# Draft

# Scope of Work

# Task 1 - RCRA Facility Investigation and Corrective Measures Study

***DRAFT***

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## *Task 1 RCRA Facility Investigation and Corrective Measures Study*

### Scope of Work:

- Develop a Resource Conservation and Recovery Act (RCRA) Corrective Action Plan (CAP) strategy

- Prepare plans and associated RCRA project documents sufficient to conduct a comprehensive RCRA Facility Investigation (RFI) for the Ordot Dump – Work Plan Documents Sub-Task.

- Conduct fieldwork, sampling, and analysis associated with the RFI – RFI Field Work Sub-Task.

- Prepare an RFI Report that presents, discusses, and assesses the site data – RFI Report and Hydrogeologic Model Sub-Task.

- Evaluate and screen the site data to determine the nature and extent of contaminants that has been released from the site – Part of the RFI Report and Hydrogeologic Model, and Quarterly Groundwater Monitoring Sub-Tasks.

- Construct a comprehensive Site Hydrogeologic Model to guide and support the RFI findings and conclusions – Part of the RFI Report and Hydrogeologic Model Sub-Tasks.

Given the disposition of the site, and what is qualitatively known about its condition, it can be presumed that the following will also be necessary:

- Interim/Stabilization Measures (ISMs)
- Conduct a Corrective Measures Study (CMS)
- Corrective Measures Implementation (CMI) Plan

Selected ISMs could be implemented as an early phase of site closure work following the initial phase of the RFI work. An example ISMs might be the installation of a leachate collection system at the southern toe of the dump, though, only the CMS has been specifically included in this Scope of Work.

### Technical Approach and Key Issues:

- Develop a CAP that has an integrated approach to the RCRA closure process.

Optimize schedule, expenditures, and quality through use of presumed remedy approach for components common to closure design elements.

- The RFI nature and extent of data, Ecological Screening Levels, Regional Screening Levels, and Guam specific numerical values, will be used in conjunction with the Hydrogeologic Model to assess the need for a CMS and any associated potential CMI Plan.

- CAP Strategy – RFI through CMI to be conducted in direct coordination with closure design team. ISMs to be coordinated with planned closure measures, and are not included in this portion of the work but, may be early completion tasks of the design closure team. The steps below outline initial preparatory work through CMS. CMI Plan specifics are not included or estimated as they haven't been developed at this time.

In support of preparing plans, and in preparation for conducting the RFI field work, the following initial site work elements will be undertaken:

Initial Preparatory Work:

- Contact, meet and hold discussions with GEPA, EPA and SWMD operations personnel as appropriate.
- Review Site Conceptual Model.
- Review Data Coverage and data quality for all potentially impacted site media.
- Review Background Determination.
- Revisit Chemicals of Potential Concerns (COPCs) determination.
- Assess Existing Data for qualitative use.
- Assess existing site specific, and surrounding, geology and hydrogeology information to develop a limited conceptual Site Hydrogeologic model for planning purposes.
- Review previously note "data gaps" to ensure that such concerns are fully addressed in the RFI Work Plan and subsequent investigation.
- Review existing site monitoring network to maximize the use of existing monitoring points.
- Perform an in depth review of all available site reports, and plans.
- Perform an initial site visit to assess and document initial site conditions, including access limitations, and other special needs.
- Attempt to locate monitoring wells that are not currently in use.

- Provide regular reporting to Receiver and regulatory agencies as required.

- Prepare a brief CAP.

Following completion of the tasks above, the information and knowledge collected will be combined with professional judgement and expertise to prepare the following plans (project deliverables):

RFI Planning Documents:

- RCRA Facility Investigation Work Plan (RFI Work Plan).
- Field Sampling & Analysis Plan (SAP) this plan includes the Field Sampling Plan (FSP) and the Quality Assurance Project Plan (QAPP).

- Site Specific Health and Safety Plan (HASP) for all site activities conducted by Consultant or its subcontractors.

Upon approval of the final plans, Consultant will begin the investigative phase of the RFI effort. The steps that are anticipated to be approved for that effort are listed below:

RCRA Facility Investigation:

- Site Preparation – Construct roadways and drill pads around the perimeter of the Dump to allow clear access for investigation crews. Construct roadways with minimum 8 inches to 2' lift of crushed coral.
- Collect Geologic Data and Hydrogeologic Data from the site and surrounds that will lead to the construction of a comprehensive Site Geologic and Hydrogeologic Model.

  The following subtasks are planned in support of this effort:

  - Drilling of 12 soil borings through the saprolite, to depths of 30 feet, at various locations around the dump and general vicinity to assess the depth to competent rock, distribution and thickness of site soils, physical properties of the soils, and extent of contamination within the soils.

  - At selected locations, Consultant will also drill and install 15 shallow monitoring wells, up to 30 feet deep into the saturated portions of these soils in order to collect hydrogeologic information that will aid in the calculation of groundwater flow into and out of the dump. These monitoring points, through subsequent sampling, will also provide data that will be used to assess contaminant concentrations, and associated transport in the shallow groundwater. Soil borings and monitoring well points will be co-located whenever possible – to facilitate cost savings.

  - At selected other locations around the dump, Consultant will drill 5 deeper monitoring well points into the competent volcanic bedrock (estimated depth 100 ft.,

likely using a conductor casing technology to prevent cross contamination from shallow groundwater in the saprolite). These samples from the competent bedrock are intended to assess the water quality in that underlying bedrock, and demonstrate whether or not the porous flow pathway (through volcanic bedrock) can generally be removed from further remedial consideration.

- Somewhat to the northeast of the dump (less than 500 feet), there is a large fault that bisects nearly the entire island of Guam. The volcanic rock along the eastern side of the fault is likely to be heavily fractured in the near vicinity of the fault. Groundwater flow in the fractures in the vicinity of the fault may affect the transport of site contaminants. An analysis of fracture flow will be completed. At selected locations, 8 deeper monitoring wells will be installed (estimated depth 100 ft.) to delineate contaminant concentrations in groundwater within the fractured zone.

- A seismic survey will be conducted to delineate the location and extent of the fractured bedrock zone associated with the fault.

• Delineate the nature and extent of site contaminants in soil, groundwater, and soil gas. In support of that objective, Consultant will collect samples of various site media (Soil, Rock, Groundwater, Surface Water, Landfill Gas, and Sediment) as follows:

- This effort will include collection of 45 surface soil samples, 45 intermediate depth soil samples (estimated depth 2-2.5 ft), and 25 deeper soil samples and selected rock samples (estimated depths – up to 30 feet). These samples will typically be collected via a soil boring, but, selected samples may also be collected from test pits or rock core holes. Analytical testing for the listed site Constituents of Potential Concern (COPCs) will be performed on each of these samples.

- Twelve sediment samples will be collected from the Lonfit River at locations upstream, adjacent, and down-stream from the Ordot Dump site. Analytical testing will be performed on each of these samples.

- Fifty samples of soil or water will be collected from two wetlands areas (25 locations in each wetlands area) in an attempt to assess leachate impact within the wetlands. Analytical testing will be performed on each of these samples.

- Eight surface water samples will be collected from various selected drainage stream areas of the site (both those thought to be impacted by leachate, and those areas that may not be impacted by leachate). In a related, but separate effort, 8 stream samples from the Lonfit River will be collected at locations both up-stream and down-stream of the dump location. Analytical testing will be performed on each of these samples.

- Initial groundwater samples will be collected from the 15 shallow monitoring wells screened at the water table and screened at depths near the soil rock interface. Initial groundwater samples will also be collected from the 5 deeper monitoring wells screened in bedrock. Eight groundwater samples will also be collected from the deeper monitoring wells in the fractured bedrock areas. Analytical testing will be

performed on each of these samples.

- The existing groundwater monitoring wells (assume 7 are located), will be video surveyed, refurbished to the extent possible, re-developed, and sampled. Seven samples will be obtained from these wells.

- A network of 20 landfill gas monitoring wells will be installed around the perimeter of the dump. A network of 12 wells will be installed (3 on each side of the dump) – and 2 step-out monitoring well points will be installed along each side of the dump. Analytical testing will be performed on each of these samples.

- Collection of physical parameters. Consultant will collect, measure, and test various portions
  of the site media that require quantification for complete design. To complete this objective, Consultant will perform the following tests:

  - Twelve wells will be slug tested (6 in the fractured zone, and 6 in the general dump area) in order to collect in-situ hydraulic conductivity data.

  - Two selected wells will be pump tested to provide groundwater flow information for modeling, and leachate collections system design. One pump test will be conducted in the fractured zone, and one pump test will be conducted in the general vicinity of the dump.

  - Six soil samples will be tested for physical soil properties such as grain size distribution, strength, unit weight, permeability, plasticity.

- Assess the usability of Existing Site Monitoring Wells – including a video survey, land survey, and redevelopment.

- Biotic Survey – identify the Biota of the site and surrounds to ascertain that remedial actions do not have a detrimental effect on the biotic species.

- Perform Quality Assurance/Quality Control (QA/QC) sampling as appropriate throughout the program (typically at a frequency of 10%). This 10% frequency has been calculated into the costs provided.

- Validate environmental data as appropriate to support closure decisions.

- Create and maintain a project data management system to store and manage environmental data collected under this effort.

At the conclusion of the data collection and validation efforts, these data will be analyzed and evaluated, culminating in an RFI Report and Hydrogeologic Model (project deliverable).

RFI Report:

- RFI Report per RCRA Guidance. Includes Draft, Draft Final, and Final versions as well as responses to Agency Comments. Includes method discussions, data presentation, analysis, findings, and conclusions. A Hydrogeologic Model including 3D visualizations will also be part of the effort.

Groundwater Monitoring:

- Groundwater Monitoring and reporting will be conducted on a quarterly basis for the period of 1 year following the initial installation and sampling of wells. Twenty-seven monitoring wells will be sampled each quarter (the 15 shallow wells, 5 deeper wells, and the 7 existing monitoring wells). The 8 deeper wells associated with the fracture zone study will not be sampled as part of this effort.

Corrective Measures Study:

- A CMS will be prepared to evaluate a range of remedial options available to address the site contaminants. The CMS will borrow heavily from the closure efforts that are currently being planned so as to optimize operational efficiency.

## GBB Deliverables/Responsibilities:

- GBB to provide access, permissions, and all right-of-ways necessary to conduct field work and associated project activities.
- GBB to continue to supply Consultant with existing documents as are available.
- GBB to supply existing laboratory data as is available.
- GBB will assist in obtaining letters of regulatory concurrence for each version of project documents.

## Assumptions:

- Consultant take lead in regulatory review and will obtain letter of regulatory concurrence for each version of project documents

- Some of the existing environmental data are useful for qualitative purposes only.

- None of the existing analytical data are useful for analytical purposes.

- The maximum depth to bedrock is no more than 30 feet from the natural ground surface.

- Initial groundwater encountered at depths of 20 ft. or less below the natural ground surface.

- Fractured bedrock investigation will not require drilling in the dump footprint or the waste.

- Monitoring wells and/or piezometers will not be required to be installed within the dump foot print, or in the waste.

- Unexploded Ordnance (UXO) and Munitions and Explosives of Concern (MEC), will not be encountered in any field activity. Only UXO avoidance practices will be required.

- Should groundwater contamination exist along the north or east sides of the landfill, this scope of work does not account for the probability that site contaminants have impacted limestone aquifer on the eastern side of the fault. Should that probability arise, such an investigation would be scoped separately in a phased manner, and is not currently included in this scope of work.

- The large fault northeast of the dump (Adelup-Pago Fault) will not require site specific seismic hazard evaluation as part of the RFI or RCRA Closure.

- The presence and proximity of the Adelup-Pago Fault will not require extraordinary design or construction considerations or measures.

- Since securing the RCRA Closure letter will be dependent upon final closure construction activities of the dump, it is assumed that the RCRA closure will be granted at the completion of the entire project and not tied to the RFI.

- Ambient Air will not be a component of the RFI, as the final remedy will include a full cap, and any potential exposure pathways will be eliminated or controlled.

- The regulators will require site clean-up to address all contaminants detected above Ecological Screening Levels, Regional Screening Levels, and Guam Numerical Values. Risk based approaches are not included in this scope of work, however, if found to be locally supported, will be included in this scope of work.

- Water generated from the pump tests and well development efforts can not be used on the dump for dust control, however does not require treatment, or off-site disposal.

- RFI and associated efforts will require meeting with the regulators approximately once per month.

- Groundwater monitoring efforts for the RFI are anticipated to require only 1 year of quarterly monitoring.

- Abandonment of monitoring wells has not been included in the scope of this work – as the duration of their need cannot be assessed at this time.

- Quarterly monitoring report will be posted as standalone documents supporting the RFI. The RFI can be finalized before the quarterly monitoring is completed.

- A wetlands access permit and property access authorizations will be obtained by the Consultant and assisted by GBB.

- Regulatory reviews of documents will be completed in accordance with the approved schedule.

- Letters of regulatory concurrence for each version of the project documents will be obtained by the Consultant.

## Consultant Deliverables:

- RCRA Facility Investigation Work Plan (RFI Work Plan)
- SAP for the RFI WP (includes the FSP and the QAPP).
- All electronic workable files generated for analysis and reporting of work
- Site Specific Health and Safety Plan
- RFI Report (Includes a Hydrogeologic Model)
- Site CAD electronic files
- Quarterly Groundwater Monitoring Reports (4)
- RCRA CMS