ATTACHMENT C

Kerckhoff Lake and Big Creek No. 4
Trip Logs and Photos

Field Trip Log - Aquatic		
Trip Log Number:	3	**Project No:** 1003811.010101
Dates:	June 18, 2003	
Site Name:	Kerckhoff Reservoir and Big Creek No. 4 Power Plant	
Location:	Kerckhoff Reservoir, Wishon Power Plant, and San Joaquin River upstream to Big Creek No. 4	
Prepared By:	Philip Unger	
Date:	July 10, 2003	

Weather Conditions:	Warm and dry
Areas Covered (attach map with notations)	Kerckhoff Reservoir, Wishon Power Plant, and San Joaquin River upstream to Big Creek No. 4
Attachments	
Photo Log	Yes
Photos	Yes
Topographic Map(s)	Yes

Field Observations:

Existing Facilities:

Existing facilities include Kerckhoff Dam, Kerckhoff Reservoir, Big Creek No. 4 Powerhouse, ancillary power facilities, developed recreation facilities, paved and unpaved roads, Auberry Road bridge.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Kerckhoff Reservoir is about 2.5 miles long. The upstream half of the reservoir appears to be very shallow due to the deposition of silt and has a well vegetated shoreline. The lower end of the reservoir is in a steep-walled canyon with a shoreline of mostly bedrock and little useful habitat for fish. The reservoir volume is small relative to the amount of flow in the San Joaquin River and consequently the flushing rate is high. The San Joaquin River upstream of the reservoir to Big Creek No. 4 has a low gradient channel with well-developed riparian vegetation and high flow at the time of the field visit. River flow was much lower upstream of the powerhouse. A number of unidentified fish fry were seen in a small, unnamed tributary that enters at the north shore of the Kerckhoff Reservoir. The lower several hundred feet of this creek was inundated by the reservoir at the time of the visit, forming a long, shallow pool. Gravel and rock substrate was covered with algae. Upstream of the pool, the gradient increased and water depth decreased sharply, making the stream impassable to fish. A larger tributary, Fish Creek, enters the reservoir about 0.5 mile east of the unnamed tributary, but was not visited. Both streams may provide spawning habitat for hardhead in the reservoir.

Need for additional (engineering/hydrological, or other) information on measures

Need surface area vs. elevation projections for proposed Temperance Flat Reservoirs (RM 274, RM 279 and RM 286 dams), and monthly reservoir surface area projections for different water year types.

Need information on how operation of new reservoir would affect upstream reservoirs and river flows.

Also, would Kerckhoff Dam be removed?

Additional data needs (within each specific discipline)

Need the following information:

Principal fish species of Kerckhoff Reservoir.

Tributary streams used for spawning by hardhead and other fish species, and the spawning locations in the streams.

Information on American shad and striped bass spawning runs in the San Joaquin River downstream of Kerckhoff Reservoir.

Information on abundance and distribution of hardhead, Kern brook lamprey and other fish species in (or potentially in) the San Joaquin River downstream of Kerckhoff

Reservoir.

Contaminants in sediments behind Kerckhoff Dam and how inundation of the reservoir would affect these sediments.

Projected water temperature and dissolved oxygen regimes in new reservoirs for different seasons and water surface elevations.

Field Trip Log - Botany		
Trip Log Number:	3	**Project No:** 1003811.010101
Dates:	June 18, 2003	
Site Name:	Kerckhoff Reservoir and Big Creek No. 4 Power Plant	
Location:	Kerckhoff Reservoir, Wishon Power Plant, and San Joaquin River upstream to Big Creek No. 4	
Prepared By:	Jeff Glazner	
Date:	July 25, 2003	

Weather Conditions:	Warm and dry
Areas Covered (attach map with notations)	Kerckhoff Reservoir, Wishon Power Plant, and San Joaquin River upstream to Big Creek No. 4
Attachments	
Photo Log	Yes
Photos	Yes
Topographic Map(s)	

Field Observations:

Existing Facilities:

Existing facilities include Kerckhoff Dam, Kerckhoff Reservoir, Big Creek No. 4 Powerhouse, ancillary power facilities, developed recreation facilities, paved and unpaved roads, Auberry Road bridge.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Kerckhoff Reservoir is about 2.5 miles long. The upstream half of the reservoir appears to be very shallow. The shoreline contains a wetland fringe and riparian vegetation due to shallow waters and slope. The lower end of the reservoir is in a steep-walled canyon with a shoreline of mostly bedrock and little vegetation. The San Joaquin River upstream of the reservoir to Big Creek Powerhouse No. 4 has a lower gradient channel with a narrow, discontinuous band of riparian vegetation. Flows were high between the powerhouse and the lake during our field visit on June 18, 2003. Tributary streams with riparian corridors flow into Kerckhoff Reservoir. Riparian vegetation along these streams includes alder, willow and Oregon ash.

Need for additional (engineering/hydrological, or other) information on measures

None at present.

Additional data needs (within each specific discipline)

Need to locate any additional information on presence or absence of rare plant species in area.

Need to spend time on ground in wetland habitats to determine potential for rare plants.

Field Trip Log - Recreation		
Trip Log Number:	3	**Project No:** 1003811.010101
Dates:	June 18, 2003	
Site Name:	Kerckhoff Reservoir and Big Creek No. 4 Power Plant	
Location:	Kerckhoff Reservoir, Wishon Power Plant, and San Joaquin River upstream to Big Creek No. 4	
Prepared By:	Sandra Walter-Perry	
Date:	July 15, 2003	

Weather Conditions:	Warm and dry
Areas Covered (attach map with notations)	Kerckhoff Reservoir, Wishon Power Plant, and San Joaquin River upstream to Big Creek No. 4
Attachments	
Photo Log	None
Photos	None
Topographic Map(s)	Excerpts from USGS 7.5 minute quads, North Fork and Cascadel Point

Field Observations:

Existing Facilities:

PG&E's Kerckhoff Lake, PG&E's Smalley Cove Recreation Area, PG&E's Wishon PH, Powerhouse Road (which crosses San Joaquin River at upper end of Kerckhoff Lake), SCE's Big Creek No. 4 Powerhouse, which is accessible on foot via a gated paved road (private SCE road).

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Kerckhoff Lake is an existing lake, which impounds water for PG&E's Kerckhoff No. 1 and Kerckhoff No. 2 power projects. PG&E's Smalley Cove Recreation Area is located on the north shore of the lake and is accessible from Powerhouse Road (also referred to as Auberry Road or North Fork Road). There are no other developed recreation facilities in the immediate vicinity of Kerckhoff Lake or upstream to SCE's Big Creek No. 4 Powerhouse.

Smalley Cove is used as a put-in location for the Patterson Bend WW boating run located downstream. It is also the take-out for a WW boating run referred to as the Horseshoe Bend Run, located upstream.

Need for additional (engineering/hydrological, or other) information on measures

None at present.

Additional data needs (within each specific discipline)

Information and alignment maps for the San Joaquin River Trail.

Whitewater boating use data for Patterson Bend and Horseshoe Bend Runs, if available. We may have to rely on anecdotal information available from local paddling groups (e.g. San Joaquin Paddlers, Gold Country Paddlers)

Can rely on SCE's boating flow study for information about minimum and optimum boating flows, rapids, etc. associated with the Horseshoe Bend Run.

Use data for Smalley Cove Recreation Area (can use PG&E's form 80 data).

Field Trip Log - Wildlife		
Trip Log Number:	3	**Project No:** 1003811.010101
Dates:	June 18, 2003	
Site Name:	Kerckhoff Reservoir and Big Creek No. 4 Power Plant	
Location:	Kerckhoff Reservoir, Wishon Power Plant, and San Joaquin River upstream to Big Creek No. 4	
Prepared By:	David Stevens	
Date:	July 19, 2003	

Weather Conditions:	Warm and dry
Areas Covered (attach map with notations)	Kerckhoff Reservoir, Wishon Power Plant, and San Joaquin River upstream to Big Creek No. 4
Attachments	None
Photo Log	
Photos	
Topographic Map(s)	

Field Observations:

Existing Facilities:

Kerckhoff Reservoir and dam, Wishon Powerhouse, Big Creek No. 4, associated public and private roads, gauging station at Willow Creek and San Joaquin River.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

The river between Kerckhoff Reservoir and Big Creek No. 4 has a varied setting where portions are located in rather steep walled canyons and other in more open, gently sloped terrain, however the former condition is predominant. The river is subtended by granitic bedrock over much of the area and this limits development of wildlife habitat, and, thus, wildlife communities. Willow Creek is an important tributary to the San Joaquin River as it historically hosted populations of mountain yellow-legged frog (a species of special concern and one that has experienced significant population declines in recent years), and it currently supports a population of western pond turtles. It is expected that the San Joaquin itself supports a population of western pond turtles in this reach. Upland wildlife habitat in this section of the project area is foothill woodland with open grassland and meadow habitats present. However, extensive cattle grazing have significantly affected the qualities of upland habitats. This area appears to support large populations of California quail, an important game bird. The tributary streams and more gentle sloped areas of this reach may support a number of species of significant concern.

Need for additional (engineering/hydrological, or other) information on measures

Planned reservoir operations including yearly and seasonal fluctuations, dry year vrs wet year comparative levels, etc.

Additional data needs (within each specific discipline)

Wildlife population status for important game species, including deer, bear, quail, rabbits, and other species.

Known distribution and habitat requirements for species of special concern.

Known habitat conditions for game and species of special concern.

Known limiting factors governing current wildlife populations and trends.

Wildlife species and species of special concern associated with tributary streams.

Field Trip Log - Cultural		
Trip Log Number:	3	**Project No:** 1003811.010101
Dates:	June 18, 2003	
Site Name:	Kerckhoff Reservoir and Big Creek No. 4 Power Plant	
Location:	Kerckhoff Reservoir, Wishon Power Plant, and San Joaquin River upstream to Big Creek No. 4	
Prepared By:	David White	
Date:	June 18, 2003	

Weather Conditions:	Warm and dry
Areas Covered (attach map with notations)	Kerckhoff Reservoir, Wishon Power Plant, and San Joaquin River upstream to Big Creek No. 4
Attachments	
Photo Log	Yes
Photos	Yes
Topographic Map(s)	North Fork and Auberry

Field Observations:

Existing Facilities:

PG&E's A. G. Wishon Powerhouse; associated employee housing and remnants of former housing; roads, bridges, transportation infrastructure; SCE's Big Creek Powerhouse No. 4.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Prehistoric: Blue Oak/Foothill Pines vegetation along the San Joaquin River would have presented diverse natural resources. There is a high probability of prehistoric archaeological sites on gentler terrain, including BRM stations, hunting & fishing camps. A known Toltichi (Yokuts) village site was formerly located in the vicinity of the Wishon Powerhouse, and there may be some remains of this village. Some sites are known to be inundated by the existing Kerckhoff Reservoir. Ephemeral use sites are likely in the San Joaquin River canyon around SCE's Big Creek Powerhouse No. 4.

Historic: Remains of the PG&E employee community at Wishon Powerhouse; various other sites likely, associated with mining, logging, hydroelectric development, recreation and other activities.

Need for additional (engineering/hydrological, or other) information on measures

Need footprint of all associated project-related ground disturbance areas, to include but not be limited to project offices and maintenance buildings, construction set-up and lay-down areas, access roads, electric transmission lines, water conveyance structures, and all other project facilities.

Additional data needs (within each specific discipline)

Need archaeological records search with California Historic Resources Inventory System (CHRIS) information center. Clearinghouse: Southern San Joaquin Valley Info Center, CSU-Bakersfield.

Need consultation with BuRec, BLM and USFS (Sierra NF) cultural resource specialists regarding sites that may not be recorded with the CHRIS information center.

Also need brief review of archaeological and ethnographic literature pertaining to the area. Minimal level of effort: 1) to identify types of archaeological remains expected, time periods represented; and 2) to identify Native American tribes historically occupying the area, along with published information on major named villages or other ethnographic sites.

Wildlife population status for important game species, including deer, bear, quail, rabbits, and other species.
Known distribution and habitat requirements for species of special concern.
Known habitat conditions for game and species of special concern.
Known limiting factors governing current wildlife populations and trends.
Wildlife species and species of special concern associated with tributary streams.

Above: A.G. Wishon Powerhouse (PG&E), view north; late morning. (P6180021.JPG)

Above: Former PG&E residential area across from A.G. Wishon Powerhouse; note oleanders (late morning). (P6180022.JPG)

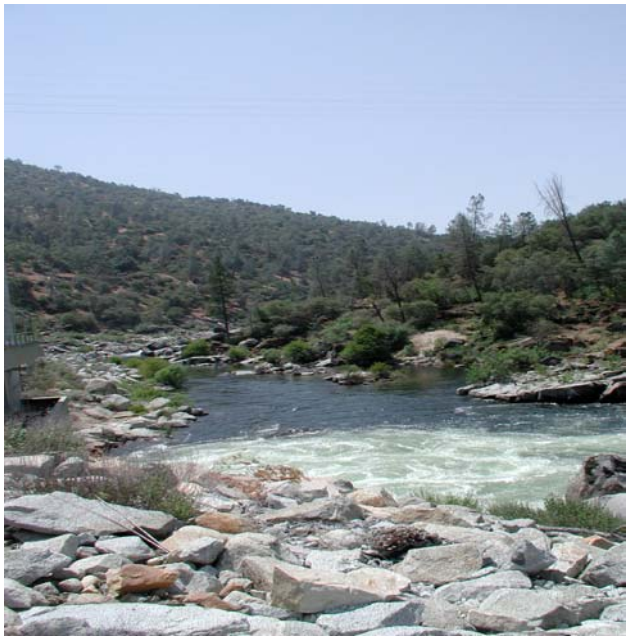
Above: General view of A.G. Wishon Powerhouse (PG&E) from across the road, view northeast (late morning). (P6180023.JPG)

Above: Former PG&E residential area across from A.G. Wishon Powerhouse; note rock walls (late morning). (P6180024.JPG)

Above: Former PG&E residential area across from A.G. Wishon Powerhouse; note rock walls and entrance gate (late morning). (P6180025.JPG)

Above: MWH team walking downhill to SCE's Big Creek Powerhouse No. 4 (late morning). (P6180026.JPG)

Above: Dave Stevens and Jeff Glazner looking upstream at SCE's Big Creek Powerhouse No. 4 (late morning). (P6180027.JPG)



Above: View upstream, at SCE's Big Creek Powerhouse No. 4 (late morning). (P6180028.JPG)

Above: View downstream, from SCE's Big Creek Powerhouse No. 4 (late morning). (P6180029.JPG)

Above: View downstream at creek or discharge channel just west of A.G. Wishon Powerhouse (early afternoon). (P6180032.JPG)

Left: View upstream at creek or discharge channel just west of A.G. Wishon Powerhouse (early afternoon). (P6180033.JPG)

Above: Joel Sturm (L) and Phil Unger (R), view downstream at creek or discharge channel just west of A.G. Wishon Powerhouse (early afternoon). (P6180034.JPG)

Above: View east at mouth of creek or discharge channel; A.G. Wishon Powerhouse in background (early afternoon). (P6180035.JPG)

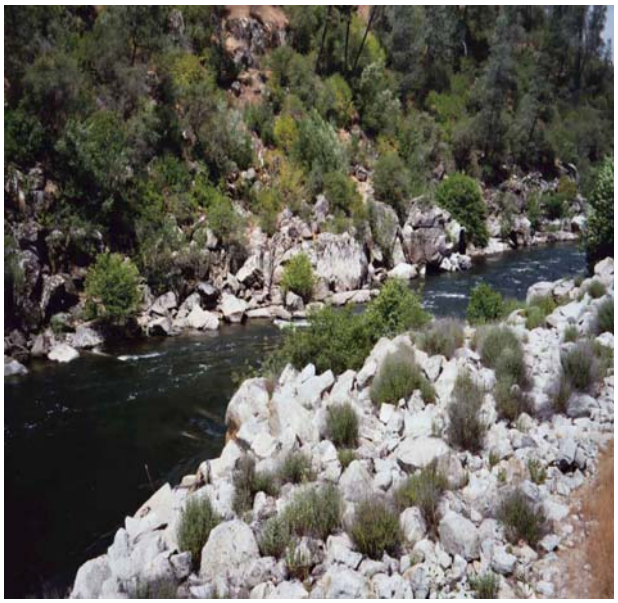
Above: Fish Creek near Kerckhoff Reservoir, most of this water comes from reservoir (view upstream, June 18 2003) (039.JPG)

Above: Fish Creek near Kerckhoff Reservoir, most of this water comes from reservoir (view upstream, June 18 2003) (040.JPG)

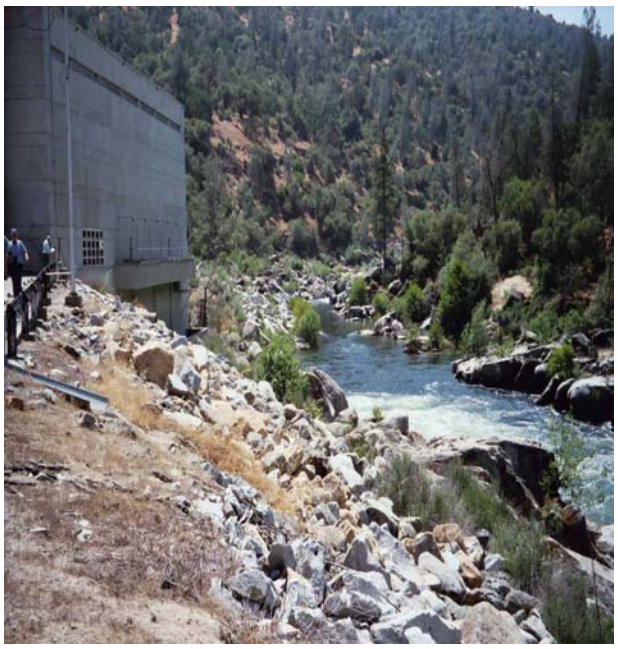
Above: Fish Creek near Kerckhoff Reservoir, most of this water comes from reservoir (view upstream, June 18 2003) (043.JPG)

Above: Fish Creek near Kerckhoff Reservoir, most of this water comes from reservoir (view upstream, June 18 2003) (046.JPG)

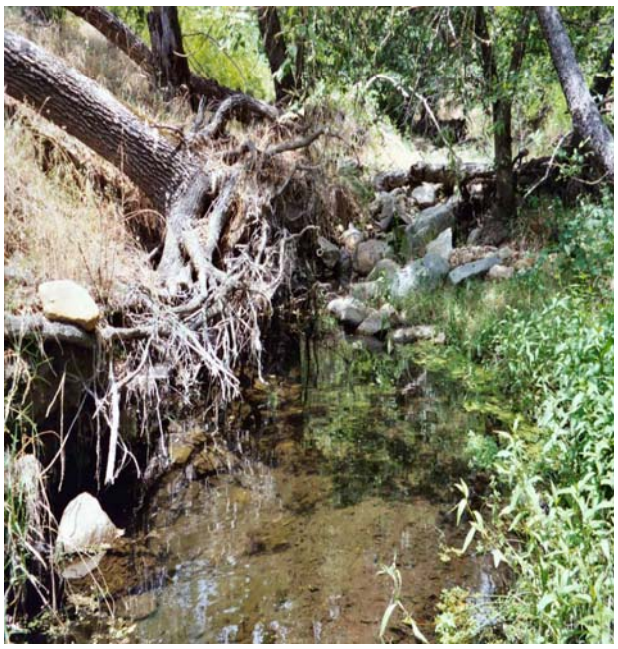
Above: Kerkhoff Reservoir near Wishon Powerhouse (view upstream, June 18 2003) (011_8.JPG)



Above: San Joaquin River at Big Creek No. 4 Powerhouse (view downstream, June 18 2003) (012_9.JPG)



Above: San Joaquin River at Big Creek No. 4 Powerhouse (view upstream, June 18 2003) (013_10.JPG)



Above: Fish Creek near Kerckhoff Reservoir, upstream fish passage barrier – flow upstream very low (view upstream, June 18 2003) (015_12.JPG)

Above: Fish Creek near Kerckhoff Reservoir, most of this water comes from reservoir (view upstream, June 18 2003) (016_13.JPG)

Above: Fish Creek near Kerckhoff Reservoir, most of this water comes from reservoir (view upstream, June 18 2003) (017_14.JPG)

Above: Kerkhoff Reservoir with Wishon Powerhouse (view upstream, June 18 2003) (018_15.JPG)

ATTACHMENT D

San Joaquin River Below Redinger Dam and Redinger Lake
Trip Logs and Photos

Field Trip Log - Aquatic		
Trip Log Number:	4	**Project No:** 1003811.010101
Dates:	June 18, 2003	
Site Name:	Redinger Lake and SJR between Redinger and Kerckhoff Lakes	
Location:	San Joaquin River	
Prepared By:	Phil Unger	
Date:	July 11, 2003	

Weather Conditions:	Sunny and hot
Areas Covered (attach map with notations)	Kerckhoff Lake, PG&E's Smalley Cove Recreation Area, Big Creek No. 4 Powerhouse, Redinger Lake, SJR between Redinger and Kerckhoff Lakes
Attachments	
Photo Log	Yes
Photos	Yes
Topographic Map(s)	

Field Observations:

Existing Facilities:

Existing facilities include Redinger Dam, Redinger Reservoir, Big Creek Power Plant No. 3, ancillary power facilities, developed recreation facilities, Chawanakee community buildings, paved and unpaved roads and Italian Bar Road Bridge.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Redinger Reservoir is 5.25 miles long and less than 2,000 feet wide. The steep topography of the basin results in little shallow water habitat and no significant coves. The reservoir volume is small relative to the amount of inflow from the San Joaquin River and the Big Creek No. 3 powerhouse, resulting in a high flushing rate. The inflow is cold and nutrient-poor, which, combined with the high flushing rate and dearth of shallow water habitat, results in low reservoir fish production. According to past studies (SCE 1997 relicensing studies), Redinger Reservoir thermally stratifies in low but not high inflow years, while dissolved oxygen concentration is generally high and pH is slightly acidic at all depths. The fish fauna of Redinger Reservoir primarily consists of native species, including hardhead, a California State Species of Special Concern. The San Joaquin River between Redinger Dam and the Big Creek No. 4 powerhouse, known as the Horseshoe Bend Reach, runs through a steep-sided canyon similar to the canyon below Kerckhoff Reservoir. The channel is low-gradient and bedrock-controlled, forming a series of long, deep pools and runs separated by rock-fall debris. Willow Creek, a major tributary that is a major source of fine sediments and warm water to the reach, joins the river about a half-mile downstream of Redinger Dam. Lower Willow Creek has very low surface flow which helps keep exotic species in upper Willow Creek and Bass Lake from invading Horseshoe Bend. Much of the natural flow of the San Joaquin River is diverted from Redinger Dam to Big Creek No. 4. Like Redinger Reservoir, the fish fauna of the Horseshoe Bend is mostly comprised of native species, with hardhead the most abundant species. The DFG currently manages the Horseshoe Bend Reach and Redinger Reservoir as a native species fishery.

Need for additional (engineering/hydrological, or other) information on measures

Need surface area vs. elevation projections for proposed Temperance Flat Reservoirs (RM 274, RM 279 and RM 286 dams), and monthly reservoir surface area projections for different water year types.

Need information on how operation of new reservoir would affect upstream reservoirs and river flows.

Also, would Redinger Dam be removed?

Additional data needs (within each specific discipline)

Need the following information:

Tributary streams used for spawning by hardhead and other fish species, and the spawning locations in the streams.

Effects of inundation of lower Willow Creek on passage of exotic fish species.

Projected water temperature and dissolved oxygen regimes in new reservoirs for different seasons and water surface elevations.

Field Trip Log - Botany		
Trip Log Number:	4	**Project No:** 1003811.010101
Dates:	June 18, 2003	
Site Name:	Redinger Lake and SJR between Redinger and Kerckhoff Lakes	
Location:	San Joaquin River	
Prepared By:	Jeff Glazner	
Date:	July 25, 2003	

Weather Conditions:	Sunny and hot
Areas Covered (attach map with notations)	Kerckhoff Lake, PG&E's Smalley Cove Recreation Area, Big Creek No. 4 Powerhouse, Redinger Lake, SJR between Redinger and Kerckhoff Lakes
Attachments	
Photo Log	Yes
Photos	Yes
Topographic Map(s)	

Field Observations:

Existing Facilities:

Existing facilities include Redinger Dam, Redinger Reservoir, Big Creek No. 4, quarry, ancillary power facilities, developed recreation facilities, Chawanakee community buildings, paved and unpaved roads and Italian Bar Road Bridge.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Narrow, steep, rocky channel below dam. Little vegetation on banks. Willow Creek confluence approx 3000 feet downstream. Willow Creek with riparian corridor (alder, cottonwood, willow, blackberry). Upper slopes are foothill woodland (primarily foothill pine and interior live oak).

Redinger Reservoir is 5.25 miles long and less than 2,000 feet wide. Banks above Redinger Lake are steep and contain very little riparian vegetation (occasional buttonwillow, willow and alder). Pool level almost at capacity- approx 10 feet below high water mark. Upper slopes are foothill woodland (primarily foothill pine and interior live oak).

Need for additional (engineering/hydrological, or other) information on measures

None at present.

Additional data needs (within each specific discipline)

Need to locate any additional information on presence or absence of rare plant species in area.

Spring ground surveys.

Field Trip Log – Cultural Resources		
Trip Log Number:	4	**Project No:** 1003811.010101
Dates:	June 18, 2003	
Site Name:	Redinger Lake and SJR between Redinger and Kerckhoff Lakes	
Location:	San Joaquin River	
Prepared By:	David Whites	
Date:	June 18, 2003	

Weather Conditions:	Sunny and hot
Areas Covered (attach map with notations)	Kerckhoff Lake, PG&E's Smalley Cove Recreation Area, Big Creek No. 4 Powerhouse, Redinger Lake, SJR between Redinger and Kerckhoff Lakes
Attachments	
Photo Log	Yes
Photos	Yes
Topographic Map(s)	Auberry

Field Observations:

Existing Facilities:

Redinger Dam and Lake; penstock from Redinger Dam to Big Creek Powerhouse No. 4; roads and other transportation infrastructure including Italian Bar Bridge; SCE's Powerhouse No. 3, Chawanakee School and remains of the Powerhouse No. 3 community.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Prehistoric: Blue Oak/Foothill Pines vegetation along the San Joaquin River would have presented diverse natural resources. Numbers of archaeological sites are known to have been inundated by Redinger Lake. There are also known archaeological sites at Chawanakee Flats and other areas, including the vicinity of Edison's Powerhouse No. 3. There is a high probability of prehistoric archaeological sites on gentler terrain throughout, including BRM stations, hunting & fishing camps. Ephemeral use sites are likely in the San Joaquin River canyon extending downstream from Redinger Dam to SCE's Big Creek Powerhouse No. 4.

Historic: Remains of the SCE employee community at SCE's Powerhouse No. 3; various other sites likely, associated with mining, logging, hydroelectric development (e.g., a construction camp located near Redinger Dam), recreation and other activities.

Need for additional (engineering/hydrological, or other) information on measures

Need footprint of all associated project-related ground disturbance areas, to include but not be limited to project offices and maintenance buildings, construction set-up and lay-down areas, access roads, electric transmission lines, water conveyance structures, and all other project facilities.

Additional data needs (within each specific discipline)

Need archaeological records search with California Historic Resources Inventory System (CHRIS) information center. Clearinghouse: Southern San Joaquin Valley Info Center, CSU-Bakersfield.

Need consultation with BuRec, BLM and USFS (Sierra NF) cultural resource specialists regarding sites that may not be recorded with the CHRIS information center.

Also need brief review of archaeological and ethnographic literature pertaining to the area. Minimal level of effort: 1) to identify types of archaeological remains expected, time periods represented; and 2) to identify Native American tribes historically occupying the area, along with published information on major named villages or other ethnographic sites.

Field Trip Log - Recreation		
Trip Log Number:	4	**Project No:** 1003811.010101
Dates:	June 18, 2003	
Site Name:	Redinger Lake and SJR between Redinger and Kerckhoff Lakes	
Location:	San Joaquin River	
Prepared By:	Sandra Walter-Perry	
Date:	July 15, 2003	

Weather Conditions:	Sunny and hot
Areas Covered (attach map with notations)	Kerckhoff Lake, PG&E's Smalley Cove Recreation Area, Big Creek No. 4 Powerhouse, Redinger Lake, SJR between Redinger and Kerckhoff Lakes
Attachments	
Photo Log	None
Photos	None
Topographic Map(s)	North Fork and Cascadel Point

Field Observations:

Existing Facilities:

PG&E's Kerckhoff Lake, PG&E's Smalley Cove Recreation Area, PG&E's Wishon Powerhouse, Powerhouse Road (which crosses San Joaquin River at upper end of Kerckhoff Lake), SCE's Big Creek No. 4 Powerhouse, which is accessible on foot via a gated paved road (private SCE road), Redinger Lake Road (paved), Italian Bar bridge, SCE's Powerhouse No. 3., located at upper end of Redinger Lake, boat launch and other semi-developed recreation facilities on shoreline of Redinger Lake.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Kerckhoff Lake is an existing lake, which impounds water for PG&E's Kerckhoff No. 1 and Kerckhoff No. 2 power projects. Redinger Lake is an existing lake, which impounds water for SCE's Big Creek No. 4 power project.

PG&E's Smalley Cove Recreation Area is located on the north shore of the Kerckhoff Lake and is accessible from Powerhouse Road (also referred to as Auberry Road or North Fork Road). There are no other developed recreation facilities in the immediate vicinity of Kerckhoff Lake or upstream to SCE's Redinger Lake.

Redinger Reservoir is not heavily developed for recreation use. Camping and day use is allowed in designated areas. Portable toilets and a boat launch are also available.

Whitewater boating occurs on the San Joaquin River between Redinger and Kerckhoff Lake (Horseshoe Bend Run) and between Kerckhoff Lake and Millerton Reservoir (Patterson Bend Run).

Need for additional (engineering/hydrological, or other) information on measures

None at present.

Additional data needs (within each specific discipline)

Information and alignment maps for the San Joaquin River Trail.

Whitewater boating use data for Patterson Bend and Horseshoe Bend Runs, if available. We may have to rely on anecdotal information available from local paddling groups (e.g. San Joaquin Paddlers, Gold Country Paddlers).

Can rely on SCE's boating flow study for information about minimum and optimum boating flows, rapids, etc. associated with the Horseshoe Bend Run.

Use data for Smalley Cove Recreation Area (can use PG&E's form 80 data).

Use data for recreation facilities around Redinger Lake (can rely on information contained in SCE's license application).

Field Trip Log - Wildlife		
Trip Log Number:	4	**Project No:** 1003811.010101
Dates:	June 18, 2003	
Site Name:	Redinger Lake and SJR between Redinger and Kerckhoff Lakes	
Location:	San Joaquin River	
Prepared By:	David Stevens	
Date:	July 19, 2003	

Weather Conditions:	Sunny and hot
Areas Covered (attach map with notations)	Kerckhoff Lake, PG&E's Smalley Cove Recreation Area, Big Creek No. 4 Powerhouse, Redinger Lake, SJR between Redinger and Kerckhoff Lakes
Attachments	
Photo Log	None
Photos	None
Topographic Map(s)	None

Field Observations:

Existing Facilities:

Redinger Lake, Big Creek No. 3; housing, old school, and support facilities for SCE's Big Creek operations.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

The San Joaquin River between Big Creek No. 4 and Redinger is quite similar in its setting as areas of the river below this reach, as discussed in Trip Reports 2 and 3. The river is situated in a narrow canyon subtended by granitic bedrock that limits development of riparian wildlife habitat. The river in this reach is highly regulated by hydro operations and flows do not appear to be significantly augmented by tributary streams in this reach. Foothill woodland is the dominant upland habitat type, as with other areas of the project area. It is likely the area provides winter range for deer and also supports other game species such as black bear, quail, rabbit, dove and band-tailed pigeons.

Redinger Lake is long and relatively narrow owing to the river topography. The lake provides resting habitat for waterfowl and may support feeding bald eagles and osprey. Western pond turtles are expected to be found in areas of the lake shoreline.

The river above Big Creek No. 4 is located in a narrow, steep walled canyon with little riparian habitat. This area would not likely be considered important habitat for any species of special concern.

Need for additional (engineering/hydrological, or other) information on measures

Expected reservoir operational levels, seasonal levels and differences in levels during wet and dry years.

Additional data needs (within each specific discipline)

Quality of upland and riparian habitats.

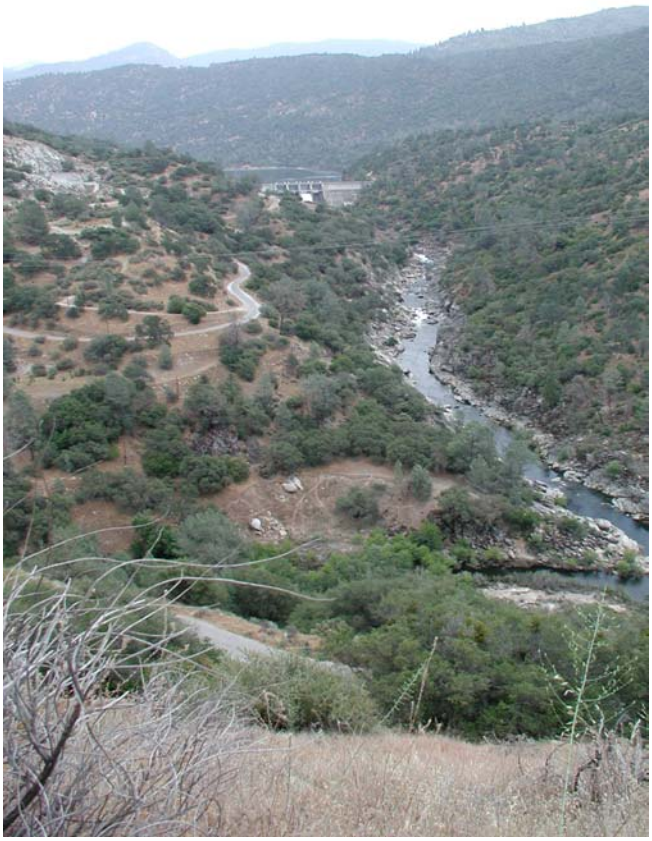
Known upland game species and population status and trends.

Distribution and population status of species of special concern.

Factors limiting or affecting status of important wildlife species in this portion of the project area.

Importance of tributary streams to the terrestrial wildlife populations of the area.

Above: SCE's Redinger Lake Dam, view east from Redinger Lake Road in Sect.17, T9S, R23E; note borrow pit scar on hillside, left of dam & slightly to foreground (mid-afternoon).(P6180036.JPG)



Right: SCE's Redinger Lake Dam, view east from Redinger Lake Road in Sect.17, T9S, R23E (mid-afternoon). (P6180037.JPG)

Above: Another view of SCE's Redinger Lake Dam, view east from Redinger Lake Road in Sect.17, T9S, R23E; note penstock to Powerhouse No. 4 in left foreground (mid-afternoon). (P6180038.JPG)

Above: Redinger Lake Dam, close-up, view east (mid-afternoon). (P6180039.JPG)

Above: Monument to David Hubbard Redinger, just above the dam that bears his name. (mid-afternoon).(P6180040.JPG)

Close-up of Redinger monument (mid-afternoon).(P6180041.JPG)

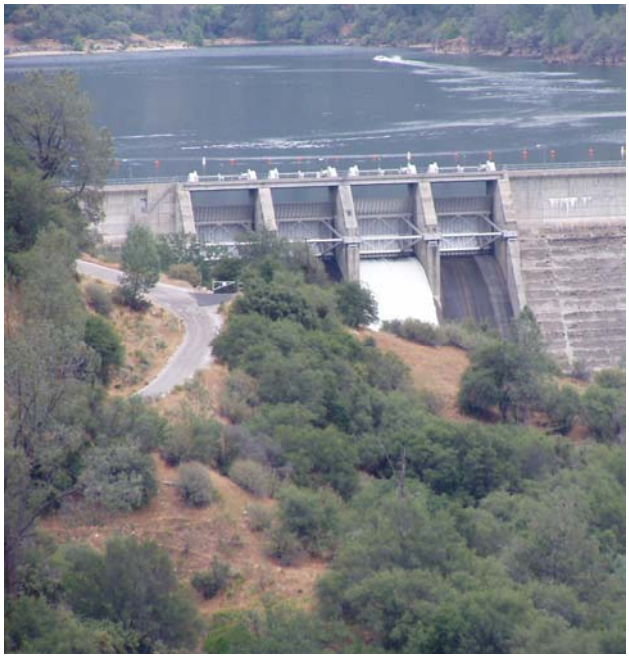
Above: Redinger Lake, Italian Bar bridge in background, view southeast; elbow and rear-view mirror in foreground (mid-afternoon). (P6180042.JPG)

Above: Chawanakee School at SCE's former Powerhouse 3 community, view northeast but only shows one end of the building (mid-afternoon). (P6180043.JPG)

Above: Chawanakee School at SCE's former Powerhouse 3 community, view askance—shows more of vehicle interior (mid-afternoon).(P6180044.JPG)

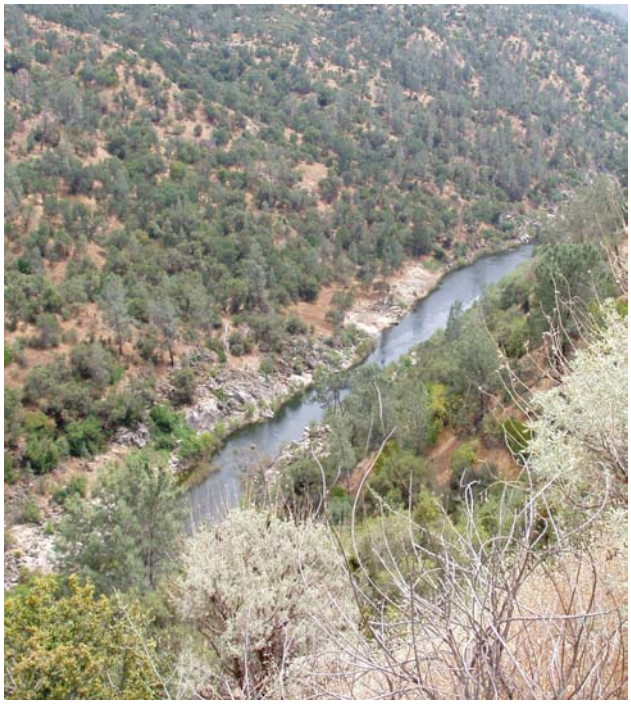
Above: Chawanakee School at SCE's former Powerhouse 3 community, view northeast—shows entire building (mid-afternoon). (P6180045.JPG)

Above: Upper Redinger Lake, view east showing penstocks to SCE's Powerhouse 3 (mid-afternoon). (P6180046.JPG)

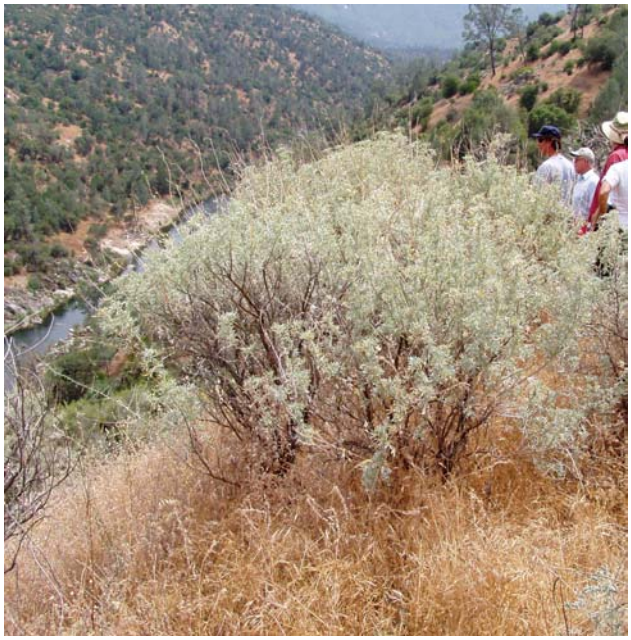


Above: Redinger Dam and Reservoir and San Joaquin River (view upstream, June 18 2003) (052.JPG)

Above: San Joaquin River below Redinger Dam (view downstream, June 18 2003) (056.JPG)



Above: San Joaquin River below Redinger Dam (view downstream, June 18 2003) (060.JPG)

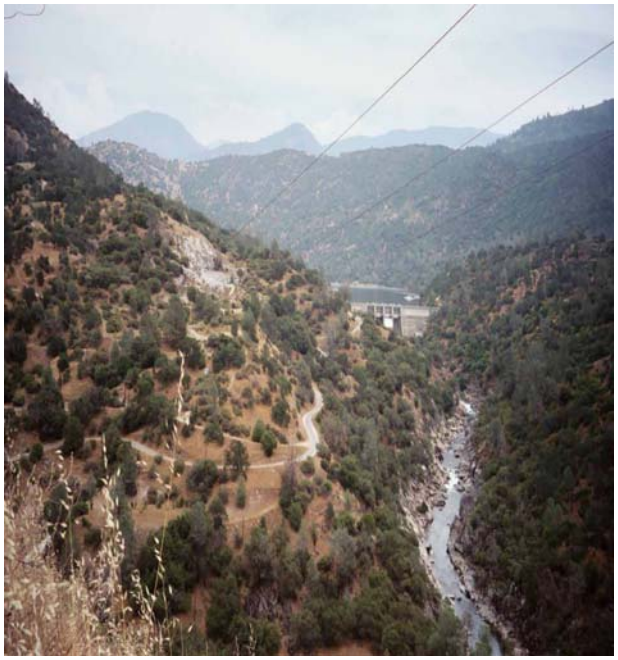


Above: San Joaquin River above Redinger Dam (June 18 2003) (058.JPG)

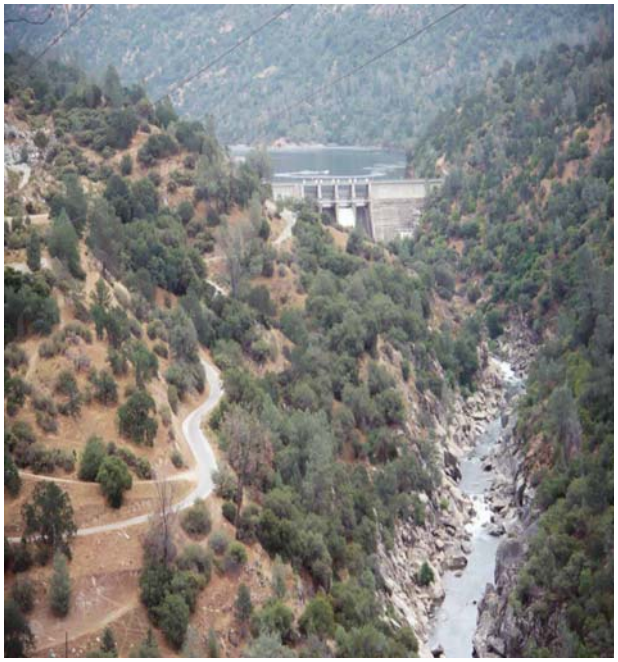
Above: San Joaquin River above Redinger Dam (June 18 2003) (059.JPG)

Above: Redinger Dam and Reservoir (view of dam, June 18 2003) (065.JPG)

Above: Upper Redinger Lake, view east showing penstocks to SCE's Powerhouse 3 (mid-afternoon) (057.JPG)

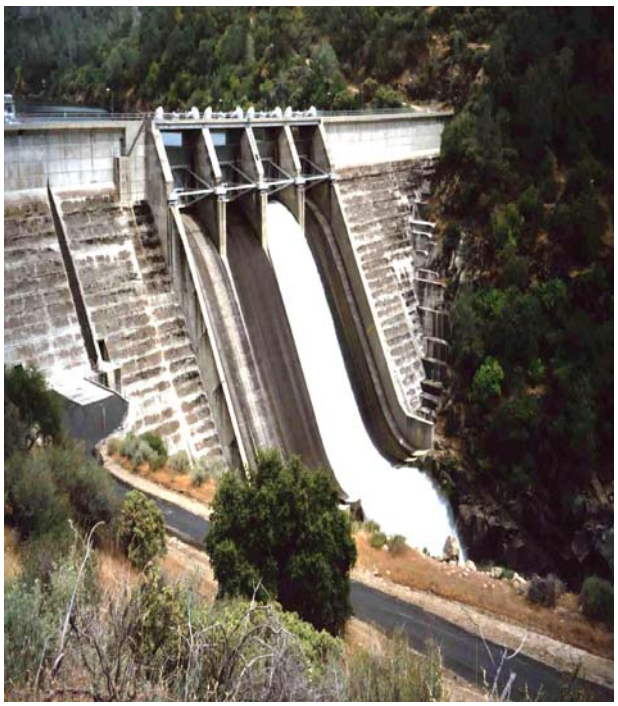


Above: Redinger Dam and Reservoir and San Joaquin River (view upstream, June 18 2003) (019_16.JPG)



Above: Redinger Dam and Reservoir and San Joaquin River (view upstream, June 18 2003) (020_17.JPG)

Above: San Joaquin River below Redinger Dam (view upstream, June 18 2003) (021_18.JPG)



Above: Redinger Dam (June 18 2003) (022_19.JPG)

ATTACHMENT E

Temperance Flat and Patterson Mine Sites

Trip Logs and Photos

Field Trip Log - Aquatic		
Trip Log Number:	5	**Project No:** 1003811.010101
Dates:	June 19, 2003	
Site Name:	Temperance Flat and Patterson Mine Dam Sites	
Location:	Temperance Flat in the vicinity of the Sullivan Mine and the opposite shore of Millerton Reservoir near the Patterson Mine	
Prepared By:	Philip Unger	
Date:	July 15, 2003	

Weather Conditions:	Warm and dry
Areas Covered (attach map with notations)	The Temperance Flat reach of Millerton Reservoir and upland areas on Temperance Flat and in the vicinity of Patterson Mine.
Attachments	
Photo Log	Yes
Photos	Yes
Topographic Map(s)	

Field Observations:

Existing Facilities:

Millerton Reservoir. Unpaved roads, abandoned and active residences, abandoned mines and mining equipment. Moderate to steeply sloping hillsides comprised of open grassland and oak woodlands characterizes the Temperance Flat and Patterson Mine areas.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

This trip log covers the upper portion Millerton Reservoir in the vicinity of the Temperance Flat Recreation Area and the RM 279 dam site. Upper Millerton Reservoir is mostly narrow and steep-sided, but the reach at Temperance Flat is broader and more open than other parts of the upper reservoir. This log also covers two small, unnamed creeks: one on Temperance Flat in the Sullivan Mine drainage and the other east of the Patterson Mine site. The reservoir water level was high at the time of the field trip and much of the shoreline aquatic habitat was out of view. The shoreline in much of this portion of the reservoir is steep-sided and rocky, with little vegetation, but the shoreline near Temperance Flat Recreation Area is gradual with many bushes and trees that would provide excellent fish habitat if flooded. Partially submerged trees (mostly willows) were observed in the Temperance Flat area. The creek in the Sullivan Mine drainage was densely covered with blackberry and grapes and an overstory of oaks and pines. This creek had too little flow to support fish. Smallmouth bass were observed in the cove in Millerton Reservoir at the mouth of this stream. The stream near Patterson Mine site had no flowing water, but the channel contained a few highly vegetated pools with many insects (water boatmen). No other aquatic habitats were seen in the area.

Need for additional (engineering/hydrological, or other) information on measures

Need surface area vs. elevation projections for the two proposed downstream Temperance Flat Reservoirs (dam sites at RM 274 and RM 279) and monthly surface area projections for different water year types for each reservoir.

Need to know how the new reservoirs would affect Millerton Reservoir operations, including the magnitude and timing of lake level fluctuations, and they would affect operation of upstream reservoirs.

Also, need detailed flow projections for the San Joaquin River downstream of Kerkhoff Dam to Millerton Lake, during May and June (American shad and striped bass spawning seasons).

Additional data needs (within each specific discipline)

Need the following information:

Principal fish species of Millerton Reservoir, especially in the Temperance Flat

Recreation Area and upstream.

Water temperature, dissolved oxygen profiles and any other existing water quality data from Millerton Reservoir, especially from sites near Temperance Flats and upstream.

Projected water temperature and dissolved oxygen regimes in the new reservoirs for different seasons and water surface elevations.

Water temperature and other water quality data for the San Joaquin River upstream of Millerton Reservoir.

Information on American shad and striped bass spawning runs in the San Joaquin River upstream of Millerton Reservoir and in upper Millerton Reservoir.

Information on abundance and distribution of hardhead, Kern brook lamprey and other fish species in the San Joaquin River upstream of Millerton Reservoir.

Field Trip Log - Biology		
Trip Log Number:	5	**Project No:** 1003811.010101
Dates:	June 19, 2003	
Site Name:	Temperance Flat and Patterson Mine Dam Sites	
Location:	Temperance Flat in the vicinity of the Sullivan Mine and the opposite shore of Millerton Reservoir near the Patterson Mine	
Prepared By:	David Stevens	
Date:	July 19, 2003	

Weather Conditions:	Warm and dry
Areas Covered (attach map with notations)	The Temperance Flat reach of Millerton Reservoir and upland areas on Temperance Flat and in the vicinity of Patterson Mine.
Attachments	None
Photo Log	
Photos	
Topographic Map(s)	

Field Observations:

Existing Facilities:

Campgrounds and picnic areas, restrooms, old mines, few residences, unimproved dirt roads.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

The Patterson Mine area is flatter in terrain than much of the overall project area. This condition allows development and establishment of wildlife populations that are more limited in areas of steep terrain. This includes deer, black bear, and mountain lions. The upland habitat is foothill woodland, as occurs throughout this region. There are tributary streams in this area and these may contribute to wildlife habitat diversity and may host some species of special concern. This area may also provide deer winter range. Several species of special concern may occur in this area, and include western pond turtles, tiger salamanders, western spadefoot toads and bats. Mine shafts in the area may provide refugia, roosting and breeding habitats for several bat species considered species of special concern.

Need for additional (engineering/hydrological, or other) information on measures

Potential and expected reservoir operational levels, including dry and wet year differences, seasonal differences.

Additional data needs (within each specific discipline)

Maps of all known mine shafts and similar structures in the area.

Status of game animal populations and factors influencing statuses.

Identification of habitats that may host, and that are known to host, species of special concern.

Calculations of habitat loss due to potential reservoir levels.

Field Trip Log - Botany		
Trip Log Number:	5	**Project No:** 1003811.010101
Dates:	June 19, 2003	
Site Name:	Temperance Flat and Patterson Mine Dam Sites	
Location:	Temperance Flat in the vicinity of the Sullivan Mine and the opposite shore of Millerton Reservoir near the Patterson Mine	
Prepared By:	Jeff Glazner	
Date:	July 25, 2003	

Weather Conditions:	Warm and dry
Areas Covered (attach map with notations)	The Temperance Flat reach of Millerton Reservoir and upland areas on Temperance Flat and in the vicinity of Patterson Mine.
Attachments	
Photo Log	Yes
Photos	Yes
Topographic Map(s)	

Field Observations:

Existing Facilities:

Millerton Reservoir. Unpaved roads, abandoned and active residences, abandoned mines and mining equipment. Moderate to steeply sloping hillsides comprised of open grassland and oak woodlands characterizes the Temperance Flat and Patterson Mine areas.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Upper Millertown Reservoir is steep sided and contains sparse foothill woodland. Foothill pine is the most common tree species with interior live oak, blue oak, buckeye, buckbrush, and poison oak as common shrubs. Riparian vegetation is minimal and confined to a few narrow drainages entering lake.

Proposed dam sites at RM 274 and RM 279 are typical of area- steep with low species diversity. A seasonal stream tributary entering Millertown Lake supports riparian vegetation. Willow, fig, blackberry and abundant California wild grape are common. Herbaceous vegetation is weedy.

Need for additional (engineering/hydrological, or other) information on measures

None at present.

Additional data needs (within each specific discipline)

Need to locate any additional information on presence or absence of rare plant species in area.

Spring ground surveys.

Field Trip Log - Cultural		
Trip Log Number:	5	**Project No:** 1003811.010101
Dates:	June 19, 2003	
Site Name:	Temperance Flat and Patterson Mine Dam Sites	
Location:	Temperance Flat in the vicinity of the Sullivan Mine and the opposite shore of Millerton Reservoir near the Patterson Mine	
Prepared By:	David White	
Date:	June 19, 2003	

Weather Conditions:	Warm and dry
Areas Covered (attach map with notations)	The Temperance Flat reach of Millerton Reservoir and upland areas on Temperance Flat and in the vicinity of Patterson Mine.
Attachments	
Photo Log	Yes
Photos	Yes
Topographic Map(s)	Millerton Lake East

Field Observations:

Existing Facilities:

Private residential cabins in Temperance Flat area; camping area and restroom facilities along south shore of river; foot trails, camping area and restrooms on north shore; Sullivan mine remains on Fresno Co. side of river at Temperance Flat; Patterson Mine on Madera Co. side farther downstream (was used by Department of Parks & Recreation as public interpretive site); more recent/contemporary cabin with remains of mining activity also on Madera Co. side slightly upstream from Patterson Mine.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

Prehistoric: Blue Oak/Foothill Pines vegetation along San Joaquin River would have presented diverse natural resources. Some sites are inundated by the existing Millerton Lake reservoir. There remains a high probability of prehistoric archaeological sites on gentler terrain, including BRM stations, hunting & fishing camps.

Historic: Fairly diverse mining features occur around Temperance Flat: remains from Chinese placer mining, an arrastra, and two mine portals associated with the Sullivan Mine. On the north side of the river, the Patterson Mine presents an exceptionally diverse set of remains, including an arrastra, mine portals, remains of cabins, and can/equipment dumps. A two-stamp lift wheel and various other mining remains, including a ball mill, an ore car and rail tracks, are present near a contemporary cabin on the north side of the river a short distance upstream from the Patterson Mine.

Need for additional (engineering/hydrological, or other) information on measures

Need footprint of all associated project-related ground disturbance areas, to include but not be limited to project offices and maintenance buildings, construction set-up and lay-down areas, access roads, electric transmission lines, water conveyance structures, and all other project facilities.

Additional data needs (within each specific discipline)

Need archaeological records search with California Historic Resources Inventory System (CHRIS) information center. Clearinghouse: Southern San Joaquin Valley Info Center, CSU-Bakersfield.

Need consultation with BuRec and BLM cultural resource specialists regarding sites that may not be recorded with the CHRIS information center. Department of Parks and Recreation should be consulted in regard to the Patterson Mine.

Also need brief review of archaeological and ethnographic literature pertaining to the area. Minimal level of effort: 1) to identify types of archaeological remains expected, time periods represented; and 2) to identify Native American tribes historically occupying the area, along with published information on major named villages or other ethnographic sites.

Field Trip Log - Mining		
Trip Log Number:	5	**Project No:** 1003811.010101
Dates:	June 19, 2003	
Site Name:	Temperance Flat and Patterson Mine Dam Sites	
Location:	Temperance Flat in the vicinity of the Sullivan Mine and the opposite shore of Millerton Reservoir near the Patterson Mine	
Prepared By:	Sandra Walter-Perry	
Date:	July 15, 2003	

Weather Conditions:	Warm and dry
Areas Covered (attach map with notations)	The Temperance Flat reach of Millerton Reservoir and upland areas on Temperance Flat and in the vicinity of Patterson Mine.
Attachments	
Photo Log	
Photos	
Topographic Map(s)	Millerton Lake East

Field Observations:

Existing Facilities:

Temperance Flat, located on the south side of the upper end of Millerton Reservoir is undeveloped. Remnants of the Sullivan Mine, an historic gold mine are present but mostly hidden by brush. Remnants include two partially collapsed mine tunnels, small tailings piles, arastras, and hand stacked walls. An unpaved road provides access from Wellbarn Road. The Patterson Mine, another historic gold mine, is located across the river, downstream. Remnants of the Patterson Mine include several mine tunnels, a well-preserved arastra, small tailings piles, and a small stamp mill foundation. A cabin and stamp mill are located upstream and upslope, but it is unclear whether these features are

part of the Patterson Mine or another historic mining operation.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

See No. 1 above.

Need for additional (engineering/hydrological, or other) information on measures

None at present.

Additional data needs (within each specific discipline)

More detailed information about historic mining operations in the area.

Soil sampling to test for the presence of mercury, if historic records indicate a high likelihood that mercury was used as part of historic mining operations.

Field Trip Log - Recreation		
Trip Log Number:	5	**Project No:** 1003811.010101
Dates:	June 19, 2003	
Site Name:	Temperance Flat and Patterson Mine Dam Sites	
Location:	Temperance Flat in the vicinity of the Sullivan Mine and the opposite shore of Millerton Reservoir near the Patterson Mine	
Prepared By:	Sandra Walter-Perry	
Date:	July 15, 2003	

Weather Conditions:	Warm and dry
Areas Covered (attach map with notations)	The Temperance Flat reach of Millerton Reservoir and upland areas on Temperance Flat and in the vicinity of Patterson Mine.
Attachments	
Photo Log	None
Photos	None
Topographic Map(s)	Millerton Lake East

Field Observations:

Existing Facilities:

Temperance Flat, located on the south side of the upper end of Millerton Reservoir is undeveloped. Remnants of the Sullivan Mine, an historic gold mine are present but mostly hidden by brush. Remnants include two partially collapsed mine tunnels, small tailings piles, arrastras, and hand stacked walls. An unpaved road provides access from Wellbarn Road. The Patterson Mine, another historic gold mine, is located across the river, downstream. Remnants of the Patterson Mine include several mine tunnels, a well preserved arastra, small tailings piles, and a small stamp mill foundation. A cabin and stamp mill are located upstream and upslope, but it is unclear whether these features are

part of the Patterson Mine or another historic mining operation.

Existing Environmental Features as Appropriate to Discipline (hydrology; aquatic-water quality; terrestrial—plants; wildlife; recreation; cultural resources; land use; aesthetic)

The area referred to as Temperance Flat is located on private land, outside the boundaries of the Millerton Lake Recreation Area and the BLM's San Joaquin River Gorge Area. A pit or vault toilet is located just to the west of Temperance Flat, on the eastern edge of BLM land. A boat in camp is located across the river (lake) from Temperance Flat and the Hewitt Valley Environmental Camp is located downstream. The lake in the immediate area of Temperance Flat is marked as a 5 mph zone.

Need for additional (engineering/hydrological, or other) information on measures

None at present.

Additional data needs (within each specific discipline)

Information and alignment maps for the San Joaquin River Trail.

Use data for the Temperance Flat Boat in camp and the Hewitt Valley Environmental Camp.

Better maps showing the trails in the area.

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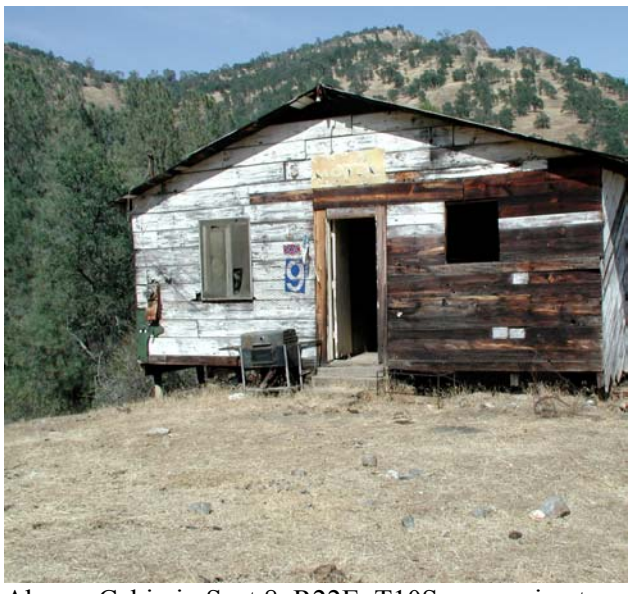
Above: Lift wheel for two-stamp mill (wood construction is unusual); near cabin in Sect.8, R22E, T10S, approximate elevation 860'; inundated by 900' pool contour or greater, RM274 damsite; inundated by any configuration of RM279 damsite (mid-afternoon).(P6190001.JPG)



Above: Cabin in Sect.8, R22E, T10S, approximate elevation 860', view east; inundated by 900' pool contour or greater, RM274 damsite; inundated by any configuration of RM279 damsite (mid-afternoon). (P6190003.JPG)

Above: Interior of cabin in Sect.8, R22E, T10S, approximate elevation 860'; inundated by 900' pool contour or greater, RM274 damsite; inundated by any configuration of RM279 damsite (mid-afternoon). (P6190008.JPG)

Above: Ball mill near cabin & mine portal in Sect.8, R22E, T10S, approximate elevation 860'; inundated by 900' pool contour or greater, RM274 damsite; inundated by any configuration of RM279 damsite (mid-afternoon). (P6190017.JPG)

Above: Ore cart and sheets of corrugated tin west of cabin in Sect.8, R22E, T10S, approximate elevation 860', near mine portal; inundated by 900' pool contour or greater, RM274 damsite; inundated by any configuration of RM279 damsite (mid-afternoon). (P6190011.JPG)

Above: Another tractor, and ore cart tracks coming from mine portal west of cabin in Sect.8, R22E, T10S, approximate elevation 860'; inundated by 900' pool contour or greater, RM274 damsite; inundated by any configuration of RM279 damsite (mid-afternoon). (P6190012.JPG)

Above: Bifurcation in tracks, view east; Sect.8, R22E, T10S, approximate elevation 860'; tracks to left go to spot where dumptruck could be backed up for loading ore while tracks to right go to spoil pile; inundated by 900' pool contour or greater, RM274 damsite; inundated by any configuration of RM279 damsite (mid-afternoon). (P6190014.JPG)

Above: Close-up of mine portal w/ ore cart track; pipe to right may drain seepage from mine; in Sect.8, R22E, T10S, approximate elevation 860'; inundated by 900' pool contour or greater, RM274 damsite; inundated by any configuration of RM279 damsite (mid-afternoon). (P6190015.JPG)

Above: Arrastra (very well preserved) at Patterson Mine, in Millerton Lake State Recreation Area, SE ¼ Sect. 7, R22E T10S, elevation < 800' (would be inundated by MP 279 dam, and by MP 274 dam) (early afternoon). (P190078.JPG)

Above: Arrastra at Patterson Mine, in Millerton Lake State Recreation Area, SE ¼ Sect. 7, R22E T10S, elevation < 800' (would be inundated by MP 279 dam, and by MP 274 dam) (early afternoon). (P190079.JPG)

Above: Arrastra at Patterson Mine, in Millerton Lake State Recreation Area, SE ¼ Sect. 7, R22E T10S, elevation < 800' (note grooves where milling stone rotated) (would be inundated by MP 279 dam, and by MP 274 dam) (early afternoon). (P190080.JPG)

Above: MWH team examining arrastra at Patterson Mine, in Millerton Lake State Recreation Area, SE ¼ Sect. 7, R22E T10S, elevation < 800' (Patterson Mine would be inundated by MP 279 dam, and by MP 274 dam) (early afternoon). (P190081.JPG)

Above: Overview of arrastra at Patterson Mine, w/ MWH team members; Millerton Lake State Recreation Area, SE ¼ Sect. 7, R22E T10S, elevation < 800' (Patterson Mine would be inundated by MP 279 dam, and by MP 274 dam) (early afternoon). (P190082.JPG)

Above: Excavation for stamp mill at Patterson Mine, Millerton Lake State Recreation Area, SE ¼ Sect. 7, R22E T10S, elevation < 800'; concrete foundation of stamp mill barely shows (would be inundated by MP 279 dam, and by MP 274 dam) (early afternoon). (P190083.JPG)

Above: Stamp mill foundation Patterson Mine, Millerton Lake State Recreation Area, SE ¼ Sect. 7, R22E T10S, elevation < 800' (would be inundated by MP 279 dam, and by MP 274 dam) (early afternoon). (P190084.JPG)

Above: Dump (cans, corrugated tin, other artifacts) at Patterson Mine, Millerton Lake State Recreation Area, SE ¼ Sect. 7, R22E T10S, elevation < 800' (would be inundated by MP 279 dam, and by MP 274 dam) (early afternoon). (P190085.JPG)

Above: Mine portal, boarded up for safety reasons, at Patterson Mine, Millerton Lake State Recreation Area, SE ¼ Sect. 7, R22E T10S, elevation < 800' (would be inundated by MP 279 dam, and by MP 274 dam) (early afternoon). (P190086.JPG)

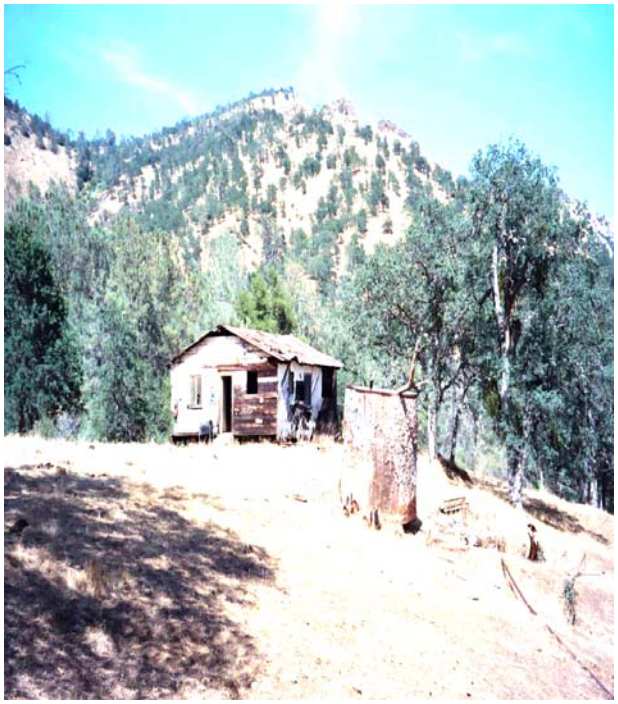
Above: Phil Unger standing alongside stone and timber cabin foundation at Patterson Mine, Millerton Lake State Recreation Area, SE ¼ Sect. 7, R22E T10S, elevation < 800' (would be inundated by MP 279 dam, and by MP 274 dam) (early afternoon). (P190087.JPG)

Above: Another view of the stone and timber cabin foundation at Patterson Mine, Millerton Lake State Recreation Area, SE ¼ Sect. 7, R22E T10S, elevation < 800' (would be inundated by MP 279 dam, and by MP 274 dam) (early afternoon). (P190088.JPG)

Above: MWH team examining lift wheel for two-stamp mill (wood construction is unusual); near cabin in Sect.8, R22E, T10S, approximate elevation 860'; inundated by 900' pool contour or greater, RM274 damsite; inundated by any configuration of RM279 damsite (mid-afternoon). (P190089.JPG)

Above: Closer view of MWH team examining lift wheel for two-stamp mill (wood construction is unusual); near cabin in Sect.8, R22E, T10S, approximate elevation 860'; inundated by 900' pool contour or greater, RM274 damsite; inundated by any configuration of RM279 damsite (mid-afternoon). (P190090.JPG)

Above: Lift wheel for two-stamp mill (wood construction is unusual); near cabin in Sect.8, R22E, T10S, approximate elevation 860'; inundated by 900' pool contour or greater, RM274 damsite; inundated by any configuration of RM279 damsite (mid-afternoon). (P190091.JPG)



Above: Cabin at Patterson Mine/Prospect site (June 19, 2003) (018_15.JPG)

Above: Wheel-type gold ore grinding tool at Patterson Mine/Prospect site (June 19, 2003) (020_17.JPG)

Above: Table Mountain over Millerton Reservoir near Patterson Mine/Prospect site (June 19, 2003) (022_19.JPG)

Above: John L. Sullivan Mine, at < elevation 800' in SE ¼ Sect. 17, R22E T10S (#1, lower, view showing portal in background) (would be inundated by MP 279 dam, and by MP 274 dam) (late morning). (P190068.JPG)

Above: John L. Sullivan Mine, at < elevation 800' in SE ¼ Sect. 17, R22E T10S (#1, lower, view showing tailings pile below portal) (would be inundated by MP 279 dam, and by MP 274 dam) (late morning). (P190069.JPG)

Above: John L. Sullivan Mine, at < elevation 800' in SE ¼ Sect. 17, R22E T10S (#1, lower, another view of tailings pile below portal) (would be inundated by MP 279 dam, and by MP 274 dam) (late morning). (P190070.JPG)

Above: John L. Sullivan Mine, at < elevation 800' in SE ¼ Sect. 17, R22E T10S (#1, lower, close-up view of portal) (would be inundated by MP 279 dam, and by MP 274 dam) (late morning). (P190071.JPG)

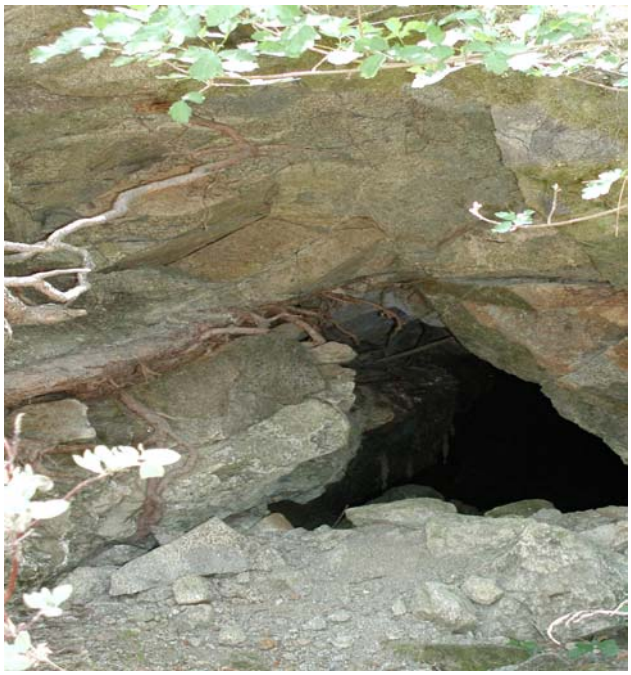
Above: John L. Sullivan Mine, at < elevation 800' in SE ¼ Sect. 17, R22E T10S (#1, lower, close-up view of portal) (would be inundated by MP 279 dam, and by MP 274 dam) (late morning). (P190072.JPG)

Right: John L. Sullivan Mine, at < elevation 800' in SE ¼ Sect. 17, R22E T10S (#2, upper, view showing portal in background) (would be inundated by MP 279 dam, and by MP 274 dam) (late morning). (P190073.JPG)

Above: John L. Sullivan Mine, at < elevation 800' in SE ¼ Sect. 17, R22E T10S (#2, upper, view showing arrastra; only the center post shows clearly) (would be inundated by MP 279 dam, and by MP 274 dam) (late morning). (P190074.JPG)

Above: John L. Sullivan Mine, at < elevation 800' in SE ¼ Sect. 17, R22E T10S (#2, upper, view showing arrastra; only the center post shows clearly) (would be inundated by MP 279 dam, and by MP 274 dam) (late morning). (P190075.JPG)

Above: John L. Sullivan Mine, at < elevation 800' in SE ¼ Sect. 17, R22E T10S (#2, upper, view of portal) (would be inundated by MP 279 dam, and by MP 274 dam) (late morning). (P190076.JPG)



Above: John L. Sullivan Mine, at < elevation 800' in SE ¼ Sect. 17, R22E T10S (#2, upper, close-up view of portal) (would be inundated by MP 279 dam, and by MP 274 dam) (late morning). (P190077.JPG)

Above: Temperance Flat; part of panoramic view NE to NW from access road at about 1300' elevation; view NE (early morning). (P190057.JPG)

Above: Temperance Flat; part of panoramic view NE to NW from access road at about 1300' elevation; view NNE (early morning). (P190058.JPG)

Above: Temperance Flat; part of panoramic view NE to NW from access road at about 1300' elevation; view N (early morning). (P190059.JPG)

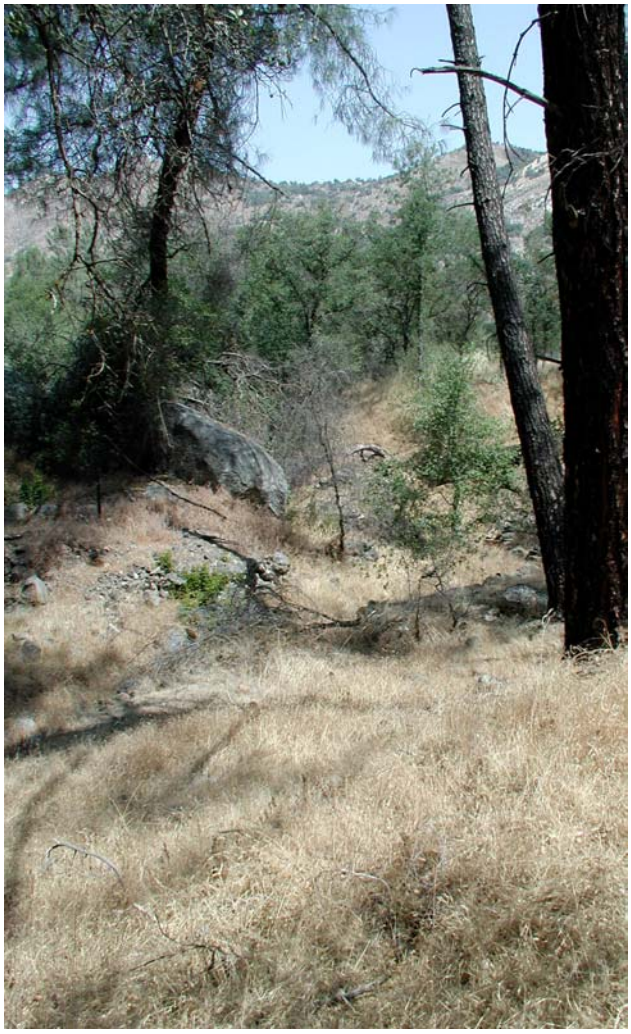
Above: Temperance Flat; part of panoramic view NE to NW from access road at about 1300' elevation; view NNW (early morning). (P190060.JPG)

Above: Temperance Flat; part of panoramic view NE to NW from access road at about 1300' elevation; view WNW (early morning).(P190062.JPG)

Above: Temperance Flat; placer mining area; Chinese rock walls along drainages; roughly 840' elevation in SW ¼ Sect. 16, R22E T10S (would be inundated by MP 279 dam, and by all but 800' pool from MP 274 dam) (mid-morning). (P190063.JPG)

Above: Temperance Flat; placer mining area; arrastra (difficult to see through poison oak; is indicative of hard rock mining but no source in the area has been identified); roughly 840' elevation in SW ¼ Sect. 16, R22E T10S (would be inundated by MP 279 dam, and by all but 800' pool from MP 274 dam) (mid-morning). (P190066.JPG)

Above: Temperance Flat; placer mining area; arrastra (difficult to see through poison oak; is indicative of hard rock mining but no source in the area has been identified); roughly 840' elevation in SW ¼ Sect. 16, R22E T10S (would be inundated by MP 279 dam, and by all but 800' pool from MP 274 dam) (mid-morning). (P190067.JPG)

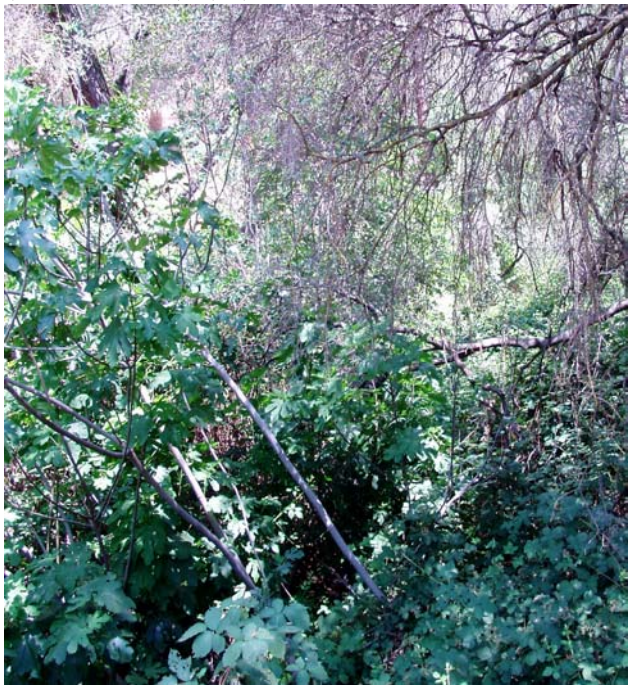


Above: Temperance Flat; placer mining area; Chinese rock walls along drainages; roughly 840' elevation in SW ¼ Sect. 16, R22E T10S (would be inundated by MP 279 dam, and by all but 800' pool from MP 274 dam) (mid-morning). (P190064.JPG)

Above: Temperance Flat; placer mining area; Chinese rock walls along drainages; roughly 840' elevation in SW ¼ Sect. 16, R22E T10S (would be inundated by MP 279 dam, and by all but 800' pool from MP 274 dam) (mid-morning). (P190065.JPG)

Above: Temperance Flat vegetation, mining area (June 19, 2003) [(19).JPG]

Above: Temperance Flat vegetation, mining area (June 19, 2003) [(20).JPG]



Above: Temperance Flat vegetation, mining area (June 19, 2003) [(21).JPG]

Above: Temperance Flat vegetation, mining area (June 19, 2003) [(22).JPG]

Above: Temperance Flat vegetation, mining area (June 19, 2003) [(23).JPG]

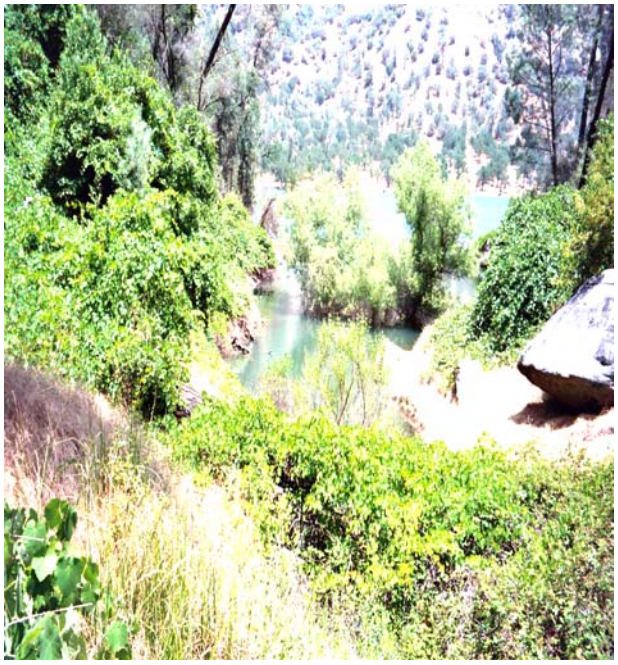
Above: Temperance Flat vegetation, mining area (June 19, 2003) [(24).JPG]

Above: Temperance Flat vegetation, mining area (June 19, 2003) [(25).JPG]

Above: Blackberry-choked stream upstream of road, minimal base flow (June 19, 2003) 006_3.JPG)

Above: Grape vines, blackberries and figs along stream below road (June 19, 2003) (008_5.JPG)

Above: Grape vines along stream below road (view downstream towards Millerton Reservoir, June 19, 2003) (007_4.JPG)



Above: Cove at stream mouth on Millerton Reservoir (June 19, 2003) (009_6.JPG)

Above: Cove at stream mouth on Millerton Reservoir (June 19, 2003) (010_7.JPG)

Above: Fish (possibly smallmouth bass) in cove at stream mouth on Millerton Reservoir (June 19, 2003) (013_10.JPG)

Above: Millerton Reservoir from cove at stream mouth (June 19, 2003) (014_11.JPG)

APPENDIX C

Cost Estimate Tables

Temperance Flat Reservoir

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __3___

FEATURE:

RM274 Dam Site
Elev. 800
Concrete Faced Rockfill Dam (CFRD)

PROJECT: USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[MP274 CFRF.xls]MP274_1100

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		1,892,500	CY	$13.00	$24,602,500
		Excavation for Left Abutment Diversion Tunnel		141,300	CY	$145.00	$20,488,500
		Concrete Liner for Left Abutment Diversion Tunnel		31,300	CY	$260.00	$8,138,000
		Rock Bolts - Left Abt. Div. Tunnel		3,270	Bolts	$500.00	$1,635,000
		Total Drilling - Left Abt. Div. Tunnel		58,860	LF	$20.00	$1,177,200
		Excavation for Right Abutment Diversion Tunnel		281,700	CY	$140.00	$39,438,000
		Concrete Liner for Right Abutment Diversion Tunnel		48,900	CY	$260.00	$12,714,000
		Rock Bolts - Right Abt. Div. Tunnel		3,050	Bolts	$600.00	$1,830,000
		Total Drilling - Right Abt. Div. Tunnel		70,150	LF	$20.00	$1,403,000
		Furnishing and Handling Cement		22,620	TONS	$100.00	$2,262,000
		Furnishing and Handling Reinforcement		12,030,000	LBS	$0.60	$7,218,000
		Diversion and Care of River Subtotal					**$120,906,200**
		Spillway					
		Excavation for Spillway		5,296,800	CY	$7.50	$39,726,000
		Concrete in spillway crest		7,670	CY	$180.00	$1,380,600
		Concrete in spillway training walls and Apron		7,500	CY	$210.00	$1,575,000
		Furnishing and Handling Cement		4,280	TONS	$110.00	$470,800
		Furnishing and Handling Reinforcement		2,275,500	LBS	$0.65	$1,479,075
		Spillway subtotal					**$44,631,475**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2___ OF __3____

FEATURE:

RM274 Dam Site
Elev. 800
Concrete Faced Rockfill Dam (CFRD)

PROJECT:

DIVISION:

FILE: **_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[MP274 CFRF.xls]MP274_1100**

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		OutletWorks					
		Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
		Excavatioon of Outlet Shaft and Gate Structure		14,730	CY	$280.00	$4,124,400
		Rock Bolt Supports		600	Bolts	$360.00	$216,000
		Total Drilling for Rock Bolts		7,200	LF	$20.00	$144,000
		Concrete in Outlet Shaft and Gate Structure		6,530	CY	$450.00	$2,938,500
		Furnishing and Handling Cement		2,720	TONS	$120.00	$326,400
		Furnishing and Handling Reinforcement		1,446,000	LBS	$0.65	$939,900
		Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
		Outlet Works subtotal					**$10,750,850**
		Control House and Powerplant					
		Steel Pipe		11,735,300	LBS	$1.50	$17,602,950
		Valves, all Sizes and Types		4,340,000	LBS	$4.00	$17,360,000
		Hydraulic Control System		120,000	LBS	$10.00	$1,200,000
		Concrete in Control House & Powerplant		42,350	CY	$350.00	$14,822,500
		Excavation for Powerplant		426,800	CY	$12.00	$5,121,600
		Furnishing and Handling Cement		11,945	TONS	$100.00	$1,194,500
		Furnishing and Handling Reinforcement		2,666,000	LBS	$0.60	$1,599,600
		Turbines		1,956,000	LBS	$6.50	$12,714,000
		Generators		1,500,000	LBS	$8.00	$12,000,000
		Governors, Motors, etc.		3-Units	LS		$3,600,000
		Powerplant subtotal					**$87,215,150**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__3___ OF __3____

FEATURE:

RM274 Dam Site
Elevation = 800'
Embankment

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[MP274 CFRF.xls]MP274_1100

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CFRF Dam					
	20	Excavation - common (removal of alluvium, rock slope cleaning by dozer to sound rock, minimal ripping.)	8313	177,000	CY	$6.50	$1,150,500
	30	Zone 1A - Exc, haul, & place (CL, SM, GM in 6" lifts to 98% Proctor, 2 mile haul) Toe slab imperv. Cap	8313	12,000	CY	$11.00	$132,000
	40	Zone 1B - Exc, haul, & place (random in 18" lifts to 95% Proctor, 0.5 mile haul) Shell for Zone 1A	8313	68,000	CY	$6.50	$442,000
	50	Zone 2 - Exc, haul, & place processed SM, GM in 18" lifts to 98% Proctor, 0.5 mile haul) Deck foundation	8313	93,200	CY	$20.00	$1,864,000
	60	Zone 3A - Exc, haul, & place (processed GP in 18" lifts to 95% Proctor, 0.5 mile haul) Transition to Shell	8313	93,200	CY	$19.50	$1,817,400
	70	Zone 3B - Exc, haul, & place (rockfill, 18" max in 3' lifts, blasting operation 0.5 mile away) Upstream Shell	8313	2,352,000	CY	$9.00	$21,168,000
	80	Zone 3C - Exc, haul, & place (rockfill, 4' max in 4' lifts, blasting operation 0.5 mile away) Downstream Shell	8313	2,400,000	CY	$8.75	$21,000,000
	90	Concrete deck (3,000 psi strength, 0.4% reinforcing)	8313	31,500	CY	$240.00	$7,560,000
	100	Concrete toe slab (3,000 psi strength, 0.3% reinforcing	8313	2,170	CY	$240.00	$520,800
	110	Anchor bars for toe slab (4' deep grouted into granite)	8313	9,750	anchors	$40.00	$390,000
	120	Parapet Wall (3,000 psi, 0.4% reinforcing)	8313	2,000	CY	$460.00	$920,000
	130	Drilling for grout program (setup, drill, test), setups=455	8313	28,000	LF	$33.00	$924,000
	140	Grouting (grout injection into competent granite.	8313	21,000	bags	$27.00	$567,000
	150	Unwatering	8313	1	LS		$1,500,000
		Subtotal, CFRF Dam					**$59,955,700**
		SUMMATION OF COSTS					
		Diversion and Care of River					$120,900,000
		Spillway					$44,600,000
		Outlet Works					$10,800,000
		Control House and Powerplant					$87,200,000
		CFRF Dam					$60,000,000
		Mobilization - 5%					$16,000,000
		Subtotal					**$339,500,000**
		Unlisted Items - 15%					$50,500,000
		Contract Cost					**$390,000,000**
		Contingencies - 25%					$100,000,000
		Field Cost					**$490,000,000**

QUANTITIES		PRICES	
BY Mark Pabst	**CHECKED** Mark Pabst	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED 7/1/2003	**APPROVED**	**DATE**	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __3____

FEATURE:

RM274 Dam Site
Elev. 960 (Interpolated)
Concrete Faced Rockfill Dam (CFRD)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[MP274 CFRF.xls]MP274_800

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		1,892,500	CY	$13.00	$24,602,500
		Excavation for Left Abutment Diversion Tunnel		141,300	CY	$145.00	$20,488,500
		Concrete Liner for Left Abutment Diversion Tunnel		31,300	CY	$260.00	$8,138,000
		Rock Bolts - Left Abt. Div. Tunnel		3,270	Bolts	$500.00	$1,635,000
		Total Drilling - Left Abt. Div. Tunnel		58,860	LF	$20.00	$1,177,200
		Excavation for Right Abutment Diversion Tunnel		281,700	CY	$140.00	$39,438,000
		Concrete Liner for Right Abutment Diversion Tunnel		48,900	CY	$260.00	$12,714,000
		Rock Bolts - Right Abt. Div. Tunnel		3,050	Bolts	$600.00	$1,830,000
		Total Drilling - Right Abt. Div. Tunnel		70,150	LF	$20.00	$1,403,000
		Furnishing and Handling Cement		22,620	TONS	$100.00	$2,262,000
		Furnishing and Handling Reinforcement		12,030,000	LBS	$0.60	$7,218,000
		Diversion and Care of River Subtotal					**$120,906,200**
		Spillway					
		Excavation for Spillway		3,289,333	CY	$8.03	$26,424,311
		Concrete in spillway crest		7,670	CY	$180.00	$1,380,600
		Concrete in spillway training walls and Apron		7,500	CY	$210.00	$1,575,000
		Furnishing and Handling Cement		4,280	TONS	$110.00	$470,800
		Furnishing and Handling Reinforcement		2,275,500	LBS	$0.65	$1,479,075
		Spillway subtotal					**$31,329,786**

QUANTITIES		PRICES	
BY	**CHECKED**	**BY**	**CHECKED**
B. Foster	**S. Osgood 11/20/03**	**B. Foster**	**S. Osgood 11/20/03**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL**
11/10/2003		**11/10/03**	**Appraisal 03**

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2__ OF __3___

FEATURE:

RM274 Dam Site
Elev. 960 (Interpolated)
Concrete Faced Rockfill Dam (CFRD)

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[MP274 CFRF.xls]MP274_800

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		OutletWorks					
		Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
		Excavatioon of Outlet Shaft and Gate Structure		14,730	CY	$280.00	$4,124,400
		Rock Bolt Supports		600	Bolts	$360.00	$216,000
		Total Drilling for Rock Bolts		7,200	LF	$20.00	$144,000
		Concrete in Outlet Shaft and Gate Structure		6,530	CY	$450.00	$2,938,500
		Furnishing and Handling Cement		2,720	TONS	$120.00	$326,400
		Furnishing and Handling Reinforcement		1,446,000	LBS	$0.65	$939,900
		Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
		Outlet Works subtotal					**$10,750,850**
		Powerplant					
		Steel Pipe		15,645,753	LBS	$1.50	$23,468,630
		Valves, all Sizes and Types		4,749,280	LBS	$4.53	$21,530,069
		Hydraulic Control System		136,000	LBS	$10.00	$1,360,000
		Concrete in Powerplant		42,350	CY	$350.00	$14,822,500
		Excavation for Powerplant		426,800	CY	$12.00	$5,121,600
		Furnishing and Handling Cement		11,945	TONS	$100.00	$1,194,500
		Furnishing and Handling Reinforcement		4,632,133	LBS	$0.60	$2,779,280
		Turbines		1,920,800	LBS	$6.50	$12,485,200
		Generators		1,948,000	LBS	$8.00	$15,584,000
		Governors, Motors, etc.		3-Units	LS		$3,600,000
		Powerplant subtotal					**$101,945,779**

QUANTITIES		PRICES	
BY B. Foster	**CHECKED** S. Osgood 11/20/03	**BY** B. Foster	**CHECKED** S. Osgood 11/20/03
DATE PREPARED 11/10/2003	**APPROVED**	**DATE** 11/10/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__3__ OF __3___

FEATURE:

RM274 Dam Site
Elevation = 960' (Interpolated)
Embankment

PROJECT: USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[MP274 CFRF.xls]MP274_800

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CFRF Dam					
	20	Excavation - common (removal of alluvium, rock slope cleaning by dozer to sound rock, minimal ripping.)	8313	460,200	CY	$5.70	$2,623,140
	30	Zone 1A - Exc, haul, & place (CL, SM, GM in 6" lifts to 98% Proctor, 2 mile haul) Toe slab imperv. Cap	8313	40,267	CY	$9.40	$378,507
	40	Zone 1B - Exc, haul, & place (random in 18" lifts to 95% Proctor, 0.5 mile haul) Shell for Zone 1A	8313	239,733	CY	$6.23	$1,494,338
	50	Zone 2 - Exc, haul, & place processed SM, GM in 18" lifts to 98% Proctor, 0.5 mile haul) Deck foundation	8313	224,293	CY	$17.87	$4,007,374
	60	Zone 3A - Exc, haul, & place (processed GP in 18" lifts to 95% Proctor, 0.5 mile haul) Transition to Shell	8313	224,293	CY	$17.37	$3,895,228
	70	Zone 3B - Exc, haul, & place (rockfill, 18" max in 3' lifts, blasting operation 0.5 mile away) Upstream Shell	8313	8,350,933	CY	$8.20	$68,477,653
	80	Zone 3C - Exc, haul, & place (rockfill, 4' max in 4' lifts, blasting operation 0.5 mile away) Downstream Shell	8313	8,522,667	CY	$7.95	$67,755,200
	90	Concrete deck (3,000 psi strength, 0.4% reinforcing)	8313	103,367	CY	$213.33	$22,051,556
	100	Concrete toe slab (3,000 psi strength, 0.3% reinforcing	8313	3,679	CY	$213.33	$784,924
	110	Anchor bars for toe slab (4' deep grouted into granite)	8313	17,878	anchors	$40.00	$715,120
	120	Parapet Wall (3,000 psi, 0.4% reinforcing)	8313	3,397	CY	$420.00	$1,426,880
	130	Drilling for grout program (setup, drill, test), setups=1165	8313	51,200	LF	$31.93	$1,634,987
	140	Grouting (grout injection into competent granite.	8313	38,413	bags	$24.33	$934,724
	150	Unwatering	8313	1	LS		$1,980,000
		Subtotal, CFRF Dam					**$178,159,631**
		SUMMATION OF COSTS					
		Diversion and Care of River					$120,900,000
		Spillway					$31,300,000
		Outlet Works					$10,800,000
		Powerplant					$101,900,000
		CFRF Dam					$178,200,000
		Mobilization - 5%					$22,000,000
		Subtotal					**$465,100,000**
		Unlisted Items - 15%					$64,900,000
		Contract Cost					**$530,000,000**
		Contingencies - 25%					$140,000,000
		Field Cost					**$670,000,000**

QUANTITIES		PRICES	
BY B. Foster	**CHECKED** S. Osgood 11/20/03	**BY** B. Foster	**CHECKED** S. Osgood 11/20/03
DATE PREPARED 11/10/2003	**APPROVED**	**DATE** 11/10/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170 **ESTIMATE WORKSHEET** SHEET__1__ OF __3___

FEATURE: **RM274 Dam Site** **Elev. 1100** **Concrete Faced Rockfill Dam (CFRD)**	**PROJECT:** **USJRBSI** **DIVISION:** **FILE:** P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[MP274 CFRF.xls]MP274_800

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		1,892,500	CY	$13.00	$24,602,500
		Excavation for Left Abutment Diversion Tunnel		141,300	CY	$145.00	$20,488,500
		Concrete Liner for Left Abutment Diversion Tunnel		31,300	CY	$260.00	$8,138,000
		Rock Bolts - Left Abt. Div. Tunnel		3,270	Bolts	$500.00	$1,635,000
		Total Drilling - Left Abt. Div. Tunnel		58,860	LF	$20.00	$1,177,200
		Excavation for Right Abutment Diversion Tunnel		281,700	CY	$140.00	$39,438,000
		Concrete Liner for Right Abutment Diversion Tunnel		48,900	CY	$260.00	$12,714,000
		Rock Bolts - Right Abt. Div. Tunnel		3,050	Bolts	$600.00	$1,830,000
		Total Drilling - Right Abt. Div. Tunnel		70,150	LF	$20.00	$1,403,000
		Furnishing and Handling Cement		22,620	TONS	$100.00	$2,262,000
		Furnishing and Handling Reinforcement		12,030,000	LBS	$0.60	$7,218,000
		Diversion and Care of River Subtotal					**$120,906,200**
		Spillway					
		Excavation for Spillway		1,532,800	CY	$8.50	$13,028,800
		Concrete in spillway crest		7,670	CY	$180.00	$1,380,600
		Concrete in spillway training walls and Apron		7,500	CY	$210.00	$1,575,000
		Furnishing and Handling Cement		4,280	TONS	$110.00	$470,800
		Furnishing and Handling Reinforcement		2,275,500	LBS	$0.65	$1,479,075
		Spillway subtotal					**$17,934,275**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2__ OF __3___

FEATURE:

RM274 Dam Site
Elev. 1100
Concrete Faced Rockfill Dam (CFRD)

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[MP274 CFRF.xls]MP274_800

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		OutletWorks					
		Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
		Excavatioon of Outlet Shaft and Gate Structure		14,730	CY	$280.00	$4,124,400
		Rock Bolt Supports		600	Bolts	$360.00	$216,000
		Total Drilling for Rock Bolts		7,200	LF	$20.00	$144,000
		Concrete in Outlet Shaft and Gate Structure		6,530	CY	$450.00	$2,938,500
		Furnishing and Handling Cement		2,720	TONS	$120.00	$326,400
		Furnishing and Handling Reinforcement		1,446,000	LBS	$0.65	$939,900
		Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
		Outlet Works subtotal					**$10,750,850**
		Powerplant					
		Steel Pipe		19,067,400	LBS	$1.50	$28,601,100
		Valves, all Sizes and Types		5,107,400	LBS	$5.00	$25,537,000
		Hydraulic Control System		150,000	LBS	$10.00	$1,500,000
		Concrete in Powerplant		42,350	CY	$350.00	$14,822,500
		Excavation for Powerplant		426,800	CY	$12.00	$5,121,600
		Furnishing and Handling Cement		11,945	TONS	$100.00	$1,194,500
		Furnishing and Handling Reinforcement		6,352,500	LBS	$0.60	$3,811,500
		Turbines		1,890,000	LBS	$6.50	$12,285,000
		Generators		2,340,000	LBS	$8.00	$18,720,000
		Governors, Motors, etc.		3-Units	LS		$3,600,000
		Powerplant subtotal					**$115,193,200**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__3__ OF __3___

FEATURE:

RM274 Dam Site
Elevation = 1100'
Embankment

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[MP274 CFRF.xls]MP274_800

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CFRF Dam					
	20	Excavation - common (removal of alluvium, rock slope	8313	708,000	CY	$5.00	$3,540,000
	30	Zone 1A - Exc, haul, & place (CL, SM, GM in 6" lifts to 98% Proctor, 2 mile haul) Toe slab imperv. Cap	8313	65,000	CY	$8.00	$520,000
	40	Zone 1B - Exc, haul, & place (random in 18" lifts to 95% Proctor, 0.5 mile haul) Shell for Zone 1A	8313	390,000	CY	$6.00	$2,340,000
	50	Zone 2 - Exc, haul, & place processed SM, GM in 18" lifts to 98% Proctor, 0.5 mile haul) Deck foundation	8313	339,000	CY	$16.00	$5,424,000
	60	Zone 3A - Exc, haul, & place (processed GP in 18" lifts to 95% Proctor, 0.5 mile haul) Transition to Shell	8313	339,000	CY	$15.50	$5,254,500
	70	Zone 3B - Exc, haul, & place (rockfill, 18" max in 3' lifts, blasting operation 0.5 mile away) Upstream Shell	8313	13,600,000	CY	$7.50	$102,000,000
	80	Zone 3C - Exc, haul, & place (rockfill, 4' max in 4' lifts, blasting operation 0.5 mile away) Downstream Shell	8313	13,880,000	CY	$7.25	$100,630,000
	90	Concrete deck (3,000 psi strength, 0.4% reinforcing)	8313	166,250	CY	$190.00	$31,587,500
	100	Concrete toe slab (3,000 psi strength, 0.3% reinforcing	8313	5,000	CY	$190.00	$950,000
	110	Anchor bars for toe slab (4' deep grouted into granite)	8313	24,990	anchors	$40.00	$999,600
	120	Parapet Wall (3,000 psi, 0.4% reinforcing)	8313	4,620	CY	$385.00	$1,778,700
	130	Drilling for grout program (setup, drill, test), setups=1165	8313	71,500	LF	$31.00	$2,216,500
	140	Grouting (grout injection into competent granite.	8313	53,650	bags	$22.00	$1,180,300
	150	Unwatering (assumes 30 month construction)	8313	1	LS		$2,400,000
		Subtotal, CFRF Dam					**$260,821,100**
		SUMMATION OF COSTS					
		Diversion and Care of River					$121,000,000
		Spillway					$18,000,000
		Outlet Works					$11,000,000
		Powerplant					$115,000,000
		CFRF Dam					$261,000,000
		Mobilization - 5%					$26,300,000
		Subtotal					**$552,300,000**
		Unlisted Items - 15%					$87,700,000
		Contract Cost					**$640,000,000**
		Contingencies - 25%					$160,000,000
		Field Cost					**$800,000,000**

QUANTITIES		PRICES	
BY: Mark Pabst	CHECKED: Mark Pabst	BY: R. Baumgarten	CHECKED:
DATE PREPARED: 7/1/03	APPROVED:	DATE: 09/09/03	PRICE LEVEL: Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __3___

FEATURE:

RM279 Dam Site
Elev. 900
Concrete Face Rockfill Dam (CFRD)

PROJECT: USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279_900

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		1,044,720	CY	$15.00	$15,670,800
		Excavation for Left Abutment Diversion Tunnel		89,120	CY	$140.00	$12,476,800
		Concrete Liner for Left Abutment Diversion Tunnel		19,730	CY	$245.00	$4,833,850
		Rock Bolts - Left Abt. Div. Tunnel		2,070	Bolts	$500.00	$1,035,000
		Total Drilling - Left Abt. Div. Tunnel		37,260	LF	$20.00	$745,200
		Excavation for Right Abutment Diversion Tunnel		247,870	CY	$140.00	$34,701,800
		Concrete Liner for Right Abutment Diversion Tunnel		43,030	CY	$245.00	$10,542,350
		Rock Bolts - Right Abt. Div. Tunnel		2,690	Bolts	$600.00	$1,614,000
		Total Drilling - Right Abt. Div. Tunnel		61,870	LF	$20.00	$1,237,400
		Furnishing and Handling Cement		17,700	TONS	$100.00	$1,770,000
		Furnishing and Handling Reinforcement		9,414,000	LBS	$0.60	$5,648,400
		Diversion and Care of River Subtotal					**$90,275,600**
		Spillway					
		Excavation for Spillway		2,012,390	CY	$8.00	$16,099,120
		Concrete in spillway crest		6,250	CY	$180.00	$1,125,000
		Concrete in spillway training walls and Apron		2,750	CY	$220.00	$605,000
		Furnishing and Handling Cement		2,538	TONS	$110.00	$279,180
		Furnishing and Handling Reinforcement		1,350,000	LBS	$0.65	$877,500
		Spillway subtotal					**$18,985,800**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2___ OF __3___

FEATURE:

RM279 Dam Site
Elev. 900
Concrete Face Rockfill Dam (CFRD)

PROJECT: USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279_900

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		OutletWorks					
		Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
		Excavatioon of Outlet Shaft and Gate Structure		12,170	CY	$280.00	$3,407,600
		Rock Bolt Supports		264	Bolts	$380.00	$100,320
		Total Drilling for Rock Bolts		6,080	LF	$20.00	$121,600
		Concrete in Outlet Shaft and Gate Structure		5,270	CY	$435.00	$2,292,450
		Furnishing and Handling Cement		2,360	TONS	$120.00	$283,200
		Furnishing and Handling Reinforcement		1,257,000	LBS	$0.65	$817,050
		Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
		Outlet Works subtotal					**$9,083,870**
		Powerplant					
		Steel Pipe		11,735,310	LBS	$1.50	$17,602,965
		Valves, all Sizes and Types		4,460,000	LBS	$5.00	$22,300,000
		Hydraulic Control System		120,000	LBS	$10.00	$1,200,000
		Concrete in Powerplant		42,350	CY	$350.00	$14,822,500
		Excavation for Powerplant		154,900	CY	$15.00	$2,323,500
		Furnishing and Handling Cement		11,945	TONS	$100.00	$1,194,500
		Furnishing and Handling Reinforcement		6,352,500	LBS	$0.60	$3,811,500
		Turbines		1,956,000	LBS	$6.50	$12,714,000
		Generators		1,500,000	LBS	$8.00	$12,000,000
		Governors, Motors, etc.		3-Units	LS		$3,600,000
		Powerplant subtotal					**$91,568,965**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__3___ OF __3___

FEATURE:

RM279 Dam - 440' high
Elevation = 900'
Appraisal Design Stage

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279_900

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
151		**CFRF Dam**					
	20	Excavation - common (removal of alluvium, rock slope cleaning by dozer to sound rock, minimal ripping.)	8313	103,000	CY	$7.00	$721,000
	30	Zone 1A - Exc, haul, & place (CL, SM, GM in 6" lifts to 98% Proctor, 2 mile haul) Toe slab imperv. Cap	8313	21,000	CY	$10.00	$210,000
	40	Zone 1B - Exc, haul, & place (random in 18" lifts to 95% Proctor, 0.5 mile haul) Shell for Zone 1A	8313	35,000	CY	$7.50	$262,500
	50	Zone 2 - Exc, haul, & place processed SM, GM in 18" lifts to 98% Proctor, 0.5 mile haul) Deck foundation	8313	115,000	CY	$20.00	$2,300,000
	60	Zone 3A - Exc, haul, & place (processed GP in 18" lifts to 95% Proctor, 0.5 mile haul) Transition to Shell	8313	115,000	CY	$19.50	$2,242,500
	70	Zone 3B - Exc, haul, & place (rockfill, 18" max in 3' lifts, blasting operation 0.5 mile away) Upstream Shell	8313	3,250,000	CY	$8.50	$27,625,000
	80	Zone 3C - Exc, haul, & place (rockfill, 4' max in 4' lifts, blasting operation 0.5 mile away) Downstream Shell	8313	3,450,000	CY	$8.25	$28,462,500
	90	Concrete deck (3,000 psi strength, 0.4% reinforcing)	8313	42,500	CY	$230.00	$9,775,000
	100	Concrete toe slab (3,000 psi strength, 0.3% reinforcing	8313	3,350	CY	$230.00	$770,500
	110	Anchor bars for toe slab (4' deep grouted into granite)	8313	15,000	anchors	$40.00	$600,000
	120	Parapet Wall (3,000 psi, 0.4% reinforcing)	8313	2,000	CY	$460.00	$920,000
	130	Drilling for grout program (setup, drill, test), setups=698	8313	35,500	LF	$33.00	$1,171,500
	140	Grouting (grout injection into competent granite.	8313	26,600	bags	$26.00	$691,600
	150	Unwatering (assumes 36 month construction duration)	8313	1	LS		$1,800,000
		Subtotal, CFRF Dam					**$77,552,100**
		SUMMARY OF COSTS					
		Diversion and Care of River					$90,300,000
		Spillway					$19,000,000
		Outlet Works					$9,100,000
		Powerplant					$91,600,000
		CFRF Dam					$77,600,000
		Mobilization - 5%					$14,400,000
		Subtotal					**$302,000,000**
		Unlisted Items - 15%					$48,000,000
		Contract Cost					**$350,000,000**
		Contingencies - 25%					$80,000,000
		Field Cost					**$430,000,000**

QUANTITIES		PRICES	
BY Mark Pabst		**BY** R. Baumgarten	**CHECKED**
DATE PREPARED 8/11/2002		**DATE**	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __2___

FEATURE:

RM279 Dam
Elev. 900
Concrete Gravity Dam (RCC)

PROJECT: USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\USBR products\Cost Sheets - Sept 2003 - Updated Options\[pdc 900 FY03.xls]pdc 900 FY03

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Diversion and care of river					
		Upstream Cofferdam (Crest @ El. 635)		707,430	CY	$16.00	$11,318,880
		Excavation for Left Abutment Diversion Tunnel		77,350	CY	$140.00	$10,829,000
		Concrete Liner for Left Abutment Diversion Tunnel		17,130	CY	$245.00	$4,196,850
		Rock Bolts - Left Abt. Div. Tunnel		1,800	Bolts	$500.00	$900,000
		Total Drilling - Left Abt. Div. Tunnel		32,400	LF	$20.00	$648,000
		Excavation for Right Abutment Diversion Tunnel		143,650	CY	$140.00	$20,111,000
		Concrete Liner for Right Abutment Diversion Tunnel		24,940	LBS	$245.00	$6,110,300
		Rock Bolts - Right Abt. Div. Tunnel		1,560	Bolts	$600.00	$936,000
		Total Drilling - Right Abt. Div. Tunnel		35,880	LF	$20.00	$717,600
		Downstream Cofferdam (Crest @ El. 578)		531,600	CY	$16.00	$8,505,600
	2	Excavation, all classes, for dam foundation		50,820	CY	$15.00	$762,300
	3	RCC in dam		1,635,100	CY	$37.00	$60,498,700
	4	Concrete facing elements		51,520	CY	$100.00	$5,152,000
	5	Concrete cap on top of dam		1,600	CY	$250.00	$400,000
	6	Leveling concrete in dam foundation		12,700	CY	$180.00	$2,286,000
	7	Concrete in spillway crest		2,300	CY	$200.00	$460,000
	8	Concrete in spillway training walls		315	CY	$350.00	$110,250
	9	Concrete in Outlet Works Intake Structure		3,110	CY	$280.00	$870,800
	10	Excavation of Outlet Shaft and Gate Structure		10,630	CY	$270.00	$2,870,100
	11	Temp. Supports - Rock Bolts		410	Bolts	$380.00	$155,800
	12	Total Drilling for Rock Bolts		4,720	LF	$20.00	$94,400
	13	Concrete in Outlet Shaft and Gate Structure		4,890	CY	$430.00	$2,102,700
		Subtotal					**$140,036,280**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2___ OF __2____

FEATURE:

RM279 Dam
Elev. 900
Concrete Gravity Dam (RCC)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\USBR products\Cost Sheets - Sept 2003 - Updated Options\[pdc 900 FY03.xls]pdc 900 FY03

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	14	Excavation for Powerplant		170,620	CY	$15.00	$2,559,300
	15	Concrete in Powerplant		42,350	CY	$350.00	$14,822,500
	16	Furnishing and Handling Cement		354,000	TONS	$90.00	$31,860,000
	17	Furnishing and Handling Reinforcement		14,496,000	LBS	$0.60	$8,697,600
	18	Grout Hole Drillilng		22,950	LF	$35.00	$803,250
	19	Foundation Grouting		22,950	Sacks	$29.00	$665,550
	20	Set up for Drain Holes in Gallery		153	Holes	$200.00	$30,600
	21	Drilling Drain Holes		20,770	LF	$55.00	$1,142,350
	22	Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
	23	Steel Pipe		11,735,310	LBS	$1.50	$17,602,965
	24	Valves, all Sizes and Types		4,460,000	LBS	$5.00	$22,300,000
	25	Turbines		1,956,000	LBS	$6.50	$12,714,000
	26	Generators		1,500,000	LBS	$8.00	$12,000,000
	27	Governors, Motors, etc.		3-Units	LS		$3,600,000
		Mobilization (5%)					$13,500,000
		Subtotal					**$283,571,895**
		Unlited Items (15%)					$46,428,105
		Contract Cost					**$330,000,000**
		Contingencies (25%)					$80,000,000
		Field Cost					**$410,000,000**

QUANTITIES		PRICES	
BY	CHECKED	BY	CHECKED
S. Higinbotham		R. Baumgarten	
DATE PREPARED	APPROVED	DATE	PRICE LEVEL
		09/09/03	Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __3____

FEATURE:

RM279 Dam Site
Elev. 960 (Interpolated)
Concrete Faced Rockfill Dam (CFRD)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279_900

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		1,269,045	CY	$14.55	$18,464,605
		Excavation for Left Abutment Diversion Tunnel		106,775	CY	$140.00	$14,948,500
		Concrete Liner for Left Abutment Diversion Tunnel		23,639	CY	$245.00	$5,791,555
		Rock Bolts - Left Abt. Div. Tunnel		2,478	Bolts	$530.00	$1,313,340
		Total Drilling - Left Abt. Div. Tunnel		44,604	LF	$20.00	$892,080
		Excavation for Right Abutment Diversion Tunnel		257,164	CY	$140.00	$36,002,960
		Concrete Liner for Right Abutment Diversion Tunnel		44,641	CY	$245.00	$10,937,045
		Rock Bolts - Right Abt. Div. Tunnel		2,786	Bolts	$600.00	$1,671,600
		Total Drilling - Right Abt. Div. Tunnel		64,078	LF	$20.00	$1,281,560
		Furnishing and Handling Cement		19,260	TONS	$100.00	$1,926,000
		Furnishing and Handling Reinforcement		10,242,000	LBS	$0.60	$6,145,200
		Diversion and Care of River Subtotal					**$99,374,445**
		Spillway					
		Excavation for Spillway		1,790,198	CY	$8.15	$14,590,114
		Concrete in spillway crest		6,250	CY	$180.00	$1,125,000
		Concrete in spillway training walls and Apron		2,750	CY	$220.00	$605,000
		Furnishing and Handling Cement		3,103	TONS	$110.00	$341,286
		Furnishing and Handling Reinforcement		1,650,150	LBS	$0.65	$1,072,598
		Spillway subtotal					**$17,733,997**

QUANTITIES		PRICES	
BY B. Foster	**CHECKED** S. Osgood	**BY** B. Foster	**CHECKED** S. Osgood
DATE PREPARED 11/10/2003	**APPROVED**	**DATE** 11/10/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2___ OF __3___

FEATURE:

Prospect (RM279) Dam Site
Elev. 960
Concrete Faced Rockfill Dam (CFRF)

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279_900

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		OutletWorks					
		Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
		Excavatioon of Outlet Shaft and Gate Structure		12,260	CY	$280.00	$3,432,800
		Rock Bolt Supports		269	Bolts	$380.00	$102,144
		Total Drilling for Rock Bolts		6,188	LF	$20.00	$123,760
		Concrete in Outlet Shaft and Gate Structure		5,324	CY	$435.00	$2,315,940
		Furnishing and Handling Cement		2,360	TONS	$120.00	$283,200
		Furnishing and Handling Reinforcement		1,265,100	LBS	$0.65	$822,315
		Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
		Outlet Works subtotal					**$9,141,809**
		Powerplant					
		Steel Pipe		13,934,940	LBS	$1.50	$20,902,410
		Valves, all Sizes and Types		6,438,020	LBS	$5.00	$32,190,100
		Hydraulic Control System		129,000	LBS	$10.00	$1,290,000
		Concrete in Powerplant		42,350	CY	$350.00	$14,822,500
		Excavation for Powerplant		212,500	CY	$14.89	$3,164,318
		Furnishing and Handling Cement		11,945	TONS	$100.00	$1,194,500
		Furnishing and Handling Reinforcement		6,352,500	LBS	$0.60	$3,811,500
		Turbines		1,936,200	LBS	$6.50	$12,585,300
		Generators		1,752,000	LBS	$8.00	$14,016,000
		Governors, Motors, etc.		3-Units	LS		$3,600,000
		Powerplant subtotal					**$107,576,628**

QUANTITIES		PRICES	
BY B. Foster	**CHECKED** S. Osgood 11/21/03	**BY** B. Foster	**CHECKED** S. Osgood 11/21/2003
DATE PREPARED 11/10/2003	**APPROVED**	**DATE** 11/10/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__3___ OF __3___

FEATURE:

RM279 Dam - 440' high
Elevation = 960' CFRD
Appraisal Design Stage

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279_900

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CFRF Dam					
	20	Excavation - common (removal of alluvium, rock slope	8313	134,500	CY	$6.85	$921,325
	30	Zone 1A - Exc, haul, & place (CL, SM, GM in 6" lifts to 98% Proctor, 2 mile haul) Toe slab imperv. Cap	8313	23,700	CY	$9.70	$229,890
	40	Zone 1B - Exc, haul, & place (random in 18" lifts to 95% Proctor, 0.5 mile haul) Shell for Zone 1A	8313	39,500	CY	$7.35	$290,325
	50	Zone 2 - Exc, haul, & place processed SM, GM in 18" lifts to 98% Proctor, 0.5 mile haul) Deck foundation	8313	167,500	CY	$18.80	$3,149,000
	60	Zone 3A - Exc, haul, & place (processed GP in 18" lifts to 95% Proctor, 0.5 mile haul) Transition to Shell	8313	167,500	CY	$18.60	$3,115,500
	70	Zone 3B - Exc, haul, & place (rockfill, 18" max in 3' lifts, blasting operation 0.5 mile away) Upstream Shell	8313	5,275,000	CY	$8.28	$43,650,625
	80	Zone 3C - Exc, haul, & place (rockfill, 4' max in 4' lifts, blasting operation 0.5 mile away) Downstream Shell	8313	5,565,000	CY	$8.03	$44,659,125
	90	Concrete deck (3,000 psi strength, 0.4% reinforcing)	8313	59,000	CY	$222.50	$13,127,500
	100	Concrete toe slab (3,000 psi strength, 0.3% reinforcing	8313	3,995	CY	$222.50	$888,888
	110	Anchor bars for toe slab (4' deep grouted into granite)	8313	17,910	anchors	$40.00	$716,400
	120	Parapet Wall (3,000 psi, 0.4% reinforcing)	8313	2,615	CY	$442.00	$1,155,830
	130	Drilling for grout program (setup, drill, test), setups=698	8313	46,150	LF	$32.40	$1,495,260
	140	Grouting (grout injection into competent granite.	8313	34,520	bags	$24.80	$856,096
	150	Unwatering (assumes 36 month construction duration)	8313	1	LS		$1,800,000
		Subtotal, CFRF Dam					**$116,055,764**
		SUMMARY OF COSTS					
		Diversion and Care of River					$99,400,000
		Spillway					$17,700,000
		Outlet Works					$9,100,000
		Powerplant					$107,600,000
		CFRF Dam					$116,100,000
		Mobilization - 5%					$17,500,000
		Subtotal					**$367,400,000**
		Unlisted Items - 15%					$52,600,000
		Contract Cost					**$420,000,000**
		Contingencies - 25%					$110,000,000
		Field Cost					**$530,000,000**

QUANTITIES		PRICES	
BY B. Foster	**CHECKED** S. Osgood 11/21/03	**BY** B. Foster	**CHECKED** S. Osgood 11/21/2003
DATE PREPARED 11/10/2003		**DATE** 11/10/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170 **ESTIMATE WORKSHEET** **SHEET__1__ OF __2____**

FEATURE:

RM279 Dam
Elev. 960 (Interpolated)
Concrete Gravity Dam (RCC)

PROJECT: **USJRBSI**

DIVISION:

FILE: C:\Documents and Settings\smosgood\Desktop\My Briefcase\Interpolated Costs\[MP279 - RCC - 900 1300.xls]Interpolated 960

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Diversion and care of river					
		Upstream Cofferdam (Crest @ El. 635)		707,430	CY	$16.00	$11,318,880
		Excavation for Left Abutment Diversion Tunnel		80,176	CY	$140.00	$11,224,640
		Concrete Liner for Left Abutment Diversion Tunnel		17,754	CY	$245.00	$4,349,730
		Rock Bolts - Left Abt. Div. Tunnel		2,037	Bolts	$530.00	$1,079,610
		Total Drilling - Left Abt. Div. Tunnel		36,666	LF	$20.00	$733,320
		Excavation for Right Abutment Diversion Tunnel		148,720	CY	$140.00	$20,820,800
		Concrete Liner for Right Abutment Diversion Tunnel		25,819	LBS	$245.00	$6,325,655
		Rock Bolts - Right Abt. Div. Tunnel		1,947	Bolts	$600.00	$1,168,200
		Total Drilling - Right Abt. Div. Tunnel		44,781	LF	$20.00	$895,620
		Downstream Cofferdam (Crest @ El. 578)		527,820	CY	$16.00	$8,445,120
	2	Excavation, all classes, for dam foundation		69,981	CY	$14.70	$1,028,721
	3	RCC in dam		2,633,281	CY	$35.50	$93,481,476
	4	Concrete facing elements		71,098	CY	$94.00	$6,683,212
	5	Concrete cap on top of dam		2,446	CY	$250.00	$611,500
	6	Leveling concrete in dam foundation		17,491	CY	$180.00	$3,148,380
	7	Concrete in spillway crest		2,300	CY	$200.00	$460,000
	8	Concrete in spillway training walls		372	CY	$350.00	$130,200
	9	Concrete in Outlet Works Intake Structure		3,110	CY	$280.00	$870,800
	10	Excavation of Outlet Shaft and Gate Structure		11,230	CY	$273.00	$3,065,790
	11	Temp. Supports - Rock Bolts		458	Bolts	$380.00	$174,040
	12	Total Drilling for Rock Bolts		5,272	LF	$20.00	$105,440
	13	Concrete in Outlet Shaft and Gate Structure		5,058	CY	$433.00	$2,190,114
		Subtotal					**$178,311,247**

QUANTITIES		PRICES	
BY B. Foster	**CHECKED** S. Osgood 11/21/03	**BY** B. Foster	**CHECKED** S. Osgood 11/21/2003
DATE PREPARED 11/10/2003	**APPROVED**	**DATE** 11/10/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170 **ESTIMATE WORKSHEET** **SHEET__2___ OF __2____**

FEATURE:

RM279 Dam
Elev 960 (Interpolated)
Concrete Gravity Dam (RCC)

PROJECT:

DIVISION:

FILE: \\Ossacfs-muni1\Jobs\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[MP279 - RCC - 900 1300.xls]Interpolated 1200

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	14	Excavation for Powerplant		142,924	CY	$15.00	$2,143,860
	15	Concrete in Powerplant		42,350	CY	$350.00	$14,822,500
	16	Furnishing and Handling Cement		548,891	TONS	$90.00	$49,400,226
	17	Furnishing and Handling Reinforcement		14,881,875	LBS	$0.60	$8,929,125
	18	Grout Hole Drillilng		41,790	LF	$33.50	$1,399,965
	19	Foundation Grouting		41,790	Sacks	$26.90	$1,124,151
	20	Set up for Drain Holes in Gallery		210	Holes	$200.00	$42,000
	21	Drilling Drain Holes		37,618	LF	$54.10	$2,035,134
	22	Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
	23	Steel Pipe		13,934,940	LBS	$1.50	$20,902,410
	24	Valves, all Sizes and Types		6,438,020	LBS	$5.00	$32,190,100
	25	Turbines		1,936,200	LBS	$6.50	$12,585,300
	26	Generators		1,752,000	LBS	$8.00	$14,016,000
	27	Governors, Motors, etc.		3-Units	LS		$3,600,000
		Subtotal pg 1					$178,311,247
		Subtotal pg 2					$164,428,271
		Mobilization					$17,000,000
		Subtotal					**$359,739,518**
		Unlited Items (15%)					$50,260,482
		Contract Cost					**$410,000,000**
		Contingencies (25%)					$110,000,000
		Field Cost					**$520,000,000**

QUANTITIES

BY	CHECKED
B. Foster	S. Osgood
DATE PREPARED	**APPROVED**
11/10/2003	

PRICES

BY	CHECKED
B. Foster	S. Osgood 11/21/2003
DATE	**PRICE LEVEL**
11/10/03	Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __3____

FEATURE:

RM279 Dam Site
Elev. 1100
Concrete Faced Rockfill Dam (CFRD)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279 900

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		1,792,470	CY	$13.50	$24,198,345
		Excavation for Left Abutment Diversion Tunnel		147,970	CY	$140.00	$20,715,800
		Concrete Liner for Left Abutment Diversion Tunnel		32,760	CY	$245.00	$8,026,200
		Rock Bolts - Left Abt. Div. Tunnel		3,430	Bolts	$600.00	$2,058,000
		Total Drilling - Left Abt. Div. Tunnel		61,740	LF	$20.00	$1,234,800
		Excavation for Right Abutment Diversion Tunnel		278,850	CY	$140.00	$39,039,000
		Concrete Liner for Right Abutment Diversion Tunnel		48,400	CY	$245.00	$11,858,000
		Rock Bolts - Right Abt. Div. Tunnel		3,010	Bolts	$600.00	$1,806,000
		Total Drilling - Right Abt. Div. Tunnel		69,230	LF	$20.00	$1,384,600
		Furnishing and Handling Cement		22,900	TONS	$100.00	$2,290,000
		Furnishing and Handling Reinforcement		12,174,000	LBS	$0.60	$7,304,400
		Diversion and Care of River Subtotal					**$119,915,145**
		Spillway					
		Excavation for Spillway		1,271,750	CY	$8.50	$10,809,875
		Concrete in spillway crest		6,250	CY	$180.00	$1,125,000
		Concrete in spillway training walls and Apron		2,750	CY	$220.00	$605,000
		Furnishing and Handling Cement		4,420	TONS	$110.00	$486,200
		Furnishing and Handling Reinforcement		2,350,500	LBS	$0.65	$1,527,825
		Concrete in Gravity Wall		6,670	CY	$250.00	$1,667,500
		Spillway subtotal					**$16,221,400**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2__ OF __3___

FEATURE:

RM279 Dam Site
Elev. 1100
Concrete Faced Rockfill Dam (CFRD)

PROJECT: USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279 900

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		OutletWorks					
		Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
		Excavatioon of Outlet Shaft and Gate Structure		12,470	CY	$280.00	$3,491,600
		Rock Bolt Supports		280	Bolts	$380.00	$106,400
		Total Drilling for Rock Bolts		6,440	LF	$20.00	$128,800
		Concrete in Outlet Shaft and Gate Structure		5,450	CY	$435.00	$2,370,750
		Furnishing and Handling Cement		2,360	TONS	$120.00	$283,200
		Furnishing and Handling Reinforcement		1,284,000	LBS	$0.65	$834,600
		Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
		Outlet Works subtotal					**$9,277,000**
		Powerplant					
		Steel Pipe		19,067,410	LBS	$1.50	$28,601,115
		Valves, all Sizes and Types		11,053,400	LBS	$5.00	$55,267,000
		Hydraulic Control System		150,000	LBS	$10.00	$1,500,000
		Concrete in Powerplant		42,350	CY	$350.00	$14,822,500
		Excavation for Powerplant		346,900	CY	$13.00	$4,509,700
		Furnishing and Handling Cement		11,945	TONS	$100.00	$1,194,500
		Furnishing and Handling Reinforcement		6,352,500	LBS	$0.60	$3,811,500
		Turbines		1,890,000	LBS	$6.50	$12,285,000
		Generators		2,340,000	LBS	$8.00	$18,720,000
		Governors, Motors, etc.		3-Units	LS		$3,600,000
		Powerplant subtotal					**$144,311,315**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL** Appraisal 03

CODE:D-8170 **ESTIMATE WORKSHEET** SHEET__3__ OF __3____

FEATURE:

RM279 Dam Site
Elev. 1100
Concrete Faced Rockfill Dam (CFRD)

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279_900

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CFRF Dam					
	20	Excavation - common (removal of alluvium, rock slope cleaning by dozer to sound rock, minimal ripping.)	8313	208,000	CY	$6.50	$1,352,000
	30	Zone 1A - Exc, haul, & place (CL, SM, GM in 6" lifts to 98% Proctor, 2 mile haul) Toe slab imperv. Cap	8313	30,000	CY	$9.00	$270,000
	40	Zone 1B - Exc, haul, & place (random in 18" lifts to 95% Proctor, 0.5 mile haul) Shell for Zone 1A	8313	50,000	CY	$7.00	$350,000
	50	Zone 2 - Exc, haul, & place processed SM, GM in 18" lifts to 98% Proctor, 0.5 mile haul) Deck foundation	8313	290,000	CY	$16.00	$4,640,000
	60	Zone 3A - Exc, haul, & place (processed GP in 18" lifts to 95% Proctor, 0.5 mile haul) Transition to Shell	8313	290,000	CY	$16.50	$4,785,000
	70	Zone 3B - Exc, haul, & place (rockfill, 18" max in 3' lifts, blasting operation 0.5 mile away) Upstream Shell	8313	10,000,000	CY	$7.75	$77,500,000
	80	Zone 3C - Exc, haul, & place (rockfill, 4' max in 4' lifts, blasting operation 0.5 mile away) Downstream Shell	8313	10,500,000	CY	$7.50	$78,750,000
	90	Concrete deck (3,000 psi strength, 0.4% reinforcing)	8313	97,500	CY	$205.00	$19,987,500
	100	Concrete toe slab (3,000 psi strength, 0.3% reinforcing	8313	5,500	CY	$205.00	$1,127,500
	110	Anchor bars for toe slab (4' deep grouted into granite)	8313	24,700	anchors	$40.00	$988,000
	120	Parapet Wall (3,000 psi, 0.4% reinforcing)	8313	4,050	CY	$400.00	$1,620,000
	130	Drilling for grout program (setup, drill, test), setups=1153	8313	71,000	LF	$31.00	$2,201,000
	140	Grouting (grout injection into competent granite.	8313	53,000	bags	$22.00	$1,166,000
	150	Unwatering (assumes 48 month construction duration)	8313	1	LS		$2,400,000
		Subtotal, CFRF Dam					**$197,137,000**
		SUMMARY OF COSTS					
		Diversion and Care of River					$119,900,000
		Spillway					$16,200,000
		Outlet Works					$9,300,000
		Powerplant					$144,300,000
		CFRF Dam					$197,100,000
		Mobilization - 5%					$24,000,000
		Subtotal					**$510,800,000**
		Unlisted Items - 15%					$79,200,000
		Contract Cost					**$590,000,000**
		Contingencies - 25%					$140,000,000
		Field Cost					**$730,000,000**

QUANTITIES		PRICES	
BY Mark Pabst		**BY** R. Baumgarten	**CHECKED**
DATE PREPARED 8/11/2002		**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __2___

FEATURE:

RM279 Dam
Elev. 1100
Concrete Gravity Dam (RCC)

PROJECT: USJRBSI

DIVISION:

FILE: C:\Documents and Settings\smosgood\Desktop\My Briefcase\Interpolated Costs\[MP279 - RCC - 900 1300.xls]1100 RCC

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Diversion and care of river					
		Upstream Cofferdam (Crest @ El. 635)		707,430	CY	$16.00	$11,318,880
		Excavation for Left Abutment Diversion Tunnel		86,770	CY	$140.00	$12,147,800
		Concrete Liner for Left Abutment Diversion Tunnel		19,210	CY	$245.00	$4,706,450
		Rock Bolts - Left Abt. Div. Tunnel		2,590	Bolts	$600.00	$1,554,000
		Total Drilling - Left Abt. Div. Tunnel		46,620	LF	$20.00	$932,400
		Excavation for Right Abutment Diversion Tunnel		160,550	CY	$140.00	$22,477,000
		Concrete Liner for Right Abutment Diversion Tunnel		27,870	LBS	$245.00	$6,828,150
		Rock Bolts - Right Abt. Div. Tunnel		2,850	Bolts	$600.00	$1,710,000
		Total Drilling - Right Abt. Div. Tunnel		65,550	LF	$20.00	$1,311,000
		Downstream Cofferdam (Crest @ El. 578)		519,000	CY	$16.00	$8,304,000
	2	Excavation, all classes, for dam foundation		114,690	CY	$14.00	$1,605,660
	3	RCC in dam		4,962,370	CY	$32.00	$158,795,840
	4	Concrete facing elements		116,780	CY	$80.00	$9,342,400
	5	Concrete cap on top of dam		4,420	CY	$250.00	$1,105,000
	6	Leveling concrete in dam foundation		28,670	CY	$180.00	$5,160,600
	7	Concrete in spillway crest		2,300	CY	$200.00	$460,000
	8	Concrete in spillway training walls		505	CY	$350.00	$176,750
	9	Concrete in Outlet Works Intake Structure		3,110	CY	$280.00	$870,800
	10	Excavation of Outlet Shaft and Gate Structure		12,630	CY	$280.00	$3,536,400
	11	Temp. Supports - Rock Bolts		570	Bolts	$380.00	$216,600
	12	Total Drilling for Rock Bolts		6,560	LF	$20.00	$131,200
	13	Concrete in Outlet Shaft and Gate Structure		5,450	CY	$440.00	$2,398,000
		Subtotal					**$255,088,930**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2___ OF __2___

FEATURE:

RM279 Dam
Elev 1100
Concrete Gravity Dam (RCC)

PROJECT:

DIVISION:

FILE: C:\Documents and Settings\smosgood\Desktop\My Briefcase\Interpolated Costs\[MP279 - RCC - 900 1300.xls]1100 RCC

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	14	Excavation for Powerplant		78,300	CY	$15.00	$1,174,500
	15	Concrete in Powerplant		42,350	CY	$350.00	$14,822,500
	16	Furnishing and Handling Cement		1,003,638	TONS	$90.00	$90,327,420
	17	Furnishing and Handling Reinforcement		15,782,250	LBS	$0.60	$9,469,350
	18	Grout Hole Drillilng		85,750	LF	$30.00	$2,572,500
	19	Foundation Grouting		85,750	Sacks	$22.00	$1,886,500
	20	Set up for Drain Holes in Gallery		343	Holes	$200.00	$68,600
	21	Drilling Drain Holes		76,930	LF	$52.00	$4,000,360
	22	Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
	23	Steel Pipe		19,067,410	LBS	$1.50	$28,601,115
	24	Valves, all Sizes and Types		11,053,400	LBS	$5.00	$55,267,000
	25	Turbines		1,890,000	LBS	$6.50	$12,285,000
	26	Generators		2,340,000	LBS	$8.00	$18,720,000
	27	Governors, Motors, etc.		3-Units	LS		$3,600,000
		Mobilization					$25,000,000
		Subtotal					**$524,121,275**
		Unlited Items (15%)					$75,878,725
		Contract Cost					**$600,000,000**
		Contingencies (25%)					$150,000,000
		Field Cost					**$750,000,000**

QUANTITIES

BY	CHECKED
S. Higinbotham	
DATE PREPARED	**APPROVED**

PRICES

BY	CHECKED
R. Baumgarten	
DATE	**PRICE LEVEL**
09/09/03	Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __2____

FEATURE:

RM279 Dam Site
Elev. 1200 (Interpolated)
Concrete Faced Rockfill Dam (CFRD)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279 1100

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		2,229,735	CY	$13.00	$28,986,555
		Excavation for Left Abutment Diversion Tunnel		180,785	CY	$140.00	$25,309,900
		Concrete Liner for Left Abutment Diversion Tunnel		40,030	CY	$250.00	$10,007,500
		Rock Bolts - Left Abt. Div. Tunnel		4,190	Bolts	$550.00	$2,304,500
		Total Drilling - Left Abt. Div. Tunnel		75,420	LF	$20.00	$1,508,400
		Excavation for Right Abutment Diversion Tunnel		299,425	CY	$140.00	$41,919,500
		Concrete Liner for Right Abutment Diversion Tunnel		52,000	CY	$250.00	$13,000,000
		Rock Bolts - Right Abt. Div. Tunnel		3,440	Bolts	$600.00	$2,064,000
		Total Drilling - Right Abt. Div. Tunnel		79,120	LF	$20.00	$1,582,400
		Furnishing and Handling Cement		25,960	TONS	$100.00	$2,596,000
		Furnishing and Handling Reinforcement		13,804,500	LBS	$0.60	$8,282,700
		Diversion and Care of River Subtotal					**$137,561,455**
		Spillway					
		Excavation for Spillway		1,456,875	CY	$8.50	$12,383,438
		Concrete in spillway crest		6,960	CY	$180.00	$1,252,800
		Concrete in spillway training walls and Apron		5,125	CY	$215.00	$1,101,875
		Furnishing and Handling Cement		4,350	TONS	$110.00	$478,500
		Furnishing and Handling Reinforcement		2,313,000	LBS	$0.65	$1,503,450
		Spillway subtotal					**$16,720,063**

QUANTITIES		PRICES	
BY B. Foster	**CHECKED** S. Osgood	**BY** B. Foster	**CHECKED** S. Osgood 11/21/2003
DATE PREPARED 11/10/2003	**APPROVED**	**DATE** 11/10/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2__ OF __3___

FEATURE:

RM279 Dam Site
Elev. 1200 (Interpolated)
Concrete Faced Rockfill Dam (CFRD)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279 1100

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Outlet Works					
		Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
		Excavatioon of Outlet Shaft and Gate Structure		12,600	CY	$280.00	$3,528,000
		Rock Bolt Supports		380	Bolts	$370.00	$140,600
		Total Drilling for Rock Bolts		6,100	LF	$20.00	$122,000
		Concrete in Outlet Shaft and Gate Structure		6,250	CY	$442.50	$2,765,625
		Furnishing and Handling Cement		2,615	TONS	$115.00	$300,725
		Furnishing and Handling Reinforcement		1,404,000	LBS	$0.65	$912,600
		Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
		Outlet Works subtotal					**$9,831,200**
		Powerplant					
		Steel Pipe		22,651,855	LBS	$1.50	$33,977,783
		Valves, all Sizes and Types		10,687,900	LBS	$5.00	$53,439,500
		Hydraulic Control System		168,500	LBS	$10.00	$1,685,000
		Concrete in Powerplant		42,350	CY	$350.00	$14,822,500
		Excavation for Powerplant		307,100	CY	$13.00	$3,992,300
		Furnishing and Handling Cement		11,945	TONS	$100.00	$1,194,500
		Furnishing and Handling Reinforcement		6,352,500	LBS	$0.60	$3,811,500
		Turbines		1,945,000	LBS	$6.50	$12,642,500
		Generators		2,420,000	LBS	$8.00	$19,360,000
		Governors, Motors, etc.		3-Units	LS		$3,600,000
		Powerplant subtotal					**$148,525,583**

QUANTITIES		PRICES	
BY	CHECKED	BY	CHECKED
B. Foster	S. Osgood 11/21/2003	B. Foster	S. Osgood 11/21/2003
DATE PREPARED	APPROVED	DATE	PRICE LEVEL
11/10/2003		11/10/03	Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__3__ OF __3____

FEATURE:

RM279 Dam Site
Elevation = 1200' (Interpolated)
Embankment Dam (CFRD)

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279 1100

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CFRF Dam					
	20	Excavation - common (removal of alluvium, rock slope cleaning by dozer to sound rock, minimal ripping.)	8313	634,000	CY	$5.50	$3,487,000
	30	Zone 1A - Exc, haul, & place (CL, SM, GM in 6" lifts to 98% Proctor, 2 mile haul) Toe slab imperv. Cap	8313	80,000	CY	$8.25	$660,000
	40	Zone 1B - Exc, haul, & place (random in 18" lifts to 95% Proctor, 0.5 mile haul) Shell for Zone 1A	8313	425,000	CY	$6.25	$2,656,250
	50	Zone 2 - Exc, haul, & place processed SM, GM in 18" lifts to 98% Proctor, 0.5 mile haul) Deck foundation	8313	495,500	CY	$15.50	$7,680,250
	60	Zone 3A - Exc, haul, & place (processed GP in 18" lifts to 95% Proctor, 0.5 mile haul) Transition to Shell	8313	495,500	CY	$15.50	$7,680,250
	70	Zone 3B - Exc, haul, & place (rockfill, 18" max in 3' lifts, blasting operation 0.5 mile away) Upstream Shell	8313	19,012,500	CY	$7.38	$140,217,188
	80	Zone 3C - Exc, haul, & place (rockfill, 4' max in 4' lifts, blasting operation 0.5 mile away) Downstream Shell	8313	19,550,000	CY	$7.13	$139,293,750
	90	Concrete deck (3,000 psi strength, 0.4% reinforcing)	8313	168,825	CY	$187.50	$31,654,688
	100	Concrete toe slab (3,000 psi strength, 0.3% reinforcing	8313	5,930	CY	$187.50	$1,111,875
	110	Anchor bars for toe slab (4' deep grouted into granite)	8313	26,650	anchors	$40.00	$1,066,000
	120	Parapet Wall (3,000 psi, 0.4% reinforcing)	8313	5,840	CY	$370.00	$2,160,800
	130	Drilling for grout program (setup, drill, test)	8313	81,175	LF	$30.00	$2,435,250
	140	Grouting (grout injection into competent granite.	8313	60,750	bags	$22.00	$1,336,500
	150	Unwatering	8313	1	LS		$3,150,000
		Subtotal, CFRF Dam					**$344,589,800**
		RCC Dike					
		Excavation, all classes, for Dike Foundation		4,660	CY	$8.50	$39,610
		RCC in Dike		42,330	CY	$48.00	$2,031,840
		Concrete facing elements in Dike		4,760	CY	$180.00	$856,800
		Concrete cap on top of Dike		560	CY	$250.00	$140,000
		Leveling concrete in Dike Foundation		935	CY	$200.00	$187,000
		Subtotal, RCC Dike					**$3,255,250**
		SUMMARY OF COSTS					
		Diversion and Care of River					$137,600,000
		Spillway					$16,700,000
		Outlet Works					$9,800,000
		Powerplant					$148,500,000
		CFRF Dam					$344,600,000
		RCC Dike					$3,300,000
		Mobilization - 5%					$33,000,000
		Subtotal					**$693,500,000**
		Unlisted Items - 15%					$106,500,000
		Contract Cost					**$800,000,000**
		Contingencies - 25%					$200,000,000
		Field Cost					**$1,000,000,000**

QUANTITIES		PRICES	
BY B. Foster	**CHECKED** S. Osgood 11/21/2003	**BY** B. Foster	**CHECKED** S. Osgood 11/21/2003
DATE PREPARED 11/10/03	**APPROVED**	**DATE** 11/10/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170 **ESTIMATE WORKSHEET** **SHEET__1__ OF __2____**

FEATURE:

RM279 Dam
Elev. 1200 (Interpolated)
Concrete Gravity Dam (RCC)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\USBR products\Cost Sheets - Sept 2003 - Updated Options\[pdc 900 FY03.xls]pdc 900 FY03

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		707,465	CY	$16.00	$11,319,440
		Excavation for Left Abutment Diversion Tunnel		89,285	CY	$140.00	$12,499,900
		Concrete Liner for Left Abutment Diversion Tunnel		19,770	CY	$245.00	$4,843,650
		Rock Bolts - Left Abt. Div. Tunnel		2,360	Bolts	$550.00	$1,298,000
		Total Drilling - Left Abt. Div. Tunnel		42,480	LF	$20.00	$849,600
		Excavation for Right Abutment Diversion Tunnel		161,425	CY	$140.00	$22,599,500
		Concrete Liner for Right Abutment Diversion Tunnel		28,015	CY	$245.00	$6,863,675
		Rock Bolts - Right Abt. Div. Tunnel		2,300	Bolts	$600.00	$1,380,000
		Total Drilling - Right Abt. Div. Tunnel		52,900	LF	$20.00	$1,058,000
		Downstream Cofferdam (Crest @ El. 578)		529,000	CY	$16.00	$8,464,000
	2	Excavation, all classes, for dam foundation		207,465	CY	$10.00	$2,074,650
	3	Excavation, all classes, for DIKE foundation		4,660	CY	$8.50	$39,610
	4	RCC in Dam		8,728,205	CY	$31.00	$270,574,355
	5	Concrete facing elements in Dam		189,090	CY	$70.00	$13,236,300
	6	Concrete cap on top of Dam		5,155	CY	$250.00	$1,288,750
	7	RCC in Dike		42,330	CY	$48.00	$2,031,840
	8	Concrete facing elements in Dike		4,760	CY	$180.00	$856,800
	9	Concrete cap on top of Dike		560	CY	$250.00	$140,000
	10	Leveling concrete in dam foundation		44,360	CY	$180.00	$7,984,800
	11	Leveling concrete in Dike foundation		935	CY	$200.00	$187,000
	12	Concrete in spillway crest		2,300	CY	$200.00	$460,000
	13	Concrete in spillway training walls		598	CY	$350.00	$209,125
	14	Concrete in Outlet Works Intake Structure		3,110	CY	$272.50	$847,475
	15	Excavation of Outlet Shaft and Gate Structure		12,330	CY	$280.00	$3,452,400
	16	Temp. Supports - Rock Bolts		510	Bolts	$380.00	$193,800
	17	Total Drilling for Rock Bolts		5,980	LF	$20.00	$119,600
	18	Concrete in Outlet Shaft and Gate Structure		6,245	CY	$465.00	$2,903,925
		Subtotal					**$377,776,195**

QUANTITIES		PRICES	
BY	**CHECKED**	**BY**	**CHECKED**
B. Foster	**S. Osgood 11/21/2003**	**B. Foster**	**S. Osgood 11/21/2003**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL**
11/10/2003		**11/10/03**	**Appraisal 03**

CODE:D-8170 **ESTIMATE WORKSHEET** **SHEET__2___ OF __2____**

FEATURE: **RM279 Dam** **Elev. 1200 (Interpolated)** **Concrete Gravity Dam (RCC)**	**PROJECT:** **USJRBSI**
	DIVISION:
	FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\USBR products\Cost Sheets - Sept 2003 - Updated Options\[pdc 900 FY03.xls]pdc 900 FY03

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	19	Excavation for Powerplant		195,815	CY	$14.00	$2,741,410
	20	Concrete in Powerplant		42,350	CY	$350.00	$14,822,500
	21	Furnishing and Handling Cement		1,746,799	TONS	$90.00	$157,211,910
	22	Furnishing and Handling Reinforcement		41,178,375	LBS	$0.60	$24,707,025
	23	Grout Hole Drillilng		109,175	LF	$28.50	$3,111,488
	24	Foundation Grouting		109,175	Sacks	$20.00	$2,183,500
	25	Set up for Drain Holes in Gallery		392	Holes	$200.00	$78,300
	26	Drilling Drain Holes		109,465	LF	$51.00	$5,582,715
	27	Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
	28	Steel Pipe		22,651,855	LBS	$1.50	$33,977,783
	29	Valves, all Sizes and Types		10,826,400	LBS	$5.00	$54,132,000
	30	Turbines		1,945,000	LBS	$6.50	$12,642,500
	31	Generators		2,420,000	LBS	$8.00	$19,360,000
	32	Governors, Motors, etc.		3-Units	LS		$3,600,000
		Subtotal pg 1					$377,776,195
		Subtotal pg 2					$335,388,630
		Mobilization					**$36,000,000**
		Subtotal					**$749,164,825**
		Unlited Items (15%)					$110,835,175
		Contract Cost					**$860,000,000**
		Contingencies (25%)					$240,000,000
		Field Cost					**$1,100,000,000**

QUANTITIES

BY **B. Foster**	**CHECKED** **S. Osgood 11/21/2003**
DATE PREPARED **11/10/2003**	**APPROVED**

PRICES

BY **B. Foster**	**CHECKED** **S. Osgood 11/21/2003**
DATE **11/10/03**	**PRICE LEVEL** **Appraisal 03**

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __2___

FEATURE:

RM279 Dam Site
Elev. 1300
Concrete Faced Rockfill Dam (CFRD)

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279 1100

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		2,667,000	CY	$12.50	$33,337,500
		Excavation for Left Abutment Diversion Tunnel		213,600	CY	$140.00	$29,904,000
		Concrete Liner for Left Abutment Diversion Tunnel		47,300	CY	$255.00	$12,061,500
		Rock Bolts - Left Abt. Div. Tunnel		4,950	Bolts	$500.00	$2,475,000
		Total Drilling - Left Abt. Div. Tunnel		89,100	LF	$20.00	$1,782,000
		Excavation for Right Abutment Diversion Tunnel		320,000	CY	$140.00	$44,800,000
		Concrete Liner for Right Abutment Diversion Tunnel		55,600	CY	$255.00	$14,178,000
		Rock Bolts - Right Abt. Div. Tunnel		3,870	Bolts	$600.00	$2,322,000
		Total Drilling - Right Abt. Div. Tunnel		89,010	LF	$20.00	$1,780,200
		Furnishing and Handling Cement		29,020	TONS	$100.00	$2,902,000
		Furnishing and Handling Reinforcement		15,435,000	LBS	$0.60	$9,261,000
		Diversion and Care of River Subtotal					**$154,803,200**
		Spillway					
		Excavation for Spillway		1,642,000	CY	$8.50	$13,957,000
		Concrete in spillway crest		7,670	CY	$180.00	$1,380,600
		Concrete in spillway training walls and Apron		7,500	CY	$210.00	$1,575,000
		Furnishing and Handling Cement		4,280	TONS	$110.00	$470,800
		Furnishing and Handling Reinforcement		2,275,500	LBS	$0.65	$1,479,075
		Spillway subtotal					**$18,862,475**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL** Appraisal 03

CODE:D-8170 **ESTIMATE WORKSHEET** SHEET__2__ OF __3____

FEATURE:

RM279 Dam Site
Elev. 1300
Concrete Faced Rockfill Dam (CFRD)

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279 1100

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		OutletWorks					
		Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
		Excavatioon of Outlet Shaft and Gate Structure		12,730	CY	$280.00	$3,564,400
		Rock Bolt Supports		480	Bolts	$360.00	$172,800
		Total Drilling for Rock Bolts		5,760	LF	$20.00	$115,200
		Concrete in Outlet Shaft and Gate Structure		7,050	CY	$450.00	$3,172,500
		Furnishing and Handling Cement		2,870	TONS	$110.00	$315,700
		Furnishing and Handling Reinforcement		1,524,000	LBS	$0.65	$990,600
		Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
		Outlet Works subtotal					**$10,392,850**
		Powerplant					
		Steel Pipe		26,236,300	LBS	$1.50	$39,354,450
		Valves, all Sizes and Types		10,322,400	LBS	$5.00	$51,612,000
		Hydraulic Control System		187,000	LBS	$10.00	$1,870,000
		Concrete in Powerplant		42,350	CY	$350.00	$14,822,500
		Excavation for Powerplant		267,300	CY	$13.00	$3,474,900
		Furnishing and Handling Cement		11,945	TONS	$100.00	$1,194,500
		Furnishing and Handling Reinforcement		6,352,500	LBS	$0.60	$3,811,500
		Turbines		2,000,000	LBS	$6.50	$13,000,000
		Generators		2,500,000	LBS	$8.00	$20,000,000
		Governors, Motors, etc.		3-Units	LS		$3,600,000
		Powerplant subtotal					**$152,739,850**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__3__ OF __3___

FEATURE:

RM279 Dam Site
Elevation = 1300'
Embankment Dam (CFRD)

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP279 CFRF 2003.xls]MP279 1100

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CFRF Dam					
	20	Excavation - common (removal of alluvium, rock slope cleaning by dozer to sound rock, minimal ripping.)	8313	1,060,000	CY	$4.50	$4,770,000
	30	Zone 1A - Exc, haul, & place (CL, SM, GM in 6" lifts to 98% Proctor, 2 mile haul) Toe slab imperv. Cap	8313	130,000	CY	$7.50	$975,000
	40	Zone 1B - Exc, haul, & place (random in 18" lifts to 95% Proctor, 0.5 mile haul) Shell for Zone 1A	8313	800,000	CY	$5.50	$4,400,000
	50	Zone 2 - Exc, haul, & place processed SM, GM in 18" lifts to 98% Proctor, 0.5 mile haul) Deck foundation	8313	701,000	CY	$15.00	$10,515,000
	60	Zone 3A - Exc, haul, & place (processed GP in 18" lifts to 95% Proctor, 0.5 mile haul) Transition to Shell	8313	701,000	CY	$14.50	$10,164,500
	70	Zone 3B - Exc, haul, & place (rockfill, 18" max in 3' lifts, blasting operation 0.5 mile away) Upstream Shell	8313	28,025,000	CY	$7.00	$196,175,000
	80	Zone 3C - Exc, haul, & place (rockfill, 4' max in 4' lifts, blasting operation 0.5 mile away) Downstream Shell	8313	28,600,000	CY	$6.75	$193,050,000
	90	Concrete deck (3,000 psi strength, 0.4% reinforcing)	8313	240,150	CY	$170.00	$40,825,500
	100	Concrete toe slab (3,000 psi strength, 0.3% reinforcing	8313	6,360	CY	$170.00	$1,081,200
	110	Anchor bars for toe slab (4' deep grouted into granite)	8313	28,600	anchors	$40.00	$1,144,000
	120	Parapet Wall (3,000 psi, 0.4% reinforcing)	8313	7,630	CY	$340.00	$2,594,200
	130	Drilling for grout program (setup, drill, test), setups=1334	8313	91,350	LF	$29.00	$2,649,150
	140	Grouting (grout injection into competent granite.	8313	68,500	bags	$22.00	$1,507,000
	150	Unwatering (assumes 36 month construction duration)	8313	1	LS		$3,900,000
		Subtotal, CFRF Dam					**$473,750,550**
		RCC Dike					
		Excavation, all classes, for Dike Foundation		9,320	CY	$8.50	$79,220
		RCC in Dike		84,660	CY	$48.00	$4,063,680
		Concrete facing elements in Dike		9,520	CY	$180.00	$1,713,600
		Concrete cap on top of Dike		1,120	CY	$250.00	$280,000
		Leveling concrete in Dike Foundation		1,870	CY	$200.00	$374,000
		Subtotal, RCC Dike					**$6,510,500**
		SUMMARY OF COSTS					
		Diversion and Care of River					$154,800,000
		Spillway					$18,900,000
		Outlet Works					$10,400,000
		Powerplant					$152,700,000
		CFRF Dam					$473,800,000
		Saddle Dam - RCC Dike					$6,500,000
		Mobilization - 5%					$41,000,000
		Subtotal					**$858,100,000**
		Unlisted Items - 15%					$131,900,000
		Contract Cost					**$990,000,000**
		Contingencies - 25%					$210,000,000
		Field Cost					**$1,200,000,000**

QUANTITIES		PRICES	
BY Mark Pabst, Steve Higinbotham	CHECKED Mark Pabst	BY R Baumgarten	CHECKED
DATE PREPARED 7/1/2003	APPROVED	DATE	PRICE LEVEL Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __2___

FEATURE:
RM279 Dam
Elev. 1300
Concrete Gravity Dam (RCC)

PROJECT: **USJRBSI**

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\USBR products\Cost Sheets - Sept 2003 - Updated Options\[pdc 900 FY03.xls]pdc 900 FY03

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		707,500	CY	$16.00	$11,320,000
		Excavation for Left Abutment Diversion Tunnel		91,800	CY	$140.00	$12,852,000
		Concrete Liner for Left Abutment Diversion Tunnel		20,330	CY	$245.00	$4,980,850
		Rock Bolts - Left Abt. Div. Tunnel		2,130	Bolts	$500.00	$1,065,000
		Total Drilling - Left Abt. Div. Tunnel		38,340	LF	$20.00	$766,800
		Excavation for Right Abutment Diversion Tunnel		162,300	CY	$140.00	$22,722,000
		Concrete Liner for Right Abutment Diversion Tunnel		28,160	CY	$245.00	$6,899,200
		Rock Bolts - Right Abt. Div. Tunnel		1,750	Bolts	$600.00	$1,050,000
		Total Drilling - Right Abt. Div. Tunnel		40,250	LF	$20.00	$805,000
		Downstream Cofferdam (Crest @ El. 578)		539,000	CY	$16.00	$8,624,000
	2	Excavation, all classes, for dam foundation		300,240	CY	$6.00	$1,801,440
	3	Excavation, all classes, for DIKE foundation		9,320	CY	$8.50	$79,220
	4	RCC in Dam		12,494,040	CY	$30.00	$374,821,200
	5	Concrete facing elements in Dam		261,400	CY	$60.00	$15,684,000
	6	Concrete cap on top of Dam		5,890	CY	$250.00	$1,472,500
	7	RCC in Dike		84,660	CY	$48.00	$4,063,680
	8	Concrete facing elements in Dike		9,520	CY	$180.00	$1,713,600
	9	Concrete cap on top of Dike		1,120	CY	$250.00	$280,000
	10	Leveling concrete in dam foundation		60,050	CY	$180.00	$10,809,000
	11	Leveling concrete in Dike foundation		1,870	CY	$200.00	$374,000
	12	Concrete in spillway crest		2,300	CY	$200.00	$460,000
	13	Concrete in spillway training walls		690	CY	$350.00	$241,500
	14	Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
	15	Excavation of Outlet Shaft and Gate Structure		12,030	CY	$280.00	$3,368,400
	16	Temp. Supports - Rock Bolts		450	Bolts	$380.00	$171,000
	17	Total Drilling for Rock Bolts		5,400	LF	$20.00	$108,000
	18	Concrete in Outlet Shaft and Gate Structure		7,040	CY	$490.00	$3,449,600
		Subtotal					**$490,806,140**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2___ OF __2___

FEATURE:
RM279 Dam
Elev. 1300
Concrete Gravity Dam (RCC)

PROJECT: **USJRBSI**

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\USBR products\Cost Sheets - Sept 2003 - Updated Options\[pdc 900 FY03.xls]pdc 900 FY03

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	19	Excavation for Powerplant		313,330	CY	$13.00	$4,073,290
	20	Concrete in Powerplant		42,350	CY	$350.00	$14,822,500
	21	Furnishing and Handling Cement		2,489,960	TONS	$90.00	$224,096,400
	22	Furnishing and Handling Reinforcement		66,574,500	LBS	$0.60	$39,944,700
	23	Grout Hole Drillilng		132,600	LF	$27.00	$3,580,200
	24	Foundation Grouting		132,600	Sacks	$18.00	$2,386,800
	25	Set up for Drain Holes in Gallery		440	Holes	$200.00	$88,000
	26	Drilling Drain Holes		142,000	LF	$50.00	$7,100,000
	27	Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
	28	Steel Pipe		26,236,300	LBS	$1.50	$39,354,450
	29	Valves, all Sizes and Types		10,599,400	LBS	$5.00	$52,997,000
	30	Turbines		2,000,000	LBS	$6.50	$13,000,000
	31	Generators		2,500,000	LBS	$8.00	$20,000,000
	32	Governors, Motors, etc.		3-Units	LS		$3,600,000
		Subtotal pg 1					$490,806,140
		Subtotal pg 2					$426,280,840
		Mobilization (5%)					**$46,000,000**
		Subtotal					**$963,086,980**
		Unlited Items (15%)					$136,913,020
		Contract Cost					**$1,100,000,000**
		Contingencies (25%)					$300,000,000
		Field Cost					**$1,400,000,000**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __3____

FEATURE:

RM286 Dam Site
Elev. 1200
Concrete Faced Rockfill Dam (CFRD)

PROJECT: USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP286 CFRF.xls]MP286_1400

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		159,100	CY	$21.00	$3,341,100
		Excavation for Left Abutment Diversion Tunnel		207,870	CY	$140.00	$29,101,800
		Concrete Liner for Left Abutment Diversion Tunnel		36,080	CY	$240.00	$8,659,200
		Rock Bolts - Left Abt. Div. Tunnel		2,250	Bolts	$600.00	$1,350,000
		Total Drilling - Left Abt. Div. Tunnel		51,750	LF	$20.00	$1,035,000
		Excavation for Right Abutment Diversion Tunnel		93,830	CY	$140.00	$13,136,200
		Concrete Liner for Right Abutment Diversion Tunnel		20,770	CY	$240.00	$4,984,800
		Rock Bolts - Right Abt. Div. Tunnel		2,170	Bolts	$600.00	$1,302,000
		Total Drilling - Right Abt. Div. Tunnel		39,060	LF	$20.00	$781,200
		Furnishing and Handling Cement		16,030	TONS	$100.00	$1,603,000
		Furnishing and Handling Reinforcement		8,527,500	LBS	$0.60	$5,116,500
		Diversion and Care of River Subtotal					**$70,410,800**
		Spillway					
		Excavation for Spillway		7,474,700	CY	$7.00	$52,322,900
		Concrete in spillway crest		7,670	CY	$180.00	$1,380,600
		Concrete in spillway training walls and Apron		7,500	CY	$210.00	$1,575,000
		Furnishing and Handling Cement		4,000	TONS	$110.00	$440,000
		Furnishing and Handling Reinforcement		2,125,500	LBS	$0.65	$1,381,575
		Spillway subtotal					**$57,100,075**

QUANTITIES		PRICES	
BY S. Higinbotham	CHECKED	BY R. Baumgarten	CHECKED
DATE PREPARED	APPROVED	DATE 09/09/03	PRICE LEVEL Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2___ OF __3____

FEATURE:

RM286 Dam Site
Elev. 1200
Concrete Faced Rockfill Dam (CFRD)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP286 CFRF.xls]MP286_1400

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		OutletWorks					
		Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
		Excavatioon of Outlet Shaft and Gate Structure		11,180	CY	$280.00	$3,130,400
		Rock Bolt Supports		400	Bolts	$380.00	$152,000
		Total Drilling for Rock Bolts		4,800	LF	$20.00	$96,000
		Concrete in Outlet Shaft and Gate Structure		5,440	CY	$440.00	$2,393,600
		Furnishing and Handling Cement		1,540	TONS	$120.00	$184,800
		Furnishing and Handling Reinforcement		816,000	LBS	$0.65	$530,400
		Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
		Outlet Works subtotal					**$8,548,850**
		Powerplant					
		Steel Pipe		11,735,310	LBS	$1.50	$17,602,965
		Valves, all Sizes and Types		2,666,000	LBS	$5.00	$13,330,000
		Hydraulic Control System		120,000	LBS	$10.00	$1,200,000
		Concrete in Control House & Powerplant		45,700	CY	$350.00	$15,995,000
		Excavation for Powerplant		504,000	CY	$12.00	$6,048,000
		Furnishing and Handling Cement		12,890	TONS	$90.00	$1,160,100
		Furnishing and Handling Reinforcement		6,855,000	LBS	$0.60	$4,113,000
		Turbines		1,956,000	LBS	$6.50	$12,714,000
		Generators		1,500,000	LBS	$8.00	$12,000,000
		Governors, Motors, etc.		3-Units	LS		$3,600,000
		Powerplant subtotal					**$87,763,065**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__3___ OF __3____

FEATURE:

RM286 Dam Site
Elevation = 1200'
Embankment

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP286 CFRF.xls]MP286 1400

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CFRF Dam					
	20	Excavation - common (removal of alluvium, rock slope cleaning by dozer to sound rock, minimal ripping.)	8313	137,200	CY	$6.50	$891,800
	30	Zone 1A - Exc, haul, & place (CL, SM, GM in 6" lifts to 98% Proctor, 2 mile haul) Toe slab imperv. Cap	8313	12,000	CY	$11.00	$132,000
	40	Zone 1B - Exc, haul, & place (random in 18" lifts to 95% Proctor, 0.5 mile haul) Shell for Zone 1A	8313	68,000	CY	$6.50	$442,000
	50	Zone 2 - Exc, haul, & place processed SM, GM in 18" lifts to 98% Proctor, 0.5 mile haul) Deck foundation	8313	83,700	CY	$20.00	$1,674,000
	60	Zone 3A - Exc, haul, & place (processed GP in 18" lifts to 95% Proctor, 0.5 mile haul) Transition to Shell	8313	83,700	CY	$19.50	$1,632,150
	70	Zone 3B - Exc, haul, & place (rockfill, 18" max in 3' lifts, blasting operation 0.5 mile away) Upstream Shell	8313	2,340,000	CY	$9.00	$21,060,000
	80	Zone 3C - Exc, haul, & place (rockfill, 4' max in 4' lifts, blasting operation 0.5 mile away) Downstream Shell	8313	2,400,000	CY	$8.75	$21,000,000
	90	Concrete deck (3,000 psi strength, 0.4% reinforcing)	8313	28,400	CY	$240.00	$6,816,000
	100	Concrete toe slab (3,000 psi strength, 0.3% reinforcing	8313	1,500	CY	$240.00	$360,000
	110	Anchor bars for toe slab (4' deep grouted into granite)	8313	6,760	anchors	$40.00	$270,400
	120	Parapet Wall (3,000 psi, 0.4% reinforcing)	8313	1,400	CY	$490.00	$686,000
	130	Drilling for grout program (setup, drill, test), setups= 315	8313	19,350	LF	$34.00	$657,900
	140	Grouting (grout injection into competent granite.	8313	14,500	bags	$32.00	$464,000
	150	Unwatering (assumes 48 month duration)	8313	1	LS		$2,400,000
		Subtotal, CFRF Dam					**$58,486,250**
		SUMMARY OF COSTS					
		Diversion and Care of River					$70,400,000
		Spillway					$57,100,000
		Outlet Works					$8,550,000
		Powerplant					$87,800,000
		CFRF Dam					$58,500,000
		Mobilization - 5%					$14,000,000
		Subtotal					**$296,350,000**
		Unlisted Items - 15%					$43,650,000
		Contract Cost					**$340,000,000**
		Contingencies - 25%					$90,000,000
		Field Cost					**$430,000,000**

QUANTITIES		PRICES	
BY Mark Pabst	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __2___

FEATURE:

RM286 Dam
Elev. 1200
Concrete Gravity Dam (RCC)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[Arch 1200-1400.xls]ARCH Interpolation

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Diversion and care of river					
		Upstream Cofferdam (Crest @ El. 850)		197,100	CY	$20.00	$3,942,000
		Excavation for Left Abutment Diversion Tunnel		147,600	CY	$140.00	$20,664,000
		Concrete Liner for Left Abutment Diversion Tunnel		25,620	CY	$245.00	$6,276,900
		Rock Bolts - Left Abt. Div. Tunnel		1,600	Bolts	$600.00	$960,000
		Total Drilling - Left Abt. Div. Tunnel		36,800	LF	$20.00	$736,000
		Excavation for Right Abutment Diversion Tunnel		77,700	CY	$140.00	$10,878,000
		Concrete Liner for Right Abutment Diversion Tunnel		17,200	CY	$245.00	$4,214,000
		Rock Bolts - Right Abt. Div. Tunnel		1,800	Bolts	$500.00	$900,000
		Total Drilling - Right Abt. Div. Tunnel		32,400	LF	$20.00	$648,000
		Downstream Cofferdam (Crest @ El. 770)		13,000	CY	$22.00	$286,000
	2	Excavation, all classes, for dam foundation(50%rock)		49,960	CY	$8.50	$424,660
	3	RCC in dam		1,129,200	CY	$38.00	$42,909,600
	4	Concrete facing elements		41,220	CY	$110.00	$4,534,200
	5	Concrete cap on top of dam		860	CY	$250.00	$215,000
	6	Leveling concrete in dam foundation		9,990	CY	$190.00	$1,898,100
	7	Concrete in spillway crest		2,300	CY	$200.00	$460,000
	8	Concrete in spillway training walls		300	CY	$350.00	$105,000
	9	Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
	10	Excavation of Outlet Shaft and Gate Structure		11,010	CY	$280.00	$3,082,800
	11	Temp. Supports - Rock Bolts		390	Bolts	$380.00	$148,200
	12	Total Drilling for Rock Bolts		4,680	LF	$20.00	$93,600
	13	Concrete in Outlet Shaft and Gate Structure		5,390	CY	$440.00	$2,371,600
		Subtotal					$106,571,810

QUANTITIES		PRICES	
BY: S. Higinbotham	CHECKED	BY: R. Baumgarten	CHECKED
DATE PREPARED	APPROVED	DATE: 10/17/03	PRICE LEVEL: Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2___ OF __2___

FEATURE:

RM286 Dam
Elev. 1200
Concrete Gravity Dam (RCC)

PROJECT: USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[Arch 1200-1400.xls]ARCH Interpolation

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	14	Excavation for Powerplant		502,200	CY	$12.00	$6,026,400
	15	Concrete in Powerplant		45,700	CY	$350.00	$15,995,000
	16	Furnishing and Handling Cement		255,063	TONS	$90.00	$22,955,670
	17	Furnishing and Handling Reinforcement		21,253,500	LBS	$0.60	$12,752,100
	18	Grout Hole Drillilng		10,300	LF	$36.00	$370,800
	19	Foundation Grouting		10,300	Sacks	$32.00	$329,600
	20	Set up for Drain Holes in Gallery		100	Holes	$200.00	$20,000
	21	Drilling Drain Holes		19,000	LF	$55.00	$1,045,000
	22	Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
	23	Steel Pipe		11,735,310	LBS	$1.50	$17,602,965
	24	Valves, all Sizes and Types		2,786,000	LBS	$5.00	$13,930,000
	25	Turbines		1,956,000	LBS	$6.50	$12,714,000
	26	Generators		1,500,000	LBS	$8.00	$12,000,000
	27	Governors, Motors, etc.		3-Units	LS		$3,600,000
		Subtotal pg 1					$106,571,810
		Subtotal pg 2					$120,579,035
		Mobilization					$11,500,000
		Subtotal					**$238,650,845**
		Unlited Items (15%)					$31,349,155
		Contract Cost					**$270,000,000**
		Contingencies (25%)					$70,000,000
		Field Cost					**$340,000,000**

QUANTITIES		PRICES	
BY S. Higinbotham	CHECKED	BY R. Baumgarten	CHECKED
DATE PREPARED	APPROVED	DATE 09/09/03	PRICE LEVEL Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __2___

FEATURE:

RM286 Dam
Elev. 1200
Concrete Arch

PROJECT:
USJRBSI

DIVISION:

FILE:
C:\Documents and Settings\smosgood\Desktop\My Briefcase\Interpolated Costs\[MP286 - ARCH - 1200 1400.xls]1200 ARCH

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Diversion and care of river					
		Upstream Cofferdam (Crest @ El. 850)		159,910	CY	$21.00	$3,358,110
		Excavation for Left Abutment Diversion Tunnel		112,670	CY	$140.00	$15,773,800
		Concrete Liner for Left Abutment Diversion Tunnel		19,560	CY	$245.00	$4,792,200
		Rock Bolts - Left Abt. Div. Tunnel		1,220	Bolts	$600.00	$732,000
		Total Drilling - Left Abt. Div. Tunnel		26,840	LF	$20.00	$536,800
		Excavation for Right Abutment Diversion Tunnel		80,039	CY	$140.00	$11,205,460
		Concrete Liner for Right Abutment Diversion Tunnel		17,720	LBS	$245.00	$4,341,400
		Rock Bolts - Right Abt. Div. Tunnel		1,855	Bolts	$500.00	$927,500
		Total Drilling - Right Abt. Div. Tunnel		33,390	LF	$20.00	$667,800
		Downstream Cofferdam (Crest @ El. 770)		9,890	CY	$22.00	$217,580
	2	Excavation, all classes, for dam foundation		38,040	CY	$19.00	$722,760
	3	Mass Concrete in dam		384,540	CY	$140.00	$53,835,600
	4	Temperature control of concrete		384,540	CY	$11.00	$4,229,940
	5	Leveling concrete in dam foundation		3,800	CY	$200.00	$760,000
	6	Concrete in spillway crest		11,670	CY	$180.00	$2,100,600
	7	Concrete in spillway training walls		660	CY	$350.00	$231,000
	8	Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
	9	Excavation of Outlet Shaft and Gate Structure		11,010	CY	$280.00	$3,082,800
	10	Temp. Supports - Rock Bolts		390	Bolts	$380.00	$148,200
	11	Total Drilling for Rock Bolts		4,680	LF	$20.00	$93,600
	12	Concrete in Outlet Shaft and Gate Structure		5,390	CY	$440.00	$2,371,600
	13	Excavation for Powerplant		504,000	CY	$12.00	$6,048,000
	14	Concrete in Powerplant		45,700	CY	$350.00	$15,995,000
		Subtotal					**$132,995,900**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2___ OF __2___

FEATURE:

RM286 Dam
Elev. 1200
Concrete Arch

PROJECT:

DIVISION:

FILE: C:\Documents and Settings\smosgood\Desktop\My Briefcase\Interpolated Costs\[MP286 - ARCH - 1200 1400.xls]1200 ARCH

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	15	Top of Dam Concrete		2,500	CY	$225.00	$562,500
	16	Furnishing and Handling Cement		103,334	TONS	$90.00	$9,300,060
	17	Furnishing and Handling Reinforcement		15,945,000	LBS	$0.60	$9,567,000
	18	Grout Hole Drilliing		18,000	LF	$35.00	$630,000
	19	Foundation Grouting		18,000	Sacks	$31.00	$558,000
	20	Set up for Drain Holes in Gallery		92	Holes	$200.00	$18,400
	21	Drilling Drain Holes		11,430	LF	$60.00	$685,800
	22	Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
	23	Steel Pipe		11,735,310	LBS	$1.50	$17,602,965
	24	Valves, all Sizes and Types		2,786,000	LBS	$5.00	$13,930,000
	25	Turbines		1,956,000	LBS	$6.50	$12,714,000
	26	Generators		1,500,000	LBS	$8.00	$12,000,000
	27	Governors, Motors, etc.		3-Units	LS		$3,600,000
		Subtotal pg 1					$132,995,900
		Subtotal pg 2					$82,406,225
		Mobilization					$11,000,000
		Subtotal					**$226,402,125**
		Unlited Items (15%)					$33,597,875
		Contract Cost					**$260,000,000**
		Contingencies (25%)					$70,000,000
		Field Cost					**$330,000,000**

QUANTITIES

BY	CHECKED
S. Higinbotham	
DATE PREPARED	**APPROVED**

PRICES

BY	CHECKED
R. Baumgarten	
DATE	**PRICE LEVEL**
09/09/03	Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __3____

FEATURE:

RM286 Dam Site
Elev. 1300 (Interpolated)
Concrete Faced Rockfill Dam (CFRD)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP286 CFRF.xls]MP286_1400

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		152,800	CY	$21.00	$3,208,800
		Excavation for Left Abutment Diversion Tunnel		205,900	CY	$140.00	$28,826,000
		Concrete Liner for Left Abutment Diversion Tunnel		35,740	CY	$240.00	$8,577,600
		Rock Bolts - Left Abt. Div. Tunnel		2,230	Bolts	$600.00	$1,338,000
		Total Drilling - Left Abt. Div. Tunnel		51,290	LF	$20.00	$1,025,800
		Excavation for Right Abutment Diversion Tunnel		109,975	CY	$140.00	$15,396,500
		Concrete Liner for Right Abutment Diversion Tunnel		24,345	CY	$240.00	$5,842,800
		Rock Bolts - Right Abt. Div. Tunnel		2,545	Bolts	$550.00	$1,399,750
		Total Drilling - Right Abt. Div. Tunnel		45,810	LF	$20.00	$916,200
		Furnishing and Handling Cement		16,945	TONS	$100.00	$1,694,500
		Furnishing and Handling Reinforcement		9,012,750	LBS	$0.60	$5,407,650
		Diversion and Care of River Subtotal					**$73,633,600**
		Spillway					
		Excavation for Spillway		7,232,550	CY	$7.00	$50,627,847
		Concrete in spillway crest		7,670	CY	$180.00	$1,380,600
		Concrete in spillway training walls and Apron		7,500	CY	$210.00	$1,575,000
		Furnishing and Handling Cement		4,140	TONS	$110.00	$455,400
		Furnishing and Handling Reinforcement		2,200,500	LBS	$0.65	$1,430,325
		Spillway subtotal					**$55,469,172**

QUANTITIES		PRICES	
BY B. Foster	**CHECKED** S. Osgood 11/23/2003	**BY** B. Foster	**CHECKED** S. Osgood 11/23/2003
DATE PREPARED 11/10/2003	**APPROVED**	**DATE** 11/10/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2___ OF __3____

FEATURE:

RM286 Dam Site
Elev. 1300 (Interpolated)
Concrete Faced Rockfill Dam (CFRD)

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP286 CFRF.xls]MP286_1400

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		OutletWorks					
		Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
		Excavatioon of Outlet Shaft and Gate Structure		11,180	CY	$280.00	$3,130,400
		Rock Bolt Supports		400	Bolts	$380.00	$152,000
		Total Drilling for Rock Bolts		4,800	LF	$20.00	$96,000
		Concrete in Outlet Shaft and Gate Structure		5,955	CY	$445.00	$2,649,975
		Furnishing and Handling Cement		2,120	TONS	$120.00	$254,400
		Furnishing and Handling Reinforcement		1,126,500	LBS	$0.65	$732,225
		Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
		Outlet Works subtotal					**$9,076,650**
		Powerplant					
		Steel Pipe		15,401,360	LBS	$1.50	$23,102,040
		Valves, all Sizes and Types		3,886,700	LBS	$5.00	$19,433,500
		Hydraulic Control System		135,000	LBS	$10.00	$1,350,000
		Concrete in Control House & Powerplant		45,700	CY	$350.00	$15,995,000
		Excavation for Powerplant		504,000	CY	$12.00	$6,048,000
		Furnishing and Handling Cement		12,890	TONS	$95.00	$1,224,550
		Furnishing and Handling Reinforcement		6,855,000	LBS	$0.60	$4,113,000
		Turbines		1,923,000	LBS	$6.50	$12,499,500
		Generators		1,920,000	LBS	$8.00	$15,360,000
		Governors, Motors, etc.		3-Units	LS		$3,600,000
		Powerplant subtotal					**$102,725,590**

QUANTITIES		PRICES	
BY B. Foster	**CHECKED** S. Osgood 11/23/2003	**BY** B. Foster	**CHECKED** S. Osgood 11/23/2003
DATE PREPARED 11/10/2003	**APPROVED**	**DATE** 11/10/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__3___ OF __3____

FEATURE:

RM286 Dam Site
Elevation = 1300' (Interpolated)
Embankment Dam (CFRD)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP286 CFRF.xls]MP286 1400

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CFRF Dam					
	20	Excavation - common (removal of alluvium, rock slope cleaning by dozer to sound rock, minimal ripping.)	8313	218,350	CY	$6.00	$1,310,100
	30	Zone 1A - Exc, haul, & place (CL, SM, GM in 6" lifts to 98% Proctor, 2 mile haul) Toe slab imperv. Cap	8313	23,500	CY	$10.00	$235,000
	40	Zone 1B - Exc, haul, & place (random in 18" lifts to 95% Proctor, 0.5 mile haul) Shell for Zone 1A	8313	129,000	CY	$6.25	$806,250
	50	Zone 2 - Exc, haul, & place processed SM, GM in 18" lifts to 98% Proctor, 0.5 mile haul) Deck foundation	8313	124,925	CY	$19.00	$2,373,575
	60	Zone 3A - Exc, haul, & place (processed GP in 18" lifts to 95% Proctor, 0.5 mile haul) Transition to Shell	8313	124,925	CY	$18.50	$2,311,113
	70	Zone 3B - Exc, haul, & place (rockfill, 18" max in 3' lifts, blasting operation 0.5 mile away) Upstream Shell	8313	4,556,000	CY	$8.50	$38,726,000
	80	Zone 3C - Exc, haul, & place (rockfill, 4' max in 4' lifts, blasting operation 0.5 mile away) Downstream Shell	8313	4,655,000	CY	$8.25	$38,403,750
	90	Concrete deck (3,000 psi strength, 0.4% reinforcing)	8313	42,800	CY	$227.50	$9,737,000
	100	Concrete toe slab (3,000 psi strength, 0.3% reinforcing	8313	1,925	CY	$227.50	$437,938
	110	Anchor bars for toe slab (4' deep grouted into granite)	8313	9,230	anchors	$40.00	$369,200
	120	Parapet Wall (3,000 psi, 0.4% reinforcing)	8313	1,780	CY	$470.00	$836,600
	130	Drilling for grout program (setup, drill, test), setups	8313	24,740	LF	$33.50	$828,790
	140	Grouting (grout injection into competent granite.	8313	18,550	bags	$29.50	$547,225
	150	Unwatering (assumes 48 month duration)	8313	1	LS		$2,400,000
		Subtotal, CFRF Dam					**$99,322,540**
		SUMMARY OF COSTS					
		Diversion and Care of River					$73,600,000
		Spillway					$55,500,000
		Outlet Works					$9,100,000
		Powerplant					$102,700,000
		CFRF Dam					$99,300,000
		Mobilization - 5%					$17,000,000
		Subtotal					**$357,200,000**
		Unlisted Items - 15%					$52,800,000
		Contract Cost					**$410,000,000**
		Contingencies - 25%					$100,000,000
		Field Cost					**$510,000,000**

QUANTITIES		PRICES	
BY	CHECKED	BY	CHECKED
B. Foster	S. Osgood 11/23/2003	B. Foster	S. Osgood 11/23/2003
DATE PREPARED	APPROVED	DATE	PRICE LEVEL
11/10/2003		11/10/03	Appraisal 03

CODE:D-8170 **ESTIMATE WORKSHEET** **SHEET__1__ OF __2____**

FEATURE:
RM286 Dam
Elev. 1300 (Interpolated)
Concrete Gravity Dam (RCC)

PROJECT: **USJRBSI**

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[Arch 1200-1400.xls]1400 RCC

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 850)		197,100	CY	$20.00	$3,942,000
		Excavation for Left Abutment Diversion Tunnel		147,600	CY	$140.00	$20,664,000
		Concrete Liner for Left Abutment Diversion Tunnel		25,620	CY	$245.00	$6,276,900
		Rock Bolts - Left Abt. Div. Tunnel		1,600	Bolts	$600.00	$960,000
		Total Drilling - Left Abt. Div. Tunnel		36,800	LF	$20.00	$736,000
		Excavation for Right Abutment Diversion Tunnel		77,700	CY	$140.00	$10,878,000
		Concrete Liner for Right Abutment Diversion Tunnel		17,200	CY	$245.00	$4,214,000
		Rock Bolts - Right Abt. Div. Tunnel		1,800	Bolts	$500.00	$900,000
		Total Drilling - Right Abt. Div. Tunnel		32,400	LF	$20.00	$648,000
		Downstream Cofferdam (Crest @ El. 770)		14,460	CY	$22.00	$318,120
	2	Excavation, all classes, for dam foundation(50%rock)		76,955	CY	$8.00	$615,640
	3	RCC in dam		2,196,855	CY	$35.50	$77,988,353
	4	Concrete facing elements		55,400	CY	$97.50	$5,401,500
	5	Concrete cap on top of dam		1,320	CY	$250.00	$330,000
	6	Leveling concrete in dam foundation		15,390	CY	$185.00	$2,847,150
	7	Concrete in spillway crest		2,300	CY	$200.00	$460,000
	8	Concrete in spillway training walls		375	CY	$350.00	$131,250
	9	Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
	10	Excavation of Outlet Shaft and Gate Structure		11,010	CY	$280.00	$3,082,800
	11	Temp. Supports - Rock Bolts		390	Bolts	$380.00	$148,200
	12	Total Drilling for Rock Bolts		4,680	LF	$20.00	$93,600
	13	Concrete in Outlet Shaft and Gate Structure		5,905	CY	$460.00	$2,716,300
		Subtotal					**$144,175,963**

QUANTITIES		PRICES	
BY	**CHECKED**	**BY**	**CHECKED**
B. Foster	**S. Osgood 11/23/2003**	**B. Foster**	**S. Osgood 11/23/2003**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL**
11/10/2003		**11/10/03**	**Appraisal 03**

CODE:D-8170 **ESTIMATE WORKSHEET** **SHEET__2___ OF __2____**

FEATURE: **RMM86 Dam** **Elev. 1300 (Interpolated)** **Concrete Gravity Dam (RCC)**	**PROJECT:** **USJRBSI**
	DIVISION:
	FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[Arch 1200-1400.xls]1400 RCC

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	14	Excavation for Powerplant		502,200	CY	$12.00	$6,026,400
	15	Concrete in Powerplant		45,700	CY	$350.00	$15,995,000
	16	Furnishing and Handling Cement		461,602	TONS	$90.00	$41,544,135
	17	Furnishing and Handling Reinforcement		23,538,750	LBS	$0.60	$14,123,250
	18	Grout Hole Drillilng		21,750	LF	$34.50	$750,375
	19	Foundation Grouting		21,750	Sacks	$28.50	$619,875
	20	Set up for Drain Holes in Gallery		133	Holes	$200.00	$26,500
	21	Drilling Drain Holes		35,975	LF	$53.50	$1,924,663
	22	Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
	23	Steel Pipe		15,401,360	LBS	$1.50	$23,102,040
	24	Valves, all Sizes and Types		4,021,700	LBS	$5.00	$20,108,500
	25	Turbines		1,923,000	LBS	$6.50	$12,499,500
	26	Generators		1,920,000	LBS	$8.00	$15,360,000
	27	Governors, Motors, etc.		3-Units	LS		$3,600,000
		Subtotal pg 1					$144,175,963
		Subtotal pg 2					$156,917,738
		Mobilization					**$15,000,000**
		Subtotal					**$316,093,700**
		Unlited Items (15%)					$43,906,300
		Contract Cost					**$360,000,000**
		Contingencies (25%)					$90,000,000
		Field Cost					**$450,000,000**

QUANTITIES		PRICES	
BY **B. Foster**	**CHECKED** **S. Osgood 11/23/2003**	**BY** **B. Foster**	**CHECKED** **S. Osgood 11/23/2003**
DATE PREPARED **11/10/2003**	**APPROVED**	**DATE** **11/10/03**	**PRICE LEVEL** **Appraisal 03**

CODE:D-8170 **ESTIMATE WORKSHEET** **SHEET__1__ OF __2____**

FEATURE: **RM286 Dam** **Elev. 1300 (Interpolated)** **Concrete Arch**	**PROJECT:** **USJRBSI** **DIVISION:** **FILE:** **\\Ussac1s-muni1\Jobs\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM**

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Diversion and care of river					
		Upstream Cofferdam (Crest @ El. 850)		159,910	CY	$21.00	$3,358,110
		Excavation for Left Abutment Diversion Tunnel		112,670	CY	$140.00	$15,773,800
		Concrete Liner for Left Abutment Diversion Tunnel		19,560	CY	$245.00	$4,792,200
		Rock Bolts - Left Abt. Div. Tunnel		1,220	Bolts	$600.00	$732,000
		Total Drilling - Left Abt. Div. Tunnel		26,840	LF	$20.00	$536,800
		Excavation for Right Abutment Diversion Tunnel		85,420	CY	$140.00	$11,958,730
		Concrete Liner for Right Abutment Diversion Tunnel		18,910	LBS	$245.00	$4,632,950
		Rock Bolts - Right Abt. Div. Tunnel		1,978	Bolts	$500.00	$988,750
		Total Drilling - Right Abt. Div. Tunnel		35,595	LF	$20.00	$711,900
		Downstream Cofferdam (Crest @ El. 770)		9,890	CY	$22.00	$217,580
	2	Excavation, all classes, for dam foundation		67,570	CY	$16.50	$1,114,905
	3	Mass Concrete in dam		1,058,720	CY	$122.50	$129,693,200
	4	Temperature control of concrete		1,058,720	CY	$10.50	$11,116,560
	5	Leveling concrete in dam foundation		6,755	CY	$195.00	$1,317,225
	6	Concrete in spillway crest		11,670	CY	$180.00	$2,100,600
	7	Concrete in spillway training walls		730	CY	$350.00	$255,500
	8	Concrete in Outlet Works Intake Structure		3,110	CY	$272.50	$847,475
	9	Excavation of Outlet Shaft and Gate Structure		12,690	CY	$275.00	$3,489,750
	10	Temp. Supports - Rock Bolts		490	Bolts	$380.00	$186,200
	11	Total Drilling for Rock Bolts		5,880	LF	$20.00	$117,600
	12	Concrete in Outlet Shaft and Gate Structure		5,905	CY	$445.00	$2,627,725
	13	Excavation for Powerplant		504,000	CY	$12.00	$6,048,000
	14	Concrete in Powerplant		45,700	CY	$350.00	$15,995,000
		Subtotal					**$218,612,560**

QUANTITIES		PRICES	
BY	**CHECKED**	**BY**	**CHECKED**
B. Foster	**S. Osgood 11/23/2003**	**B. Foster**	**S. Osgood 11/23/2003**
DATE PREPARED	**APPROVED**	**DATE**	**PRICE LEVEL**
11/10/2003		**10/10/03**	**Appraisal 03**

CODE:D-8170 **ESTIMATE WORKSHEET** **SHEET__2___ OF __2____**

FEATURE: RM286 Dam Elev. 1300 (Interpolated) Concrete Arch #REF!	**PROJECT:** USJRBSI **DIVISION:** **FILE:** C:\Documents and Settings\smosgood\Desktop\My Briefcase\Interpolated Costs\[MP286 - ARCH - 1200_1400.xls]ARCH Interpolation

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	15	Top of Dam Concrete		4,865	CY	$212.50	$1,033,813
	16	Furnishing and Handling Cement		232,085	TONS	$90.00	$20,887,605
	17	Furnishing and Handling Reinforcement		16,566,000	LBS	$0.60	$9,939,600
	18	Grout Hole Drillilng		34,000	LF	$33.50	$1,139,000
	19	Foundation Grouting		34,000	Sacks	$27.50	$935,000
	20	Set up for Drain Holes in Gallery		126	Holes	$200.00	$25,200
	21	Drilling Drain Holes		23,615	LF	$57.00	$1,346,055
	22	Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
	23	Steel Pipe		15,401,355	LBS	$1.50	$23,102,033
	24	Valves, all Sizes and Types		4,021,700	LBS	$5.00	$20,108,500
	25	Turbines		1,923,000	LBS	$6.50	$12,499,500
	26	Generators		1,920,000	LBS	$8.00	$15,360,000
	27	Governors, Motors, etc.		3-Units	LS		$3,600,000
		Subtotal pg 1					$218,612,560
		Subtotal pg 2					$111,213,805
		Mobilization					$16,500,000
		Subtotal					**$346,326,365**
		Unlited Items (15%)					$53,673,635
		Contract Cost					**$400,000,000**
		Contingencies (25%)					$100,000,000
		Field Cost					**$500,000,000**

QUANTITIES		PRICES	
BY B. Foster	**CHECKED** S. Osgood 11/23/2003	**BY** B. Foster	**CHECKED** S. Osgood 11/23/2003
DATE PREPARED 11/10/2003	**APPROVED**	**DATE** 11/10/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __3____

FEATURE:

RM286 Dam Site
Elev. 1400
Concrete Faced Rockfill Dam (CFRD)

PROJECT: USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP286 CFRF.xls]MP286 1400

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 635)		146,500	CY	$21.00	$3,076,500
		Excavation for Left Abutment Diversion Tunnel		203,930	CY	$140.00	$28,550,200
		Concrete Liner for Left Abutment Diversion Tunnel		35,400	CY	$240.00	$8,496,000
		Rock Bolts - Left Abt. Div. Tunnel		2,210	Bolts	$600.00	$1,326,000
		Total Drilling - Left Abt. Div. Tunnel		50,830	LF	$20.00	$1,016,600
		Excavation for Right Abutment Diversion Tunnel		126,120	CY	$140.00	$17,656,800
		Concrete Liner for Right Abutment Diversion Tunnel		27,920	CY	$240.00	$6,700,800
		Rock Bolts - Right Abt. Div. Tunnel		2,920	Bolts	$500.00	$1,460,000
		Total Drilling - Right Abt. Div. Tunnel		52,560	LF	$20.00	$1,051,200
		Furnishing and Handling Cement		17,860	TONS	$100.00	$1,786,000
		Furnishing and Handling Reinforcement		9,498,000	LBS	$0.60	$5,698,800
		Diversion and Care of River Subtotal					**$76,818,900**
		Spillway					
		Excavation for Spillway		6,990,399	CY	$7.00	$48,932,793
		Concrete in spillway crest		7,670	CY	$180.00	$1,380,600
		Concrete in spillway training walls and Apron		7,500	CY	$210.00	$1,575,000
		Furnishing and Handling Cement		4,280	TONS	$110.00	$470,800
		Furnishing and Handling Reinforcement		2,275,500	LBS	$0.65	$1,479,075
		Spillway subtotal					**$53,838,268**

QUANTITIES		PRICES	
BY S. Higinbotham	CHECKED	BY R. Baumgarten	CHECKED
DATE PREPARED	APPROVED	DATE 09/09/03	PRICE LEVEL Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2__ OF __3___

FEATURE:

RM286 Dam Site
Elev. 1400
Concrete Faced Rockfill Dam (CFRD)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP286 CFRF.xls]MP286 1400

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		OutletWorks					
		Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
		Excavatioon of Outlet Shaft and Gate Structure		11,180	CY	$280.00	$3,130,400
		Rock Bolt Supports		400	Bolts	$380.00	$152,000
		Total Drilling for Rock Bolts		4,800	LF	$20.00	$96,000
		Concrete in Outlet Shaft and Gate Structure		6,470	CY	$450.00	$2,911,500
		Furnishing and Handling Cement		2,700	TONS	$120.00	$324,000
		Furnishing and Handling Reinforcement		1,437,000	LBS	$0.65	$934,050
		Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
		Outlet Works subtotal					**$9,609,600**
		Powerplant					
		Steel Pipe		19,067,410	LBS	$1.50	$28,601,115
		Valves, all Sizes and Types		5,107,400	LBS	$5.00	$25,537,000
		Hydraulic Control System		150,000	LBS	$10.00	$1,500,000
		Concrete in Powerplant		45,700	CY	$350.00	$15,995,000
		Excavation for Powerplant		504,000	CY	$12.00	$6,048,000
		Furnishing and Handling Cement		12,890	TONS	$100.00	$1,289,000
		Furnishing and Handling Reinforcement		6,855,000	LBS	$0.60	$4,113,000
		Turbines		1,890,000	LBS	$6.50	$12,285,000
		Generators		2,340,000	LBS	$8.00	$18,720,000
		Governors, Motors, etc.		3-Units	LS		$3,600,000
		Powerplant subtotal					**$117,688,115**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170 **ESTIMATE WORKSHEET** SHEET__3__ OF __3___

FEATURE:

RM286 Dam Site
Elevation = 1400'
Embankment Dam (CFRD)

PROJECT: USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Pilorin cost sheets\[MP286 CFRF.xls]MP286 1400

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CFRF Dam					
	20	Excavation - common (removal of alluvium, rock slope cleaning by dozer to sound rock, minimal ripping.)	8313	299,500	CY	$5.50	$1,647,250
	30	Zone 1A - Exc, haul, & place (CL, SM, GM in 6" lifts to 98% Proctor, 2 mile haul) Toe slab imperv. Cap	8313	35,000	CY	$9.00	$315,000
	40	Zone 1B - Exc, haul, & place (random in 18" lifts to 95% Proctor, 0.5 mile haul) Shell for Zone 1A	8313	190,000	CY	$6.00	$1,140,000
	50	Zone 2 - Exc, haul, & place processed SM, GM in 18" lifts to 98% Proctor, 0.5 mile haul) Deck foundation	8313	166,150	CY	$18.00	$2,990,700
	60	Zone 3A - Exc, haul, & place (processed GP in 18" lifts to 95% Proctor, 0.5 mile haul) Transition to Shell	8313	166,150	CY	$17.50	$2,907,625
	70	Zone 3B - Exc, haul, & place (rockfill, 18" max in 3' lifts, blasting operation 0.5 mile away) Upstream Shell	8313	6,772,000	CY	$8.00	$54,176,000
	80	Zone 3C - Exc, haul, & place (rockfill, 4' max in 4' lifts, blasting operation 0.5 mile away) Downstream Shell	8313	6,910,000	CY	$7.75	$53,552,500
	90	Concrete deck (3,000 psi strength, 0.4% reinforcing)	8313	57,200	CY	$215.00	$12,298,000
	100	Concrete toe slab (3,000 psi strength, 0.3% reinforcing	8313	2,350	CY	$215.00	$505,250
	110	Anchor bars for toe slab (4' deep grouted into granite)	8313	11,700	anchors	$40.00	$468,000
	120	Parapet Wall (3,000 psi, 0.4% reinforcing)	8313	2,160	CY	$450.00	$972,000
	130	Drilling for grout program (setup, drill, test), setups=491	8313	30,130	LF	$33.00	$994,290
	140	Grouting (grout injection into competent granite.	8313	22,600	bags	$27.00	$610,200
	150	Unwatering (assumes 48 month duration)	8313	1	LS		$2,400,000
		Subtotal, CFRF Dam					**$134,976,815**
		SUMMARY OF COSTS					
		Diversion and Care of River					$76,800,000
		Spillway					$53,800,000
		Outlet Works					$9,600,000
		Powerplant					$117,700,000
		CFRF Dam					$135,000,000
		Mobilization - 5%					$19,600,000
		Subtotal					**$412,500,000**
		Unlisted Items - 15%					$57,500,000
		Contract Cost					**$470,000,000**
		Contingencies - 25%					$120,000,000
		Field Cost					**$590,000,000**

QUANTITIES		PRICES	
BY Mark Pabst	CHECKED	BY R. Baumgarten	CHECKED
DATE PREPARED 7/1/2003	APPROVED	DATE 09/09/03	PRICE LEVEL Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __2___

FEATURE:

RM 286 Dam
Elev. 1400
Concrete Gravity Dam (RCC)

PROJECT:
USJRBSI

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[Arch 1200-1400.xls]1200 RCC

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Diversion and care of river**					
		Upstream Cofferdam (Crest @ El. 850)		197,100	CY	$20.00	$3,942,000
		Excavation for Left Abutment Diversion Tunnel		147,600	CY	$140.00	$20,664,000
		Concrete Liner for Left Abutment Diversion Tunnel		25,620	CY	$245.00	$6,276,900
		Rock Bolts - Left Abt. Div. Tunnel		1,600	Bolts	$600.00	$960,000
		Total Drilling - Left Abt. Div. Tunnel		36,800	LF	$20.00	$736,000
		Excavation for Right Abutment Diversion Tunnel		77,700	CY	$140.00	$10,878,000
		Concrete Liner for Right Abutment Diversion Tunnel		17,200	CY	$245.00	$4,214,000
		Rock Bolts - Right Abt. Div. Tunnel		1,800	Bolts	$500.00	$900,000
		Total Drilling - Right Abt. Div. Tunnel		32,400	LF	$20.00	$648,000
		Downstream Cofferdam (Crest @ El. 770)		15,920	CY	$22.00	$350,240
	2	Excavation, all classes, for dam foundation(50%rock)		103,950	CY	$7.50	$779,625
	3	RCC in dam		3,264,510	CY	$33.00	$107,728,830
	4	Concrete facing elements		69,580	CY	$85.00	$5,914,300
	5	Concrete cap on top of dam		1,780	CY	$250.00	$445,000
	6	Leveling concrete in dam foundation		20,790	CY	$180.00	$3,742,200
	7	Concrete in spillway crest		2,300	CY	$200.00	$460,000
	8	Concrete in spillway training walls		450	CY	$350.00	$157,500
	9	Concrete in Outlet Works Intake Structure		3,110	CY	$265.00	$824,150
	10	Excavation of Outlet Shaft and Gate Structure		11,010	CY	$280.00	$3,082,800
	11	Temp. Supports - Rock Bolts		390	Bolts	$380.00	$148,200
	12	Total Drilling for Rock Bolts		4,680	LF	$20.00	$93,600
	13	Concrete in Outlet Shaft and Gate Structure		6,420	CY	$480.00	$3,081,600
		Subtotal					$176,026,945

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2___ OF __2___

FEATURE:

MP286 Dam
Elev. 1400
Concrete Gravity Dam (RCC)

PROJECT:

DIVISION:

FILE: P:\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Temperance\Interpolated Costs\[Arch 1200-1400.xls]1200 RCC

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	14	Excavation for Powerplant		502,200	CY	$12.00	$6,026,400
	15	Concrete in Powerplant		45,700	CY	$350.00	$15,995,000
	16	Furnishing and Handling Cement		668,140	TONS	$90.00	$60,132,600
	17	Furnishing and Handling Reinforcement		25,824,000	LBS	$0.60	$15,494,400
	18	Grout Hole Drillilng		33,200	LF	$33.00	$1,095,600
	19	Foundation Grouting		33,200	Sacks	$25.00	$830,000
	20	Set up for Drain Holes in Gallery		165	Holes	$200.00	$33,000
	21	Drilling Drain Holes		52,950	LF	$52.00	$2,753,400
	22	Outlet Works Trashracks		495,000	LBS	$2.50	$1,237,500
	23	Steel Pipe		19,067,410	LBS	$1.50	$28,601,115
	24	Valves, all Sizes and Types		5,257,400	LBS	$5.00	$26,287,000
	25	Turbines		1,890,000	LBS	$6.50	$12,285,000
	26	Generators		2,340,000	LBS	$8.00	$18,720,000
	27	Governors, Motors, etc.		3-Units	LS		$3,600,000
		Subtotal pg 1					$176,026,945
		Subtotal pg 2					$193,091,015
		Mobilization					$18,500,000
		Subtotal					**$387,617,960**
		Unlited Items (15%)					$62,382,040
		Contract Cost					**$450,000,000**
		Contingencies (25%)					$110,000,000
		Field Cost					**$560,000,000**

QUANTITIES		PRICES	
BY: S. Higinbotham	CHECKED	BY: R. Baumgarten	CHECKED
DATE PREPARED	APPROVED	DATE: 09/09/03	PRICE LEVEL: Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__1__ OF __2____

FEATURE:

RM286 Dam
Elev. 1400
Concrete Arch

PROJECT:
USJRBSI

DIVISION:

FILE: C:\Documents and Settings\smosgood\Desktop\My Briefcase\Interpolated Costs\[MP286 - ARCH - 1200 1400.xls]1400 ARCH

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Diversion and care of river					
		Upstream Cofferdam (Crest @ El. 850)		159,910	CY	$21.00	$3,358,110
		Excavation for Left Abutment Diversion Tunnel		112,670	CY	$140.00	$15,773,800
		Concrete Liner for Left Abutment Diversion Tunnel		19,560	CY	$245.00	$4,792,200
		Rock Bolts - Left Abt. Div. Tunnel		1,220	Bolts	$600.00	$732,000
		Total Drilling - Left Abt. Div. Tunnel		26,840	LF	$20.00	$536,800
		Excavation for Right Abutment Diversion Tunnel		90,800	CY	$140.00	$12,712,000
		Concrete Liner for Right Abutment Diversion Tunnel		20,100	LBS	$245.00	$4,924,500
		Rock Bolts - Right Abt. Div. Tunnel		2,100	Bolts	$500.00	$1,050,000
		Total Drilling - Right Abt. Div. Tunnel		37,800	LF	$20.00	$756,000
		Downstream Cofferdam (Crest @ El. 770)		9,890	CY	$22.00	$217,580
	2	Excavation, all classes, for dam foundation		97,100	CY	$14.00	$1,359,400
	3	Mass Concrete in dam		1,732,900	CY	$105.00	$181,954,500
	4	Temperature control of concrete		1,732,900	CY	$10.00	$17,329,000
	5	Leveling concrete in dam foundation		9,710	CY	$190.00	$1,844,900
	6	Concrete in spillway crest		11,670	CY	$180.00	$2,100,600
	7	Concrete in spillway training walls		800	CY	$350.00	$280,000
	8	Concrete in Outlet Works Intake Structure		3,110	CY	$280.00	$870,800
	9	Excavation of Outlet Shaft and Gate Structure		14,370	CY	$270.00	$3,879,900
	10	Temp. Supports - Rock Bolts		590	Bolts	$380.00	$224,200
	11	Total Drilling for Rock Bolts		7,080	LF	$20.00	$141,600
	12	Concrete in Outlet Shaft and Gate Structure		6,420	CY	$450.00	$2,889,000
		Subtotal					**$257,726,890**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03

CODE:D-8170

ESTIMATE WORKSHEET

SHEET__2___ OF __2___

FEATURE:

RM286 Dam
Elev. 1400
Concrete Arch

PROJECT:

DIVISION:

FILE: C:\Documents and Settings\smosgood\Desktop\My Briefcase\Interpolated Costs\[MP286 - ARCH - 1200_1400.xls]1400 ARCH

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	13	Excavation for Powerplant		504,000	CY	$12.00	6,048,000
	14	Concrete in Powerplant		45,700	CY	$350.00	15,995,000
	15	Top of Dam Concrete		7,230	CY	$200.00	1,446,000
	16	Furnishing and Handling Cement		360,835	TONS	$90.00	32,475,150
	17	Furnishing and Handling Reinforcement		17,187,000	LBS	$0.60	10,312,200
	18	Grout Hole Drillilng		50,000	LF	$32.00	1,600,000
	19	Foundation Grouting		50,000	Sacks	$24.00	1,200,000
	20	Set up for Drain Holes in Gallery		160	Holes	$200.00	32,000
	21	Drilling Drain Holes		35,800	LF	$54.00	1,933,200
	22	Outlet Works Trashracks		495,000	LBS	$2.50	1,237,500
	23	Steel Pipe		19,067,400	LBS	$1.50	28,601,100
	24	Valves, all Sizes and Types		5,257,400	LBS	$5.00	26,287,000
	25	Turbines		1,890,000	LBS	$6.50	12,285,000
	26	Generators		2,340,000	LBS	$8.00	18,720,000
	27	Governors, Motors, etc.		3-Units	LS		3,600,000
		Subtotal Sheet #1					257,726,890
		Subtotal Sheet #2					161,772,150
		Mobilization					21,000,000
		Subtotal					**440,499,040**
		Unlited Items (15%)					69,500,960
		Contract Cost					**510,000,000**
		Contingencies (25%)					120,000,000
		Field Cost					**630,000,000**

QUANTITIES		PRICES	
BY S. Higinbotham	**CHECKED**	**BY** R. Baumgarten	**CHECKED**
DATE PREPARED	**APPROVED**	**DATE** 09/09/03	**PRICE LEVEL** Appraisal 03