

Statement of Understanding

Under the terms of the original contract dated July 1, 2003 with the City of Columbus Division of Water, **ms consultants, inc.** was to perform engineering services related to the cleaning, rehabilitation and improvement of the existing lime sludge lagoons. The following major work elements are included in the original scope of work:

1. Design, bidding and construction services associated with the removal of all debris, vegetation and lime softening sludge from the three lagoons, with at least one of the lagoons available for sludge discharge at all times.
2. Conduct geotechnical evaluations to assess the existing condition of, and prepare a Preliminary Design Report of necessary modifications to, the existing containment embankment for each lagoon.

The Preliminary Design Report concluded that continued safe use of the lagoons in their current configuration would require significant repairs to the existing embankments along the Big Walnut Creek. In addition, it was recommended that the lagoon configuration be modified with internal baffles to provide improved decant of the alum sludge produced by the plant. These baffles would include channels through which sub-areas of the lagoons could be connected. Liquid level elevations in each sub-area would be controlled through the use of stop logs installed in the channels.

The proposed sequence of work for sludge removal and embankment modifications to the existing lagoons is as follows:

Part 1 - Sludge Removal from Lagoons No. 2 and No. 3 (Construction substantially complete), including:

- Sludge Removal from Lagoon No. 3.
- Extending the sludge line east into Lagoon No. 3.
- Filling the west portion of Lagoon No. 3 to the new terminus of the sludge line. The filled portion of the Lagoon is the future location of the new Raw Water Intake line, under design by others.
- Return Lagoon No. 3 to service
- Sludge Removal from Lagoon No. 2.

Part 2 - Sludge Removal from Lagoon No. 1 (Construction contract award in process).

Part 3 - Modifications to Lagoon No. 2, including:

- Outside embankment modifications
- Internal earthen baffle construction
- decant structure replacement/improvements
- Return Lagoon No. 2 to service.

Part 4 - Modifications to Lagoons No. 1 and No. 3, including:

- Outside embankment modifications, earthen internal baffle construction and decant structure improvements for Lagoon No. 1.
- Return of Lagoon No. 1 to service.
- Removal of Sludge from Lagoon No. 3.
- Embankment modifications, filling and abandonment of Lagoon No. 3.

This proposed modification to the original engineering services contract includes engineering services associated with the design, bidding and construction of the Lagoon modifications based on the accepted Preliminary Design Report. Specifically, to:

1. Improve all existing access drives along the top of the containment embankment and causeway baffles of each lagoon.
2. Perform modifications in Lagoons No. 1 and No. 2 to improve the structural integrity of the lagoon exterior embankment and new construction in the Lagoons to improve performance. This work will include replacement of the existing decant structures, construction of interior embankments to divide the Lagoons, and discharge outfall modifications.
3. Perform exterior embankment improvements, filling, closure and abandonment of Lagoon No. 3.

Project Approach

Based on the information developed in the Preliminary Design Report and discussions with City of Columbus Division of Water personnel, the following detailed project approach is presented for the City's review and consideration. The scope of work for Parts C and D of the assignment as described below is *in addition to* the engineering services already being performed for the removal of sludge from Lagoons No. 1 through No. 3 (Part 1 and 2), and associated geotechnical evaluations both before and after sludge removal.

A. Prepare Contract Documents and Permit to Install (PTI) for Part 3 - Embankment Modifications, Internal Lagoon Baffles, Channels, and Decant Structures for Lagoon No. 2

Prepare detailed plans and technical specifications for the modifications to existing embankments of Lagoon No. 2 along Big Walnut Creek. Install new internal earthen baffles necessary to divide the existing lagoon, channels to interconnect the lagoon cells, and provide stop logs for use in controlling sludge levels.

- a) Detailed plans will include a title sheet, notes sheet, and typical plan, elevation and section views of the Subject lagoon.
- b) We anticipate that an Ohio EPA Permit to Install will be required for the embankment modifications, channel and stop log installations.

- c) It should be noted that these lagoons are currently classified as up-ground reservoirs exempt from the State's authority under ORC 1521.062. Any significant modifications to (raising the embankment height) these lagoons will require coordination with ODNR during the design and construction phases. We do not anticipate ODNR review based on current recommended improvements and regulatory requirements.
- d) Technical Specifications will be presented as either plan note, CMSC reference or as supplemental technical specifications in CSI format.
- e) City of Columbus Contract Bid Documents, as provided by the City, will be utilized.
- f) Prepare an Engineer's construction cost estimate and total project cost estimate. Each item in the construction cost estimate will coincide with an item in the work and material section of the specifications.
- g) Furnish a maximum of five (5) sets of 40% complete plans for review by the City within 60 calendar days after execution of contract, and a maximum of five (5) sets of 90% complete plans within 30 calendar days after the City returns 40% review comments.
- h) Within 14 calendar days after the City returns 90% review comments, provide the City with:
 - Two (2) sets of final contract documents;
 - One (1) set of reproducible (mylar) plans;
 - One (1) mylar cover sheet for original signatures by appropriate City officials;
 - One (1) copy of electronic drawings in AutoCAD 2000, or compatible format;
 - One (1) copy of all text files on electronic media in Microsoft Word, or compatible format;
 - One (1) copy of design calculations;
 - One (1) copy of field notes and surveying notes

B. Bid & Construction Assistance for Part 3 - Embankment Modifications, Internal Lagoon Baffles, Channels, and Decant Structures for Lagoon No. 2

Task B.1. – Bid Assistance

The following services will be provided during the bidding phase:

- a) Reproduce contract documents and plans for interested bidders & vendors;
- b) Administer the distribution of contract documents to interested parties;
- c) Conduct pre-bid meeting at the site;
- d) Provide interpretation of plans and specifications during bidding;
- e) Prepare project addenda, if required, and transmit to plan-holders;
- f) Attend bid opening;
- g) Review bids submitted and make recommendations relative to apparent low, responsive, responsible bidder

Task B.2 - Construction Services

It is assumed that construction bids for Lagoon No. 2 will be received in the winter of 2005, with a conservative construction period of eight (8) months.

For budgetary purposes, we have assumed a level of effort for construction management at 8 hours per week for 35 weeks, for a total of 280 hours. The estimated level of effort for the resident representative is based on a 32-week period of construction activities at 32 hours per week plus 10 percent for time and a half overtime, for a total of 1104 man-hours.

The following tasks shall be undertaken at the appropriate time during the construction phase:

- a) Conduct the pre-construction meeting.
- b) Conduct monthly construction progress meetings.
- c) Review and process any required submittals and shop drawings.
- d) Review and assist City in processing monthly payment requests from the contractor.
- e) Issue necessary interpretations and clarifications of the Contract Documents and in connection therewith prepare work directive changes and change orders as required.
- f) Make visits to the site at intervals appropriate to the various stages of construction as deemed necessary in order to observe the progress and quality of the Contractor(s)' work; determine in general if such work is proceeding in accordance with the Contract Documents; and keep the City informed of the progress of the work.
- g) In addition, we shall provide the services of a Resident Project Representative (and assistants as agreed) at the site to provide more continuous observation of such work, and perform quality control testing. The Resident Project Representative (and any assistants) will be under the Project Manager and/or Construction Manager's supervision. The City reserves the right to have the Resident Project Representative(s) removed if they fail to cooperate with the City and/or satisfactorily perform any work activity in accordance with The Joint Engineering Council's Exhibit A1, "Duties, Responsibilities and Limitations of Authority of Resident Project Representative".
- h) Prepare a set of reproducible record mylars and diskettes of Drawings showing those significant changes made during construction phase, based on marked-up prints, drawings and other data furnished by Contractor(s) and the Resident Project Representative.

C. Prepare Contract Documents and Permit to Install (PTI) for Part 4 - Embankment Modifications in Lagoons No. 1 and No. 3, Internal Lagoon Baffles, Channels, and Decant Structures for Lagoon No. 1 and the Filling, Closure and Abandonment of Lagoon No. 3.

Prepare detailed plans and technical specifications for the construction of modifications to existing embankments of Lagoon No. 1 along Big Walnut Creek. This will include new interior baffles in Lagoon No. 1 necessary to divide the existing lagoon, channels to interconnect the lagoon cells and stop logs for use in controlling sludge levels in Lagoon No. 1. Plans will also be prepared for the filling, closure and abandonment of Lagoon No. 3 to allow its usage for other purposes. Finally, a prefabricated building enclosure will be sited for the purposes of storing stop logs and other lagoon operational equipment.

It is assumed that this work will be performed under one contract, to be awarded after the return of Lagoon No. 2 to service and the removal of sludge from Lagoons No. 1 and No. 3. The work included under this contract will be sequenced to ensure that Plant operations are not adversely affected by the construction work. The sequence is as follows:

- After the cleaning of Lagoon No. 1 is completed, improvement of the exterior embankment of Lagoon No. 1 shall begin. Construction of internal lagoon baffles, channels and decant structures shall also be completed.
 - After all work on Lagoon No. 1 is completed, cleaning of Lagoon No. 3 shall begin.
 - After cleaning of Lagoon No. 3 is completed, improvement of the external embankment of Lagoon No. 3 shall begin.
 - When the external embankment improvements are completed, filling and closure of Lagoon No.3 shall be performed.
- a) Detailed plans will include a title sheet, notes sheet, and typical plan, elevation and section views of the Subject lagoon.
 - b) We anticipate that an Ohio EPA Permit to Install will be required for the closure and abandonment.
 - c) Technical Specifications will be presented as either plan note, CMSC reference or as supplemental technical specifications in CSI format.
 - d) City of Columbus Contract Bid Documents, as provided by the City will be utilized.
 - e) Prepare an Engineer's construction cost estimate and total project cost estimate. Each item in the construction cost estimate should coincide with an item in the work and material section of the specifications.
 - f) Furnish a maximum of five (5) sets of 40% complete plans for review by the City within 60 calendar days after execution of contract, and a maximum of five (5) sets of 90% complete plans within 30 calendar days after the City returns 40% review comments.

g) Within 14 calendar days after the City returns 90% review comments, provide the City with:

- Two (2) sets of final contract documents;
- One (1) set of reproducible (mylar) plans;
- One (1) mylar cover sheet for original signatures by appropriate City officials;
- One (1) copy of electronic drawings in AutoCAD 2000, or compatible format;
- One (1) copy of all text files on electronic media in Microsoft Word, or compatible format;
- One (1) copy of design calculations;
- One (1) copy of field notes and surveying notes

D. Bid & Construction Assistance for Part D - Embankment Modifications in Lagoons No. 1 and No. 3, Internal Lagoon Baffles, Channels, and Decant Structures for Lagoon No. 1 and the Filling, Closure and Abandonment of Lagoon No. 3.

Task D.1. – Bid Assistance

The following services will be provided during the bidding phase:

- a) Reproduce contract documents and plans for interested bidders & vendors;
- b) Administer the distribution of contract documents to interested parties;
- c) Conduct pre-bid meeting at the site;
- d) Provide interpretation of plans and specifications during bidding;
- e) Prepare project addenda, if required, and transmit to plan-holders;
- f) Attend bid opening;
- g) Review bids submitted and make recommendations relative to apparent low, responsive, responsible bidder

Task D.2 - Construction Services

It is assumed that this project will be advertised under one contract. It is assumed that bids for this work will be received in the spring of 2007, with a conservative construction period of ten (10) months, which includes seven (7) months for work on Lagoon No. 1 and five (5) months for work on Lagoon No. 3.

For budgetary purposes, we have assumed a level of effort for construction management at 8 hours per week for 48 weeks, for a total of 384 hours. The estimated level of effort for the resident representative is based on a 44-week period of construction activities at 32 hours per week plus 10 percent for time and a half overtime, for a total of 1620 man-hours.

The following tasks shall be undertaken at the appropriate time during the construction phase:

- a) Conduct the pre-construction meeting.
- b) Conduct monthly construction progress meetings.
- c) Review and process any required submittals and shop drawings.
- d) Review and assist City in processing monthly payment requests from the contractor.
- e) Issue necessary interpretations and clarifications of the Contract Documents and in connection therewith prepare work directive changes and change orders as required.
- f) Make visits to the site at intervals appropriate to the various stages of construction as deemed necessary in order to observe the progress and quality of the Contractor(s)' work; determine in general if such work is proceeding in accordance with the Contract Documents; and keep the City informed of the progress of the work.
- g) In addition, we shall provide the services of a Resident Project Representative (and assistants as agreed) at the site to provide more continuous observation of such work, and perform quality control testing. The Resident Project Representative (and any assistants) will be under the Project Manager and/or Construction Manager's supervision. The City reserves the right to have the Resident Project Representative(s) removed if they fail to cooperate with the City and/or satisfactorily perform any work activity in accordance with The Joint Engineering Council's Exhibit A1, "Duties, Responsibilities and Limitations of Authority of Resident Project Representative".
- a) Prepare a set of reproducible record mylars and diskettes of Drawings showing those significant changes made during construction phase, based on marked-up prints, drawings and other data furnished by Contractor(s) and the Resident Project Representative.