CHANGE ORDER FORM
DEP Contract No. SP644

Change Order No.: SP644-004 **Contractor Name:** CDM Constructors, Inc. (CDM)

Contractor Contract Manager: Dean Carter **Phone No:** (407) 660-6423

Description of Change(s) (Attach additional documents if referenced in description below.):

Activity Reference Code[1]	Change(s) authorized by this Change Order	Deliverable(s) and Due Date(s)	DEP Deliverable Review in Work Days	Payment Method	Dollar Value of Change (+ or -)[2]	Change in Payment Basis
B1	Addition and corresponding changes to Payment Basis language on Attachment C, Payment and Delieverable Schedule, for Process Water Consumption by additional Spray Evaporation Systems in areas SE-3, SE-4, SE-7, and SE-9 as described or revised by CDM's July 13, 18, and 19, 2005 correspondence as attached, and hereby approved by the Department's Contract Manager pursuant to paragraph 34.I. of DEP Contract No. SP644.	No Change other than as noted for Payment Basis	No Change	No Change	$0.00	Yes

Total Increase or Decrease in Project Costs resulting from this Change Order:	$0.00
Ceiling Amount of Contract Impacted? (Yes or No)	No
Total Impact on Ceiling Amount all Change Orders (SP644-001 to SP644-001) to Date:	$0.00
Ceiling Adjustments made by Amendments (-- to --) to Date:	$0.00
Current Ceiling Amount Adjustments Needed:	$0.00

Notes: [1]Activity Reference Code shall conform to the activity code system established in Attachment C. [2]Contractor understands that all funding for DEP Contract SP644 is established by authorized funding increment amounts. This Change Order does not increase or decrease the authorized funding increment amount of the Contract. All changes in authorized funding increment amounts shall be processed by letter or contract amendment as addressed in paragraph 7 of the Contract.

CHANGE ORDER FORM
DEP Contract No. SP644
Change Order No. SP644-004, Page 2 of 2

Change(s) in Contract Completion Date Needed as a Result of this Change Order:

Current Contract Completion Date (without renewals):	February 22, 2010
Completion Date of Contract (without renewals) impacted by this Change Order? (Yes or No)	No
Increase or Decrease, in Calendar Days, Needed as a Result of this Change Order:	0
Total Increase/Decrease, in Calendar Days, Needed as a Result of all Change Orders (SP644-001 to SP644-001) to Date:	0
Completion Date Changes (in Calendar Days) Authorized by Amendments (-- to --) to Date:	0
Current Completion Date Changes, in Calendar Days, Needed by Amendment:	0

This Change Order is a modification to the Contract between the Contractor and the Department (DEP), and all contract provisions shall apply unless specifically exempted. The amount and time change designated are the maximum agreed to by both the Department and the Contractor for this change. In consideration of the foregoing adjustments in contract time and contract sum the Contractor hereby releases Department from all claims, demands or causes of action arising out of the transations, events and occurrences giving rise to this Change Order. This written Change Order is the entire agreement between the Department and Contractor with respect to this Change Order. No other agreements or modifications shall apply to this Change Order unless expressly provided herein.

Approval Required	Signature	Date
Director or Deputy Director, Division of Water Resource Management (Contract Authority, DEP):	Not required for Minor Changes in the Project per Contract paragraph 34.I.	na
DEP Contract Manager, Bureau of Mine Reclamation:	Jack Coates	8/1/05
Vice President, CDM Constructors Inc.:	Richard Long	7/29/05

List of Attachments/Exhibits Included with this Change Order:

Specify Type/Reference	Title/Description of Document	Number of Pages
DEP Contract No. SP644, Attachment C	DEP Contract No. SP644 revised per Change Order SP644-004	6
CDM's July 13, 2005 correspondence	CDM's July 13, 2005, Revised Spray System Layout SE-7	3
CDM's July 18, 2005 correspondence	CDM's July 18, 2005, Proposed Spray Evaporation System SE-9	4
CDM's July 19, 2005 correspondence	CDM's July 19, 2005, Proposed Spray Evaporation System SE-4 NCP	3
Ardaman's July 25, 2005 correspondence	Ardaman's July 25, 2005, Estimated Spray Evaporation for a Nozzle Pressure of 50 psi	1
July 25, 2005 Summary of Revised Spray Evaporation Estimates	July 25, 2005, Summary of Revised Spray Evaporation Estimates for SE-3, SE-4, SE- 7, and SE-9	1

cc: Gwenn Godfrey, Procurement Section (MS93)
DEP Contracts Disbursements Section (MS78) - 2 Copies

ATTACHMENT C
PAYMENT AND DELIVERABLE SCHEDULE

	DESCRIPTION	Fixed-Price	Lump Sum Unit Rate	APPROVAL PERIOD [5]	DELIVERABLES	PAYMENT BASIS [8]
A. OPERATION AND MAINTENANCE						
OPERATION AND MAINTENANCE, Years 1-2		$6,552,794	NA		Operation and Maintenance activities are to be reported in the "Piney Point Operation and Maintenance Status Report" (Monthly Status Report) to be submitted with the monthly Operation and Maintenance Invoices. The format for the Monthly Status Report shall provide sufficient detail and summary information for the Department Contract Manager to determine the extent to which contract requirements are being met. The specific format will be mutually agreed upon by the Contractor and the Department.	
OPERATION AND MAINTENANCE, Years 3-5		$3,958,663	NA			
A1	Site Operation and Maintenance (Including Process Water and Runoff Management, Inspections, Site Security, Mowing, Repairs, and Post-Closure Care & Maintenance)				Activity to be included on the Monthly Status Report.	Monthly invoice line items shall be provided as follows: 1. During the first contract month only for Operation & Maintenance (O&M), an invoice line item shall include the price for "O&M Activities and Mobilization" based on the agreed upon lump sum allocation of $ 375,000. 2. During the second month, and on a monthly basis thereafter, the lump sum O&M amounts shall be invoiced as "Site Operation & Maintenance Activities" based on the agreed upon O&M Monthly Lump Sum Allocation Values shown below for this Scope of Services. The invoice line item should reference the corresponding year and month for services. O&M Monthly Lump Sum Allocation Values, not to exceed: - Contract Year 1, Months 2-12 shall be $ 268,600 / month - Contract Year 2, Months 1-12 shall be $ 268,600 / month - Contract Year 3, Months 1-12 shall be $ 149,950 / month - Contract Year 4, Months 1-12 shall be $ 100,000 / month - Contract Year 5, Months 1-12 shall be $ 79,939 / month Retainage: None, unless otherwise specified in Change Order after
A2	Utilities (Power, excluding power used in process water consumption, Water, Domestic Wastewater, Refuse Collection, etc.)				Include KWH consumption in the Monthly Status Report.	
A3	Safety Training and Safety Compliance				1. Incident Reports to be included in the Monthly Status Report and verbal notifications provided to DEP Contract Manager as needed. 2. A copy of an Employee Training Log shall be provided monthly showing the required training for employees performing services under this contract, and either the planned or actual dates or corresponding employee training.	
A4	Groundwater Monitoring Plan Implementation				Reporting according to Discharge Monitoring Reports (DMRs) per Administrative Agreement, National Pollutant Discharge Elimination System (NPDES) permit, or other Department issued orders as may be effective, issued, or amended during contract period for the subject site/facilities.	
A5	Surface Water Monitoring Plan Implementation				Reporting according to DMRs per Administrative Agreement, NPDES permit, or other Department issued orders as may be effective, issued, or amended during contract period for the subject site/facilities.	
A6	Project Coordination, Direction & Reporting				Include activity summary information in the Monthly Status Report including Monthly Site Meeting minutes between DEP contract manager, Receiver, Engineer, and Contractor's team.	
A7	Liability Insurance Coverage (Including Pollution Liability)				Copy of effective Insurance Policy showing policy type, coverage limits, and policy term.	

Task A, Total Lump Sum: **$10,511,457**

	DESCRIPTION	Fixed-Price	Lump Sum Unit Rate	APPROVAL PERIOD [5]	DELIVERABLES	PAYMENT BASIS [8]
B. PROCESS WATER CONSUMPTION						
B1	Years 1-2, Up to 712.5 MGal Consumption Years 3-5, Greater than 712.5 MGal Consumption up to 950 MGal Consumption Water consumption shall continue under contract terms for process water consumption; however, volumes greater than 950 MGal are not billable beyond the lump sum amount, except as specified for Tasks B2 and B3. At the end of Years 1-2 from the effective start date for this task, any remaining lump sum balance of the Years 1-2 fixed-price, if any, will be paid upon satisfactory completion of Years 1-2 process water consumption tasks as outlined in this contract. At the end of Years 3-5 from the effective start date for this task, any remaining lump sum balance of the Years 3-5 fixed-price, if any, will be paid upon satisfactory completion of Years 3-5 process water consumption tasks as outlined in this contract.	$ 7,624,007 $ 2,021,268 $ 0.00	$ 10.70 / 1,000 gal. $ 8.51 / 1,000 gal. $ 0.00 / 1,000 gal.		Weekly Water Report spreadsheet including, but not limited to: - daily rainfall, pond water levels, and water volumes for each consumption method (i.e., Double-lime, RO, Spray Evaporation, or Spray Irrigation), - daily measured ammonia nitrogen and estimated total nitrogen concentrations at Outfall 003, - calculated daily total discharge load in lbs. for total nitrogen and ammonia nitrogen at Outfall 003, and - the total discharge volume at Outfall 003, the 15-day rolling average and 30-day rolling average ammonia nitrogen and total nitrogen load (in lbs.) at Outfall 003. The Weekly Water Report shall reflect the weekly period from Tuesday - Monday of a given week and be submitted to the Department within 48 hours of the end of the weekly period. The content and format for the Weekly Water Report shall be as agreed upon by the Department Contract Manager.	Monthly Invoice line items shall be provided as follows: 1. Each monthly invoice shall specify the total water consumption for each day in the period based on: - measured water consumption volumes (by final disposal / discharge method) for double lime, RO permeate, and/or spray irrigation discharges in accordance with Note [1], and - spray evaporation consumption based on the reported Operation Factor for the period, and the agreed upon monthly adjusted baseline evaporative loss design rates in Note [2] corresponding to each Department approved spray evaporation system. Retainage: None, unless otherwise specified in Change Order after contract execution.
	Spray Evaporation Consumption Adjustment	See B1	See B1			2. An additional invoice line item shall be added to reflect any invoiced amount or credit to be applied for an anticipated semi-annual "Spray Evaporation Consumption Adjustment" that will be determined based on semi-annual water balance modeling results provided by the Engineer. The water balance modeling results, or an alternative method proposed by the Engineer where mutually agreed upon, will be used to determine the spray evaporation consumption taking into consideration the measured or estimated water inputs/outputs and changes in water inventory.
B2	Year 1, Additional 10.6 MGal / inch rainfall above 55 inches Year 2, Additional 7.1 MGal / inch rainfall above 55 inches Year 3, Additional 4.1 MGal / inch rainfall above 55 inches	NA	$ 12.40 / 1,000 gal. $ 13.02 / 1,000 gal. $ 14.66 / 1,000 gal.			3. Pursuant to the Contract terms, an additional invoice line item shall be added at the end of Years 1, 2, and 3 to reflect any additional "Contract Allowance for Rainfall greater than 55 inches/year."
B3	Year 1, Debited 10.6 MGal / inch rainfall less than 50 inches Year 2, Debited 7.1 MGal / inch rainfall less than 50 inches Year 3, Debited 4.1 MGal / inch rainfall less than 50 inches	NA	$ 5.63 / 1,000 gal. $ 5.63 / 1,000 gal. $ 1.66 / 1,000 gal.			4. Pursuant to the Contract terms, an additional invoice line item shall be added at the end of Years 1, 2, and 3 to reflect any "Contract Deduction for Rainfall less than 50 inches/year."
B4	Years 1-2, Allowance for variation in drainable pore water volume and rate	$211,500	NA			5. A monthly invoice line item shall include a uniformly allocated "Pore Water Allowance" cost based on the lump sum amount for the indicated period. Accordingly, Years 1-2 shall be invoiced for a total not to exceed $211,500, or $8,812.50 / month and Years 3-5 shall be invoiced for a total not to exceed $70,500, or $1,985.34 / month.
	Years 3-5, Allowance for variation in drainable pore water volume and rate	$70,500	NA			

Task B, Total Lump Sum: **$9,927,275** [3]

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

	DESCRIPTION	Fixed-Price	Lump Sum Unit Rate	APPROVAL PERIOD [5]	DELIVERABLES	PAYMENT BASIS [8]
C. CLOSURE CONSTRUCTION ACTIVITIES						
	RESERVOIR SLOPE COVER (All 4 Ponds)					
C1	Reservoir Slope Cover (All 4 Ponds)	$6,454,324	[4]	10		
	PHASE III - NGS-S COMPARTMENT					
C2a	NGS-S Reservoir (2005)	$4,158,450	[4]	10	Monthly submittals with Closure Construction Invoice: - Weekly construction meeting minutes, prepared by Engineer - Copies of agenda/minutes from ad hoc construction coordination and update meetings - Percent completion of each phase of each activity and work element - Conditional acceptance by Engineer of each phase/work element for invoicing of closure construction activities. See Note [4]. End of Construction Phase: - Engineer's certification of completion of construction for each activity - As Built drawings for each activity	Invoice based on Percent Complete, approved by Third Party Engineer, of the lump sum amount for each construction phase and each work segment. Retainage: 25% of each submitted invoice amount, except as specified below for seeding activities, to be released following Engineer's conditional acceptance of a given phase/work segment. Upon completion, submittals shall include a copy of the Engineer's Completion of Construction Certification and As-built Drawings provided by the Contractor. Retainage - seeding subtasks/activities: 40%, with the retainage to be released six months after seeding activity resulting in successful establishment of grassed cover following approval of Engineer.
C2b	NGS-S Cap Area (2005)	$742,309	[4]	10		
C2c	OGS Cap Areas (2005)	$732,150	[4]	10		
C2d	NGS-N Relief Ditch (2005)	$547,056	[4]	10		
C2e	Re-Closure of NGS-N Relief Ditch if Used for Disposal of Plant Scale (at FDEP's Option)	$1,413,000	[4]	10		
	STACK SLOPES AND DITCHES					
C3a	Phase I Slopes - OGS (2005)	$2,790,147	[4]	10		
C3b	Phase II Slopes - NGS (2006)	$2,747,917	[4]	10		
	COOLING/SLUDGE PONDS & DITCHES					
C4a	NCP Closure	$3,787,926	[4]	10		
C4b	SCP Closure	$7,076,574	[4]	10		

Task C, Total Lump Sum: **$30,449,853**

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

	DESCRIPTION	Fixed-Price	Lump Sum Unit Rate	APPROVAL PERIOD [5]	DELIVERABLES	PAYMENT BASIS [8]
	MISCELLANEOUS BILLABLE ITEMS					
E2	Transport Plant Scale to Stack (25,000 cy)	$250,000	$ 10.00 / cy	10	Documentation showing percent complete approval from Engineer for scale placement.	Invoice line items to be included on Construction Invoice based on percent task completion as approved by Engineer.
F5	Miscellaneous Lump Sum Costs other than Fluctuation and Plant Scale Costs	$956,000	NA		Record keeping as required by state law.	Invoice as a separate lump sum line item as "Miscellaneous Lump Sum Costs other than Fluctuation and Plant Scale Costs." This separate invoice item shall be included on the monthly Operation and Maintenance invoices based the contract fixed-price amount, uniformly allocated over the expected 5 year term of the contract.
	Fluctuation in Electric Power Costs - Operation and Maintenance			10	Documentation showing the applicable power usage (in KWH), and the change in unit power cost from Florida Power and Light (FPL) for most favored commercial customers in the Tampa Bay area after considering an escalation corresponding to 3% per year from the FPL base rate charged for such customers in December 2004.	An additional invoice line item shall be added to reflect an invoiced amount (invoice debit or credit) to be applied for the annual "Fluctuation in Electric Power Costs" that shall be determined as outlined in Note [6] for electric power costs applicable to Operation and Maintenance activities and electric power costs associated with Process Water Consumption. The line item and amount (invoice credit or debit) shall be invoiced in the monthly invoice for the end of Contract Years 2, 3, 4, and 5.
	Fluctuation in Liner Resin Costs			10	Documentation showing the neat liner quantities for 40-mil, 60-mil, and 80-mil liner determined by the Engineer for planned construction activities in Contract Years 1, 2, and 3, and Liner Resin unit price quotes and unit conversions as outlined in Note [7]. The documentation shall show the change in actual liner resin unit cost for Contract Years 1, 2, and 3 after considering an escalation corresponding to 3% per year from the November 2004 Base Liner Resin Unit Cost established as outlined in Note [7].	Documentation showing the neat liner quantities for 40-mil, 60-mil, and 80-mil liner determined by the Engineer from detailed construction drawings for planned construction activities in Contract Years 1, 2, and 3, and supporting documentation for determination of the "lowest adjusted price" (expressed in dollars per square feet) as outlined in Note [7].

Notes:

[1] For days where the calculated 30-day rolling average ammonia nitrogen discharge is greater than 20 lbs./day and less than or equal to 50 lbs./day, the "billable consumption volume" for discharges to Bishop Harbor will be adjusted to reflect 90% of the actual corresponding volume (i.e., equivalent to 0.9 times the lump sum unit price for <= 50 lbs./day ammonia nitrogen). For days where the calculated 30-day rolling average ammonia nitrogen discharge is greater than 50 lbs./day, the "billable consumption volume" for discharges to Bishop Harbor shall be shown as zero. For days where the calculated 30-day rolling average ammonia nitrogen discharge is less or equal to 20 lbs./day, the "billable consumption volume" for discharges to Bishop Harbor shall be the water treatment volume.

[2] Monthly Adjusted Baseline Evaporative Loss Design Rates are provided below, for each Department approved system, based on 24-hour/day, 7-days/week operation with an Operating Factor of 0.80.

2.1 SE-1, Existing Spray Evaporation System in NGS-N reservoir where the average Net Spray Consumption rate (in MGD) for the values from January through December is 0.200 MGD, when operating with 1169 nozzles at a minimum nozzle pressure and rate of 50 psi and 2.91 gpm/nozzle, respectively. When operating at sprayfield pressures between 25 and 50 psi, the Net Spray Consumption (MGD) at the given operating pressure may be determined by interpolating or extrapolating the Spray Consumption Factor from those shown in the corresponding table, multiplied by the listed monthly Net Spray Consumption (MGD) for the values at 50 psi to yield the reduced Net Spray Consumption (in MGD) for periods during that month when operating at pressures between 25 and 50 psi.

Month	Average Pond Evaporation (in)	Average Net Spray Consumption (MGD)
Jan	2.48	0.116
Feb	2.62	0.135
Mar	3.88	0.181
Apr	5.42	0.261
May	6.26	0.292
Jun	6.13	0.295

Month	Average Pond Evaporation (in)	Average Net Spray Consumption (MGD)
Jul	5.70	0.267
Aug	5.23	0.244
Sep	4.52	0.218
Oct	3.43	0.160
Nov	2.47	0.119
Dec	2.34	0.109

Spray Consumption Factors

Pressure	Net Spray Consumption (MGD)	Spray Consumption Factor (factor)
30	0.08	0.400
40	0.131	0.655
50	0.2	1.000

2.2 Pursuant to Change Order SP644-004, the Average Net Spray Water Consumption rates are shown below for areas SE-3, SE-4, SE-7, and SE-9, as described below, when operating at minimum nozzle pressure of 50 psi and inflow rate of 2.91 gpm/nozzle, respectively. Subject to Department approval, where the indicated number of operating spray system nozzles are changed from those indicated, the net spray consumption rate (in MGD) shall be adjusted accordingly, per nozzle increased or decreased, in the system as constructed. A written approval letter, referencing CDM's proposed construction and operation details, from the Department's Contract Manager must be obtained prior to any construction for SE-9, or any related alteration of the existing spray evaporation system located in the NGS-N reservoir, SE-1, or its supporting infrastructure. Construction and operation of additional spray systems listed below shall provide for drift and erosion monitoring and immediate suspension of individual or all segments of such systems as the Department may determine is warranted.

- SE-3, Spray Evaporation System in South Cooling Pond (SCP) Internal Dams and Ditch Area between Dams.
- SE-4, Spray Evaporation System in North Cooling Pond (NCP).
- SE-7, Spray Evaporation System along the northern and western dikes of SCP-N.
- SE-9, Spray Evaporation System addition along the lined inboard slopes of NGS-N.

Month	SE-3 Average Net Spray Consumption for 614 nozzles (MGD)	SE-4 Average Net Spray Consumption for 360 nozzles (MGD)	SE-7 Average Net Spray Consumption for 203 nozzles (MGD)	SE-9 Average Net Spray Consumption for 500 nozzles (MGD)
Jan	0.0777	0.0363	0.0233	0.0565
Feb	0.0821	0.0384	0.0246	0.0597
Mar	0.1215	0.0569	0.0364	0.0884
Apr	0.1698	0.0794	0.0508	0.1235
May	0.1961	0.0917	0.0587	0.1427
Jun	0.1920	0.0898	0.0575	0.1397
Jul	0.1786	0.0835	0.0535	0.1299
Aug	0.1638	0.0766	0.0490	0.1192
Sep	0.1416	0.0662	0.0424	0.1030
Oct	0.1075	0.0503	0.0322	0.0782
Nov	0.0774	0.0362	0.0232	0.0563
Dec	0.0733	0.0343	0.0219	0.0533

(3) Total Lump Sum for Process Water Consumption subject to adjustment for items B2 and B3 as governed by contract terms.

(4) Closure Construction Activities subject to schedule subdivision and future updates by Engineer, including subdivision into mutually agreed upon releasable work segments for progress monitoring and payment purposes. Please see Attachment C, Table 1, Closure Task Breakdown, Piney Point ITN 2005002C for current subdivision of Closure Construction Activities.

(5) The Approval Period shall be five (5) working days to inspect and approve the invoiced services for payment, unless another period of working days is specified herein.

(6) The adjustment to pricing, if any, for fluctuations in electric power costs will be made based upon the posted unit price (in $ per KWH) as charged by Florida Power and Light to its most favored commercial customers in the Tampa Bay area, compared to the adjusted unit price charged by Florida Power and Light to the same customers in December 2004 but after considering an escalation corresponding to 3% inflation per year. The change in unit power cost, relative to the escalated base unit price, in December 2005, December 2006, December 2007 and December 2008 will be used for making the adjustment (either debit or credit) for electric power costs during contract years 2, 3, 4 and 5, assuming a theoretical power usage of 11.3 Million KWH (Year 2), 3.8 Million KWH (Year 3), 2.6 Million KWH (Year 4) and 2.0 Million KWH (Year 5), respectively, during each of the corresponding four contract years.

(7) The adjustments to pricing, if any, for fluctuations in Liner Resin prices will be made based upon the neat liner quantities determined by the Engineer from detailed design drawings (without any adjustment for liner overlaps, liner buried in anchor trenches, increased liner area due to sloping surfaces, liner for repair patches, waste, etc.) for planned liner installation activities during each calendar year. The adjustment (either debit or credit) will be based upon the lower of either:

1) The lowest documented change in liner sheet unit price from at least two liner manufacturers (expressed in dollars per square feet) for orders placed in November 2004 escalated by 3% inflation per year, compared to orders placed in February 2005 and in December 2005 and December 2006, respectively, for planned construction activities in each of the first three contract years; or

2) The lowest documented change in Liner Resin unit price from at least two liner manufacturers or resin suppliers for orders placed in November 2004 compared to orders placed in February 2005 and in December 2005 and December 2006, respectively, for planned construction activities in each of the first three contract years. The change in actual liner resin unit price (expressed in dollars per pound of resin), after accounting for 3% escalation per year from the November 2004 BAFO unit price of $0.64/lb. shall be multiplied by 0.237 lb/ft2, 0.347 lb/ft2 and 0.442 lb/ft2 for 40-mil, 60-mil and 80-mil liner, respectively.

The lowest adjusted price as determined above (expressed in dollars per square feet) shall be multiplied by the neat liner quantity from detailed design drawings (expressed in square feet) times a factor of 1.10 adopted herein to accommodate additional liner buried in anchor trenches, liner overlaps, waste, etc.

(8) Lump Sum Unit rates or monthly allocations of the fixed cost amounts are rounded to the nearest cent or dollar as shown. In all cases, the final monthly invoice for a given period shall reflect the necessary amount so that the indicated fixed-price is not exceeded. There shall be no adjustment to the lump sum pricing presented in Attachment C for any fluctuations in Contractor's costs, including lime costs, fuel costs or any other utility or commodity cost during the term of the contract, except as specifically provided for herein, including Notes (6) and (7).

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

ATTACHMENT C
TABLE 1

CLOSURE TASK BREAKDOWN
PINEY POINT - ITN 2005002C

Item	Closure Construction Element		Engineer's Estimate	CDM BAFO Estimate	CDM BAFO PRICE	Computed Unit Rate	CDM BAFO Unit Rate		
C1	**ITEM C1. RESERVOIR SLOPE COVER (All 4 Ponds)**								
	Soil Cover (NGS-N, OGS-S & OGS-N Lined Slopes)	cy	270,000	270,000	$ 3,350,000	$ 12.41	$ 12.41		
	Soil Cover (NGS-S Lined Slopes - From C2)	cy	130,000	140,000	$ 1,580,924	$ 11.29	$ 11.29		
	80-Mil HDPE Liner (Crest Roads)	sf	175,000	175000	$ 120,000	$ 0.69	$ 0.69		
	Drain Composite (All 4 Ponds)	sy	85,000	85,000	$ 816,000	$ 9.60	$ 9.60		
	Sodding NGS-N, OGS-S & OGS-N Slope Cover	ac	40	40	$ 351,700	$ 8,792.50	$ 8,792.50		
	Sodding NGS-S Slope Cover (From C2)	ac	18	18	$ 158,300	$ 8,794.44	$ 8,794.44		
	Seed or Sod (Soil Crest Cover)	ac	4	4	$ 9,400	$ 2,350.00	$ 2,350.00		**TOTAL ITEM C1**
	Other Ancillary	lump	lump	lump	$ 68,000	-			**$ 6,454,324**
C2	**ITEM C2. PHASE III - NGS-S COMPARTMENT**								
	Task C2a. NGS-S Reservoir (2005)								
	Sludge Excavation (see Note 4)	cy	5,000	0	$ -	$ -	$ 8.80		
	Gypsum Fill (see Note 4)	cy	380,000	206,500	$ 1,547,675	$ 7.49	$ 5.97		
	80-Mil HDPE Liner (see Note 5)	sf	3,000,000	3,000,000	$ 2,222,208	$ 0.741	$ 0.68		
	Soil Cover	cy	3,000	3,000	$ 33,877	$ 11.29	$ 11.29		
	Seed or Sod (West Dike Crest Road)	ac	1	1	$ 2,342	$ 2,341.67	$ 2,341.67		
	Outlet Structure	lump	lump	lump	$ 10,000	-	-	**Total Task C2a**	
	Other Ancillary	lump	lump	lump	$ 342,349	-	-	**$ 4,158,450.12**	
	(Note: Soil cover and associated drain composite and sodding were moved from Item C2 to Item C1								
	Task C2b. NGS-S Cap Area (2005)								
	Gypsum Fill	cy	5,000	5,000	$ 29,867	$ 5.97	$ 5.97		
	40-Mil HDPE Liner	sf	500,000	500,000	$ 198,000	$ 0.396	$ 0.40		
	Soil Cover	cy	25,000	37,725	$ 426,003	$ 11.29	$ 11.29		
	Seed or Sod	ac	10.5	10.5	$ 24,588	$ 2,341.67	$ 2,341.67		
	Outlet Structure	lump	lump	lump	$ 10,000	-	-	**Total Task C2b**	
	Other Ancillary	lump	lump	lump	$ 53,851	-	-	**$ 742,308.50**	
	Task C2c. OGS Cap Areas (2005)								
	Gypsum Fill	cy	10,000	10,000	$ 59,735	$ 5.97	$ 5.97		
	60-Mil HDPE Liner	sf	450,000	450,000	$ 211,800	$ 0.471	$ 0.47		
	Soil Cover	cy	24,000	34,000	$ 383,939	$ 11.29	$ 11.29		
	Seed or Sod	ac	7.5	7.5	$ 17,563	$ 2,341.67	$ 2,341.67		
	Outlet Structures (2)	lump	lump	lump	$ 6,000	-	-	**Total Task C2c**	
	Other Ancillary	lump	lump	lump	$ 53,114	-	-	**$ 732,150.11**	
	Task C2d. NGS-N Relief Ditch (2005)								
	Gypsum Fill	cy	5,000	5,000	$ 29,867	$ 5.97			
	60-Mil HDPE Liner	sf	300,000	300,000	$ 141,200	$ 0.471	$ 0.47		
	Soil Cover	cy	18,000	22,578	$ 254,958	$ 11.29	$ 11.29		
	Seed or Sod (Soil Cover)	ac	5	5	$ 11,708	$ 2,341.67	$ 2,341.67		
	Amended Gypsum Grassing (From C3)	ac	10	10	$ 66,636	$ 6,663.64	$ 6,663.64		
	Outlet Structure	lump	lump	lump	$ 3,000	-	-	**Total Task C2d**	
	Other Ancillary	lump	lump	lump	$ 39,686	-	-	**$ 547,056.38**	
	Task C2e. Re-Closure of NGS-N Relief Ditch if Used for Disposal of Plant Scale (at FDEP's Option)								
	60-Mil HDPE Liner	sf	500,000	500,000	$ 235,000	$ 0.47	$ 0.47		
	Soil Cover	cy	50,000	50,000	$ 531,000	$ 10.62	$ 10.62		
	Sodding	ac	12	12	$ 105,000	$ 8,750.00	$ 8,750.00		
	Outlet Structure Modification	lump	lump	lump	$ 3,800		-		
	Gypsum Fill (Encapsulate Scale)	cy	75,000	75,000	$ 273,000	$ 3.64	$ 3.64		
	Gypsum Borrow Area Work						-		
	Remove & Restore Soil Cover	cy	25,000	25,000	$ 93,500	$ 3.74	$ 3.74		
	Remove & Replace 40-Mil Liner	sf	350,000	350,000	$ 139,000	$ 0.40	$ 0.40		
	Restore Grass (Seed or Sod)	ac	8	8	$ 18,400	$ 2,300.00	$ 2,300.00	**Total Task C2e**	**TOTAL ITEM C2**
	Other Anciliary	lump	lump	lump	$ 14,300	-	-	**$ 1,413,000.00**	**$ 7,592,965.11**
C3	**ITEM C3. STACK SLOPES AND DITCHES**								
	Task C3a. Phase I Slopes - OGS (2005)								
	Gypsum Earthwork	cy	50,000	94,318	$ 194,349	$ 2.06	$ 2.06		
	80-Mil HDPE Liner (Runoff Ditches)	sf	575,000	575,000	$ 393,875	$ 0.685	$ 0.69		
	60-Mil HDPE Liner (Transfer Pond)	sf	130,000	130,000	$ 61,286	$ 0.471	$ 0.47		
	Drains	lf	5,500	5,610	$ 647,240	$ 115.37	$ 115.37		
	Soil Cover	cy	80,000	88,778	$ 1,121,598	$ 12.63	$ 12.63		
	Soil Grassing								
	Seeding (Stormwater Ponds)	ac	3	3	$ 7,031	$ 2,343.75	$ 2,343.75		
	Sodding (Runoff Ditches)	ac	13	13	$ 114,263	$ 8,789.47	$ 8,789.47		
	Amended Gypsum Grassing	ac	23	23	$ 153,264	$ 6,663.64	$ 6,663.64	**Total Task C3a**	
	Other Ancillary	lump	lump	lump	$ 97,241	-	-	**$ 2,790,147.05**	
	Task C3b. Phase II Slopes - NGS (2006)								
	Gypsum Earthwork	cy	50,000	94,319	$ 194,351	$ 2.06	$ 2.06		
	80-Mil HDPE Liner (Runoff Ditches)	sf	225,000	225,000	$ 154,125	$ 0.685	$ 0.69		
	60-Mil HDPE Liner (Stormwater Pond)	sf	570,000	570,000	$ 268,714	$ 0.471	$ 0.47		
	Drains	lf	7,000	7,140	$ 823,760	$ 115.37	$ 115.37		
	Soil Cover	cy	70,000	77,681	$ 981,402	$ 12.63	$ 12.63		
	Soil Grassing								
	Seeding (Stormwater Pond)	ac	13	13	$ 30,469	$ 2,343.75	$ 2,343.75		
	Sodding (Runoff Ditches)	ac	6	6	$ 52,737	$ 8,789.47	$ 8,789.47		
	Amended Gypsum Grassing	ac	22	22	$ 146,600	$ 6,663.64	$ 6,663.64	**Total Task C3b**	**TOTAL ITEM C3**
	Other Ancillary	lump	lump	lump	$ 95,759	-	-	**$ 2,747,916.59**	**$ 5,538,063.64**
C4	**ITEM C4. COOLING/SLUDGE PONDS & DITCHES**								
	Task C4a. NCP Closure								
	Earthwork (Soil)	cy	200,000	198,050	$ 1,351,225	$ 6.82	$ 6.82		
	80-Mil HDPE Liner (Runoff Ditches)	sf	100,000	100,000	$ 68,500	$ 0.685	$ 0.69		
	40-Mil HDPE Liner	sf	1,300,000	1,300,000	$ 514,800	$ 0.396	$ 0.40		
	Drains	lf	2,500	2,560	$ 293,880	$ 114.80	$ 114.80		
	Soil Cover	cy	110,000	103,184	$ 1,400,008	$ 13.57	$ 13.57		
	Soil Grassing								
	Seeding (Cap Areas)	ac	30	30	$ 70,292	$ 2,343.08	$ 2,343.08		
	Sodding (Runoff Ditches)	ac	4	4	$ 35,180	$ 8,795.00	$ 8,795.00	**Total Task C4a**	
	Other Ancillary	lump	lump	lump	$ 54,041			**$ 3,787,925.60**	
	Task C4b. SCP Closure								
	Earthwork (Soil)		50,000	49508	$ 337,775	$ 6.82	$ 6.82		
	80-Mil HDPE Liner (Process Water Sump)	sf	485,000	485,000	$ 332,225	$ 0.685	$ 0.69		
	80-Mil HDPE Liner (Runoff Ditches)	sf	415,000	415000	$ 284,275	$ 0.685	$ 0.69		
	40-Mil HDPE Liner	sf	3,200,000	3,200,000	$ 1,267,200	$ 0.396	$ 0.40		
	Drains	lf	6,500	6665	$ 765,120	$ 114.80	$ 114.80		
	Soil Cover	cy	290,000	266360	$ 3,613,992	$ 13.57	$ 13.57		
	Soil Grassing								
	Seeding (Cap Areas and Plant Areas)	ac	100	100	$ 234,308	$ 2,343.08	$ 2,343.08		
	Sodding (Runoff Ditches)	ac	16	16	$ 140,720	$ 8,795.00	$ 8,795.00	**Total Task C4a**	**TOTAL ITEM C4**
	Other Ancillary	lump	lump	lump	$ 100,959			**$ 7,076,574.40**	**$ 10,864,500**
	ITEM C - CLOSURE CONSTRUCTION TOTAL				**$ 30,449,853**				**$ 30,449,853**

NOTES:
1. The "Engineer's Estimate" column reflects those quantities provided by the Engineer for the Department under the ITN and BAFO.
2. In some cases, the values for the CDM BAFO Estimate and the CDM BAFO Price indicate task breakdowns that were computed proportionately to the Department's breakdown values for elements where CDM's BAFO quantity is less than or greater than the Engineer's estimated quantity.
3. CDM's BAFO values for Other Ancillary items were tenatively prorated to individual tasks on the basis of total task price.
4. CDM's original BAFO Estimate and Price for Sludge Excavation was revised from 5,000 cy and $44,000 to 0 cy and $0 per Change Order SP644-002. CDM's original BAFO Estimate and Price for Gypsum Fill was revised from 373,740 cy and $2,232,530 to 206,500 cy and $1,547,675 per Change Order SP644-002.
5. CDM's original BAFO Price for 80-mil HDPE liner was revised from $2,054,000 to $2,222,208 per Change Order SP644-003 for the fluctuation in liner resin costs.

Coates, John

From: Carter, Dean [CarterDE@cdm.com]

Sent: Wednesday, July 13, 2005 8:27 AM

To: Coates, John; Coram, Phil; Zamani, Sam

Cc: Fuleihan, N (Priority); Werner, Rob; Leto, Tom; Solters, Stephen; Paul Roberts; Craig Kovach; Cruz, Michael; Edgar, Michael

Subject: Revised Spray System Layout SE-7

John,
Attached is memo describing changes to the Spray Evaporation System SE-7 being installed in the North Compartment of the South Cooling Pond. The location of the system has been changed from the sludge beach area on the north side to the perimeter of the cooling pond and total number of heads has increased from 186 to 210. This memo is to document the change in the system configuration.

Dean

<<SE-7.pdf>>

QuietEarth consultants, inc.

QUIETEARTH CONSULTANTS, INC.
P.O. BOX 3147 · RIVERVIEW, FL 33568 · (813) 677-5026

Date: July 5, 2005

From: Craig A. Kovach, P.G.

MEMORANDUM

To: S. Solters

Cc: P. Roberts, V. Astley, D. Carter, M. Cruz, M. Edgar

Subject: **Piney Point Phosphates Closure**
Update on Short-term Conceptual Spray Evaporation Alternatives: SE-7

CDM continues to pursue process water reduction through enhanced spray evaporation alternatives. The following provides an update and design change for Alternative SE-7. A site map containing all existing alternatives is included as Figure 1.

SE-7: North Sludge Beach of SCP-N

CDM and QECI have further evaluated SE-7 since issuance of the 4-18-05 alternatives memo (Short-term Conceptual Spray Evaporation Alternatives) and determined that construction of a grid sprayfield on the lime sludge beach in the north central portion of the south cooling pond north compartment (SCP-N) is not feasible due to construction and maintenance issues. Therefore, CDM proposes to return to the original concept with a few minor modifications. A perimeter manifold will be installed on the break in slope along the north and west dams. The manifold will feed short branch pipes that run inward, normal to the dam along the ground of the inner slope (±15 ft), and extend to the inner toe of the pond (or high water line, as applicable). Refer to Figure 2. Drift should not pose any offsite impact due to the distance from property boundaries, and site physiography generally precludes a water quality issue regardless.

A total of approximately 210 sprays can be installed for SE-7 in this fashion. At 60 psi (3.18 GPM), an 80% operating factor, and 5% of spray volume evaporated, this equates to an average of approximately 14 million gallons per year in process water inventory reduction.

Attachments

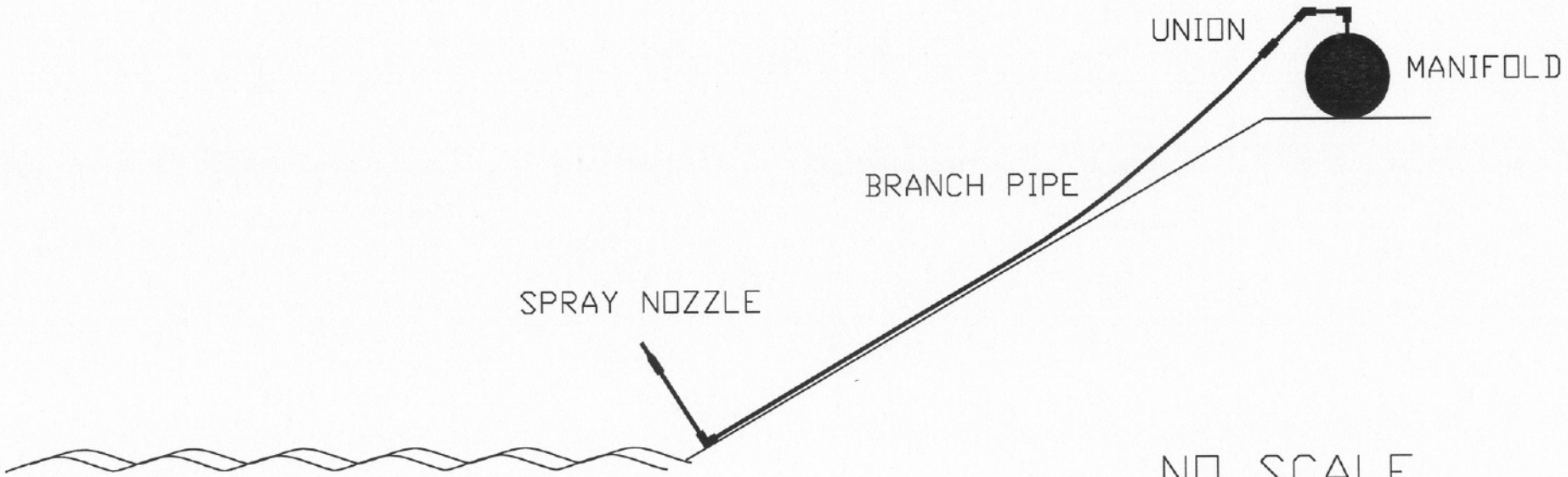

FIGURE 2. TYPICAL SPRAY EVAPORATION BRANCH PIPE AND MANIFOLD

GrieEarth consultants, inc.

Coates, John

From: Carter, Dean [CarterDE@cdm.com]
Sent: Monday, July 18, 2005 5:55 PM
To: Coates, John; Coram, Phil; Zamani, Sam
Cc: Fuleihan, N (Priority); Leto, Tom; Werner, Rob; Solters, Stephen; Paul Roberts
Subject: Proposed Spray Evaporation System SE-9

John,
Attached is the revised proposal for the additional spray evaporation system for the NGS-N compartment. Please review and provide any comments or concerns on the proposed plan. Thanks

Dean

<<SE-9_Rev.pdf>>

QuietEarth Consultants, Inc.
P.O. Box 3147 • Riverview, FL 33568 • (813) 677-5026

Date: July 13, 2005

From: Craig A. Kovach, P.G.

MEMORANDUM

To: P. Roberts, V. Astley, D. Carter, S. Solters. M. Cruz, M. Edgar

Cc: J. Coates (FDEP), N. Fuleihan (Ardaman & Associates)

Subject: **Piney Point Phosphates Closure**
Spray Evaporation Alternative SE-9

CDM continues to pursue process water reduction through enhanced spray evaporation alternatives. The following provides conceptual details for a new Alternative, SE-9. A site map containing all existing alternatives is included as Figure 1.

SE-9: Additional Ring of Fixed Sprays Around Floating sprayfield in NGS-N (SE-1)

Observation of the spray system in the NGS-N suggests that significant additional evaporative capacity is available in SE-1. Evaporation enhancement can be achieved by adding a ring manifold around the perimeter of the lined cell, with branch pipes extending down slope similar to the configuration proposed for SE-4 and SE-7 (Figure 2). The existing bollards would provide tie-backs for the manifold, and branch pipes would extend approximately 20 ft down slope into the NGS-N. Valves and tees would be installed to allow the north and east manifold sections to be shut off independently as needed to eliminate any offsite drift impacts. If necessary, HDPE rub pads would be placed under each short spray head riser. A total of approximately 500 additional sprays could be added in this fashion, increasing process water evaporation on the order of 53 million additional gallons per year (based on 60 psi/3.18 GPM, 80% operating factor, and 8% of flow evaporated). A higher evaporation efficiency is anticipated due to the exposed black liner and increased air flow at the top of the stack.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Attachments
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

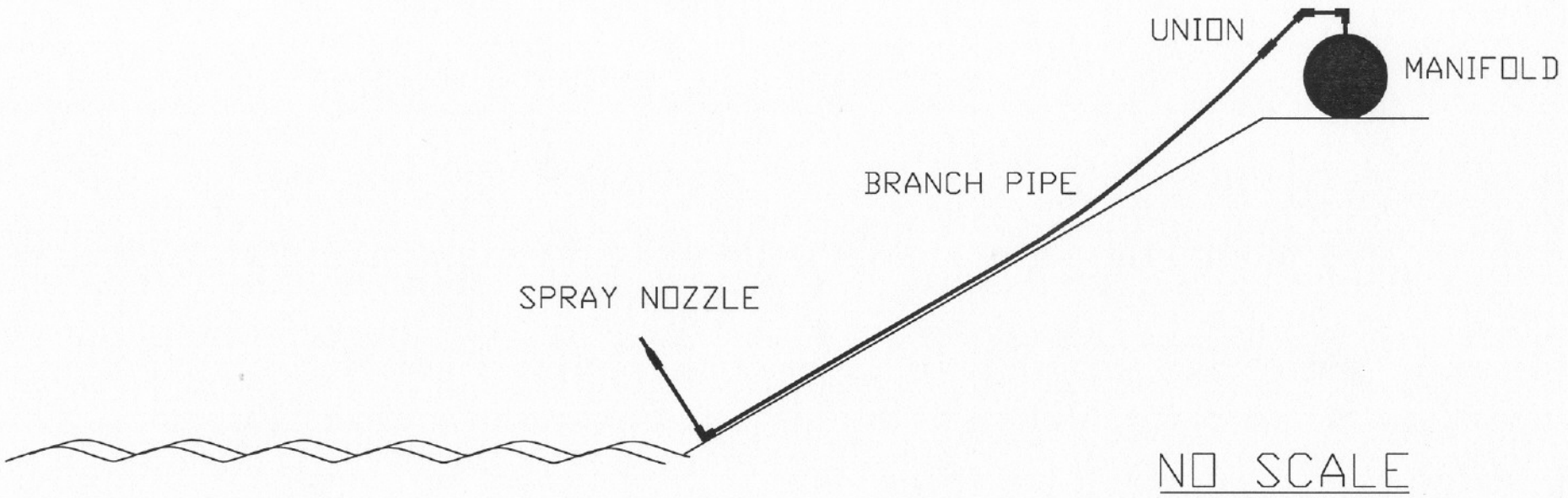

FIGURE 2. TYPICAL SPRAY EVAPORATION BRANCH PIPE AND MANIFOLD

QuietEarth consultants, inc.

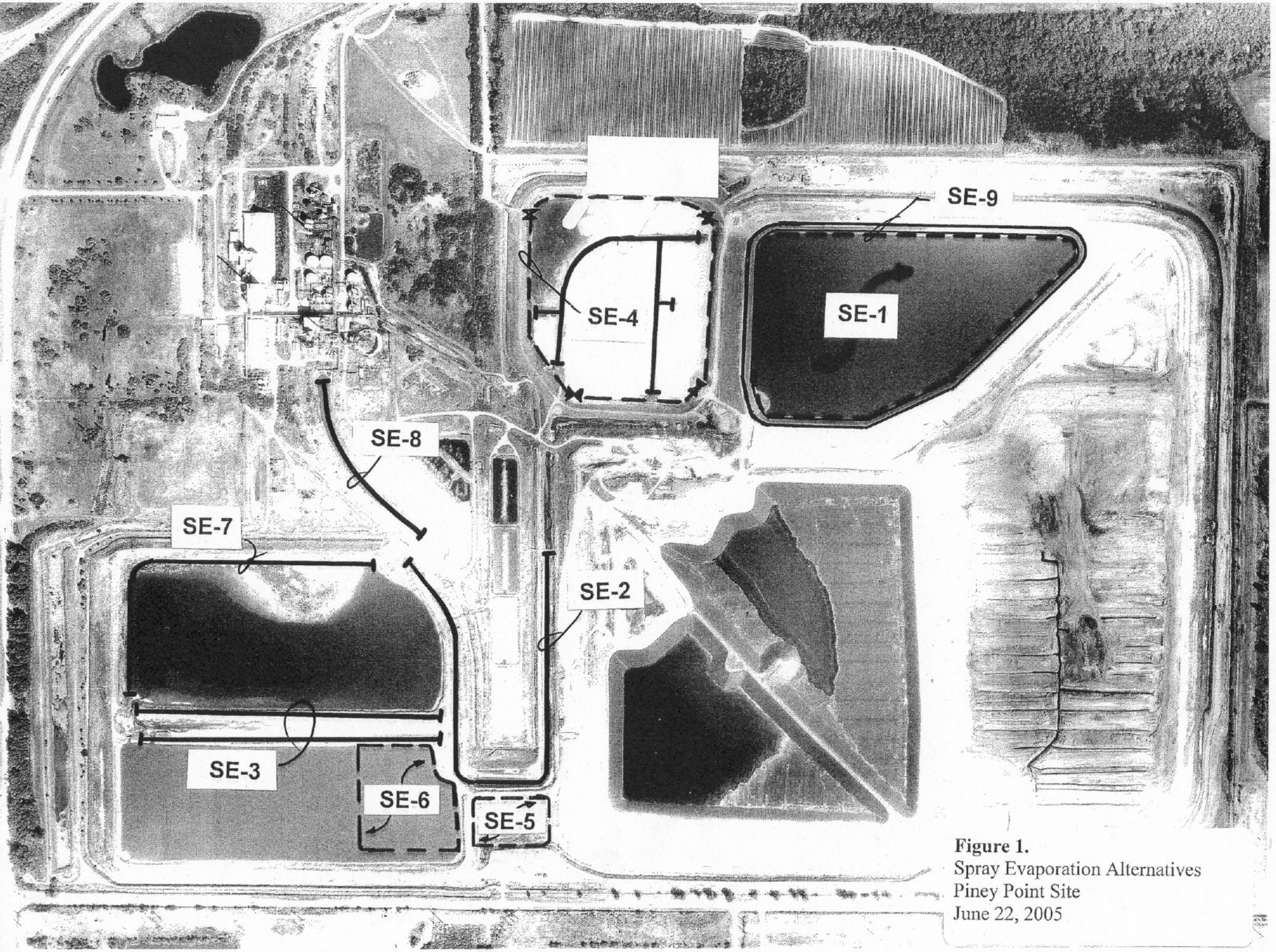

Figure 1.
Spray Evaporation Alternatives
Piney Point Site
June 22, 2005

Coates, John

From: Carter, Dean [CarterDE@cdm.com]
Sent: Tuesday, July 19, 2005 9:39 AM
To: Coates, John; Coram, Phil; Zamani, Sam
Cc: Fuleihan, N (Priority); Leto, Tom; Werner, Rob; Solters, Stephen; Paul Roberts
Subject: Proposed Spray Evaporation System SE-4 NCP

John,
Attached is the revised proposal for the additional spray evaporation system for the NCP. Please review and provide any comments or concerns on the proposed plan. Thanks

Dean

<<SE-4.pdf>>

QuietEarth consultants, inc.

QUIETEARTH CONSULTANTS, INC.
P.O. BOX 3147 · RIVERVIEW, FL 33568 · (813) 677-5026

Date: July 5, 2005

From: Craig A. Kovach, P.G.

MEMORANDUM

To: S. Solters

Cc: P. Roberts, V. Astley, D. Carter, M. Cruz, M. Edgar

Subject: **Piney Point Phosphates Closure**
Update on Short-term Conceptual Spray Evaporation Alternatives: SE-4

CDM continues to pursue process water reduction through enhanced spray evaporation alternatives. The following provides an update of Alternative SE-4. A site map containing all existing alternatives is included as Figure 1.

SE-4: North Cooling Pond (NCP)

CDM and QECI have further evaluated SE-4 since publication of the QECI memo dated 4-18-05 (Short-term Conceptual Spray Evaporation Alternatives) and determined that this alternative, as originally proposed, is infeasible because the internal separation berms in the NCP are not suitable for spray system construction and maintenance. However, it is feasible to install a perimeter manifold on the break in slope along the NCP top of berm that would serve short branch pipes that run inward, normal to the berm along the ground of the inner slope (±15 ft), and extend to the inner toe of the pond (or high water line, as applicable). Spray nozzles (BETE ¼" TF8 Full Cone 90°, PVC) would be installed on stub outs at 90 degrees to each branch pipe (Figure 2). This configuration would provide moderate protection against drift and help contain the spray mist within the footprint of the pond. Valves and tees would be installed to allow each manifold section (north, south, east, or west) to be shut off independently as needed to eliminate any offsite drift. This is particularly important for the north boundary of the NCP, which is close to the property boundary. In the event of shut down of any leg of the manifold, excess flow would be directed back into the NCP through a tee installed at each juncture. This would allow the system to maintain appropriate pressure without having to throttle the spray pump to the point of cavitation.

Configuration in this fashion would allow the installation of approximately 360 spray nozzles. Operated at 60 psi (3.18 GPM) total flow and utilizing an 80% operating factor with 5% of total flow evaporated, the annual average evaporation would be approximately 24 million gallons per year. If the north leg is not operated, performance would be reduced by approximately 25%.

Attachments

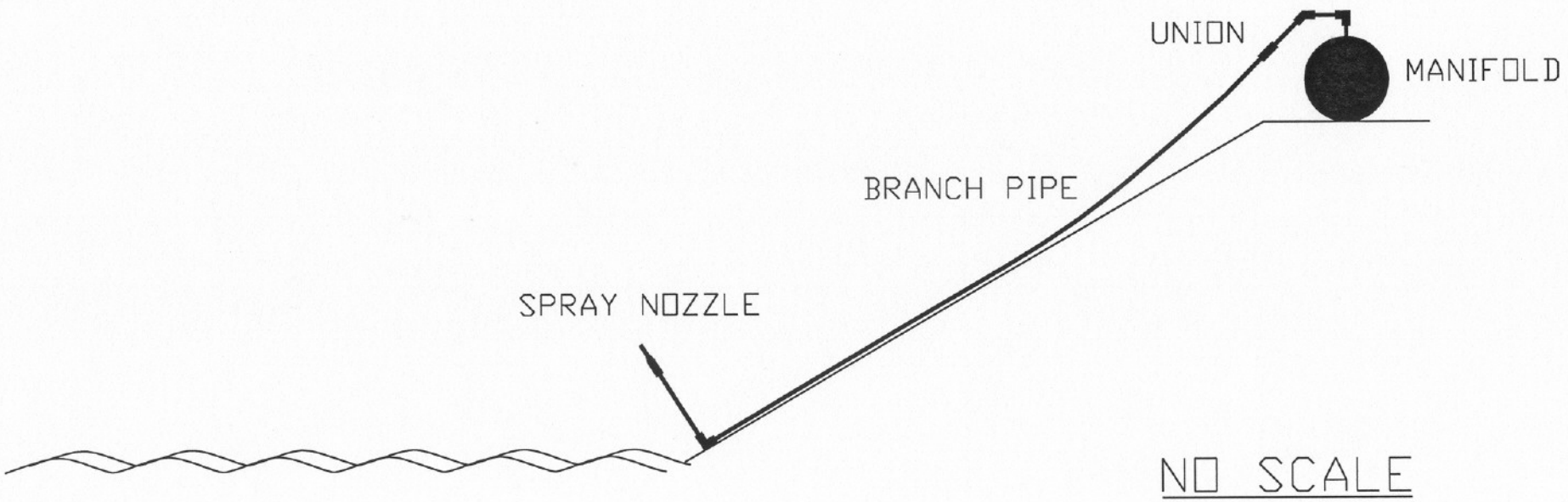

FIGURE 2. TYPICAL SPRAY EVAPORATION BRANCH PIPE AND MANIFOLD

GeoEarth consultants, inc.

Coates, John

From: Leto, Tom [tleto@ardaman.com]
Sent: Monday, July 25, 2005 9:54 AM
To: Coates, John
Cc: Fuleihan, N (Priority); Roberts, Paul; Solters, Stephen; Carter, Dean; Michael Edgar (E-mail)
Subject: FW: Estimated Spray Evaporation for a Nozzle Pressure of 50 psi

John:

As discussed last Thursday it was decided to use a uniform nozzle pressure of 50 psi to estimate the average annualized loss by evaporation of process water sprayed by CDM in the below listed project areas. We have estimated the net annual loss for each area as listed below, based on the actual or estimated number of nozzles deployed, or to be deployed, if the project is deemed feasible.

Tom Leto

-----Original Message-----
From: Shrestha, Rajendra
Sent: Monday, July 25, 2005 9:27 AM
To: Leto, Tom
Cc: Fuleihan, NF (Private); Werner, Rob
Subject: Estimated Spray Evaporation for a Nozzle Pressure of 50 psi

The following are the estimated net annual losses for a nozzle pressure of **50 psi**, inflow per nozzle of **2.91 gpm**, and an operating factor of **80 percent**:

System	No. of Nozzles	Net Annual Evaporation (Million Gallons)
SE-3	614	48.1
SE-4	360	22.5
SE-7	203	14.4
SE-9	500	35.0

Rajendra

Summary of Revised Spray Evaporation Estimates
July 25, 2005

Month	Average Pond Evaporation (Inches)	SE-3 Evaporation Based on Monthly Pond Evaporation Rate (MGD)	SE-4 Evaporation Based on Monthly Pond Evaporation Rate (MGD)	SE-7 Evaporation Based on Monthly Pond Evaporation Rate (MGD)	SE-9 Evaporation Based on Monthly Pond Evaporation Rate (MGD)
		Nozzle Pressure= **50** psi Inflow/Nozzle= 2.91 gpm No. of Nozzels = 614	Nozzle Pressure= **50** psi Inflow/Nozzle= 2.91 gpm No. of Nozzels = 360	Nozzle Pressure= **50** psi Inflow/Nozzle= 2.91 gpm No. of Nozzels = 203	Nozzle Pressure= **50** psi Inflow/Nozzle= 2.91 gpm No. of Nozzels = 500
Net Average Evaporation (MGD): [1]		0.1318	0.0616	0.0395	0.0959
Net Average Evaporation (MGal/Year): [1]		48.1	22.5	14.4	35.0
Jan	2.48	0.0777	0.0363	0.0233	0.0565
Feb	2.62	0.0821	0.0384	0.0246	0.0597
Mar	3.88	0.1215	0.0569	0.0364	0.0884
Apr	5.42	0.1698	0.0794	0.0508	0.1235
May	6.26	0.1961	0.0917	0.0587	0.1427
Jun	6.13	0.1920	0.0898	0.0575	0.1397
Jul	5.70	0.1786	0.0835	0.0535	0.1299
Aug	5.23	0.1638	0.0766	0.0490	0.1192
Sep	4.52	0.1416	0.0662	0.0424	0.1030
Oct	3.43	0.1075	0.0503	0.0322	0.0782
Nov	2.47	0.0774	0.0362	0.0232	0.0563
Dec	2.34	0.0733	0.0343	0.0219	0.0533
Total	50.48	1.5814	0.7397	0.4734	1.1507
Average	4.21	0.1318	0.0616	0.0395	0.0959

Notes:

[1] Estimated Net Spray Evaporation Rates calculated by Ardaman & Associates, July 25, 2005, for updated nozzle numbers provided by CDM, based on an average minimum operating pressure of 50 psi, a nozzle inflow rate of 2.91 gpm, and an operating factor of 0.8.