APPENDIX VII-B

CORRECTIVE MEASURES STUDY AND IMPLEMENTATION

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Objectives and Purpose

The objectives of the Corrective Measures Study (CMS) and Corrective Measures Implementation (CMI) are to evaluate corrective action alternatives and to select and implement the chosen alternative as needed for protection of human health and the environment. The CMS and CMI shall be completed for each SWMU that does not meet the risk based no further action (NFA) or industrial closure criteria outlined in Appendix VII-A, Utah Admin. Code R315-101 and as recommended in approved Phase II RCRA Facility Investigation (RFI) Reports and CMS Workplans.

1. Description of Current Situation

The Permittee shall provide an update to the information presented in the RFI Reports to the Director regarding previous response activities and any interim measures which have or are being implemented at TEAD-N. The Permittee shall also make a Facility-specific statement of the purpose for the response, based on the results of the RFI. The statement of purpose shall identify the actual or potential exposure pathways that should be addressed by corrective measures.

2. Establishment of Corrective Action Objectives

The Permittee shall establish site-specific objectives for the corrective action in the CMS Workplan. These objectives shall be based on public health and environmental criteria, information gathered during the RFIs, EPA and State of Utah guidance, and the requirements of any applicable State and federal statutes. Any corrective actions concerning groundwater releases must provide human health and environmental protections consistent with those required under Utah Admin. Code R315-101 and other requirements or groundwater management plans approved by the Director. The Permittee shall also consider the use, value and vulnerability of groundwater in establishing Corrective Action Objectives (CAOs) and preparing groundwater management plans.

3. Screening of Corrective Measure Technologies

The Permittee shall review the results of the RFIs to identify technologies that are appropriate for the Facility. The Permittee shall screen technologies and identify those having severe limitations, those that present safety hazards for a given set of waste and site-specific conditions or that do not meet the requirements of this Permit or the Utah Admin. Code.

Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail in sections 3.1 - 3.3 below:

3.1. Site Characteristics

Site data shall be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics shall be eliminated from further consideration.

3.2. Waste Characteristics

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics shall be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site).

3.3. Technology Limitations

During the screening process, the level of technology development, performance, record, and inherent construction, operation, and maintenance problems shall be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated shall be eliminated in the screening process. Technologies evaluated by the Interstate Technology Regulatory Council (ITRC) (see http://www.itrcweb.org/) may be favored for use with minimum requirements for site specific testing and prove-out.

4. Identification of Corrective Measure Alternatives

The Permittee shall develop corrective measure alternatives based on the corrective action objectives and shall report these alternatives in the CMS Workplan. The Permittee shall rely on engineering practice to determine which technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternative(s). The alternative(s) developed should represent a workable number of options that each appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. The Permittee shall document in the Workplan the reasons for excluding any technologies.

5. Evaluation of the Corrective Measure Alternatives

The Permittee shall describe each corrective measure alternative that passes the screening in Section 2 and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human

health and institutional concerns. The Permittee shall also develop cost estimates of each corrective measure.

The Permittee shall evaluate each alternative using the following criteria and in accordance with current USEPA guidance for CMS.

5.1. Technical

The Permittee shall evaluate each corrective measure alternative based on performance, reliability, feasibility to implement, and safety.

5.2. Environmental

The Permittee shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on the Facility conditions and pathways of contamination addressed by each alternative. The Environmental Assessment for each alternative will include an evaluation of the short- and long-term beneficial and adverse effects of the response alternative, and adverse effects on environmentally sensitive areas, and an analysis of measures to mitigate adverse effects.

5.3. Human Health

The Permittee shall assess each alternative in terms of the extent to which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementing the corrective measures. The assessment will describe the types and levels of contaminants on-site, potential exposure routes, and potentially affected populations. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, and guidelines acceptable to the Director.

5.4. Institutional

The Permittee shall assess the effects of federal, State, and local environmental and public health standards, regulations, guidance, advisories, ordinances, and community relations on the design, operation, and timing of each alternative.

5.5. Cost

The Permittee shall develop an estimate of the cost of each corrective measure alternative and for each phase or segment of the alternative. The cost estimate shall include capital and operation and maintenance costs.

6. Corrective Measures Report and Recommendation

The Permittee shall justify and recommend a corrective measures alternative in the CMS Report, using the criteria outlined in Section 5. The Permittee shall submit summary tables of the corrective measure alternatives that were evaluated. Tradeoffs among health risks, environmental effects, and other pertinent factors shall be highlighted. The CMS shall contain a Statement of Basis in accordance with Task VI. The Director shall approve CMS Report and Statement of Basis..

7. Corrective Measures Implementation

The purpose of the Corrective Measures Implementation (CMI) is to design, construct, operate, maintain, and monitor the performance of the corrective measures selected in the CMS Report and Statement of Basis to protect human health and the environment. This information shall be included in the CMI Workplan.

7.1. Corrective Measures Design

The Permittee shall prepare final construction plans and specifications to implement the corrective measures at the Facility as defined in the CMI work plan. The construction plans and specification shall include, but not be limited to:

7.1.a. Design Plans and Specifications:

7.1.a.i. Design strategy and basis for implementation;

7.1.a.ii. Currently accepted environmental control measures, construction practices and techniques, and the constructability of the design.

7.1.a.iii. Assumptions, detailed drawings including, but not limited to process flow diagrams, general arrangement, and any applicable piping and instrumentation diagrams), equipment and specifications, and material and energy balances; and

7.1.a.iv. Discussion of the possible sources of error and potential operation and maintenance problems.

7.1.b. Operations and Maintenance Plan:

7.1.b.i. Normal and alternate operation and maintenance (O&M) practices including, but not limited to, tasks for operation, tasks for maintenance, prescribed treatment or operation conditions, and schedule;

7.1.b.ii. Routine monitoring and laboratory testing including, but not limited to, a description of monitoring tasks, required laboratory tests and their interpretation, required Quality Assurance/Quality Control (QA/QC), and a schedule of monitoring frequency;

7.1.b.iii. Equipment description (including equipment identification, installation of monitoring components, maintenance procedures, and replacement schedule), and

records and reporting including, but not limited to, daily operation logs, laboratory records, records, for operating costs, reporting emergencies, personnel, and maintenance records, and required monthly and annual reports to be submitted to the Director;

7.1.b.iv. Alternate O&M procedures to prevent undue hazard due to system failure and analysis of vulnerability and additional resource requirements should a failure occur; and

7.1.b.v. A Safety Plan to be implemented during routine operations and safety tasks in the event of systems failure.

7.1.c. Project Schedule identifying timing for initiation and completion of all critical path tasks, dates for completion of the project, and major milestones.

7.1.d. Construction Quality Assurance Plan establishing construction quality assurance objectives (including but not limited to personnel qualifications, inspections activities, sampling requirements, and documentation).

7.1.e. Health and Safety Plan (the Health and Safety Plan developed for the RCRA Facility Investigation shall be modified to address the activities to be performed to implement the corrective measures).

7.1.f. Design phases shall include a preliminary design, intermediate design, equipment startup and operator training, additional studies, prefinal design, and final design:

7.1.f.i. Preliminary design, approximately 30% design completion. The Permittee shall field verify the existing condition of the TEAD-N. The technical design requirements of the project shall be at an adequate level of completion to enable a determination if the final design will provide an operable and usable corrective measure. Supporting data and documentation shall be provided with the design documents defining the functional aspects of the program. The Permittee shall include with the preliminary submission design calculations reflecting the same percentage of completion as the designs they support.

7.1.f.ii. Intermediate design, approximately 60% completion. The intermediate design shall include the Design Plans and Specifications, O&M Plan, Project Schedule, Quality Assurance Plan, and specifications for the Health and Safety Plan.

7.1.f.iii. Equipment start-up and operator training identifying the contractor requirements for providing appropriate service visits by experienced personnel to supervise the installation, adjustment, start-up and operation of the treatment systems, and training covering appropriate operational procedures once the start-up has been successfully accomplished.

7.1.f.iv. Additional studies to supplement the available technical corrective measure implementation data may be required. Upon written notification from the Director, the Permittee shall provide sufficient sampling, testing and analysis to optimize the required treatment or disposal operations and systems. A final report of the testing shall include all data taken during the testing and a summary of the results of the studies.

7.1.f.v. Submittal of the prefinal design, approximately 95% completion. The prefinal design submittal shall include the Design Plans and Specifications, O&M Plan, Project Schedule, Quality Assurance Plan, and specifications for the Health and Safety Plan.

7.1.f.vi. Submittal of final design, 100% completion. The final design submittal shall include the Final Design Plans and Specification, the Final O&M Plan, Final Quality Assurance Plan, Final Project Schedule, and Final Health and Safety Plan specifications.

7.2. Corrective Measures Construction

Following the Director approval of the final design, the Permittee shall implement the Construction Quality Assurance Program to ensure, with a reasonable degree of certainty, that completed corrective measures meet or exceed all design criteria, plans, and specifications. The Construction Quality Assurance Plan is a facility-specific document which must be submitted to the Director for approval prior to the start of construction. At a minimum, the Construction Quality Assurance Plan shall include the elements, which are summarized below. Upon the Director's approval of the Construction Quality Assurance Plan, the Permittee shall construct and implement the corrective measures in accordance with the approved design, and the Construction Quality Assurance Plan. The Permittee shall also implement the elements of the approved O&M Plan.

7.2.a. The responsibility and authority of all organizations and the qualifications of all personnel shall be described in the construction quality assurance plan.

7.2.b. The observations and tests that will be used to monitor the construction and installation of the components of the corrective measures shall be summarized in the Construction Quality Assurance Plan. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements and include, but not be limited to, air quality, and emissions monitoring records, and waste disposal records. The inspections shall also ensure compliance with all health and safety procedures.

7.2.b.i. A preconstruction inspection and meeting shall be held to discuss methods for documenting and reporting inspection data, reviewing the distribution and storage of documents and reports, reviewing work area safety, discussing appropriate modifications to the construction quality assurance plan, and conducting a site visit.

7.2.b.ii. Upon preliminary project completion, the Permittee shall notify the Director for the purposes of conducting a prefinal inspection which will consist of a walk-through inspection of the entire site. The inspection is to determine whether the project is complete and consistent with the contract documents and the corrective measures as approved by the Director. The Permittee shall operationally test the treatment equipment. The Permittee shall certify in the Prefinal Inspection Report that the equipment has performed to meet the purpose and intent of the

specifications. Retesting shall be completed where deficiencies are revealed. This prefinal inspection report shall outline the outstanding construction items, actions required to resolve items, completion date(s) for these items, and the date of the final inspection.

7.2.b.iii. Upon completion of all outstanding construction items, the Permittee shall notify the Director, for the purposes of conducting a final inspection. A final inspection by the Director or his representatives will focus on confirming that outstanding items have been resolved.

7.3. Sampling Requirements

The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems shall be presented in the Construction Measures Design.

7.4. Documentation

Reporting requirements for construction quality assurance activities shall be described in detail in the Construction Quality Assurance Plan. This shall include but not be limited to such items as daily summary reports, inspection data sheets, problem identification and corrective measure reports, and design acceptance reports.

8. Reports

8.1. Corrective Measures Study Report

The Permittee shall prepare the CMS Report in accordance with Condition VII.H of this Permit.

8.2. Corrective Measures Implementation Report

8.2.a. At the completion of construction, the Permittee shall submit a Corrective Measures Implementation Report to the Director for written approval. The report shall establish that the project was built according to the specifications and that the corrective measures are performing adequately. The report shall include, but not be limited to the following elements:

8.2.a.i. Certification of the design and construction;

8.2.a.ii. Explanation of any modifications to the plans and why these modifications were necessary;

8.2.a.iii. Listing of the criteria established for judging the functioning of the corrective measures and also justifying any modification to these criteria;

8.2.a.iv. Results of facility monitoring, indicating that the corrective measures will meet or exceed the performance criteria; and

8.2.a.v. Description of the O&M (including monitoring) to be undertaken at the facility.

8.2.b. This report shall include all of the daily inspection summary reports, inspection summary reports, inspection data sheets, problem identification and corrective

measure reports, block evaluations reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications, and as-built drawings.

9. Statement of Basis

A Statement of Basis will be prepared by the Permittee for all sites addressed by this Permit. The Statement of Basis is required for the purpose of (1) demonstrating that the corrective measures chosen are consistent with and meet the requirements of RCRA and the conditions of this Permit, and (2) to document TEAD-N decisions regarding corrective measures selection.

9.1. Statement of Basis Content

The Statement of Basis shall summarize the information contained in either the RFI or CMS reports. The Statement of Basis shall:

9.1.a. Identify the proposed remedy for a correction action.

9.1.b. Discussion the rationale for selecting the corrective action.

9.1.c. Summarize other remedies that were considered, in either the RFI or CMS.

9.1.d. Allow for public comment in accordance with Utah Admin. Code R315-124.