plans and specifications, and final design plans and specifications, a construction quality assurance plan, and a health and safety plan. The owner or operator must construct the corrective measure as specified in the design portion. Upon completion of construction, the owner or operator must submit a construction completion report to NMED. After NMED approves the report, the owner or operator begins the operation and maintenance phase. The owner or operator must operate and maintain the corrective measure until NMED determines that the corrective action objectives have been achieved.

To determine whether corrective action objectives have been achieved, the owner or operator may have to conduct performance monitoring. In particular, performance monitoring is important for ground-water remediation, because the concentration and distribution of contamination may change over time. It also is important for corrective measures that rely on engineering controls (e.g., liners, covers, barrier walls), because poorly designed or constructed engineering controls can allow continued releases of hazardous constituents. NMED or EPA may make decisions regarding the completion of corrective measures on a site-by-site or facility-wide basis. The public should be given an opportunity to review and comment on all proposals regarding the completion of corrective measures.