BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

SHEET 10 OF 13

FEATURE:
Upper San Joaquin River Basin
New K2 Option Powerplant
Apprasial Level Quanity Estimates

Plant - Mechanical

PROJECT:
Upper San Joaquin River Basin

REGION PN **PRICE LEVEL:** Appraisal

FILE: J:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Powerplant - New K2.xls]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	12	Electric traction elevator, overhead, geared,	D-8410	1	UNIT	$500,000.00	$500,000.00
		capacity = 3500 pounds, passenger elevator,					
		travel = 100 feet, landings = 5, speed = 200 ft/min					
	13	Bulkhead gates, lifting beam, and guides	D-8410				
		(assumes one set of two bulkheads for isolation of 1					
		turbine, assumes four sets of guides for four units)					
		a. Structural steel A36:					
		1. Bulkhead gates = 8,500 #/gate x 2 = 17,000#		46,500	LBS	$4.00	$186,000.00
		2. Guides (excluding S.S) = 28,000#					
		3. Lifting frame = 1,500#					
		b. Embedded anchor bolts,steel = 2,500#		2,500	LBS	$4.00	$10,000.00
		c. Stainless steel for guides = 2,500#		2,500	LBS	$15.00	$37,500.00
		HVAC NOT INCLUDED AS SEPARATE ITEM,					
		WILL BE INCLUDED IN UNLISTED ITEMS.					
		ALSO, MONORAIL HOIST FOR BULKHEAD GATE					
		NOT INCLUDED					
		Sheet 10 Subtotal					**$733,500.00**
		Sheet 6 Subtotal					**$16,077,600.00**
		Sheet 7 Subtotal					**$12,471,200.00**
		Sheet 8 Subtotal					**$771,000.00**
		Sheet 9 Subtotal					**$3,035,000.00**
		Powerplant - Mechanical Subtotal					**$33,088,300.00**

QUANTITIES		**PRICES**	
BY Alex Ritt/Wayne Delzer	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED	**PEER REVIEW**	**DATE PREPARED** 02/22/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

SHEET__11__ OF __13__

FEATURE: Upper San Joaquin River Basin New Powerplant at K2 Appraisal Level Quantity Estimates Powerplant - Electrical	**PROJECT:** Upper San Joaquin River Basin **REGION** MP **PRICE LEVEL:** Appraisal **FILE:** J:\DS_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Powerplant - New K2.xls]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Furnishing, installing, & testing 45,600 kVA, 60	D-8430	4	Each	$2,750,000.00	$11,000,000.00
		HZ, 360 RPM, 90 percent power factor, 3					
		phase, 13,800 Volt, vertical-shaft, water-cooled					
		AC generator including static excitation system					
		Cost curves: 1992 [50 mva and 43.75 mva avg.]				2,260,000	
		Index number: 1992 - 2004	262			1.218605	
			215				
	2	Furnisning and installing 15 KV, 2000 amperes,	D-8430	400	Feet	$650.00	$260,000.00
		non-segregated phase bus					
	3	Furnishing and installing generator neutral	D-8430	4	Each	$15,000.00	$60,000.00
		grounding equipment					
	4	Furnishing and installing generator metal-clad	D-8430	4	Each	$62,500.00	$250,000.00
		switchgear, 15 KV, 2000 amperes					
	5	Furnishing and installing Duplex control	D-8430	1	LS	$500,000.00	$500,000.00
		switchboard for operation of four generators, and					
		switchyard controls and protection					
	6	Furnishing and installing indoor double-ended	D-8430	1	Each	$100,000.00	$100,000.00
		secondary unit substation with two dry type					
		transformer 13.8 KV-480Y277 V; 1,000 KVA					
	7	Furnishing and installing plant battery system	D-8430	1	LS	$6,400.00	$6,400.00
		125 VDC, 200 ampere-hour, with battery charger	batts	50	ea	$100.00	
			charger	1	ea	$400.00	
			rack	2	ls	$500.00	
	8	Furnishing and installing lighting system	D-8430	1	LS	$83,400.00	$83,400.00
		lighting control panelboard		1	ea	$5,000.00	
		overhead lighting:	**	10,000	ft2	$7.50	
		emergency lighting units		4	ea	$650.00	
		exit lighting		4	ea	$200.00	
		** The square footage is major guess - correct with actual floorplan info					
		The cost per square foot is a mid-point value from the electrical D50					
		industrial lighting tables. Means elect. Pages 336 - 347.					
		Subtotal for items 9 and 10 - from sheet 12					$252,680.00
		Powerplant - Electrical Subtotal					**$12,512,480.00**

QUANTITIES		**PRICES**	
BY Richard Noi	**CHECKED**	**BY** *LP* L. Pedde	**CHECKED**
DATE PREPARED	**PEER REVIEW**	**DATE PREPARED** 02/22/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

SHEET_12_ OF __13__

FEATURE:
Upper San Joaquin River Basin
New Powerplant at K2
Appraisal Level Quantity Estimates

Switchyard

PROJECT:
Upper San Joaquin River Basin

REGION MP **PRICE LEVEL:** Appraisal

FILE: J:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Powerplant - New K2.xls]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	9	Furnishing and installing 3 phase, 480 volt,	D-8430	4	Each	$13,170.00	$52,680.00
		distribution panels include:					
		Main panelboard enclosure: 225A lugs		1	ea.	$2,400.00	
		Main panelboard enclosure: 100A lugs		1	ea.	$2,250.00	
		225 Amp frame, 225 amp trip		1	ea.	$1,100.00	
		100 Amp frame, 100 amp trip		2	ea.	$530.00	
		100 Amp frame, 60 amp trip		4	ea.	$530.00	
		100 Amp frame, 20 amp trip		4	ea.	$530.00	
		100 Amp frame, 15 amp trip		4	ea.	$530.00	
		M: 16400 800 0170/0190 820 0280/0420					
	10	Furnishing and installing spherical valve control board	D-8430	4	Each	$50,000.00	$200,000.00
		avg control board cost - insufficent data					
		to know sufficency/accuracy of this value					
		Powerplant - electrical - continued					$252,680.00
		not included in sheet 12 subtotal - moved into sheet 11 subtotal					
		ELECTRICAL					
		Switchyard					
		Furnish and Install:					
	1	Oil-filled, conservator-type power	D8440	2	EA	$2,800,000.00	$5,600,000.00
		transformer					
		200 MVA; 115-13.8 kV, 3-phase		200	mva	$14,000.00	
	2	115-kV disconnect switches,	D8440	6	EA	$40,000.00	$240,000.00
		2000 amp, 3-phase					
		means: 16360 800 3090 161kv - manual	29700				
		means: 16360 800 3110 161kv - mtr-op	41700				
	3	115-kV circuit breakers, 2000 amp	D8440	2	EA	$250,000.00	$500,000.00
		means: 16360 800 2080 161kv - oil	242000				
		means: 16360 800 2100 161kv - air	204500				
		means: 16360 800 2160 161kv - gas	264500				
	4	**SCADA**	D8440	Assume covered under unlisted items			
		STRUCTURAL	D8120	Assume switchyard structures covered under unlisted items			
		Switchyard Subtotal					**$6,340,000.00**

QUANTITIES		**PRICES**	
BY Lisa Gamuciello	**CHECKED**	**BY** *LP* L. Pedde	**CHECKED**
DATE PREPARED	**PEER REVIEW**	**DATE PREPARED** 02/22/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

SHEET_13_ OF __13__

FEATURE:
Upper San Joaquin River Basin
Powerplant at RM 286
Appraisal Level Quantity Estimates

Switchyard

PROJECT:
Upper San Joaquin River Basin

REGION MP **PRICE LEVEL:** Appraisal

FILE: J:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Powerplant - New K2.xls]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	7	**SCADA**	D8440	Unlisted Item	LS	Included in Unlisted Items	
		Sheet 13 Subtotal					**$0.00**
		Sheet 12 Subtotal					**$6,340,000.00**
		Switchyard & Transmission Line Subtotal					**$6,340,000.00**

QUANTITIES		PRICES	
BY Lisa Gamuciello	**CHECKED**	**BY** L. Pedde	**CHECKED**
DATE PREPARED	**PEER REVIEW**	**DATE PREPARED** 02/22/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
Upper San Joaquin River Basin
Redinger Powerplant
Appraisal Level Quantity Estimates

Summary Sheet

PROJECT:
Upper San Joaquin River Basin

REGION MP **PRICE LEVEL:** Appraisal

FILE: E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Redinger Powerplant - Final Qty

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Tailwater Weir & Penstock Removal					$1,253,250.00
		Powerplant - Civil/Structural Subtotal					$14,994,010.00
		Powerplant - Mechanical Subtotal					$5,027,448.00
		Powerplant - Electrical Subtotal					$1,952,000.00
		Switchyard & Transmission Line Subtotal					$1,050,000.00
		Subtotal					$24,276,708.00
		Mobilization +/-	5%				$1,200,000.00
		Subtotal w/Mobilization					$25,476,708.00
		Unlisted Items +/-	15%				$3,523,292.00
		CONTRACT COST					**$29,000,000.00**
		Contingencies +/-	25%				$8,000,000.00
		FIELD COST					**$37,000,000.00**

QUANTITIES		PRICES	
BY	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED	**PEER REVIEW**	**DATE PREPARED** 05/31/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
Upper San Joaquin River Basin
Redinger Powerplant
Appraisal Level Quantity Estimates

Cofferdam for Powerplant

PROJECT:
Upper San Joaquin River Basin

REGION MP **PRICE LEVEL:** Appraisal

FILE: E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Redinger Powerplant - Final Qty

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Construct/Remove Cellular Cofferdam					
		Assume cofferdam for this powerplant					
		is small enough to be included within					
		the unlisted items.					
	1	Removal of existing steel penstock pipe	D8120	439,000	LBS	$1.00	$439,000.00
	2	Removal of penstock pipe steel supports	D8120	36,000	LBS	$1.00	$36,000.00
	3	Concrete plug for existing penstock tunnel	D8120	Include in Unlisted Items			
	4	Rock Excavation for Tailwater Weir	D8120	370	CY	$125.00	$46,250.00
	5	Concrete for Tailwater Weir	D8120	1,350	CY	$500.00	$675,000.00
	6	Cement for Tailwater Weir	D8120	380	TONS	$150.00	$57,000.00
							$1,253,250.00

QUANTITIES		PRICES	
BY P. M. Ruchti	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED	**PEER REVIEW**	**DATE PREPARED** 05/31/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE: Upper San Joaquin River Basin Redinger Powerplant Appraisal Level Quantity Estimates Powerplant - Civil	**PROJECT:** Upper San Joaquin River Basin **REGION** MP **PRICE LEVEL:** Appraisal **FILE:** E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Redinger Powerplant - Final Qty

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Realignment of Existing County Road					
		Road Relocation for Service Yard & Access Road					
	1	Clearing and Grubbing	D8140		AC	Included in Unlisted Items	
	2	Excavation (rock)	D8140	42,000	CY	$15.00	$630,000.00
	3	Compacted embankment	D8140	100	CY	$50.00	$5,000.00
	4	Gravel surfacing	D8140	290	CY	$50.00	$14,500.00
	5	24" dia corrugated metal pipe	D8140	140	LF	$80.00	$11,200.00
	6	Metal Beam Guard Rail	D8140		LF	Included in Unlisted Items	
		Powerplant Site					
	7	Rock excavation to Service Yard El.1253.5	D8120	112,400	CY	$13.00	$1,461,200.00
	8	Rock excavation for penstock pipe trench	D8120		CY	Included in Unlisted Items	
	9	Backfill for penstock pipe trench	D8120		CY	Included in Unlisted Items	
	10	Compacted backfill for Service Yard to El. 1253.5	D8120	14,050	CY	$10.00	$140,500.00
		Structural Excavation and Backfill					
		Assume all rock excavation.					
		Assume stockpile rock for later use as riprap or rockfill.					
	11	Rock excavation for powerplant tailrace (drill & blast)	D8120	9,100	CY	$30.00	$273,000.00
	12	Rock excavation for structures (drill & blast)	D8120	93,400	CY	$13.00	$1,214,200.00
	13	Compacted backfill for plant structure (assume local borrow)	D8120		CY	Included in Unlisted Items	
	14	Furnish, place, & compact backfill for penstock pipe	D8120		CY	Included in Unlisted Items	
		(assume local borrow)					
		Sheet Subtotal					**$3,749,600.00**

QUANTITIES		**PRICES**	
BY M. R. O'Shea Mark Leavitt	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED 8/11/04	**PEER REVIEW**	**DATE PREPARED** 05/31/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
Upper San Joaquin River Basin
Redinger Powerplant
Appraisal Level Quantity Estimates

Powerplant - Structural

PROJECT:
Upper San Joaquin River Basin

REGION MP **PRICE LEVEL:** Appraisal

FILE: E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Redinger Powerplant - Final Qty

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		STRUCTURAL					
		Construct Powerplant Structure					
	15	Furnish, form, and place reinforced concrete	D8120	16,000	CY	$400.00	$6,400,000.00
	16	Furnish and place concrete reinforcement.	D8120	1,760,000	LBS	$0.80	$1,408,000.00
		Assume 110 #/CY					
	17	Furnish and handle cement (.282T/CY)	D8120	4,512	TONS	$120.00	$541,440.00
	18	Furnish & install precast, prestressed double tees for roof	D8120	13	EA	$30,000.00	$390,000.00
		8DT 20A+2 = 8' wide & 20" deep - 56' Span					
		Penstock Pipe Encasement					
	19	Furnish, form, and place reinforced concrete	D8120		CY	Included in Unlisted Items	
	20	Furnish and place concrete reinforcement.	D8120		LBS	Included in Unlisted Items	
		Assume 125 #/CY					
	21	Furnish and handle cement (.282T/CY)	D8120		TONS	Included in Unlisted Items	
		Service Yard Retaining Wall					
	22	Furnish, form, and place reinforced concrete	D8120	4,500	CY	$400.00	$1,800,000.00
	23	Cement for Service Yard Retaining Wall	D8120	1,269	TONS	$130.00	$164,970.00
	24	Furnish and place concrete reinforcement.	D8120	675,000	LBS	$0.80	$540,000.00
		Structural Steel					
	22	Included in Unlisted Items	D8120		LBS	Included in Unlisted Items	
		Miscellaneous Metalwork					
	23	Included in Unlisted Items	D8120		LBS	Included in Unlisted Items	
		Sheet 4 Subtotal					**$11,244,410.00**
		Sheet 3 Subtotal					**$3,749,600.00**
		Powerplant - Civil/Structural Subtotal (Sheets 3 and 4)					**$14,994,010.00**

QUANTITIES

BY P. M. Ruchti & M. R. O'Shea **CHECKED**

DATE PREPARED 8/11/04 **PEER REVIEW**

PRICES

BY D. Donaldson **CHECKED**

DATE PREPARED 05/31/05 **PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE: Upper San Joaquin River Basin Redinger Powerplant Appraisal Level Quantity Estimates Powerplant - Mechanical	**PROJECT:** Upper San Joaquin River Basin **REGION** MP **PRICE LEVEL:** Appraisal **FILE:** E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Redinger Powerplant - Final Qty

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Turbine Weight - 1 unit	D-8420	180,400	lbs	$13.00	$2,345,200.00
		CF3 18-8 stainless Runner, 6.1' outlet dia.					
		Turbine-Vertical Francis, 28,271 hp					
		300 rpm, 280 ft. Design Head					
		Gross head range, 350 - 150 feet					
	2	Digital Governor - 1 unit	D-8420	17,600	lbs	$11.50	$202,400.00
		57,884 ft-lb capacity					
	3	Steel piping	D-8420				
		108" Dia. t = .500", Wt. = 579 lb/ft		110	lin ft.	$2.00	$220.00
		186" Dia., t = .563", Wt. = 1121 lb/ft		24	lin ft.	$2.00	$48.00
	4	Flange	D-8420	5,770	lb.	$4.00	$23,080.00
		2 -108" AWWA Class D flanges,					
		2884 lb. per flange					
	5	Valve	D-8420	41,000	lb.	$10.00	$410,000.00
		108" Dia. AWWA Class 150, Butterfly					
		valve with hydraulic cylinder operator,					
		41,000 lb. ea.					
		Sheet Subtotal					**$2,980,948.00**

QUANTITIES		PRICES	
BY Dave Hulse Rick Frisz	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED		**DATE PREPARED** 05/31/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE: Upper San Joaquin River Basin Redinger Powerplant Appraisal Level Quantity Estimates Powerplant - Mechanical	**PROJECT:** **Upper San Joaquin River Basin** **REGION** MP **PRICE LEVEL:** Appraisal **FILE:** E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Redinger Powerplant - Final Qty

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	CO2 High Pressure Fire Extinguishing System:	D-8410	1	L.S.	$18,000.00	$18,000.00
		6 - 100# Storage Cylinders w/ control panel					
		and appurtenances and 300 lbs. of					
		sch. 80 carbon steel pipe, valves & fittings					
	2	Fire Suppression System:	D-8410	1	L.S.	$48,000.00	$48,000.00
		6 - Fire hose reels w/ 75 feet of hose					
		10 - Portable hand-held 20# extinguishers					
		1,500 lbs. of sch. 40 carbon steel pipe, valves & fittings					
		1 - Fire pump, split-case, 500 gpm @ 300 ft of head					
	3	Unit Cooling Water System:	D-8410	1	L.S.	$110,000.00	$110,000.00
		2 - Cooling water pumps, end-suction type, 150 gpm					
		2 - 6-inch automatic, self-cleaning strainers					
		4,000 lbs. of sch. 40 carbon steel pipe, valves & fittings					
		600 lbs. of ductile iron, mechanical joint pipe & fittings					
	4	Lubricating Oil System:	D-8410	1	L.S.	$21,000.00	$21,000.00
		2 - 500 gal carbon steel storage tanks					
		1 - 10 gpm @ 100 psi oil pump					
		1 - lube oil filter					
		1,000 lbs. of sch. 40 carbon steel pipe, valves & fittings					
	5	Compressed Air System:	D-8410	1	L.S.	$53,000.00	$53,000.00
		2 - 100 cfm @ 125 psi rotary screw air compressors					
		1 - 250 gal. carbon steel air receiver					
		1 - 100 cfm air dryer					
		500 lbs. of sch. 40 carbon steel pipe, valves & fittings					
	6	Service Water System:	D-8410	1	L.S.	$58,000.00	$58,000.00
		1 - Service water pump, 75 gpm @ 200 ft. of head					
		1 - Hydropneumatic Tank, 300 gal.					
		400 lbs. of type K copper tubing, valves & fittings					
	7	Gravity Drainage System:	D-8410	1	L.S.	$42,000.00	$42,000.00
		20 - Floor drains, cast iron					
		4,000 lbs. of cast iron hub & spigot, service weight					
		soil pipe					
		Sheet Subtotal					**$350,000.00**

QUANTITIES		**PRICES**	
BY John Grass	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED		**DATE PREPARED** 05/31/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE: Upper San Joaquin River Basin Redinger Powerplant *Appraisal Level Quanity Estimates* Plant - Mechanical	**PROJECT:** **Upper San Joaquin River Basin** **REGION** PN **PRICE LEVEL:** Appraisal **FILE:** E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Redinger Powerplant - Final Qty

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	8	Plant Unwatering System:	D-8410	1	L.S.	$96,000.00	$96,000.00
		2 - Vertical turbine type sump pump, 500 gpm @ 100 ft hd					
		1 - Drainage jet type drainage pump					
		500 lbs. of type K copper tube, valves & fittings					
		2,000 lbs. of ductile iron, mechanical joint pipe & fittings					
	9	Domestic Water and Sanitary Waste System:	D-8410	1	L.S.	$60,000.00	$60,000.00
		2 - Water Closets					
		1 - Urinal					
		2 - Lavatories & accessories					
		1 - Duplex Sewage Ejector					
		2,800 lbs. of cast iron hub & spigot service weight					
		sewer pipe					
		300 lbs. of type K copper tubing, valves & fittings					
	10	60 Ton Overhead Crane, 53'-0" span, 110 ft long rails		1	LS	$900,000.00	$900,000.00
		a. Crane: 100,000 lbs (includes 10T aux.)					
		b. Trolley: 35,000 lbs					
		c. 110 ft x 2 = 220 ft of 135# (per yd.) rail= 10,000 lbs					
	11	Electric traction elevator, overhead, geared,	D-8410	1	UNIT	$500,000.00	$500,000.00
		capacity = 3500 pounds, passenger elevator,					
		travel = 66 ft., landings = 5, speed = 200 fpm					
	12	Bulkhead gates, lifting beam, and guides					
		(assumes one set of two bulkheads for isolation of 1					
		turbine, assumes two sets of guides for one unit)					
		a. Structural steel A36:					
		1. Bulkhead Gates = 8,000 #/gate x 2 = 16,000 #		30,000	LBS	$4.00	$120,000.00
		2. Guides (excluding S.S.) = 12,500 #					
		3. Lifting frame = 1,500 #					
		b. Embedded anchor bolts, steel = 1,100#		2,500	LBS	$4.00	$10,000.00
		c. Stainless steel for guides = 700#		700	LBS	$15.00	$10,500.00
		HVAC NOT INCLUDED AS SEPARATE ITEM, WILL BE INCLUDED IN UNLISTED ITEMS					
		ALSO, MONORAIL HOIST FOR BULKHEAD GATE NOT INCLUDED					
		Sheet Subtotal					**$1,696,500.00**

QUANTITIES		**PRICES**	
BY John Grass/Wayne Delzer	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED	**PEER REVIEW**	**DATE PREPARED** 05/31/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE: Upper San Joaquin River Basin Redinger Powerplant *Apprasial Level Quanity Estimates* Plant - Mechanical	**PROJECT:** **Upper San Joaquin River Basin** **REGION** PN **PRICE LEVEL:** Appraisal **FILE:** E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Redinger Powerplant - Final Qty

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Sheet 7 Subtotal					**$1,696,500.00**
		Sheet 6 Subtotal					**$350,000.00**
		Sheet 5 Subtotal					**$2,980,948.00**
		Powerplant - Mechanical Subtotal					**$5,027,448.00**

QUANTITIES		**PRICES**	
BY	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED	**PEER REVIEW**	**DATE PREPARED** 05/31/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE: Upper San Joaquin River Basin Redinger Powerplant Appraisal Level Quantity Estimates Powerplant - Electrical	**PROJECT:** Upper San Joaquin River Basin **REGION** MP **PRICE LEVEL:** Appraisal **FILE:** E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Redinger Powerplant - Final Qty

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Furnishing, installing, & testing 13,444KVA, 60	D-8430	1	Each	$1,450,000.00	$1,450,000.00
		cycle, 276.9 RPM, 90 percent power factor, 3					
		phase, 6,900 Volt, vertical-shaft, water-cooled					
		AC generator including static excitation system					
	2	Furnisning and installing 15 KV, 1200 amperes,	D-8430	100	Feet	$850.00	$85,000.00
		non-segregated phase bus					
	3	Furnishing and installing generator neutral	D-8430	1	Each	$15,000.00	$15,000.00
		grounding equipment					
	4	Furnishing and installing generator metal-clad	D-8430	1	Each	$25,000.00	$25,000.00
		switchgear, 15 KV, 1200 amperes					
	5	Furnishing and installing Duplex control	D-8430	1	LS	$175,000.00	$175,000.00
		switchboard for operation of one generators, and					
		switchyard controls and protection					
	6	Furnishing and installing indoor	D-8430	1	Each	$70,000.00	$70,000.00
		unit substation with one dry type					
		transformer 6.9 KV-480Y277 V; 500 KVA					
	7	Furnishing and installing plant battery system	D-8430	1	LS	$3,500.00	$3,500.00
		125 VDC, 100 ampere-hour, with battery charger					
	8	Furnishing and installing lighting system	D-8430	1	LS	$65,000.00	$65,000.00
	9	Furnishing and installing 3 phase, 480 volt,	D-8430	1	LS	$13,500.00	$13,500.00
		distribution panels include:					
		1 - 225 Amp frame, 225 amp trip					
		2 - 100 Amp frame, 100 amp trip					
		4 - 100 Amp frame, 60 amp trip					
		4 - 100 Amp frame, 20 amp trip					
		4 - 100 Amp frame, 15 amp trip					
	10	Furnishing and installing spherical valve control board	D-8430	1	Each	$50,000.00	$50,000.00
		Powerplant - Electrical Subtotal					**$1,952,000.00**

QUANTITIES		PRICES	
BY Richard Noi	**CHECKED**	**BY** L Pedde	**CHECKED**
DATE PREPARED	**PEER REVIEW**	**DATE PREPARED** 05/31/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
Upper San Joaquin River Basin
Redinger Powerplant
Appraisal Level Quantity Estimates

Switchyard

PROJECT:
Upper San Joaquin River Basin

REGION MP **PRICE LEVEL:** Appraisal

FILE: E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Redinger Powerplant - Final Qty

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		STRUCTURAL	D8120	1	LS	*	
		Assume switchyard structures covered under					
		unlisted items.					
		ELECTRICAL					
		Switchyard					
		Furnish and Install:					
	1	Oil-filled, conservator-type power	D8440	1	EA	$700,000.00	$700,000.00
		transformer					
		50 MVA; 230-6.9kV, 3-phase					
	2	230-kV disconnect switches,	D8440	2	EA	$50,000.00	$100,000.00
		1200 amp, 3-phase					
	3	230-kV circuit breakers, 1200 amp	D8440	1	EA	$250,000.00	$250,000.00
	4	**SCADA**	D8440	1	LS	*	
		Assume covered by unlisted items.					
		Sheet Subtotal					**$1,050,000.00**

QUANTITIES		**PRICES**	
BY Lisa Gamuciello	**CHECKED**	**BY** L Pedde	**CHECKED**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

SHEET_11_ OF __11 __

FEATURE: Upper San Joaquin River Basin Redinger Powerplant Appraisal Level Quantity Estimates Switchyard	**PROJECT:** Upper San Joaquin River Basin **REGION** MP **PRICE LEVEL:** Appraisal **FILE:** E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Redinger Powerplant - Final Qty

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Sheet 11 Subtotal					$0.00
		Sheet 10 Subtotal					$1,050,000.00
		Switchyard & Transmission Line Subtotal					**$1,050,000.00**

QUANTITIES		**PRICES**	
BY	**CHECKED**	**BY** L Pedde	**CHECKED**
DATE PREPARED	**PEER REVIEW**	**DATE PREPARED** 05/31/05	**PEER REVIEW**

COMMON_ADJ COSTS

CONTRACT COST FOR VARIOUS SIZES OF NEW KERCKHOFF POWERHOUSE AT MILLERTON LAKE

180MW Powerhouse Contrat Cost (from MILL LK_NEW PH_1) $115,000,000

Description	Amount
New Kerckhoff 90MW Powerhouse at Millerton Lake	
Conversion Factor (square root of MW ratio)	0.71
Adjusted Contract Cost for 90MW Powerhouse @ Millerton Lake (Jul-2004 costs)	**$81,000,000**
New Kerckhoff 40MW Powerhouse at Millerton Lake	
Conversion Factor (square root of MW ratio)	0.47
Adjusted Contract Cost for 40MW Powerhouse @ Millerton Lake (Jul-2004 costs)	**$54,000,000**

CONTRACT COSTS FOR KERCKHOFF AND REDINGER POWERHOUSES

Redinger 13MW PH Contrat Cost (from RED_NEW PH_1) $29,000,000

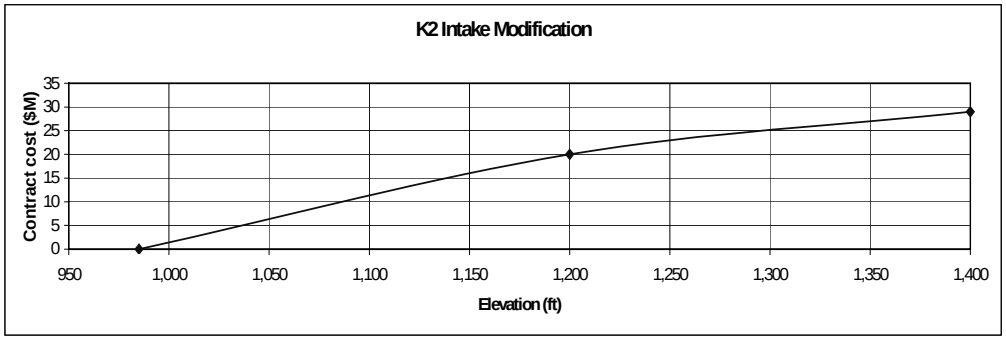
Description	Amount
New 20MW Powerhouse at Kerckhoff Dam	
Conversion Factor (square root of MW ratio)	1.24
Adjusted Contract Cost for 20MW Powerhouse @ Kerckhoff Dam (Jul-2004 costs)	**$36,000,000**
80 MW Redinger Powerhouse	
Conversion Factor (square root of MW ratio)	2.48
Adjusted Contract Cost for 80MW Redinger Powerhouse (Jul-2004 costs)	**$72,000,000**
30 MW Redinger Powerhouse	
Conversion Factor (square root of MW ratio)	1.52
Adjusted Contract Cost for 30MW Redinger Powerhouse (Jul-2004 costs)	**$44,000,000**

KERCKHOFF POWERHOUSE NO. 2 DIVERSION

Description	Amount
Extension of Kerckhoff PH2 Diversion Tunnel to below RM279	
4.7 miles at $13M per mile (unit cost from 2004 SCE scoping comment)	$61,100,000
Mobilization (5%)	$3,055,000
Subtotal	$64,155,000
Unlisted items (~15%)	$9,845,000
Contract Cost for Extension of Kerckhoff No. 2 Powerhouse Diversion Tunnel (Jul-2004	**$74,000,000**

Description				Amount
Steel Liner, Contract Cost (for specified reservoir surface elevation)		Reservr Elev	Elev Diff	($M)
	reference KER_PH2_DIV TNL_7	1,400	415	$105
		985	0	$0
		1,100	115	**$29**
Contract Cost for Kerckhoff No.2 Powerhouse Diverstion Tunnel, Steel Liner (Jul-2004 c		1,200	215	**$54**
		1,275	290	**$73**
		1,300	315	**$80**
	Ratio (Contract Cost : Elev Diff)		**0.25**	

Description			Amount
Modify Kerckhoff No. 2 Diversion Intake (1100 and 1115 Foot Options) (Jul-2004 costs)		Elevation	($M)
		985	$0
	reference KER_PH2_DIV TNL_5	1,200	$20
	reference KER_PH2_DIV TNL_7	1,400	$29
Contract Cost to Modify Kerckhoff No. 2 Diversion Intake for 1300 Foot Option (Jul-2004		1,300	**$25**
Approximate Contract Cost to Modify Intake for 1100 and 1115 Foot Options (see graph		1,100	**$11**



BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
Upper San Joaquin River Basin Replacement K2
4100 Feet Steel Liner in Tunnel

NEW

PROJECT: Upper San Joaquin River Basin

REGION MP **PRICE LEVEL:** Appraisal

FILE: [illegible]_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Additional Items - Nov 04\[D-8420 - 4100 LF Tunnel Steel Liner.xls]page1

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Furnish and install the following:					
	1	Steel Liner Pipe for Tunnel	D8420				
		Steel plate used for pipe fabrication:					
		ASTM A36: Sy = 36,000 psi Sa = 18,000 psi					
		(All pipe sizes are inside diameters)					
	a	272" Dia., 1-9/16" wall, L= 404.7 ft., 5,100 lbs/ft		2,063,848	LBS		
	b	272" Dia., 1-5/8" wall, L= 410.3 ft., 5,305 lbs/ft		2,176,880	LBS		
	c	272" Dia.,1-11/16" wall, L= 410.0 ft., 5,510 lbs/ft		2,259,085	LBS		
	d	272" Dia., 1-3/4" wall, L= 409.6 ft., 5,716 lbs/ft		2,341,199	LBS		
	e	272" Dia., 1-13/16" wall, L= 409.2 ft., 5,921 lbs/ft		2,423,189	LBS		
	f	272" Dia., 1-7/8" wall, L= 408.9 ft., 6,127 lbs/ft		2,505,067	LBS		
	g	272" Dia., 1-15/16" wall, L= 408.5 ft., 6,332 lbs/ft		2,586,831	LBS		
	h	272" Dia., 2" wall, L= 408.2 ft., 6,538 lbs/ft		2,668,503	LBS		
	i	272" Dia., 2-1/16" wall, L= 407.8 ft., 6,744 lbs/ft		2,750,049	LBS		
	j	272" Dia., 2-1/8" wall, L= 407.4 ft., 6,950 lbs/ft		2,831,496	LBS		
	k	272" Dia., 2-3/16" wall, L= 15.4 ft., 7,156 lbs/ft		109,867	LBS		
		TOTAL steel pipe weight		24,716,014	LBS		
		Rounded steel pipe weight		**24,720,000**	**LBS**	$3.50	$86,520,000.00
		Sheet Subtotal					**$86,520,000.00**

QUANTITIES		**PRICES**	
BY Ken Smith, D8420	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED 2004 October 22		**DATE PREPARED** 02/23/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE: Upper San Joaquin River Basin Replacement K2 4100 Feet Steel Liner in Tunnel **NEW**	**PROJECT:** Upper San Joaquin River Basin **REGION** MP **PRICE LEVEL:** Appraisal **FILE:** J:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Additional Items - Nov 04\D-8420 - 4100 LF Tunnel

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Subtotal (from Sheet 1 of 1)					**$86,520,000.00**
		Mobilization	+/- 5%				$4,300,000.00
		Subtotal w/ mobilization					$90,820,000.00
		Unlisted Items	+/- 15%				$14,180,000.00
		CONTRACT COST					**$105,000,000.00**
		Contingencies	+/- 25%				$25,000,000.00
		FIELD COST					**$130,000,000.00**

QUANTITIES		PRICES	
BY Ken Smith, D8420	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED 2004 October 22		**DATE PREPARED** 02/23/05	**PEER REVIEW**

CODE:D-8170

ESTIMATE WORKSHEET

FEATURE: Nov. 1, 2004

New Penstock Intake Structure for Kerckhoff Powerplant No. 2, with RM286 Dam at Elevation 1200

NEW

PROJECT: Upper San Joaquin River Basin

REGION: MP **PRICE LEVEL:** Appraisal

FILE: J:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Additional Items - Nov 04\[K2 Intake

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Size and length of shaft and tunnel not provided.					
	1	Excavation, open cut, for control structure	8130	2,500	cy	$50.00	$125,000.00
		(some overburden, mostly rock)					
	2	Excavation of shaft, in rock	8130	14,000	cy	$300.00	$4,200,000.00
	3	Excavation of rock to enlarge existing	8130	1,000	cy	$300.00	$300,000.00
		tunnel					
	4	Concrete in tunnel lining	8130	1,000	cy	$500.00	$500,000.00
	5	Concrete in lining of shaft	8130	3,100	cy	$500.00	$1,550,000.00
	6	Concrete in gate chamber	8130	1,800	cy	$500.00	$900,000.00
	7	Concrete in cover at top of shaft	8130	200	cy	$750.00	$150,000.00
	8	Concrete in control structure building	8130	120	cy	$750.00	$90,000.00
	9	Concrete in center pier of tunnel	8130	225	cy	$750.00	$168,750.00
	10	Concrete in interior walls of shaft	8130	1,100	cy	$500.00	$550,000.00
	11	Furnish cement	8130	2,000	tons	$140.00	$280,000.00
	12	Furnish reinforcing steel	8130	1,320,000	lbs	$1.00	$1,320,000.00
	13	Drill 3-inch drain holes in shaft and	8130	4,000	lf	$70.00	$280,000.00
		gate chamber					
	14	Furnish and install two 10.75 ft by	8420	700,000	lbs	$5.00	$3,500,000.00
		24.5 ft high pressure gates					
	15	Furnish and install hydraulic control	8420	6,000	lbs	$15.00	$90,000.00
		system					
	16	Furnish and install two 10.75 ft by 24.5 ft	8420	180,000	lbs	$5.00	$900,000.00
		wheel-mounted guard gates					
	17	Furnish and install tracks for wheel-	8420	62,000	lbs	$5.00	$310,000.00
		mounted gates					
	18	Furnish and install stems for wheel-	8420	110,000	lbs	$5.00	$550,000.00
		mounted gates					
	19	Furnish and install hoists for wheel-	8420	150,000	lbs	$5.00	$750,000.00
		mounted gates					
	20	Furnish and install miscellaneous	8420	60,000	lbs	$7.00	$420,000.00
		equipment for wheel-mounted gates					
		Sheet Subtotal					**$16,933,750.00**

QUANTITIES		PRICES	
BY Dave Hinchliff	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED 11/01/04	**APPROVED**	**DATE** 02/23/05	**PEER REVIEW**

CODE:D-8170

ESTIMATE WORKSHEET

FEATURE: Nov. 1, 2004

New Penstock Intake Structure for Kerckhoff Powerplant No. 2, with RM286 Dam at Elevation 1200

NEW

PROJECT: Upper San Joaquin River Basin

REGION: MP **PRICE LEVEL:** Appraisal

FILE: J:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Additional Items - Nov 04\[K2 Intake

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Subtotal (from Sheet 1 of 1)					**$16,933,750.00**
		Mobilization	+/- 5%				$850,000.00
		Subtotal w/ mobilization					$17,783,750.00
		Unlisted Items	+/- 15%				$2,216,250.00
		CONTRACT COST					**$20,000,000.00**
		Contingencies	+/- 25%				$6,000,000.00
		FIELD COST					**$26,000,000.00**

QUANTITIES		PRICES	
BY Dave Hinchliff	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED 11/01/04	**APPROVED**	**DATE** 02/23/05	**PEER REVIEW**

CODE:D-8170

ESTIMATE WORKSHEET

FEATURE: Nov. 1, 2004

New Penstock Intake Structure for Kerckhoff Powerplant No. 2, with RM286 Dam at Elevation 1400

NEW

PROJECT: Upper San Joaquin River Basin

REGIC MP | PRICE LEVEL: Appraisal

FILE: J:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Additional Items - Nov 04\[K2 Intake 1400 11-01-04.xls]A

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Size and length of shaft and tunnel not provided.					
	1	Excavation, open cut, for control structure	8130	2,500	cy	$50.00	$125,000.00
		(some overburden, mostly rock)					
	2	Excavation of shaft, in rock	8130	25,000	cy	$300.00	$7,500,000.00
	3	Excavation of rock to enlarge existing	8130	1,000	cy	$300.00	$300,000.00
		tunnel					
	4	Concrete in tunnel lining	8130	1,000	cy	$500.00	$500,000.00
	5	Concrete in lining of shaft	8130	6,000	cy	$500.00	$3,000,000.00
	6	Concrete in gate chamber	8130	1,800	cy	$500.00	$900,000.00
	7	Concrete in cover at top of shaft	8130	200	cy	$750.00	$150,000.00
	8	Concrete in control structure building	8130	120	cy	$750.00	$90,000.00
	9	Concrete in center pier of tunnel	8130	225	cy	$750.00	$168,750.00
	10	Concrete in interior walls of shaft	8130	2,100	cy	$500.00	$1,050,000.00
	11	Furnish cement	8130	3,100	tons	$140.00	$434,000.00
	12	Furnish reinforcing steel	8130	2,110,000	lbs	$1.00	$2,110,000.00
	13	Drill 3-inch drain holes in shaft and	8130	7,500	lf	$70.00	$525,000.00
		gate chamber					
	14	Furnish and install two 10.75 ft by	8420	700,000	lbs	$5.00	$3,500,000.00
		24.5 ft high pressure gates					
	15	Furnish and install hydraulic control	8420	6,000	lbs	$15.00	$90,000.00
		system					
	16	Furnish and install two 10.75 ft by 24.5 ft	8420	180,000	lbs	$5.00	$900,000.00
		wheel-mounted guard gates					
	17	Furnish and install tracks for wheel-	8420	120,000	lbs	$5.00	$600,000.00
		mounted gates					
	18	Furnish and install stems for wheel-	8420	212,000	lbs	$5.00	$1,060,000.00
		mounted gates					
	19	Furnish and install hoists for wheel-	8420	150,000	lbs	$5.00	$750,000.00
		mounted gates					
	20	Furnish and install miscellaneous	8420	60,000	lbs	$7.00	$420,000.00
		equipment for wheel-mounted gates					
		Sheet Subtotal					**$24,172,750.00**

QUANTITIES		PRICES	
BY: Dave Hinchliff	CHECKED:	BY: D. Donaldson	CHECKED:
DATE PREPARED: 11/01/04	APPROVED:	DATE: 02/23/05	PEER REVIEW:

CODE:D-8170

ESTIMATE WORKSHEET

FEATURE: Nov. 1, 2004

New Penstock Intake Structure for Kerckhoff Powerplant No. 2, with RM286 Dam at Elevation 1400

NEW

PROJECT: Upper San Joaquin River Basin

REGIC MP | **PRICE LEVEL:** Appraisal

FILE: J:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Additional Items - Nov 04\[K2 Intake 1400 11-01-04.xls]A

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Subtotal (from Sheet 1 of 1)					**$24,172,750.00**
		Mobilization	+/- 5%				$1,200,000.00
		Subtotal w/ mobilization					$25,372,750.00
		Unlisted Items	+/- 15%				$3,627,250.00
		CONTRACT COST					**$29,000,000.00**
		Contingencies	+/- 25%				$7,000,000.00
		FIELD COST					**$36,000,000.00**

QUANTITIES		PRICES	
BY Dave Hinchliff	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED 11/01/04	**APPROVED**	**DATE** 02/23/05	**PEER REVIEW**

CODE:D-8140

ESTIMATE WORKSHEET

FEATURE: 23-Feb-05

Tunnel Lining, 4,100 feet
Backfill Concrete between new steel liner and existing tunnel wall

NEW

PROJECT: Upper San Joaquin River Basin

REGION: MP

PRICE LEVEL: Appraisal

FILE: J:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Additional Items - Nov 04\[D-8140 - 4100 LF Tunnel Backfill Concrete.XLS]Grout

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		4,100 LF of Tunnel Lining					
		Tunnel Lining Length provided by Montgomery-Watson-Harza					
	1	Backfill Concrete	D-8140	6,250	cy	$250.00	$1,562,500.00
	2	Cement	D-8140	1,765	tons	$140.00	$247,100.00
		Sheet Subtotal					**1,809,600.00**

QUANTITIES		PRICES	
BY Art Streifel	CHECKED	BY D. Donaldson	CHECKED
DATE PREPARED 11/8/2004	APPROVED	DATE 2/23/2005	PEER REVIEW

CODE:D-8140

ESTIMATE WORKSHEET

FEATURE: 23-Feb-05

Tunnel Lining, 4,100 feet
Backfill Concrete between new steel liner and existing tunnel wall

NEW

PROJECT:
Upper San Joaquin River Basin

REGION: MP

PRICE LEVEL: Appraisal

FILE: J:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Additional Items - Nov 04\[D-8140 - 4100 LF Tunnel Backfill Concrete.XLS]Grout

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Subtotal (from Sheet 1 of 1)					**$1,809,600.00**
		Mobilization	+/- 5%				$90,000.00
		Subtotal w/ mobilization					$1,899,600.00
		Unlisted Items	+/- 15%				$300,400.00
		CONTRACT COST					**$2,200,000.00**
		Contingencies	+/- 25%				$500,000.00
		FIELD COST					**$2,700,000.00**

QUANTITIES		PRICES	
BY Art Streifel	CHECKED	BY D. Donaldson	CHECKED
DATE PREPARED 11/8/2004	APPROVED	DATE 2/23/2005	PEER REVIEW

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE: Upper San Joaquin River Basin K2 Turbine Replacement with spherical valve or ring-follower gate	**PROJECT:** Upper San Joaquin River Basin
REVISION	**REGION** MP **PRICE LEVEL:** Appraisal
	FILE: [illegible] in_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Additional Items - Nov 04\[D-8420 K2 Turbine Replacement.xls]page 1

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Furnish and install the following:					
	1	Steel Pipe for Penstock	D8420				
		Steel plate used for pipe fabrication:					
		ASTM A36: Sy = 36 kpsi Sa = 18 kpsi					
		(All pipe sizes are inside diameters)					
	a	272" Dia., 2-7/16" wall, L= 149.7 ft., 7,981 lbs/ft		1,194,616	LBS		
	b	272" Dia., 2-3/8" wall, L= 8.9 ft., 7,774 lbs/ft		69,119	LBS		
	c	204" Dia.,2-7/16" wall, L= 433.6 ft., 5,917 lbs/ft		2,565,586	LBS		
	d	204" Dia., 2-3/8" wall, L= 32.6 ft., 5,764 lbs/ft		188,036	LBS		
	e	204" Dia., 2-5/16" wall, L= 32.6 ft., 5,610 lbs/ft		183,032	LBS		
	f	204" Dia., 2-1/4" wall, L= 32.6 ft., 5,457 lbs/ft		178,032	LBS		
	g	204" Dia., 2-3/16" wall, L= 32.6 ft., 5,304 lbs/ft		173,034	LBS		
	h	204" Dia., 2-1/8" wall, L= 32.6 ft., 5,151 lbs/ft		168,039	LBS		
	i	204" Dia., 2-1/16" wall, L= 32.6 ft., 4,998 lbs/ft		163,047	LBS		
	j	204" Dia., 2" wall, L= 32.6 ft., 4,844 lbs/ft		158,059	LBS		
	k	204" Dia., 1-15/16" wall, L= 32.6 ft., 4,692 lbs/ft		153,073	LBS		
	l	204" Dia., 1-7/8" wall, L= 32.6 ft., 4,539 lbs/ft		148,090	LBS		
	m	204" Dia., 1-13/16" wall, L= 20.9 ft., 4,387 lbs/ft		91,683	LBS		
		TOTAL steel pipe weight		5,433,446	LBS		
		Rounded steel pipe weight		**5,434,000**	**LBS**	$2.00	$10,868,000.00
		Sheet Subtotal					**$10,868,000.00**

QUANTITIES		PRICES	
BY Ken Smith, D8420	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED 2004 September 3		**DATE PREPARED** 02/23/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE: Upper San Joaquin River Basin K2 Turbine Replacement with spherical valve or ring-follower gate **REVISION**	**PROJECT:** Upper San Joaquin River Basin **REGION** MP **PRICE LEVEL:** Appraisal **FILE:** J:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Additional Items - Nov 04\[D-8420 K2

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Furnish and install the following:					
	2	Ring-Follower Gate	D8420				
	a	144" Dia. ring-follower gate					
		Gate leaf slides on wheels on each side.					
		includes hydraulic operating system.					
		400,000 lbs.		400,000	LBS	$10.00	$4,000,000.00
		New gate chamber will be needed.					
		Sheet Subtotal					**$4,000,000.00**
		Subtotal (from Sheet 1 of 2)					**$10,868,000.00**
		Subtotal (from Sheet 2 of 2)					**$4,000,000.00**
		Total of Subtotals					**$14,868,000.00**
		Mobilization	+/- 5%				$740,000.00
		Subtotal w/ mobilization					$15,608,000.00
		Unlisted Items	+/- 15%				$2,392,000.00
		CONTRACT COST					**$18,000,000.00**
		Contingencies	+/- 25%				$4,000,000.00
		FIELD COST					**$22,000,000.00**

QUANTITIES		PRICES	
BY Ken Smith, D8420	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED 2004 September 3		**DATE PREPARED** 02/23/05	**PEER REVIEW**

a.

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

SHEET__1__ OF __1__

FEATURE:
Upper San Joaquin River Basin
Wishon Powerplant Decommissioning
Appraisal Level Quantity Estimates

Demolition

PROJECT:
Upper San Joaquin River Basin

REGION MP **PRICE LEVEL:** Appraisal

FILE: E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\[Wishon and Big Creek No. 4

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Wishon Powerplant					
	1	Hazardous material removal.	D-8160	1	LS	$300,000.00	$300,000.00
		Hazardous material inventory.					
		Drain and dispose of oils.					
		Vacuum recovery of refrigerants.					
		Removal of CO_2 cylinders.					
		Removal and disposal of storage batteries.					
		Remove and dispose of asbestos-containing materials.					
		Remove and dispose of mercury-containing equipment.					
		Remove window glass and other saftey hazards.					
	2	Transformer and circuit breaker disposal.	D-8440				
		Transformers (7).		700,000	lbs.	$0.50	$350,000.00
		Station service transformers (4).		200,000	lbs.	$0.50	$100,000.00
		Oil-filled circuit breaker (3).		39,000	lbs.	$0.50	$19,500.00
	3	Removal and disposal of mechanical equipment.	D-8420	197,000	lbs.	$0.50	$98,500.00
		Impulse turbines (4)					
	4	Weight of Heaviest Part (Rotor) (2 ea.)	D-8430	88,000	lbs.	$0.50	$44,000.00
		Total Net Weight (Generator Assembly) (2 ea.)		196,000	lbs.	$0.50	$98,000.00
	5	Removal of switchyard.		900	ft.^2	$50.00	$45,000.00
		Subtotal					**$1,055,000.00**
		Mobilization +/-	5%				$53,000.00
		Subtotal w/Mobilization					$1,108,000.00
		Unlisted Items +/-	15%				$142,000.00
		CONTRACT COST					**$1,250,000.00**
		Contingencies +/-	25%				$350,000.00
		FIELD COST					**$1,600,000.00**

QUANTITIES		PRICES	
BY Carlton D. Smith (D-8160) Toby J. Turnage (D-8420)	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED 8/3/04	**PEER REVIEW**	**DATE PREPARED** 05/31/05	**PEER REVIEW**

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

SHEET__1__ OF __1__

FEATURE:
Upper San Joaquin River Basin
Big Creek No. 4 Powerplant Decommissioning
Appraisal Level Quantity Estimates

Demolition

PROJECT:
Upper San Joaquin River Basin

REGION MP **PRICE LEVEL:** Appraisal

FILE: E:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_FR-EIS-EIR_(Phase_2)\Reclamation products\TSC products\Cost worksheets\Group 2 - Sept 04\Wishon and Big Creek No. 4

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Big Creek No. 4 Powerplant					
	1	Hazardous material removal.	D-8160	1	LS	$300,000.00	$300,000.00
		Hazardous material inventory.					
		Drain and dispose of oils.					
		Vacuum recovery of refrigerants.					
		Removal of CO_2 cylinders.					
		Removal and disposal of storage batteries.					
		Remove and dispose of asbestos-containing					
		materials.					
		Remove and dispose of mercury-containing					
		equipment.					
		Remove window glass and other safety hazards.					
	2	Transformer and circuit breaker disposal.	D-8440				
		Three-phase 100/133 MVA, 240-11.5kV					
		transformer (1 ea.)		200,000	lbs.	$0.50	$100,000.00
		Single-phase 28/36.7 MVA, 230-11.5kV					
		transformer (3 ea.)		450,000	lbs.	$0.50	$225,000.00
		Station Service transformers (3 ea.)		180,000	lbs.	$0.50	$90,000.00
		Single-phase, 150 kVA, 11.5 kV-240/120 volt					
		Oil-filled circuit breaker, 15-kV (3 ea.)		30,000	lbs.	$0.50	$15,000.00
	3	Removal and disposal of mechanical equipment.	D-8420				
		Francis turbines (2 ea.)		663,000	lbs.	$0.50	$331,500.00
		Governors (2 ea.)		59,000	lbs.	$0.50	$29,500.00
	4	Weight of Heaviest Part (Rotor and Shaft) (2 ea.)	D-8430	500,000	lbs.	$0.50	$250,000.00
		Total Net Weight (Exciter, Air Housing, Cooler, etc.) (2 ea.)		1,000,000	lbs.	$0.50	$500,000.00
	5	Switchyard removal, including Bus Structure		5,000	ft.^2	$50.00	$250,000.00
		Subtotal					**$2,091,000.00**
		Mobilization +/-	5%				$105,000.00
		Subtotal w/Mobilization					$2,196,000.00
		Unlisted Items +/-	15%				$304,000.00
		CONTRACT COST					**$2,500,000.00**
		Contingencies +/-	25%				$700,000.00
		FIELD COST					**$3,200,000.00**

QUANTITIES		**PRICES**	
BY Carlton D. Smith (D-8160) Toby J. Turnage (D-8420)	**CHECKED**	**BY** D. Donaldson	**CHECKED**
DATE PREPARED 8/3/04	**PEER REVIEW**	**DATE PREPARED** 05/31/05	**PEER REVIEW**

AUXILIARY MECHANICAL SYSTEMS FOR NEW KERCKHOFF #2 POWERHOUSE
(NEAR EXISTING KERCKHOFF NO. 2 POWERHOUSE LOCATION)

1. 150-Ton Overhead Crane (Unit Bay Crane)
    a. Span = Approx. 63 ft.
    b. 250 ft. long
    c. Heaviest load expected to be lifted is the rotor and shaft, approximately 250,000 lbs.

2. 75-Ton Overhead Crane
    a. Span = Approx. 63 ft.
    b. 100 ft. long
    c. Heaviest load expected to be lifted are the disassembled components of the rotor/shaft assembly, approximately 125,000 lbs

3. Electric Traction Elevator
    a. Passenger elevator
    b. Capacity = 3,500 lbs., typical size for passenger elevator
    c. Travel = 100 ft., approximated from drawing
    d. Landings = 5 (assumes elevator stops at each floor shown on drawing)
    e. Speed = 200 ft/min., typical speed for elevator

4. Bulkhead Gates, lifting beam, and guides
    a. Design head = 89 ft. [603.0 (Max TWS, 1000 yr. flood) – 514.0 (Invert)]
    b. Approx gate dimensions 10 ft wide x 7 ft high
    c. Two gates required, to isolate 1 turbine draft tube.
    d. Four sets of embedded guides, one for each turbine unit.
    e. One lifting beam provided.
    f. Material used is structural steel A36, except sealing surfaces of guides are stainless steel, and embedded anchor bolts are steel.

5. Powerplant Auxiliary Mechanical Systems
    a. Includes the necessary auxiliary mechanical systems for operation of the turbine/generating equipment and for plant maintenance activities.
    b. Systems provided include the following:
        i. Unit Cooling Water System – This system supplies cooling water for the main turbine/generating units and associated equipment.
        ii. Lubricating Oil System – This system stores and filters lubricating oil for use by the turbine/generator bearings.
        iii. Compressed Air System – This system provides compressed air for service hose outlets located throughout the plant for maintenance and repair, for operation of the plant sewage ejectors and for operation of any air operated control valves.

iv. Service Water System – This system provides service water to hose outlets located throughout the plant for maintenance and repair. Irrigation water for the landscape features on the exterior of the plant is also provided from the service water system.
v. Fire Suppression System – This system provides a water-based fire suppression system within the plant and a CO_2 fire extinguishing system for the main unit generators.
vi. Domestic Water and Sanitary Waste System – This system within the interior of the plant provides domestic water to the restrooms and collects sewage to be discharged from the plant.
vii. Gravity Drainage System – This system conveys wastewater collected by plant floor drains through an embedded piping system to the plant drainage sump.
viii. Plant Unwatering System – This system is provided to empty the plant sump of water from the gravity drainage system and water drained from the main unit penstock and draft tubes.

c. All of these systems will be provided in accordance with the applicable industry codes and standards.

6. HVAC
   a. Not included explicitly as a separate item in estimate, will be included in the percentage for unlisted items.

AUXILIARY MECHANICAL SYSTEMS FOR NEW REDINGER POWERPLANT (BIG CREEK NO. 4 POWERHOUSE RELOCATION)

1. 60-Ton Overhead Crane
   a. Span = Approx. 53 ft.
   b. 110 ft. long
   c. Heaviest load expected to be lifted is the rotor and shaft, approximately 105,000 lbs.

2. Electric Traction Elevator
   a. Passenger elevator
   b. Capacity = 3,500 lbs., typical size for passenger elevator
   c. Travel = 66 ft., approximated from drawing
   d. Landings = 5 (assumes elevator stops at each floor shown on drawing)
   e. Speed = 200 ft/min., typical speed for elevator

3. Bulkhead Gates, lifting beam, and guides
   a. Design head = 68.4 ft. [1250.0 (Max TWS) – 1181.60 (Invert)]
   b. Approx gate dimensions 11 ft wide x 7.5 ft high
   c. Two gates required, to isolate 1 turbine draft tube.
   d. Two sets of embedded guides, one for each turbine draft tube.
   e. One lifting beam provided.
   f. Material used is structural steel A36, except sealing surfaces of guides are stainless steel, and embedded anchor bolts are steel.

4. Powerplant Auxiliary Mechanical Systems
   a. Includes the necessary auxiliary mechanical systems for operation of the turbine/generating equipment and for plant maintenance activities.
   b. Systems provided include the following:
      i. Unit Cooling Water System – This system supplies cooling water for the main turbine/generating units and associated equipment.
      ii. Lubricating Oil System – This system stores and filters lubricating oil for use by the turbine/generator bearings.
      iii. Compressed Air System – This system provides compressed air for service hose outlets located throughout the plant for maintenance and repair, for operation of the plant sewage ejectors and for operation of any air operated control valves.
      iv. Service Water System – This system provides service water to hose outlets located throughout the plant for maintenance and repair. Irrigation water for the landscape features on the exterior of the plant is also provided from the service water system.
      v. Fire Suppression System – This system provides a water-based fire suppression system within the plant and a CO_2 fire extinguishing system for the main unit generators.
      vi. Domestic Water and Sanitary Waste System – This system within the interior of the plant provides domestic water to the restrooms and collects sewage to be discharged from the plant.

vii. Gravity Drainage System – This system conveys wastewater collected by plant floor drains through an embedded piping system to the plant drainage sump.
viii. Plant Unwatering System – This system is provided to empty the plant sump of water from the gravity drainage system and water drained from the main unit penstock and draft tubes.

c. All of these systems will be provided in accordance with the applicable industry codes and standards.

5. HVAC
   a. Not included explicitly as a separate item in estimate, will be included in the percentage for unlisted items.

for Private Reservoir Area Lands

	Friant Raise			RM274 Options					RM279 Options						RM286 Options				Fine Gold Options				Yokohl Option
	25 ft	60 ft	140 ft																				
Gross Pool Elevation (ft) ->	**603**	**638**	**718**	**800**	**865**	**960**	**985**	**1100**	**900**	**985**	**1100**	**1115**	**1200**	**1300**	**1200**	**1275**	**1300**	**1400**	**900**	**1020**	**1100**	**1110**	**790**
New storage (TAF) ->	**130**	**340**	**920**	**460**	**725**	**1170**	**1310**	**2110**	**450**	**725**	**1260**	**1350**	**1910**	**2740**	**460**	**725**	**830**	**1360**	**120**	**400**	**740**	**800**	**450**
Component																							
Estimated inundated acreage	704	1,421	3,156	2,233	3,127	4,590	5,017	7,172	2,318	3,476	5,307	5,540	7,042	8,982	3,155	4,282	4,692	6,262	1,373	3,438	5,298	5,407	4,292
Estimated private inundated acreage				95	365	815	935	1,588	231	710	1,350	1,390	2,110	2,542	1,221	1,505	1,645	2,233	1,373	3,438	5,298	5,407	4,292
Estimated public inundated acreage				2,138	2,762	3,775	4,082	5,584	2,087	2,766	3,957	4,150	4,932	6,440	1,934	2,777	3,047	4,029	0	0	0	0	0
Number of roofed structures	58	109	165																		10		12
Unit price, private acreage ($/ac)				$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$1,200
Estimated cost - private acreage only ($Millions)				$0	$1	$3	$3	$6	$1	$2	$5	$5	$7	$9	$4	$5	$6	$8	$5	$12	$19	$19	$5
Approximate value of improvements ($ Millions)				$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$2	$3	$3	$4
Lands and Improvements Cost ($ Millions, rounded)	**$27**	**$42**	**$65**	**$1**	**$2**	**$4**	**$4**	**$7**	**$2**	**$3**	**$6**	**$6**	**$8**	**$10**	**$5**	**$6**	**$7**	**$9**	**$6**	**$14**	**$22**	**$22**	**$9**

Note: Friant Raise acquisition costs for 25, 60, and 140 ft raises from appraiser's report
Estimated inundated acreage from storage elevation workbook data
Privately held inundated acreage from J. Darke, Feb. 2005.
Publicly held inundated acreage estimated as difference between inundated acreage and