

## AGREEMENT FOR PROFESSIONAL SERVICES

Project No. \_\_\_\_\_

This AGREEMENT made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 2016 by and between Norman Utilities Authority, (hereinafter "OWNER"), and Carollo Engineers, Inc., (hereinafter "ENGINEER").

WITNESSETH:

WHEREAS, the OWNER and the ENGINEER wish to enter into an Agreement (hereinafter "Agreement") for the furnishing of Engineering Services in connection with the:

Pilot Testing a Fixed-Based Biological Treatment System for Efficient Hexavalent Chromium Removal Project

(hereinafter "Project"), and

WHEREAS, ENGINEER is qualified and prepared to perform the necessary professional services in connection with the Project.

NOW THEREFORE, in consideration of the mutual promises and covenants of the parties hereto, it is agreed as follows:

### SECTION 1 - PROFESSIONAL SERVICES

- 1.1 ENGINEER shall provide professional engineering services in all phases of the Project to which this Agreement applies. The services furnished by the ENGINEER will be defined by Task Orders which will set forth the Engineer's Services, Time of Performance, and Payment.
- 1.2 It is intended that each Task Order, after execution by both parties shall become a supplement to and a part of this Agreement.

### SECTION 2 - PAYMENT TO ENGINEER

- 2.1 As consideration for providing the services referred to in Section 1, the OWNER shall pay ENGINEER on the

basis to be established in the Task Order for Services.

- 2.2 The ENGINEER is not responsible for damage or delay in performance caused by events beyond the control of ENGINEER. In the event ENGINEER's services are suspended, delayed or interrupted for the convenience of the OWNER or delays occur beyond the control of ENGINEER, an equitable adjustment in ENGINEER's time of performance and cost of ENGINEER's personnel and subcontractors shall be made.

- 2.3 OWNER reserves the right to direct revision of ENGINEER's services as may be necessary. When ENGINEER is directed to make revisions under this section of the agreement, ENGINEER shall advise OWNER of

the probable costs involved in completing engineering services and the time of performance for such completion. Extra services also include those that are required for defense of claims, in which event ENGINEER shall bill OWNER on an hourly basis together with cost of material.

2.4 In the event OWNER and ENGINEER cannot agree on equitable compensation for services rendered in making revisions, then, at OWNER's option, ENGINEER shall either continue performance under the revised Agreement and an equitable adjustment in ENGINEER's time of performance and cost of ENGINEER's personnel shall be made at completion of the revised work or ENGINEER shall not be obligated to continue performance under this Agreement.

2.5 If ENGINEER's work products require revisions prior to construction bidding due to ENGINEER's errors or omissions, the exclusive remedy will be limited to revisions made by ENGINEER without compensation.

2.6 The ENGINEER shall bill the OWNER monthly indicating the services performed and the cost of such services.

OWNER agrees to pay invoices within 45 days of their date. Payments not received by ENGINEER within 45 days shall be considered delinquent and subject to a finance charge of 1 percent per month for each month unpaid after the date of invoice. ENGINEER may suspend services should an invoice remain delinquent for 75 days from date of invoice.

2.7 All notices shall be made in writing and may be given by personal delivery or by mail. Notices sent by mail shall be addressed to the designated responsible person or office:

TO OWNER:

Chris Mattingly, P.E.

201 W. Gray, Bldg. C

Norman, OK 73069

TO ENGINEER:

Thomas Crowley, P.E.

100 N.E. 5th Street

Oklahoma City, OK 73104

and when so addressed, shall be deemed given upon deposit in the United States Mail, postage prepaid. In all other instances, notices and invoices shall be deemed given at the time of actual delivery.

All payments are to be mailed to:

Carollo Engineers, Inc.

P.O. Box 4932

Houston, TX 77210-4932

unless otherwise informed on the face of the invoice.

### SECTION 3 - MISCELLANEOUS

3.1 The OWNER shall furnish the ENGINEER available studies, reports and other data pertinent to ENGINEER's services; obtain or authorize ENGINEER to obtain or provide additional reports and data as required; furnish to ENGINEER services of others required for the performance of ENGINEER's services hereunder, and ENGINEER shall be

entitled to use and rely upon all such information and services provided by OWNER or others in performing ENGINEER's services under this Agreement.

- 3.2 The OWNER shall arrange for access to and make all provisions for ENGINEER to enter upon public and private property as required for ENGINEER to perform services hereunder.
- 3.3 Documents, including drawings and specifications, prepared by ENGINEER pursuant to this Agreement are not intended or represented to be suitable for reuse by OWNER or others for this Project or on any other project. Any reuse of completed documents or use of partially completed documents without written verification or concurrence by ENGINEER for the specific purpose intended will be at OWNER's sole risk and without liability or legal exposure to ENGINEER; and OWNER shall indemnify and hold harmless ENGINEER from all claims, damages, losses and expenses, including attorney's fees arising out of or resulting therefrom.
- 3.4 The ENGINEER maintains, at its own expense, Worker's Compensation and Employers Liability, Comprehensive General Liability, Automobile Liability and Professional Liability policies with limits at or above that which is reasonably required of other engineering firms and will, upon request, furnish insurance certificates to OWNER.

#### **SECTION 4 - LEGAL RELATIONS**

- 4.1 The ENGINEER shall be responsible for professional negligence, which is

failure to exercise skill and ability as ordinarily required of engineers under the same or similar circumstances. The ENGINEER shall not be responsible for warranties, guarantees, fitness for a particular purpose or breach of fiduciary duty and shall only indemnify for failure to perform in accordance with the generally accepted engineering and consulting standards.

- 4.2 OWNER and ENGINEER shall each defend, indemnify and hold harmless the other and their respective principals, directors, officers and employees from and against claims, loss, liability, suits and damages, including attorney's fees, caused in whole or in part by either party's negligent acts, errors or omissions, willful misconduct or OWNER's lawful responsibility respectively or, anyone directly or indirectly employed by either of them or anyone for whose acts they may be liable regardless of whether or not such claim, loss, liability or damage is caused in part by a party indemnified hereunder.

In the event that both OWNER's and ENGINEER's wrongful act or lawful responsibility is the proximate cause of any liability or damages, then in such event, each party shall be liable for a portion of the damages and claim costs resulting therefrom equal to such party's comparative share of the total negligence or lawful responsibility for such damages and claim costs. Notwithstanding the foregoing, a party's defense obligation hereunder shall be limited to reimbursement of the other party's reasonable defense costs which are judicially determined to have been incurred as a result of the first party's negligence.

- 4.3 Hazardous materials or asbestos may exist at a site where there is no reason to believe they could or should be present. The ENGINEER and OWNER agree that the discovery of unanticipated hazardous materials or asbestos constitutes a changed condition mandating a renegotiation of ENGINEER's services.
- 4.4 The ENGINEER has no control over the cost of labor, materials, equipment or services furnished by others, or over Contractor's methods of determining prices, or other competitive bidding or market conditions, practices or bidding strategies. Cost estimates are based on ENGINEER's opinion based on experience and judgment. ENGINEER cannot and does not guarantee that proposals, bids or actual Project construction costs will not vary from cost estimates prepared by ENGINEER.
- 4.5 If the project involves construction of any kind, the parties agree that OWNER and ENGINEER shall be indemnified to the fullest extent permitted by law for all claims, damages, losses and expense including attorney's fees arising out of or resulting from Contractor's performance of work including injury to any worker on the job site except for the sole negligence of OWNER or ENGINEER. Both OWNER and ENGINEER shall be named as additional primary insured(s) by Contractor's General Liability and Builders All Risk insurance policies without offset and all Construction Documents and insurance certificates shall include wording acceptable to the parties herein with reference to such provisions.
- 4.6 ENGINEER shall not be responsible for the means, methods, techniques, sequences, or procedures of construction selected by contractors or the safety precautions and programs incident to the work of contractors and will not be responsible for Contractor's failure to carry out work in accordance with the Contract Documents.
- 4.7 The services to be performed by ENGINEER are intended solely for the benefit of the OWNER. No person or entity not a signatory to this Agreement shall be entitled to rely on the ENGINEER's performance of its services hereunder, and no right to assert a claim against the ENGINEER by assignment of indemnity rights or otherwise shall accrue to a third party as a result of this Agreement or the performance of the ENGINEER's services hereunder.
- 4.8 The ENGINEER's instruments of service hereunder are the printed hard copy drawings and specifications issued for the Project, whereas electronic media, including CADD files, are tools for their preparation. As a convenience to the OWNER, the ENGINEER shall furnish to the OWNER both printed hard copies and electronic media. In the event of a conflict in their content, the printed hard copies shall take precedence over the electronic media.
- Because data stored in electronic media form can be altered, inadvertently, it is agreed that the OWNER shall hold ENGINEER harmless from liability arising out of changes or modifications to ENGINEER's data in electronic media form in the OWNER's possession or released to others by the OWNER.

**SECTION 5 - TERMINATION OF AGREEMENT**

- 5.1 If this Agreement is terminated with or without cause, in either event, OWNER shall provide:
- not less than five (5) working days' written notice of intent to terminate, and
  - an opportunity for good faith consultation prior to termination.

**SECTION 6 - DISPUTE RESOLUTION**

- 6.1 Disputes arising during the course of this Agreement shall be promptly addressed at completion of construction when professional services, together with construction evaluation, can be reasonably and fully assessed. The parties shall use best efforts to reach final resolution of disputes through meetings and negotiations required to resolve the

dispute before any other forms of dispute resolution.

**SECTION 7 - ENTIRE AGREEMENT**

- 7.1 This Agreement, including attachments incorporated herein by reference, represents the entire Agreement and understanding between the parties and any negotiations, proposals or oral agreements are intended to be integrated herein and to be superseded by this written Agreement. Any supplement or amendment to this Agreement to be effective shall be in writing and signed by the OWNER and ENGINEER.

**SECTION 8 - GOVERNING LAW**

- 8.1 This Agreement is to be governed by and construed in accordance with the laws of the State of Oklahoma.

IN WITNESS WHEREOF, duly authorized representatives of the parties have signed in confirmation of this Agreement, with effective date the day and year first above written.

CAROLLO ENGINEERS, INC.

NORMAN UTILITIES AUTHORITY

By: [Signature]  
Vice President

PE# 39920 (CO)

By: [Signature]  
Vice President

PE# 37480 (CO)

By: \_\_\_\_\_  
Chairman

By: \_\_\_\_\_  
Attorney

TASK ORDER NO. 1

NORMAN UTILITIES AUTHORITY  
OWNER

AND

CAROLLO ENGINEERS, INC.

This Task Order is issued by the OWNER and accepted by ENGINEER pursuant to the mutual promises, covenants and conditions contained in the Agreement between the above named parties dated the \_\_\_\_\_ day of \_\_\_\_\_, 2016, in connection with:

Pilot Testing a Fixed-Based Biological Treatment System for Efficient Hexavalent Chromium Removal Project

(Project)

PURPOSE

The purpose of this Task Order is to:

Conduct pilot testing for hexavalent chromium removal, as more specifically described under ENGINEER'S SERVICES.

ENGINEER'S SERVICES

**Task 1. Establish Pilot Plant Facilities**

***Subtask 1. 1: Coordinate with Suppliers and Purchase Equipment***

This task will focus on acquiring the equipment needed for the pilot project. Carollo's biottta™ 1 skid will be used for the pilot study. Acetic acid, polymer, hydrogen peroxide, and contaminant spiking chemicals will be purchased. Equipment needed to connect the pilot skid to the well sources (e.g., pipe and valves) also will be purchased.

***Subtask 1.2: Develop Pilot Testing Protocol***

This task will document treatment objectives, pilot equipment operation, and experimental design.

***Subtask 1.3: Install, Test, and Commission Pilot***

This task will include the installation, testing, and commissioning of the biottta™ skid at the selected wellhead site. Norman and Carollo will install the required piping and electrical supply for the pilot equipment.

**Task 2. Pilot Plant Operation**

***Subtask 2. 1: Biological Acclimation***

The objective of this phase is to establish microbial populations in the bioreactor and polishing biofilter using organisms indigenous to the Garber-Wellington Aquifer. A flow rate of 11.75 gpm will be used initially, providing an EBCT of 10 minutes and hydraulic loading rate of 3.74 gpm/ft<sup>2</sup>. The flow rate will be adjusted based on Cr(VI) removal performance. The system will be operated initially in bypass (of the second column) mode and hydrogen peroxide will be dosed upstream of the polishing biofilter to reoxygenate the water. To meet effluent turbidity targets, a low molecular weight cationic polymer will be dosed downstream of the hydrogen peroxide feed point, but upstream of the polishing biofilter.

### ***Subtask 2.2: Optimization***

#### **2.2.1 Establish Backwash Criteria**

Headloss and contaminant removal data will be monitored closely and will be used to establish backwash design criteria (frequency, air scour rate/duration, fluidization rate/duration). To minimize stress on developing biofilms, backwashes will be based initially only on headloss accumulation (approximately 5 feet terminal headloss). Once steady-state Cr(VI) removal is observed, backwashes will be performed at set time intervals (expected to be approximately 24 hours for the bioreactor and approximately 48 hours for the polishing biofilter). Pilot effluent will be used to backwash the columns, and the following backwash sequence will be used initially and adjusted as necessary:

- Hydrogen peroxide soak step.
- Drain system to create an air gap.
- Air scour for 4 minutes at a rate of 5 scfm.
- Combined air/water wash (4 scfm/ft<sup>2</sup> and 12 gpm/ft<sup>2</sup>) until water surface reaches one foot below the drain line at the top of the column.
- Hydraulic fluidization of the bed for 10 minutes at 12 gpm/ft<sup>2</sup>.

During the Biological Acclimation phase, the backwash frequency and protocol will be adjusted as necessary based on hydraulic performance. The optimized backwash frequency and protocol identified during Phase 1 will be used through the remainder of pilot testing.

#### **2.2.2 EBCT Optimization**

The flow rate will be adjusted to determine the minimum EBCT required to achieve an effluent Cr(VI) concentration of <10 µg/L. Acetic acid and phosphoric acid will be dosed so that substrate and phosphorus are in excess during EBCT optimization.

#### **2.2.3 Acetic and Phosphoric Acid Dose Optimization**

At the beginning of the pilot, acetic acid doses will be based on stoichiometric requirement considering a net growth yield of 0.4 mg biomass COD/mg-COD of acetate. Phosphoric acid dose will be determined based on a molar ratio of 100 (C):1(P). Acetic and phosphoric acid doses will be adjusted to determine the minimum substrate and nutrient requirements. The previously established design EBCT will be used throughout this phase.

#### **2.2.4 Hydrogen Peroxide, Polymer, and Degasification**

While the first stage bioreactor is being optimized with respect to Cr(VI) removal, hydrogen peroxide and polymer doses will be adjusted to meet final effluent DO and turbidity requirements.

### ***Subtask 2.3: Optimal Operation***

The purpose of this phase is to demonstrate sustained Cr(VI) removal to below target levels using the design criteria developed during Task 2.2 (EBCT, backwash criteria, and chemical dosing). For one month, the system will be operated 24 hours per day, 7 days per week. Water quality sampling will be performed for the parameters shown in the box below. Additional testing will be performed during this phase to take advantage of the steady-state operating conditions, including backwash wastewater characterization, CT testing, and DBPFP testing.

#### Water Quality Monitoring

The biottta™ pilot skid is equipped with an inline data collection system that generates real-time nitrate/nitrite, dissolved oxygen (DO), turbidity, headloss, and flow data. The grab samples will be taken on a pre-determined schedule for the following additional parameters:

- Total Chromium
- Cr(VI)
- Arsenic
- Sulfate
- Orthophosphate
- DOC
- pH
- Temperature
- Metals
- Gross alphas

#### 2.3.1 Backwash Wastewater Characterization

Backwash wastewater composite samples will be collected and analyzed for total suspended solids (TSS), five-day biochemical oxygen demand (BOD5), volatile suspended solids (VSS), turbidity, pH, and metals.

#### 2.3.2 DBPFP Tests

Instantaneous free chlorine demand will be measured in samples collected from the first-stage bioreactor feed, the first-stage bioreactor effluent, and the second-stage biofilter effluent. Samples will be collected again and dosed with free chlorine at 2 mg/L + instantaneous chlorine demand. TTHM and HAA5 samples will be collected and quenched 15 minutes, 1 day, and 5 days after chlorine addition. Residual chlorine will also be measured at these intervals. Two separate DBPFP tests will be performed during this task.

#### Subtask 2.4: Robustness Characterization

The purpose of this phase is to evaluate how the biottta™ process responds to forced system disturbances. The design criteria established during Task 2.2 will be used throughout this testing (EBCT, backwash criteria, and chemical dosing). Cr(VI) removal and hydraulic performance will be monitored during and after each system disruption. Four disturbances will be tested: backwashing, raw water quality fluctuation, acetic acid feed failure, and system shutdown.



#### **2.4.1 Backwashing**

Because portions of the established microbial population will be removed from the bioreactor and biofilter during backwashing, effluent Cr(VI) and turbidity will be measured immediately following backwash events to evaluate the impact of periodic biomass removal. This test is to determine if a re-acclimation (ripening) or filter-to-waste period is required following backwashing.

#### **2.4.2 Raw Water Quality Fluctuation**

The impact of step changes in raw water Cr(VI) concentration will be evaluated. Over a 1-week period, Cr(VI) will be spiked to the raw water to attain influent Cr(VI) concentration approximately equal to the historical observed maximum and then to two times the historical observed maximum. Acetic and phosphoric acid dose will be adjusted accordingly to achieve target microbial nutritional requirements, but EBCT will not be adjusted unless necessary.

#### **2.4.3 Acetic Acid Feed Failure Simulation**

The acetic acid feed system will be turned off for a 24-hour period to simulate a full-scale chemical dosing system failure. Cr(VI) and turbidity will be monitored during the system shutdown and after resumption of the acetic acid feed.

#### **2.4.4 System Shutdown Simulation**

The pilot system will be shut down completely for 24-hour and 3-day periods. Cr(VI) monitoring will be performed upon system restart, and performance recovery periods for Cr(VI) removal will be quantified.

#### ***Subtask 2.5: Intermittent Operation***

The intermittent operating conditions listed below will be evaluated. The optimized design criteria established during Task 2.2 will be used during this testing (EBCT, backwash criteria, and chemical dosing). Performance will be compared to the data collected in Task 2.3. Each intermittent operating condition will be tested for approximately 2 weeks.

1. 100 hours on (equivalent to 8 am Monday to noon Friday) then off 68 hours (Friday afternoon through Monday morning).
2. On 45 minutes, off 15 minutes, repeated for 12 hours, then off 12 hours (simulate systems that run to meet immediate demands).
3. On one week, off one week.

#### ***Subtask 2.6: Decommissioning and Site Cleanup***

This task includes the decommissioning of the biotita™ skid and cleanup of the pilot testing site. Proper cleaning procedures will be performed for all equipment. Norman and Carollo will coordinate pickup of the pilot unit and restore the pilot site to its original condition.

### **Task 3. Project Management**

#### ***Subtask 3. 1: Quarterly Technical Progress Reports***

In accordance with Reclamation requirements, quarterly technical progress reports will be prepared and submitted. It is estimated that up to five progress reports will be required during the duration of the pilot testing. The reports will be letter-style and will include a summary of the completed activities, activities in progress, and a calculation of the estimated percent of completed work. The quarterly reports also will identify areas where delays have occurred

and the reason for the delay, planned activities during the next reporting period, and recommendations to get the project back on schedule and/or budget, if necessary.

### ***Subtask 3.2: Project Meetings***

Onsite project progress meetings will occur at the beginning of the project, at the beginning, middle, and end of pilot operation, and after pilot data have been compiled and analyzed. A total of five onsite meetings are planned. Reclamation project team members are welcome to attend any of these meetings. Meetings will be held at the Norman WTP (which is also the pilot plant site).

### ***Subtask 3.3: Advisory Panel Reviews and Workshops***

Project Advisory Panel members will be asked to provide an independent review and feedback on the pilot project at key milestones. In addition to reviewing the draft report, the Advisory Panelists will be consulted at three Advisory Panel Workshops to be held (1) near the project outset, to help guide and implement the study's work plan and confirm study goals, (2) at a midpoint progress workshop, and (3) during development of the draft report.

## **Task 4. Reporting**

### ***Subtask 4.1: Compile Pilot Plant Data***

Operational data from Task 2 will be compiled and evaluated to determine the performance of biotita™ to remove Cr(VI). Tables and figures will be produced for use in the draft and final reports. Norman and Carollo staff will meet to discuss the pilot data and develop conclusions about performance.

### ***Subtask 4.2: Prepare Draft Report***

Preparation of the report will begin after the completion of pilot testing. The report will include a detailed description of the pilot work, test plan procedures, presentation and interpretation of the results, and conclusions. The report also will include a comparison of the accomplishments of the work with the stated objectives. If any objectives were not achieved, an explanation as to why the objective was not achieved will be included.

### ***Subtask 4.3: Presentation to Reclamation in Denver***

In accordance with Reclamation's DWPR requirements, the project team will present the findings of the pilot study and its implications for future Cr(VI) full-scale implementation to Reclamation's Denver staff.

### ***Subtask 4.4: Finalize Report***

After receiving comments from Reclamation staff and our participating funding partners, all comments will be addressed and incorporated to finalize the report.

## **TIME OF PERFORMANCE**

ENGINEER shall perform the services under the terms of the schedule below, excerpted from the Assistance Agreement between the U.S. Department of the Interior Bureau of Reclamation and the Norman Utilities Authority. Interim schedule dates may be modified as mutually agreed by the OWNER and ENGINEER project managers, to reflect the actual date written notice to proceed is provided to ENGINEER and any other project conditions that may warrant adjustment.

Milestone / Task / Activity	Planned Start Date	Planned Completion Date
Notice to Proceed		July 12, 2016
Task 1 Establish Pilot Plant Facilities	July 12, 2016	November 30, 2016
Task 2 Pilot Plant Operation	December 1, 2016	August 31, 2017
Task 3 Project Management	July 12, 2016	March 31, 2018
Task 4 Reporting	October 1, 2017	March 31, 2018

PAYMENT

Total payment for services rendered under this Task Order No. 1 shall not exceed \$334,254 inclusive of all labor, overhead and profit, subconsultant expenses, and other direct costs unless this Task Order No. 1 is modified in writing and approved by OWNER and ENGINEER. Payment shall be made on a lump sum basis, based on monthly invoices submitted by ENGINEER indicating percent complete of each major task described under ENGINEER'S SERVICES.

EFFECTIVE DATE

This Task Order No. 1 is effective as of the \_\_\_\_ day of \_\_\_\_\_, 2016.

IN WITNESS WHEREOF, duly authorized representatives of the OWNER and of the ENGINEER have executed this Task Order No. 1 evidencing its issuance by OWNER and acceptance by ENGINEER.

CAROLLO ENGINEERS, INC.

NORMAN UTILITIES AUTHORITY

Accepted this \_\_\_\_ day of \_\_\_\_\_,  
2016

By: \_\_\_\_\_  
Vice President

By: \_\_\_\_\_  
Chairman

By: \_\_\_\_\_  
Vice President

By: \_\_\_\_\_  
Attorney

Norman Utilities Authority		Pilot Testing a Fixed-Based Biological Treatment System for Efficient Cr(VI) Removal						CAROLLO IN-KIND*	NET CONTRACT AMOUNT
		CAROLLO LABOR HOURS	CAROLLO DIRECT LABOR	TRAVEL	EQUIPMENT	SUPPLIES/ MATERIALS	ANALYT- ICAL SERVICES		
Task 1: Establish pilot plant facilities									
1.1	Coordinate w/suppliers & purchase equipment	12	\$2,100	\$0	\$0	\$0	\$0	\$480	\$1,620
1.2	Develop pilot testing protocol	24	\$4,281	\$0	\$0	\$0	\$0	\$480	\$3,801
1.3	Install, test, and commission pilot	80	\$10,056	\$800	\$4,500	\$0	\$0	\$1,920	\$13,436
Task 2: Pilot plant operation									
2.1	Biological activation (2 weeks)	78	\$7,893	\$0	\$2,000	\$0	\$0	\$1,960	\$7,933
2.2	Optimization (2 weeks)	86	\$11,446	\$800	\$2,000	\$0	\$0	\$1,960	\$12,286
2.3	Optimal operation (16 weeks)	448	\$38,442	\$0	\$16,000	\$12,386	\$73,860	\$8,960	\$131,728
2.4	Robustness characterization (4 weeks)	160	\$13,152	\$0	\$4,000	\$0	\$0	\$2,960	\$14,192
2.5	Intermittent operation (8 weeks)	344	\$31,225	\$0	\$8,000	\$0	\$0	\$6,880	\$32,345
2.6	Decommissioning and site clean-up	92	\$6,356	\$800	\$6,500	\$0	\$0	\$1,480	\$12,176
Task 3: Project management									
3.1	Quarterly technical progress reports	57	\$10,447	\$0	\$0	\$0	\$0	\$600	\$9,847
3.2	Project meetings	144	\$25,445	\$4,800	\$0	\$0	\$0	\$2,880	\$27,365
3.3	Advisory Panel reviews and workshops	120	\$23,304	\$4,800	\$0	\$0	\$0	\$2,880	\$25,224
Task 4: Report		236	\$44,901	\$0	\$0	\$0	\$0	\$4,800	\$40,101
4.1	Compile pilot plant data	Incl. above		\$0	\$0	\$0	\$0	\$0	\$0
4.2	Prepare draft report	Incl. above		\$1,600	\$0	\$0	\$0	\$0	\$1,600
4.4	Presentation to Reclamation in Denver	Incl. above		\$1,200	\$0	\$0	\$0	\$600	\$600
4.5	Finalize report	Incl. above		\$0	\$0	\$0	\$0	\$0	\$0
subtotal: hours / dollars		1881	229,048	14,800	43,000	12,386	73,860	38,840	334,254
<b>SUBTOTAL: COSTS</b>			<b>\$229,048</b>	<b>\$14,800</b>	<b>\$43,000</b>	<b>\$12,386</b>	<b>\$73,860</b>	<b>\$38,840</b>	<b>\$334,254</b>

\* in-kind contributions (50% of J. Brown labor plus 50% of pilot rental equipment fee) are subtracted to determine the net contract amount at right