



**CYPRUS PLATEAU  
MINING CORPORATION**  
A Cyprus Amax Company

Cyprus Plateau Mining Corporation  
Post Office Drawer PMC  
Price, Utah 84501  
(801) 637-2875

January 25, 1997

ACT/007/004  
#2

Mr. Pete Hess  
Utah Department of Natural Resources  
Division of Oil, Gas and Mining  
451 East 400 North  
CEU Box 169  
Price, Utah 84501-2699

Received  
1/29/97

Dear Mr. Hess,

RE: WILLOW CREEK PERMIT CHANGE - GEOTECHNICAL DRILLING PROJECT -  
REFUSE PILE EXPANSION AND THICKENER POND REDESIGN PROJECTS

Enclosed is a change form and information describing a proposed geotechnical drilling program for the subject projects.

As discussed with you previously we are desirous of expanding the refuse pile and improving the functionality of the preparation plant thickener pond system. To accomplish these goals, we have contracted with a consulting firm to start the design process. A geotechnical firm has also been contracted to work with the consultant to investigate the foundation conditions of both areas.

We believe the redesign of the refuse pile will accomplish the following:

1. Improve stability of the pile.
2. Improve the reclamation potential of the pile by flattening out its face.
3. Increase refuse storage volume and extend the life of the pile.

We believe redesigning the preparation plant thickener pond system will accomplish the following:

1. Improve the functionality of the system.
2. Provide a system that is more environmentally safe.
3. Improve the ability to clean out the coal fines from the pond/s.
4. Improve water handling and recirculation of plant water.

We will be meeting with the Division in the near future to outline the design parameters for both projects, and to discuss the permitting process. Proposed drill holes T97-1 through T97-3 are to investigate soil conditions for the thickener pond

system redesign. Drill holes R97-1 through R97-7 are to investigate soil conditions and refuse stability conditions for the refuse pile redesign and expansion. Drill holes R97-6 and R97-7 will be converted into ground water monitoring wells or piezometers to monitor internal water levels in the refuse pile.

Enclose are copies of the proposals for design and geotechnical drilling.

After completion of the designs, permit changes will be submitted to the Division for construction of the projects. This change is only for geotechnical investigations.

We are excited to start these projects and ask that you review this change as soon as possible.

Respectfully,



**Ben Grimes**  
Sr. Staff Project Engineer

Enclosures

**C: Paul Baker**  
**J. Pappas**

**File: WCENV 2.5.2.19.4**  
**WCENG 5.1.1**  
**Chron: BG970113**

# APPLICATION FOR PERMIT CHANGE

<b>Title of Change:</b> Geotechnical drilling project for refuse pile and thickener pond expansion.	Permit Number: ACT/007/038 Mine: Willow Creek Mine Permittee: Cyprus Plateau Mining Corp.
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Description, include reason for change and timing required to implement:

The thickener pond system at the preparation plant is not adequate to handle coal fines and water recirculation. Reconstruction of the refuse pile will benefit the environment, make the pile more stable, and extend the life of the pile. This change is for geotechnical investigation of foundation conditions to support engineering designs for both projects. After redesign and approval of the designs permit changes will be submitted to accomplish the actual construction projects.

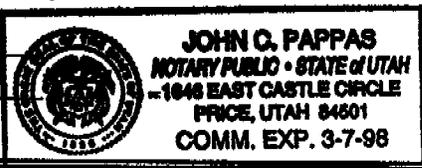
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	1. Change in the size of the Permit Area? _____ acres <input type="checkbox"/> increase <input type="checkbox"/> decrease.
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	2. Change in the size of the Disturbed Area? _____ acres <input type="checkbox"/> increase <input type="checkbox"/> decrease.
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	3. Will permit change include operations outside the Cumulative Hydrologic Impact Area?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	4. Will permit change include operations in hydrologic basins other than currently approved?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	5. Does permit change result from cancellation, reduction or increase of insurance or reclamation bond?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	6. Does permit change require or include public notice publication?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	7. Permit change as a result of a Violation? Violation # _____
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	8. Permit change as a result of a Division Order? D.O.# _____
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	9. Permit change as a result of other laws or regulations? Explain: _____
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	10. Does permit change require or include ownership, control, right-of-entry, or compliance information?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	11. Does the permit change affect the surface landowner or change the post mining land use?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	12. Does permit change require or include collection and reporting of any baseline information?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	13. Could the permit change have any effect on wildlife or vegetation outside the current disturbed area?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	14. Does permit change require or include soil removal, storage or placement?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	15. Does permit change require or include vegetation monitoring, removal or revegetation activities?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	16. Does permit change require or include construction, modification, or removal of surface facilities?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	17. Does permit change require or include water monitoring, sediment or drainage control measures?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	18. Does permit change require or include certified designs, maps, or calculations?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	19. Does permit change require or include underground design or mine sequence and timing?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	20. Does permit change require or include subsidence control or monitoring?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	21. Have reclamation costs for bonding been provided or revised for any change in the reclamation plan?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	22. Is permit change within 100 feet of a public road or perennial stream or 500 feet of an occupied dwelling?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	23. Is this permit change coal exploration activity <input type="checkbox"/> inside <input type="checkbox"/> outside of the permit area?

**Attach 2** complete copies of proposed permit change as it would be incorporated into the Mining and Reclamation Plan.

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

*John C. Pappas*  
 Signed - Name - Position - Date  
 JOHN C. PAPPAS / Sr. Staff Proj. Eng. / 1/29/97

Subscribed and sworn to before me this 27 day of JAN, 1997.  
*John C. Pappas*  
 Notary Public  
 My Commission Expires: 3-7 1998  
 STATE OF UTAH  
 COUNTY OF CARBON



Received by Oil, Gas & Mining

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ASSIGNED PERMIT CHANGE NUMBER



Mr. Ben Grimes  
Cyprus Plateau Mining Corporation  
P.O. Drawer PMC  
Price, Utah 84501

January 20, 1997

Re: Proposal for Engineering Services  
Redesign of Refuse Pile in School House Canyon

Dear Ben:

We appreciate the opportunity of providing a proposal to Cyprus Plateau Mining Company (CPMC) to assist CPMC in redesigning the refuse pile in School House Canyon associated with the Willow Creek Mine. Our proposal is organized to address our understanding of the project, our proposed scope of services, and our estimated fee for accomplishing the scope of services.

Our scope of services and estimated fee are based on what we anticipate may be required to provide a new layout for the refuse pile, design the associated sedimentation control facilities (sedimentation ponds), prepare a reclamation plan, and summarize the results in a Design Engineering Report.

### **UNDERSTANDING OF THE PROJECT**

CPMC currently operates a refuse pile in School House Canyon for the Willow Creek Mine. CPMC has recognized that the current layout of the refuse pile is limited in size and is creating slopes that are too steep to facilitate future reclamation of the refuse pile. Flattening and benching the slopes of the refuse pile will provide additional storage volume and will make future reclamation of the refuse pile much more practical. However, flattening the slopes of the reclamation pile will require redesign of the roadway which crosses the refuse pile, design of a new roadway to access the lower end of the refuse pile, and the redesign of the sediment control facilities for the refuse pile area. Sediment control is currently accomplished using a single sedimentation pond which will be covered by the redesigned refuse pile. Due to the limited areas which will be available for new ponds, two smaller sedimentation ponds may be required to replace the existing sedimentation pond.

Layout of the refuse pile must consider 1) Geotechnical stability, 2) Relocation of sediment control facilities, 3) Requirements for roadways through the refuse pile area, 4) Operating conditions, and 5) Future reclamation of the refuse pile area. Geotechnical analysis of the refuse pile will be performed by Applied Geotechnical Engineering Consultants and the results will be summarized by HA&L in the Design Engineering Report.

## WORK PLAN

Our proposed work plan in assisting CPMC in the redesign of the refuse pile is as follows:

### Task 100 - Establish Design Criteria for the Refuse Pile

1. Meet with CPMC, DOGM, and MSHA to discuss and establish acceptable guidelines upon which the redesign of the refuse pile will be based. The refuse pile redesign must be based on operating conditions and reclamation criteria that is acceptable to DOGM, MSHA, and CPMC. We understand that during operation of the refuse pile CPMC must maintain access to both the upper and lower ends of the refuse pile. Therefore, the redesign must also include the replacing the existing roadway which provides access to the top of the refuse pile and a new roadway which will provide access to the lower end of the refuse pile. Design criteria that is needed from CPMC for the roadways includes: the maximum grade, cross slope, roadway width, berm height, and minimum turning radius.

### Task 200 - Geotechnical Services

1. Attached is a proposal from AGECEC which defines the scope of services for the geotechnical analysis. We have assumed that the geotechnical services will be provided under a separate contract. We will summarize the results of AGECEC's geotechnical analysis in the Design Engineering Report.

### Task 300 - Redesign the Refuse Pile and Roadways

1. Using an existing topographic map of the refuse pile provided by CPMC, prepare a base map for the refuse pile design.
2. Based on the guidelines established in Task 100, prepare a preliminary design and layout of the refuse pile and roadways. We have assumed that the ditch which intercepts undisturbed runoff above the refuse pile defines the maximum extent of the refuse pile.
3. Calculate the volume of refuse needed to fill the refuse pile to the new proposed layout. Cross sections will be generated to calculate quantities by the average end method. This work item will not be performed until the preliminary design and layout is approved by CPMC.
4. Prepare maps illustrating the proposed redesign of the refuse pile. These maps are to consist of one (1) sheet showing the plan view of the refuse pile and one (1) sheet showing details of the refuse pile and roadway. Maps will be submitted to CPMC for review and comment.

**Task 400 - Sediment Control Measures**

1. Determine the hydrologic characteristics of the areas which will be tributary to the sedimentation ponds. The hydrologic characteristics include the SCS Curve Number and the time of concentration and are based upon soil types, vegetation types, slopes, and layout of the runoff collection system.
2. Evaluate sediment yield based on a modified version of the universal soil loss equation.
3. Prepare a HEC 1 model of the refuse pile area to compute runoff hydrographs and runoff volume. Input to the HEC 1 model will include watershed characteristics, design rainfall events, and runoff routing.
4. Using the HEC 1 model and design criteria established by CPMC and DOGM, design ditches to collect and convey runoff from the refuse pile area including the roadway. The design of the ditches will include erosion protection as needed. The ditch designs will be adequate for final reclamation.
5. Using the HEC 1 model and design criteria established by CPMC and DOGM, design sedimentation ponds to detain runoff and collect sediment from the refuse pile area. These ponds will replace the existing sedimentation pond that is expected to be covered by the redesigned refuse pile. The number of sedimentation ponds that are necessary will depend upon the final layout of the refuse pile. Our estimated fee is based on the design and layout of two (2) new sedimentation ponds. If only one (1) pond is required, then the actual costs will be less.
6. Calculate the stage-capacity and stage-discharge relationships for each sedimentation pond. Demonstrate that the sedimentation ponds will provide 24-hour detention based on the inflow and outflow hydrographs calculated with the HEC 1 model. The stage-capacity and stage-discharge relationship for the sedimentation ponds will be used as input into the HEC 1 model to calculate the outflow hydrographs.
7. Prepare maps illustrating the proposed design of the sedimentation ponds. These maps are to consist of 1 sheet for each pond. Each sheet will show a plan view of the sedimentation pond and necessary design details such as outlets and emergency spillways.

**Task 500 - Reclamation Plan**

1. Evaluate natural sediment yield based on a modified version of the universal soil loss equation.

2. Develop an erosion/sediment control plan for reclamation conditions based on limiting sediment concentrations in effluent from erosion control measures to historical sediment yields. This plan will describe the reclamation methodology and procedures. This plan will also provide a discussion of BTCA associated with erosion/sediment control.
3. Prepare maps illustrating typical design details for the erosion/sediment control measures associated with the refuse pile, reclaimed road cuts, and pad out slopes. Specific locations of proposed sediment control measures for reclaimed road cuts and pad out slopes are not proposed to be located on these maps. We have assumed that the typical design details and erosion/sediment control measures associated with the reclamation plan can be shown on two sheets.

**Task 600 - Design Engineering Report**

1. Prepare a draft copy of the Design Engineering Report. We anticipate that this report will contain the following major sections: 1) Refuse Pile Design, 2) Sediment Control Measures, and 3) Reclamation Plan. This report will present the design criteria, methodology, maps and design drawings, and will summarize the results of the geotechnical evaluation.
2. Finalize the Design Engineering Report after review and comments by CPMC.

**Task 700 - Contract Bidding Documents, Technical Specifications, and Construction Quantities for the Sediment Control Ponds**

1. Define construction quantities to be included in the contract bidding documents.
2. Prepare contract documents and technical specifications.
3. Submit a draft of the contract bidding documents and technical specifications to CPMC for review and comment.
4. Finalize the contract bidding documents and technical specifications and provide ten copies of the final documents to CPMC.

Please note, that not all anticipated communications with CPMC personnel have been identified in the above work plan. We anticipate significant interface with CPMC personnel in obtaining information and your input in order to accomplish this project. Some of this interface may occur in the form of telephone communications and other in the form of meetings. For the purpose of estimating costs, we have assumed that two progress review meetings will be held at our office during the completion of Task 400 and Task 500.

### ESTIMATED FEE

Our estimated fee to accomplish the tasks as outlined above is presented by task in the following table. We propose that our contract be on a unit price basis with a not-to-exceed contract amount without prior approval from CPMC. Our fees would be determined based on the attached fee schedule.

TASK	ESTIMATED FEE
Task 100 - Establish Design Criteria for the Refuse Pile	
Task 200 A - Geotechnical Services - Refuse Pile	
Task 200 B - Geotechnical Services - Monitoring Wells	
Task 300 - Redesign the Refuse Pile and Roadways	
Task 400 - Sediment Control Measures	
Task 500 - Reclamation Plan	
Task 600 - Design Engineering Report	
Task 700 - Contract and Bidding Documents (Sediment Pond)	
<b>Total Estimated Fee</b>	

- \* The \$ 2,000 estimated fee for the monitoring wells is for 2½" dia. welded pipe. If the monitoring wells are constructed with 2" dia. threaded pipe, the estimated fee is \$ 1,400 for this item.

We have made the following assumptions in the preparation of this fee estimate:

1. Our fee estimate covers only the scope of services outlined herein.
2. The existing mapping will be adequate and no additional surveying will be required to complete this project.
3. We have assumed that the meeting with MSHA can be conducted by telephone. Our estimated fee does not include a trip to meet with MSHA in Price.
4. Costs of responding to comments by regulating agencies have not been assumed. We can provide to CPMC an estimated fee in responding to any comments once the comments have been received and the scope of services can be defined..

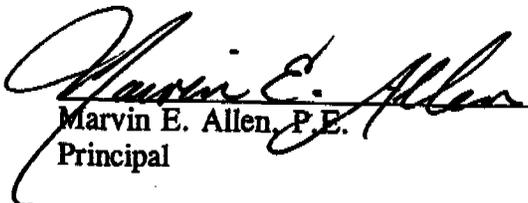
Mr. Ben Grimes  
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5. The geotechnical evaluation and construction of the monitoring wells to be performed by AGECE will be under direct contract with CPMC.
6. Two new sedimentation ponds will be adequate to replace the existing sedimentation pond. We have also assumed that the pond volumes will be less than 20 acre-feet and the embankments will be less than 20 feet high, as measured from the upstream toe. Therefore, ponds will not need to meet the more stringent MSHA requirements.
7. Our proposal and scope of services is up through the preparation of the contract and bidding documents, but does not include either services during contract bidding or services during construction. If desired, we can provide CPMC with an estimated fee for services during contract bidding and construction of the sedimentation ponds.
8. We have assumed a maximum of six design drawings will be required, including the following:
  - a. Refuse Pile and Roadway Layout - Plan View
  - b. Refuse Pile Details - Refuse Pile Sections, Roadway Sections, and Runoff Collection Ditch Details
  - c. Sedimentation Pond #1 - Plan View, Sections the Pond, Pond Details, and the calculated Stage-Capacity Curve
  - d. Sedimentation Pond #2 - Plan View, Sections the Pond, Pond Details, and the calculated Stage-Capacity Curve
  - e. Reclamation Layout - Plan View
  - f. Reclamation Details

Again, we appreciate the opportunity of submitting this proposal to you. Attached please find two copies of our "Engineering Services Agreement". You can indicate your acceptance of our proposal by signing both copies, and returning one copy to our office. Please note that this letter will serve as Exhibit A to the agreement. We look forward to working with you on this project. Please call if you have any questions.

Sincerely,

HANSEN, ALLEN & LUCE, INC.

  
Marvin E. Allen, P.E.  
Principal

attachments

Mr. Ben Grimes  
Cyprus Plateau Mining Company  
P.O. Drawer PMC  
Price, Utah 84501

January 17, 1997

Re: Proposal for Engineering Services  
Design of Thickener Treatment Ponds  
Willow Creek Mine

Dear Ben:

Hansen, Allen & Luce, Inc. (HA&L) appreciates the opportunity of responding to your request for assistance in design of the Thickener Treatment Ponds associated with the Willow Creek Mine. Our proposal is organized to address our understanding of the project, our proposed scope of services, and our estimated fee for accomplishing the scope of services.

### **UNDERSTANDING OF THE PROJECT**

Cyprus Plateau Mining Company (CPMC) is currently operating a coal preparation plant associated with the Willow Creek Mine. The preparation plant includes a thickener treatment tank, the outflow of which is directed into a thickener treatment pond for removal of suspended sediments. The outflow from the treatment pond is then recycled back to the preparation plant. Makeup water for this process is obtained from the Price River which is diverted into a raw water pond located to the north of the coal preparation plant or directly by pipeline from the river.

CPMC is desirous of redesigning the current treatment pond to provide a pond system similar to that previously designed by Hansen, Allen & Luce at your Star Point Mine. This pond system is to include the following:

1. Two separate ponds, probably separated by a concrete wall due to space limitations. The ponds are to have a concrete ramp and floor to provide access and to facilitate cleaning of the ponds of settled sediments. The purpose for two separate ponds is so that one pond can be in service while the other pond is being cleaned.
2. The design is to include some sort of "splitter" devise such that the flow into the ponds can be directed into one pond or the other.
3. The design will also include a clear water pond to receive outflow from the treatment ponds after sediments have been removed. Water from the clear water pond is to be

pumped back (recycled) into either the facility or into the raw water pond. Thus, the design will include a simple pumping facility and return pipeline to the facility and raw water pond.

## WORK PLAN

Our proposed work plan in assisting CPMC in the design of the thickener treatment ponds is as follows:

### Task 100 - Data Collection

1. Obtain required data from CPMC and other sources in order to accomplish the required design. Such data needs include:
  - a. Climatic data for the facility (precipitation and evaporation).
  - b. Characteristics (quantity and quality, including TDS and suspended solids) of the makeup water and the outflow from the thickener tanks (i.e. inflow in the thickener treatment ponds).
  - c. Results from flocculent tests on inflowing water into the ponds.
  - d. Characteristics of natural waters, including storm runoff water, in the area.

### Task 200 - Engineering Design Calculations

1. Prepare engineering design calculations including the following:
  - a. Pond efficiency calculations.
  - b. System water budget calculations, including quantity and quality (i.e. TDS).
  - c. Hydraulic design calculations associated with the inflowing (gravity) piping system.
  - d. Hydraulic design calculations associated with the pressure return pipeline.
  - e. Pipeline design calculations for overflow pipes from the treatment pond to the clear water pond.
  - f. Runoff control calculations.
  - g. Structural evaluation of concrete separating wall between the two thickener treatment ponds.

### Task 300 - Layout and Design of Ponds and Related Facilities

1. Layout the design associated with the treatment ponds, the clear water pond, the inflowing pipeline, the outflowing pipelines, the return pipelines and a pump station.
2. Prepare design drawings of these facilities for both agency review and approval and for construction purposes.
3. Meet with CPMC at the 10%, the 50% and the 90% design level to receive direction and input into the design of the facilities.
4. Submit a draft of the design details and drawings to CPMC for review and comment.

5. Based on comments received from CPMC, finalize the design drawings.

#### Task 400 - Engineering Design Report

1. Prepare an engineering design report that summarizes the design of the facilities, which can be submitted to the regulatory agencies for review and approval. We anticipate that the report will be similar to that provided for the ponds at the Star Point Mine, and will contain the following major sections: Introduction, Existing Site Conditions, Design Characteristics and Construction Criteria, Runoff Control Plan, Quality Control During Construction, Monitoring, Disposal of Settleable Solids, and Operation Plan for the Ponds.
2. Prepare figures, including a vicinity map, a figure illustrating variation in TDS over time in ponds based on water budget calculations, and a figure illustrating the tributary areas assumed in the runoff control plan.
3. Submit a draft of the engineering design report to CPMC for review and comment.
4. Finalize the engineering design report and submit six copies to CPMC.

#### Task 500 - Contract Bidding Documents, Technical Specifications, and Construction Quantities

1. Define construction quantities to be included in the contract bidding documents.
2. Prepare contract bidding documents and technical specifications.
3. Submit a draft of the contract bidding documents and technical specifications to CPMC for review and comment.
4. Finalize the contract bidding documents and technical specifications and provide ten copies of the final documents to CPMC.

#### Task 600 - Geotechnical

Attached is a proposal from Applied Geotechnical Engineering Consultants (AGEC) which outlines their proposed services associated with this project.

#### Task 700 - Electrical and Instrumentation

We have not as yet defined the level of electrical work and instrumentation that you would like to include in this project. Therefore, we need your input to more fully define the scope of services and therefore fee estimate for this task.

#### **ESTIMATED FEE**

Our estimated fee to accomplish the tasks as outlined above is presented by task in the following table. We propose that our contract be on a unit price basis with a not-to-exceed contract amount without prior approval from CPMC. Our fees would be determined based on the attached fee schedule.

<b>TASK</b>	<b>ESTIMATED FEE</b>
Task 100 - Data Collection	
Task 200 - Engineering Design Calculations	
Task 300 - Layout and Design of Ponds and Related Facilities	
Task 400 - Engineering Design Report	
Task 500 - Contract Bidding Documents, Technical Specifications & Construction Quantities	
Task 600 - Geotechnical (by AGEC)	
Task 700 - Electrical & Instrumentation	
<b>TOTAL ESTIMATED FEE (without Electrical &amp; Instrumentation)</b>	

We have made the following assumptions in the preparation of our fee estimate:

1. Our fee estimate covers only the scope of services as outlined herein.
2. The existing mapping will be adequate and no additional surveying will be required in order to complete this project.
3. Costs for responding to regulatory agency comments have not been assumed. We can provide to CPMC an estimated fee in responding to any comments once the comments have been received and the scope of services can be defined.
4. The geotechnical evaluation to be performed by AGEC will be under direct contract with CPMC.
5. Because you are frequently in Salt Lake City and in order to save project costs, we have assumed that design and review meetings will be held at the office of HA&L. Thus, we have not assumed any additional trips to the project site in our fee estimate.
6. We have assumed a maximum of six copies of the Design Engineering Report and a maximum of ten copies of the Contract and Bidding Documents will be provided to CPMC.
7. Our proposal and scope of services is up through the preparation of the contract and bidding documents, but does not include either services during bidding or services during construction.
8. We have assumed a maximum of ten design drawings will be required, including the following:
  - a. Cover Sheet
  - b. Site Plan Drawing
  - c. Plan View Drawing of the Treatment Ponds and Clear Water Pond
  - d. Sections through Ponds and Pond Details

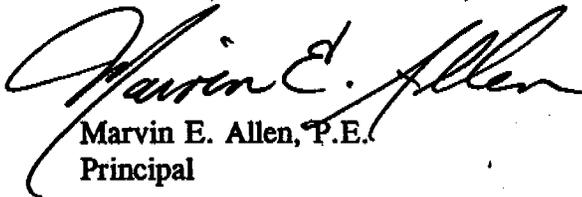
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- e. Plan & Profile Drawing of Return Pipeline from Clear Water Pond to the Facility and Raw Water Pond.
- f. Plan & Profile of Inflowing and Outflowing Pipelines to and from Treatment Ponds
- g. Details Drawing (Overflow outlets, miscellaneous concrete structures, separating wall between ponds)
- h. Details Drawing (Diversion manhole, trench section, thrust blocks, ditches)
- i. Pump Station Drawing
- j. Electrical Drawing

Again, we appreciate the opportunity of submitting this proposal to you. Attached please find two copies of our "Engineering Services Agreement". You can indicate your acceptance of our proposal by signing both copies, and returning one copy to our office. Please note that this letter will serve as Exhibit A to the Agreement. We look forward to the opportunity of working with you on this project. Please call if you have any questions.

Sincerely,

HANSEN, ALLEN & LUCE, INC.



Marvin E. Allen, P.E.  
Principal

attachments

## EXHIBIT B - SCOPE OF SERVICES

### APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

Based on the anticipated subsurface conditions and the proposed construction, we propose the following Scope of Work.

#### 1. Field Investigation

Our field investigation will be described for each facility. Each of the areas of investigation are indicated below.

##### Refuse Pile

Drill 2 borings within the existing refuse pile. We anticipate drilling one boring up to a depth of 100 feet on the upper end of the pond where we can drill through the refuse down to the underlying natural materials. A second boring would also be drilled on the front face of the refuse pile, also drilling up to a depth of 100 feet, in order to obtain samples of the refuse, along with extending down to the natural soils.

One boring would be drilled in the center of the existing runoff control pond embankment. We anticipate that this boring would be drilled up to a depth of 100 feet in order to obtain information on the embankment materials, and also extending down to the natural soils.

We do not plan to drill into bedrock which may be encountered at each location.

Samples of the natural soil on the side slopes will be obtained.

##### Runoff Control Pond

Two areas are being considered for the runoff control pond. Two borings would be drilled at each location to depths ranging from 30 to 40 feet.

##### Thickener Drain Pond

Three borings would be drilled in the area proposed for the thickener drain pond expansion. The three borings would be drilled to provide indication on the subsurface profile for the pond.

Two samples of the material which has accumulated in the thickener drain pond will be obtained for laboratory testing.

Each of the borings will be drilled to observe the subsurface profile, to obtain samples for laboratory testing and to measure the depth to groundwater. The borings drilled in the refuse pile and in the runoff control pond embankment will receive slotted pipe to facilitate future measurement of the water level. The type of pipe to be used is to be determined, based on the type most desirable for Plateau Mining Company.

#### 2. Laboratory Testing

Conduct a laboratory testing program to help define the following characteristics of the subsurface materials.

- Classification
- Moisture Content
- Dry Density
- Consolidation
- Strength
- Permeability
- Moisture/Density Relationship

**3. Engineering Analysis**

Analyze the results of the field and laboratory investigations to determine the following items:

- Characterize the subsurface materials.
- Determine the strength and drainage characteristics of the existing refuse material.
- Determine the strength and drainage characteristics of the natural soils.
- Evaluate the stability of the refuse pile in the proposed configuration. Determine alternatives that would minimize the monitoring requirements of the refuse that is placed and the water levels within the refuse pile.
- Provide recommendations for design of the new runoff control pond. This will include evaluation and recommendations for any reconstruction of the existing fill materials.
- Drainage considerations.
- Seismic characteristics and consideration for the embankments and refuse pile.
- Suitability of the on site materials for use in embankments fills and also potentially as lower permeable soil layers.
- Recommendations for import fill.
- Fill compaction criteria.
- Refuse placement criteria, if necessary to maintain stability.

**4. Report**

Prepare a report which summarizes the information obtained during the study and presents our conclusions and recommendations. The study will be conducted under the supervision of a registered professional engineer.

PR-10



EXISTING SUBSTATION

MAX. HEIGHT OF REFUSE PILE

### REFUSE PILE EXPANSION & THICKENER POND REDESIGN GEOTECHNICAL DRILLING PROJECT

- ▼ GEOTECHNICAL DRILL HOLES
- ⊕ GEOTECHNICAL DRILL HOLES - GROUNDWATER MONITOR WELLS