

PRELIMINARY

**American Electric Power, Inc.
Columbus, Ohio**

**Gypsum Dewatering and Disposal Study
Big Sandy Unit 2
Louisa, Kentucky**

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Project No. 537707
Report No. AEBS-2-LI-ZD-0001/ Rev. BC
February 21, 2006 December 7, 2005

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1.0 EXECUTIVE SUMMARY

The purpose of this study is to present the economical evaluations of the method for byproduct disposal and the location of the Dewatering Building with respect to the byproduct disposal location for Big Sandy Unit 2.

The scope of this study considers two gypsum slurry treatments, two byproduct disposal locations and two Dewatering Building locations. These six possible options were combined to result in four options that are studied as summarized below.

Option A – The Dewatering Building will be located local to the plant and the dewatered gypsum cake will be re-hydrated with reclaimed Bottom Ash Pond water and pumped to the north-western end of the existing Flyash Pond.

Option B-1 – Byproduct slurry will be pumped to a new pond that will be built on landfill called Burke Branch located 1.1 miles north-west of the plant. No mechanical dewatering plant is considered. Reclaimed water will be pumped back to the plant.

Option B-2 – The Dewatering Building will be located local to the plant and dewatered gypsum cake will be conveyed to a location local to the landfill called Burke Branch. At that location, the dewatered gypsum cake will be loaded into trucks for disposal in the landfill.

Option B-3 – Byproduct slurry will be pumped from the plant to the Dewatering Building located local to the landfill called Burke Branch. Dewatered gypsum cake will be conveyed out of the Dewatering Building to trucks for disposal in the landfill. Reclaimed water will be pumped back to the plant.

The total installed costs for the Byproduct Dewatering and Disposal Options are listed below. The cost of the Black & Veatch dewatering equipment and its installation is not included in the WorleyParsons estimate and is indicated as an AEP responsibility in the table.

	Part 1 Byproduct Slurry Cost	Part2 Mechanical Dewatering Cost	Part 3 B&V (Equipment & Installation)
Option A	\$16,031,923	\$5,837,458	AEP
Option B-1	\$8,713,220	0	0
Option B-2	0	\$14,567,488	AEP
Option B-3	\$7,757,226	\$11,113,306	AEP

2.0 DESIGN BASIS

The following forms the design basis for the study:

Boiler MCR Heat Input:	8,180 MMBtu/hr
Gypsum Production at MCR:	52.1 STPH
Plant Operation:	24 hrs/day, 7days/wk @ full load firing 4.5 lb SO ₂ /MMBtu coal

Gypsum Specifications:

Dry Bulk Density:

For volumetric sizing of system components (i.e. hoppers, chutes, bins belt width, etc.)	50 lb/ft ³
For sizing of piles and silos	60 lb/ft ³
For structural loading calculations	100 lb/ft ³
Angle of repose (static)	45°
Moisture Content	15%

Slurry (water):

Solids	20% by weight
Specific gravity	1.13

Re-hydrated Gypsum Specifications:

Slurry (Bottom Ash Pond water)

Solids	~7% by weight
Specific gravity	~1.06

3.0 SYSTEM DRAWINGS

The following WorleyParsons Drawings show the arrangement of the dewatering system options and are part of this study:

<u>Drawing Number</u>	<u>Revision</u>	<u>Drawing Title</u>
AEBS-2-SK-ZD-302-001	B	Flow Diagram Process Slurry Option A
AEBS-2-SK-ZD-302-002	A	Flow Diagram Process Slurry Option B-1
AEBS-2-SK-ZD-302-003	B	Flow Diagram Process Slurry Option B-2
AEBS-2-SK-ZD-302-004	B	Flow Diagram Process Slurry Option B-3
AEBS-2-SK-ZB-302-005	A	Gypsum Dewatering Material Handling Flow Diagram Option B-2 & B-3
AEBS-2-SK-ZB-002-001	A	Gypsum Dewatering Material Handling Elevations Option B-2
AEBS-2-SK-ZB-002-002	A	Gypsum Dewatering Material Handling Elevations Option B-2
AEBS-2-SK-ZB-002-003	B	General Arrangement Gypsum Dewatering Option A
AEBS-2-SK-ZB-002-004	AB	General Arrangement Gypsum Dewatering Option B-1
AEBS-2-SK-ZB-002-005	A	General Arrangement Gypsum Dewatering Option B-2
AEBS-2-SK-ZB-002-006	A	General Arrangement Gypsum Dewatering Option B-3
AEBS-2-SK-ZB-002-007	AB	Gypsum Dewatering Material Handling Re-Hydration Conveyors G1, G2

The following AEP document has been used as reference in preparation of this study:

<u>Document Number</u>	<u>Revision</u>	<u>Document Title</u>
AEBS-2-DV-044-FGD- DISPOSAL-FACILITY-	11	FGD Disposal Facility Sitting Study Big

SITING-STUDY

Sandy Plant – Unit 2

4.0 SYSTEM DESCRIPTION

4.1 Introduction

The current approach for Big Sandy Unit 2 FGD facility is to have the Jet Bubbling Reactor (JBR) centrally located adjacent to the generating unit. The JBR would have local byproduct storage tanks and local reagent preparation. However, the JBR may or may not be supported by mechanical gypsum dewatering facility. If the JBR is not supported by a mechanical gypsum dewatering facility, then gypsum slurry will be pumped to a remote location and reclaim water will be pumped back to the plant. The interchange and exchange of major process streams between the JBR island and the remote gypsum disposal (ponding) site is discussed in section 4.3. Refer to drawing AEBS-2-SK-ZD-302-002.

If the JBR is supported by a mechanical gypsum dewatering facility, the dewatering facility may be locally located or may be remotely located from the JBR. The dewatering facility will process a 20 percent solid by weight gypsum slurry stream generated in the JBR. The dewatering facility will produce an 85 weight percent solid cake and a reclaim water stream containing approximately 2 percent suspended solids. The interchange and exchange of major process streams between the JBR island and the local or remote mechanical dewatering facility are discussed in section 4.4. Refer to drawings AEBS-2-SK-ZD-302-001, 003 & 004.

Appendix 4 contains listings by option of the major components and modifications for each option.

4.2 Common Design Inputs

The following design parameters are common to all four options.

The JBR and other local equipment will be at an elevation of 560 feet.

Byproduct bleed from the JBR will be stored in tanks local to the JBR. These tanks will have a total storage capacity of 8 hours assuming full load conditions firing the design coal. These tanks will be agitated as the byproduct gypsum slurry contains 20 percent solids by weight.

The current design incorporates HDPE pipe at velocities between 5 and 9 fps for gypsum slurry. The design pressure for gypsum slurry HDPE pipe is 198 psig (460 ft). Hard metal impeller slurry pumps will have maximum head capacity of about 230 ft and rubber lined impeller slurry pumps will have about 140 ft. This study assumes metal impeller slurry pumps are used.

Redundancy is required for gypsum slurry, dewatering, and reclaimed water service equipment. Each service will have two 100% tanks and each service will be equipped with two 100% pumps.

4.3 Gypsum Slurry Disposal

There is one possible byproduct disposal location without mechanical dewatering of the gypsum currently under discussion (Option B-1). ~~Option B-1 is 1.1 miles away from the plant in a north-west direction at an elevation of 700 feet.~~

~~Layout for this option can be seen~~ **Option B-1 has been laid out** in Drawing AEBS-2-SK-ZB-002-004.

~~For~~**In** Option B-1, gypsum slurry will be pumped by the Byproduct Forwarding Pumps to a new pond located at the landfill called Burke Branch. This landfill is 1.1 miles north-west of the plant at an elevation of 700 feet. Reclaim water will be pumped from the pond via Floating Filtrate Water Pumps to the Filtrate Water Tanks. The reclaimed water will then be pumped by the Filtrate Water Tank Pumps to the Reclaimed Water Tanks at the plant. Flush water pumps taking suction from Filtrate Water Tanks will provide flush water for the byproduct slurry lines. Flushing will be "downhill" and pipe leg flush water will be drained to the JBR area. A 5,000 gallon slug of water will be used to flush the byproduct slurry pipe route.

This option requires a jack and bore (approximately 255 feet) under a railroad and 4 lanes of Route 23 for the filtrate water and the gypsum slurry lines. Additional permits may be required for construction of these options.

4.4 Mechanical Gypsum Dewatering

There are two possible dewatering facility locations currently under discussion:

Option A is local to the JBR.

Option B-2 is local to the JBR.

Option B-3 is 1.1 miles from the plant in a north-west direction at an elevation of 700 feet.

Layouts for these options can be seen in Drawings AEBS-2-SK-ZB-002-003, 005, and 006. See section 4.5 for the Dewatering Building description and see section 4.6 for the Gypsum Cake Handling description.

Option A

For Option A, byproduct slurry will be pumped from the Filter Feed Tanks to the Hydrocyclones in the Dewatering Building, which is local to the plant. The dewatered gypsum will be then transferred to the Re-hydration Tanks, via conveyors, where it will be mixed with reclaimed Bottom Ash Pond water producing slurry containing approximately 7 percent solids by weight. The byproduct slurry will be then pumped to the north-western most point of the existing Fly Ash Pond.

As part of this option, Bottom Ash Pond Recirculation Pumps 3 and 4 will be relocated from the Bottom Ash Pond Recirculation Pump House. These two pumps will be located next to the Re-hydration Tanks and used to pump the re-hydrated byproduct slurry to the Fly Ash Pond.

Bottom Ash Pond Recirculation Pumps 1 and 2 will remain in the Bottom Ash Pond Recirculation Pump House and continue to supply make-up water to the fly ash slurry tank and the ash hopper ring header. The existing 575V motors on the two (2) relocated pumps will be replaced with new 4000V motors.

Two (2) new 460V Bottom Ash Pond Recirculation Pumps will be added in the Bottom Ash Pond Recirculation Pump House to pump bottom ash water from the Bottom Ash Ponds to the Re-hydration Tanks.

It is assumed that the existing road will be improved/extended 8000 feet (1.5 miles) to the north-western end of the Fly Ash Pond. This option requires a jack and bore (approximately 255 feet) under a railroad and 4 lanes of Route 23 for the gypsum slurry lines. Additional permits may be required for construction of these options.

Option B-2

For Option B-2, byproduct slurry will be pumped from the Filter Feed Tanks to the Hydrocyclones in the Dewatering Building, which is local to the plant. The dewatered gypsum will be then transferred to the landfill site, Burke Branch, via conveyors.

Option B-3

For Option B-3, byproduct slurry will be pumped from the Byproduct Storage Tanks to the Filter Feed Tanks. The Filter Feed Tanks will be located at the landfill site called Burke Branch.

The current design assumes that at full load conditions firing the design coal that flow from the Byproduct Storage Tanks to the Filter Feed Tanks will be continuous and at a level great enough to maintain solids movement uphill to the dewatering facility. At reduced loads, or when firing low sulfur content coal, the gypsum slurry bleed from the JBR will be stored in the Byproduct Storage Tanks. At Byproduct Storage Tank high level, gypsum slurry would be pumped up to the Filter Feed Tanks. After low level is reached in the Byproduct Storage Tanks, the pump will shut down and after a predetermined time the suction valve will close. This delay in closing the pump suction valve allows time for slurry to drain from the transfer line. The slurry drain valves open. The flush water valve located at the end of the transfer pipe close to the Filter Feed Tanks opens. The slurry drain valves and pump discharge valve close after a predetermined time.

This option requires a jack and bore (approximately 255 feet) under a railroad and 4 lanes of Route 23 for utility and gypsum slurry lines. Additional permits may be required for construction of these options.

4.5 Dewatering Buildings and Utilities for Options A, B-2, and B-3

Options A and B-2

The Dewatering Building is approximately 85' x 115' and houses the dewatering equipment, the Filter Feed Pumps, and the Filtrate Pumps. The Dewatering Building is located local to the plant and will be equipped with roof exhaust fans, electric heaters, electrical room supply fans, and necessary hoists for equipment maintenance.

The building will be supplied all utilities from the plant. These utilities will include service water for vacuum pump seals; potable water for eye wash stations, drinking water, and for sanitary use; fire water for fire protection; service and instrument air; and electrical power for the building and the equipment. Except for service air, the piping will be HDPE with FRP used for any piping supported on pipe racks. The service air will be in galvanized carbon steel pipe.

Option B-3

The Dewatering Building is approximately 85' X 115' and houses the dewatering equipment, the FilterFeed Pumps and the Filtrate Pumps. Adjacent to the dewatering building are service transformers, twin Filter Feed Tanks and twin Filtrate Water Tanks. The dewatering building will be equipped with roof exhaust fans, electric heaters, electrical room supply fans and necessary hoists for equipment maintenance.

The building will be supplied utilities from the plant. These utilities will include service water for vacuum pump seals and flushing, fire water for fire protection, service air, and electrical power for the building and the equipment. Potable water for eye wash stations, drinking, water and for sanitary use will be furnished from a locally drilled well and sanitary disposal will be by septic systems local to the dewatering building. Redundant desiccant dryers with a receiver will be provided in the dewatering building to furnish instrument quality air for valves, instrumentation, etc. Except for the service air, the piping will be HDPE with FRP used for any piping supported on pipe racks. The service air will be in galvanized carbon steel pipe.

It is assumed that the existing road will be upgraded by paving approximately 1500 feet.

All of the piped utility services will be run underground in a trench for freeze protection.

4.6 Gypsum Cake Handling

Following dewatering, the gypsum will be handled by conveyor systems:

Option A

The Gypsum Handling Belt Conveyor System will consist of two parallel transfer conveyors beginning at the discharge of each of the two (2) vacuum belt filters located inside the Dewatering Building. Each vacuum belt filter, operating non-concurrently, will discharge gypsum at a rate of 52.1 STPH onto either gypsum transfer conveyor via a diverter gate. Each transfer conveyor will then convey the gypsum to a single dedicated re-hydration tank.

The elevated conveyor sections will be supported by a common truss with a single walkway in the middle. All outdoor conveyor sections will be covered by galvanized hood covers to minimize dusting and protect the belting from the environment.

A closed circuit television system (CCTV) will be provided to monitor the operation of the system remotely. The gypsum handling system will be controlled as part of the overall plant DCS system.

Option B-2:

The Gypsum Handling Belt Conveyor System will begin at the discharge of the two (2) vacuum belt filters located inside the Dewatering Building. Each vacuum belt filter, operating non-concurrently, will discharge gypsum at a rate of 52.1 STPH onto 30" Gypsum Collecting Conveyor G1. Conveyor G1 will be designed to convey 135 STPH of gypsum at a belt speed of 140 FPM. Conveyor G1 will convey the gypsum to an extension of the Dewatering Building where it will be transferred onto 30" Gypsum Transfer Conveyor G2. Conveyor G2 will convey the gypsum at grade, elevate to clear a secondary plant entrance road and into Transfer Tower 1. The gypsum will be transferred onto 30" Gypsum Transfer Conveyor G3 at Transfer Tower 1. Conveyor G3 will then convey the gypsum along grade parallel to an existing railroad track and elevate over the main plant entrance road to Transfer Tower 2. From this transfer point, the gypsum will be conveyed at grade parallel to the existing railroad track via 30" Gypsum Transfer Conveyor G4 to Transfer Tower #3. The gypsum will then be transferred onto 30" Gypsum Transfer Conveyor G5 at Transfer Tower #3. Conveyor G5 will convey the gypsum along grade to Transfer Tower #4. At Transfer Tower #4, the gypsum will be transferred onto 36" Gypsum Transfer Conveyor G6. This conveyor will elevate the gypsum to convey it across Highway 23 and up to the Gypsum Storage Area (Site B). At this point, the gypsum will be transferred from Conveyor G6 onto 36" Radial Stacker Conveyor G7. Radial Stacker Conveyor G7 will have the ability to load dump trucks to transport and distribute the gypsum within the Gypsum Storage Area (Burke Branch landfill). The radial stacker conveyor will also be able to luff and slew to form a 3 day Gypsum Storage Pile.

The vacuum belt filter discharge chutework will also include a diverter gate to alternately direct the gypsum, in emergency situations, to 30" Emergency Gypsum Collecting Conveyor G9. This conveyor will run parallel to 30" Gypsum Collecting Conveyor G1 inside of the Dewatering Building. This conveyor will transport the gypsum outside of the Dewatering Building where it will be transferred onto 36" Emergency Gypsum Radial Stacker Conveyor G9. Conveyor G9 will have the ability to luff and slew to form a 3 day Emergency Gypsum Storage Pile adjacent to the Dewatering Building. The radial stacker conveyor will also be able to slew to one end of the pile to load dump trucks to transport the gypsum, via the access road, to the Gypsum Storage Area (Burke Branch landfill).

The four gypsum transfer towers will be enclosed by un-insulated roofing and siding with the stairways located inside of the towers. These towers will be unheated, but will include a ventilation system.

The conveyor sections located at grade will be supported by channel stringer sections. The elevated conveyor sections will be supported by box trusses with a single walkway on one side only. All outdoor conveyor sections will be covered by galvanized hood covers to minimize dusting and protect the belting from the environment.

A closed circuit television system (CCTV) will be provided to monitor the operation of the system remotely. The gypsum handling system will be controlled as part of the overall plant DCS system.

Option B-3:

The Gypsum Handling Belt Conveyor System will begin at the discharge of the two (2) vacuum belt filters located inside the Dewatering Building. Each vacuum belt filter, operating non-concurrently, will discharge gypsum at a rate of 52.1 STPH onto 30" Gypsum Collecting Conveyor G1. Conveyor G1 will be designed to convey 135 STPH of gypsum at a belt speed of 140 FPM. Conveyor G1 will convey the gypsum outside of the Dewatering Building where it will be transferred onto 36" Gypsum Radial Stacker Conveyor G2. Conveyor G2 will have the ability to load dump trucks to transport and distribute the gypsum within the Gypsum Storage Area (Burke Branch landfill). The radial stacker conveyor will also be able to luff and slew to form a 3 day Gypsum Storage Pile adjacent to the Dewatering Building.

A closed circuit television system (CCTV) will be provided to monitor the operation of the system remotely. The gypsum handling system will be controlled as part of the overall plant DCS system.

Freeze Protection:

Freeze protection for the dewatered gypsum should not normally be required as it is planned that the normal procedure for handling it is to load trucks and place it directly in the disposal area (Burke Branch landfill).

If however the gypsum is placed in a storage pile formed by the radial stacker adjacent to the Dewatering Building and the outer surfaces of the pile freeze, the following alternatives are suggested:

Mobile Equipment – Use of mobile equipment to break-up any frozen lumps before or as they are being loaded into dump trucks for transport within the disposal area.

Enclosed Structure – The gypsum storage pile could be enclosed with a covered structure to protect it from freezing temperatures. This option was reviewed but not considered to be an economical method of freeze protection for the dewatered gypsum based on the capital investment required

Dust Control for Gypsum in Storage Pile:

Wind Screens – Wind screens could be erected around the storage pile to minimize the effects of the wind. The wind screens are made of a porous fabric that can reduce wind velocities by 50% or more. The porous material can be knitted from an industrial grade woven polyester material. The porous fabric is more effective than a solid surface type wind screen as wind forces tend to increase at the outer portions of a solid surface due to differential pressures that result on each side.

Enclosed Structure – The gypsum storage pile could be enclosed with a covered structure to protect it from windy conditions. This option was reviewed but not considered to be an economical method of dust control for the dewatered gypsum based on the capital investment required

Crusting Agent – A crusting agent could be applied to the exposed surface of the gypsum pile if areas are to be inactive for a period of time. The crusting agent would be applied after

compaction of the selected inactive material zone. The crusting agent produces a solid cohesive binding surface that reduces dust from becoming airborne when the pile is exposed to wind.

4.7 Electrical Service

Electrical power for all the option in the Gypsum Dewatering Study is supplied from the existing SCR 13.8kV Bus 2F and the new 13.8kV FGD Bus powered from the existing 15/20/25 MVA ONAN/ONAF/ONAF 135.6-13.8kV SCR Transformers 2SCR-2F and 2SCR-2FR. The baseline electrical design for the overall FGD Project includes modification of the existing SCR Electrical Distribution System such that all FGD loads except for the ID Fans are powered from the existing Unit 2 SCR transformers. The FGD base line electrical design is not included in this study. Refer to the Electrical Optional Power Source Study Report for a detail description of the FGD baseline electrical design.

Option A

In Option A, the 350 HP 4kV Byproduct Forwarding Pumps shall be powered from the 4160V FGD Switchgear. Each running pump shall be powered from redundant 4160V FGD Switchgear. One 1200AF 5kV circuit breaker shall be added on each 4160V FGD Switchgear (total of 2). The FGD 4160V Switchgear are included in the FGD baseline electrical design.

Size 1 non-reversing combination starters shall be added to redundant FGD Dewatering MCCs to power the Byproduct Re-hydrating Tanks A and B Agitators. The redundant FGD Dewatering MCCs are included in the FGD baseline electrical design.

The new 150 HP 460V Bottom Ash Pond Recirculation Pumps shall be powered from redundant FGD 480V switchgear. One 800AF 480V circuit breaker shall be added on each switchgear. The redundant 480V FGD switchgear are included in the FGD baseline electric design.

For the Gypsum Conveyor System in Option A the Conveyor System Vendor will be provided with two 480V power from redundant sources. It is within the vendor's scope to provide the MCC that will power all the equipment and building within the Gypsum Conveying System. Lighting, receptacles, grounding and lightning protection for the system are also included in the vendor's scope. The 480V feed will be extended or tapped to provide power to the system at a single location of the vendor's choosing.

Option B-1

In Option B-1, for the gypsum slurry facility, a power feed from the existing Bus 2F and the new 13.8kV FGD bus shall be routed in a combination of above and below grade raceway from the new FGD or existing SCR Electrical Building to the remote area north-west of the plant where a concentration of electrical loads are located. The use of a 13.8kV in lieu of a lower voltage is recommended for primary power distribution because of voltage drop considerations. Since 13.8kV is not the utilization voltage associated with the study option, two 13,800-480V transformers and double-ended secondary distribution equipment will be installed in strategic remote location with the most concentration of loads (see Appendix 2). Reliable power for the DCS function and switchgear control will be provided via UPS system with self-contained batteries. The remote facility will also be provided with lighting and receptacle systems,

grounding and lightning protection systems, communication systems and power distribution for building services and maintenance system.

Also, in Option B-1, MCC vertical stacks with non-reversing combination starters shall be added to redundant FGD Dewatering MCCs to power the Byproduct Forwarding Pumps located in the plant area. The redundant FGD Dewatering MCCs are included in the FGD baseline electrical design.

Option B-2

In Option B-2, for the additional two 150HP Fire Water Booster Pumps which are located local to the JBR, additional MCC vertical stack with size-5 non-reversing combination starters shall be added to redundant FGD Dewatering MCCs to power these pumps. The redundant FGD Dewatering MCCs are included in the FGD baseline electrical design.

For the Gypsum Conveyor System in Options B-2, the Conveyor System Vendor will be provided with two sources of 13.8kV power. It is within the vendor's scope to provide the electrical distribution system that will power all the equipment and building within the Gypsum Conveying System. Lighting, receptacles, grounding and lightning protection for the system are also included in the vendor's scope. The 13.8kV feed will be extended or tapped to provide power to the system at a single location of the vendor's choosing.

Option B-3

In Option B-3, the redundant power feeds shall have a longer route to the Dewatering Building (included in the FGD baseline design). Because of the building's new location which is about 1.1 miles north-west of the plant area, feeder cables will be sized bigger to compensate for the additional voltage drop due to the long cable run. Additional MCC vertical stacks with non-reversing combination starters ranging from size 1 to 5 shall be added to redundant FGD Dewatering MCCs (included in the FGD electrical baseline design) to power the additional loads for this option.

For the Gypsum Conveyor System in Options B-3, the Conveyor System Vendor will be provided with two sources of 480V power. It is within the vendor's scope to provide the electrical distribution system that will power all the equipment within the Gypsum Conveying System. The 480V feed will be extended or tapped to provide power to the system at a single location of the vendor's choosing.

5.0 ESTIMATE SUMMARY

An indicative cost estimate has been prepared for the modifications required to the Gypsum Dewatering System for the various option methods and locations at the Big Sandy Unit 2 FGD system project. This study does not account for construction of the containment and embankments for the Burke Branch site.

The following scope is included in the option estimate:

- Vendor supplied furnish & erect Gypsum Handling System including structural steel and complete electrical scope.
- Civil/Structural BOP scope to support the Gypsum Handling System location options.
- Electrical BOP scope to support the additional loads required for the gypsum handling equipment, pumping station and storage tanks.
- Please note that the Byproduct Dewatering equipment and facilities required for the base FGD design are included in Option A, B-2, and B-3 of this study. ~~The equipment and facilities included in the estimate are those specifically required to support the design for conveying the gypsum to the alternate locations.~~

Gypsum Handling System equipment and steel pricing is based upon vendor quotations solicited for the above system equipment and erection. The balance of BOP equipment pricing is based on quotations for recent FGD projects and in-house database information, and has been adjusted to reflect design parameter differences.

Bulk quantity development was based on a combination of engineering quantity input, estimating takeoff from engineering drawings, and factoring based on equipment sizes. Lengths were based on the equipment locations per the site layout drawings. Input from engineering was solicited for major bulk commodities such as civil commodities, and electrical equipment and electrical bulks.

Costs are based on the third quarter of 2005. No additional escalation has been applied to account for unpredictable fluctuations in market pricing of raw materials. Labor pricing is based on local union rates in effect until August 2005, and includes 3.5% overhead and 4% profit. No additional escalation is included. It is recommended that additional escalation be applied at a rate of 4% annually.

5.1 Material Take Off (MTO)/Design/Procurement/Contingency

Quantities in the direct cost estimate file are not “neat” quantities. Quantities were factored or routed manually, based on the site layout drawings and were not downloaded from engineering models. Consequently the quantities in the direct cost file include a 7% MTO allowance and a 3% design/procurement allowance on bulk materials. Bulk material unit man-hour rates have also been adjusted to account for work in an existing, operating plant.

Commercial/Construction Clarifications

- The expected accuracy of ~~this option price~~ **the pricing in this study** is +/- 30%.
- All federal, state and local taxes are excluded, with the exception of payroll taxes.
- The estimate is based on union shop craft rates for the, ~~Moundsville, West Virginia-Ashland, Kentucky area. based on the AEP Mitchell Plant.~~ The wage rates are based on the 90% rate granted in the NMAPC agreements.
- Since a labor survey for the Big Sandy Unit 2 project is in progress, the estimate is based on normal market conditions in effect in the third quarter of 2005 regarding material procurement and construction.
- No contingency has been applied to the estimate.
- The estimate includes no costs for mitigation of or any pre-existing hazardous materials or conditions.
- Lead and asbestos abatement are excluded.
- Archeological investigation is excluded.
- Owner's costs are excluded.
- Embankment design and construction for Option A and B-1 are not included.

5.2 Cost Summary

The total installed costs for the Gypsum Dewatering and Disposal Options are listed below. The cost of the Black & Veatch dewatering equipment and its installation is not included in the WorleyParsons estimate and is indicated as an AEP responsibility in the table.

	Part 1 Byproduct Slurry Cost	Part2 Mechanical Dewatering Cost	Part 3 B&V (Equipment & Installation)
Option A	\$16,031,923	\$5,837,458	AEP
Option B-1	\$8,713,220	0	0
Option B-2	0	\$14,567,488	AEP
Option B-3	\$7,757,226	\$11,113,306	AEP

The cost estimate details are included in Appendix 3.

Due to the preliminary nature of the design, the operation and maintenance costs have been determined based on a function of the total installed cost and the additional auxiliary load associated with each option. The O&M costs are conceptual in nature and can fluctuate widely being influenced by the final detailed design, manufacturer's warranties, plant maintenance schedules, equipment operational characteristics and durations, etc. Following are the expected annual O&M costs for each option:

Expected Annual Operating Costs

Option A:	\$	19,000
Option B-1:	\$	32,000
Option B-2:	\$	11,500
Option B-3:	\$	36,000

Expected Annual Maintenance Costs

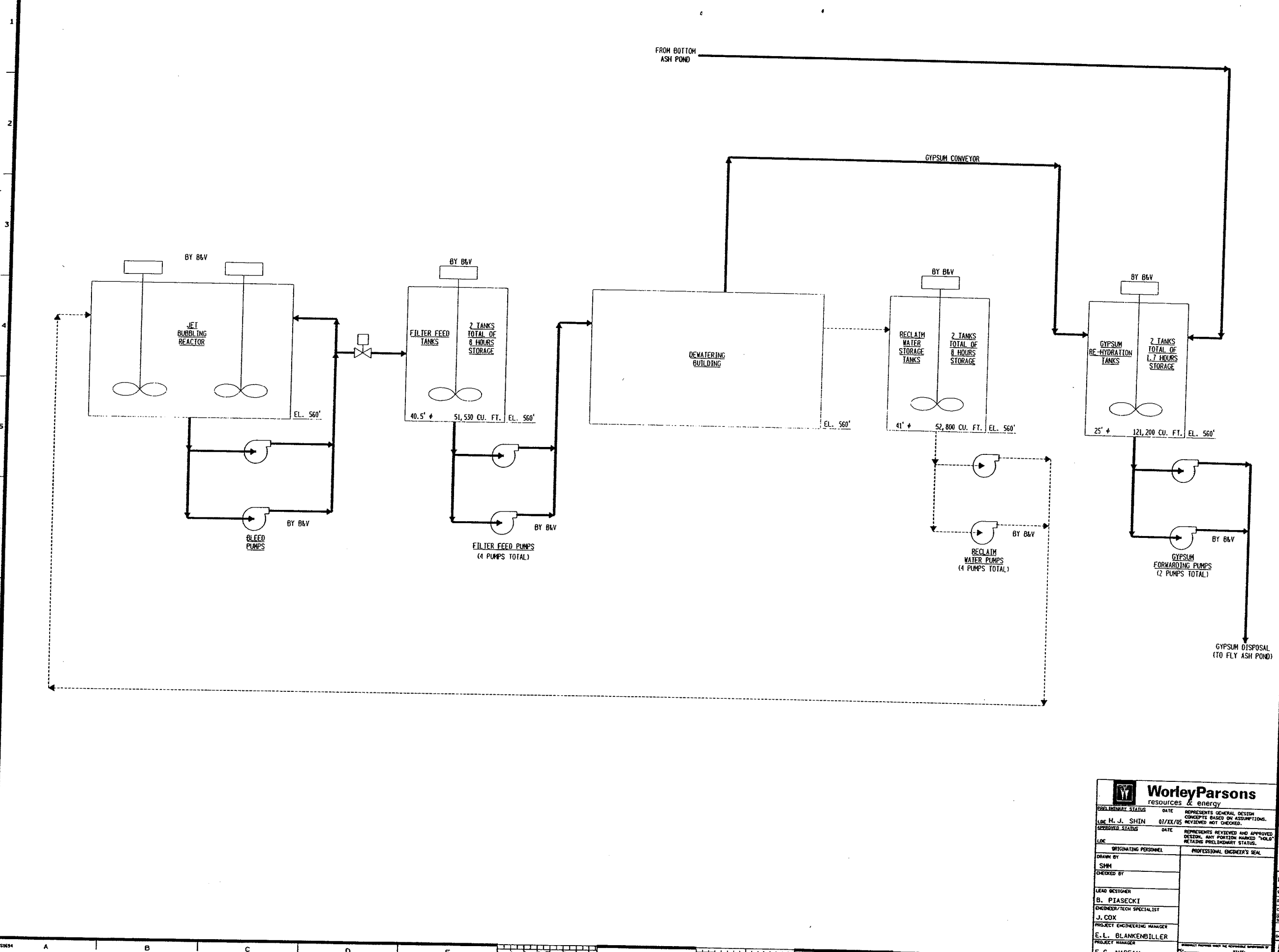
Option A:	\$	546,735
Option B-1:	\$	217,831
Option B-2:	\$	215,804
Option B-3:	\$	471,763

APPENDIX 1

WORLEYPARSONS DRAWINGS

LEGEND

—— GYPSUM SLURRY
- - - - RECLAIM/FILTRATE WATER



ISSUED FOR INFORMATION

REV	DATE	BY	CHKD	APPD	DESCRIPTION
0					

ISSUED FOR INFORMATION

REV	DATE	BY	CHKD	APPD	DESCRIPTION
0					

REVISIONS

NO.	DATE	DESCRIPTION	APPD.
1			

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OHIO POWER COMPANY
BIG SANDY UNIT 2
BIG SANDY KENTUCKY

FLOW DIAGRAM
PROCESS SLURRY
OPTION A

DWG. NO. AEBBS-2-SK-ZD-302-001

SCALE: 1" = 10'

DOCUMENT PREPARED BY
PARSONS E&C

AMERICAN ELECTRIC POWER
ASP SERVICE CORP.
COLUMBUS, OH 43215

WorleyParsons
resources & energy

PRELIMINARY STATUS DATE 07/XX/05
LEAD DESIGNER B. PIASECKI
DESIGNED BY J. COX
PROJECT ENGINEERING MANAGER E. L. BLANKENBILLER
PROJECT MANAGER F. G. NADEAU

DATE 07/XX/05
REVIEWED AND APPROVED
DESIGN. ANY PORTION MARKED "HOLD"
RETAINS PRELIMINARY STATUS.

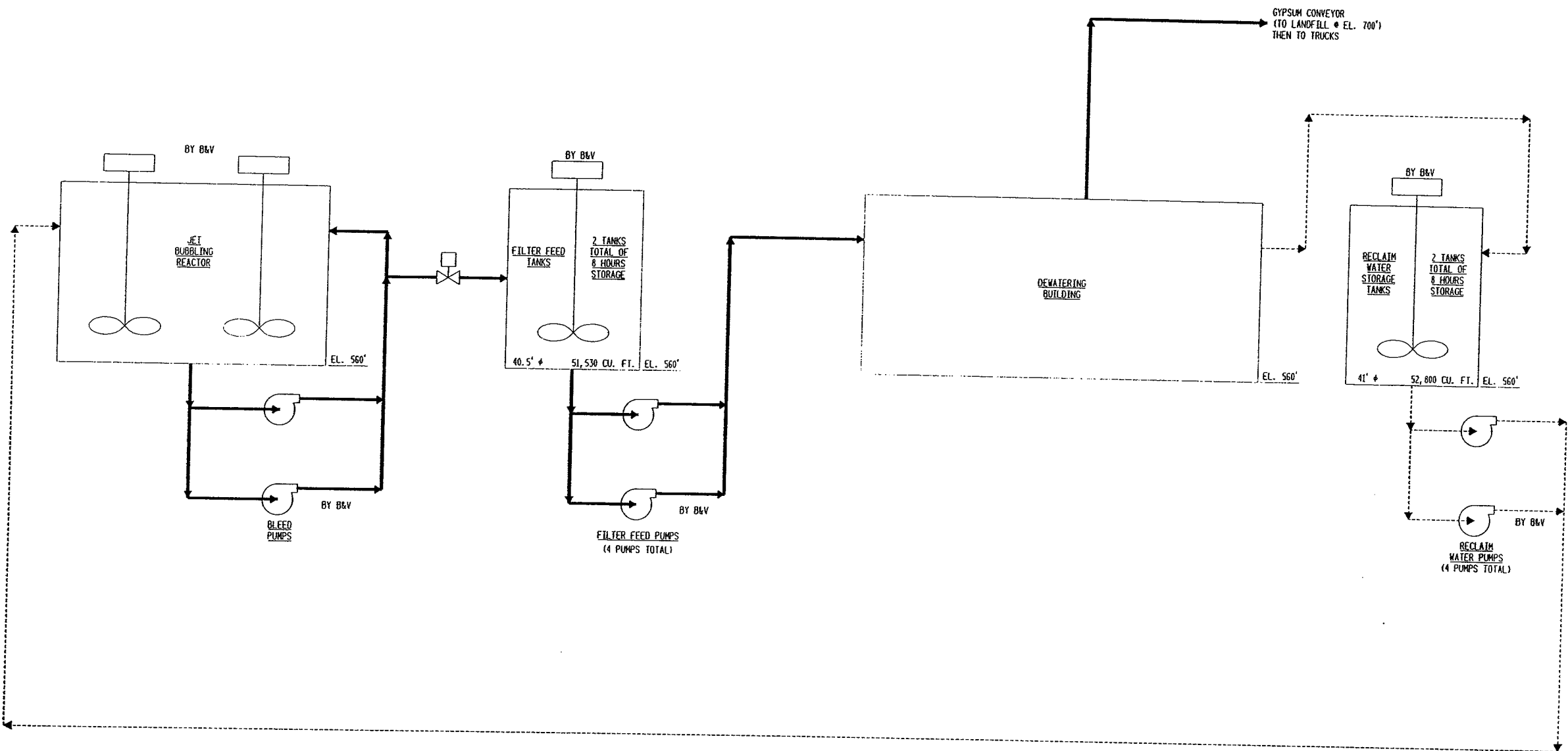
PROFESSIONAL ENGINEER'S SEAL

DATE 07/XX/05
BY F. G. NADEAU

PE/C-FILE: AEBBS-2-SK-ZD-302-001.dgn
PE/C-DATE: 04-Nov-04 07:55

LEGEND

GYPSUM SLURRY
RECLAIM/FILTRATE WATER



ISSUED FOR INFORMATION

REV	DATE	BY	CHKD	APPD	ELB	FGN
B	12/16/95	HJS	BP	JC	HJS	ELB

ISSUED FOR INFORMATION

REV	DATE	BY	CHKD	APPD	ELB	FGN
A	12/16/95	SMH	BP	JC	HJS	ELB

REVISIONS

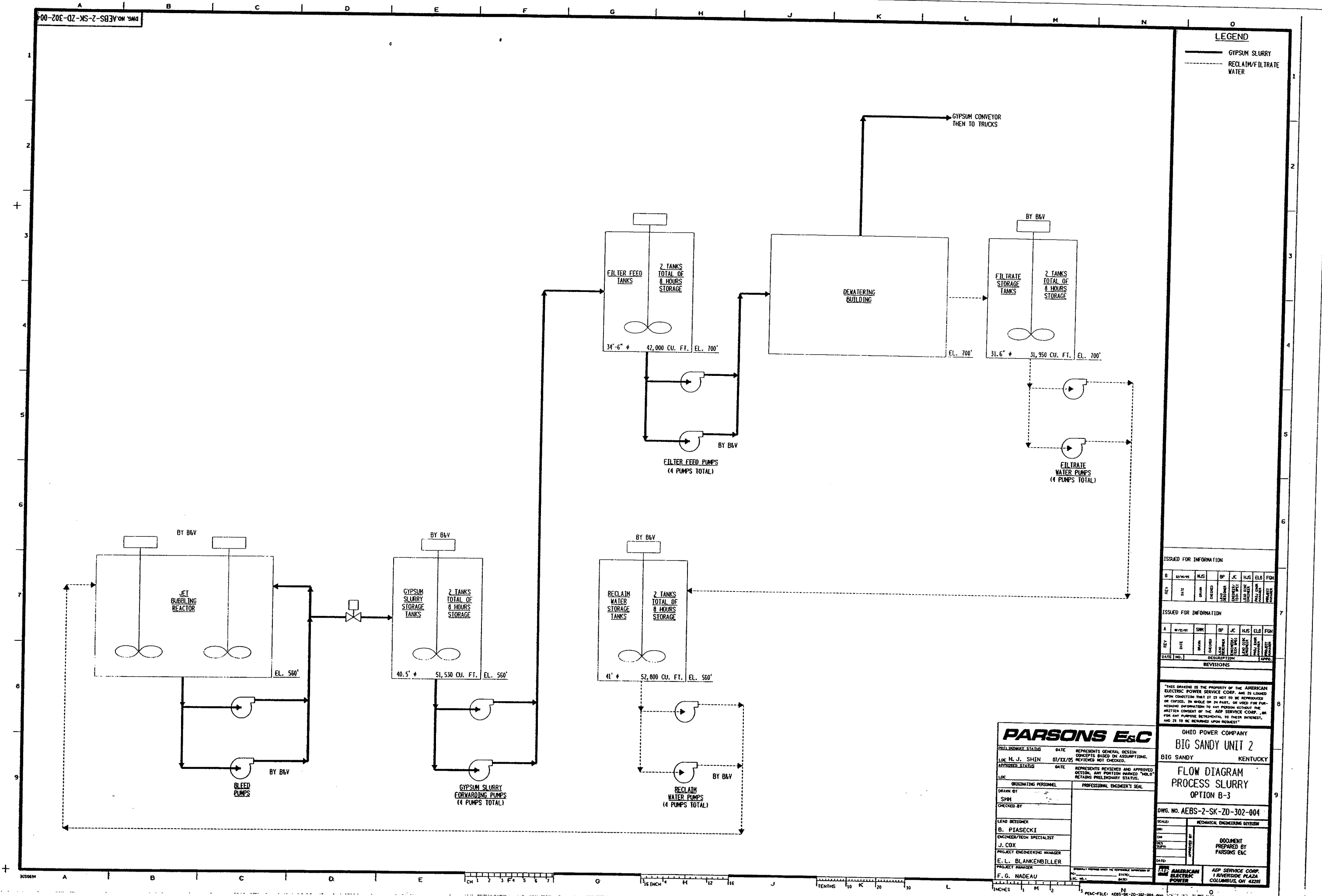
NO.	DESCRIPTION	DATE	BY	CHKD	APPD
1	ISSUED FOR INFORMATION	12/16/95	HJS	BP	JC

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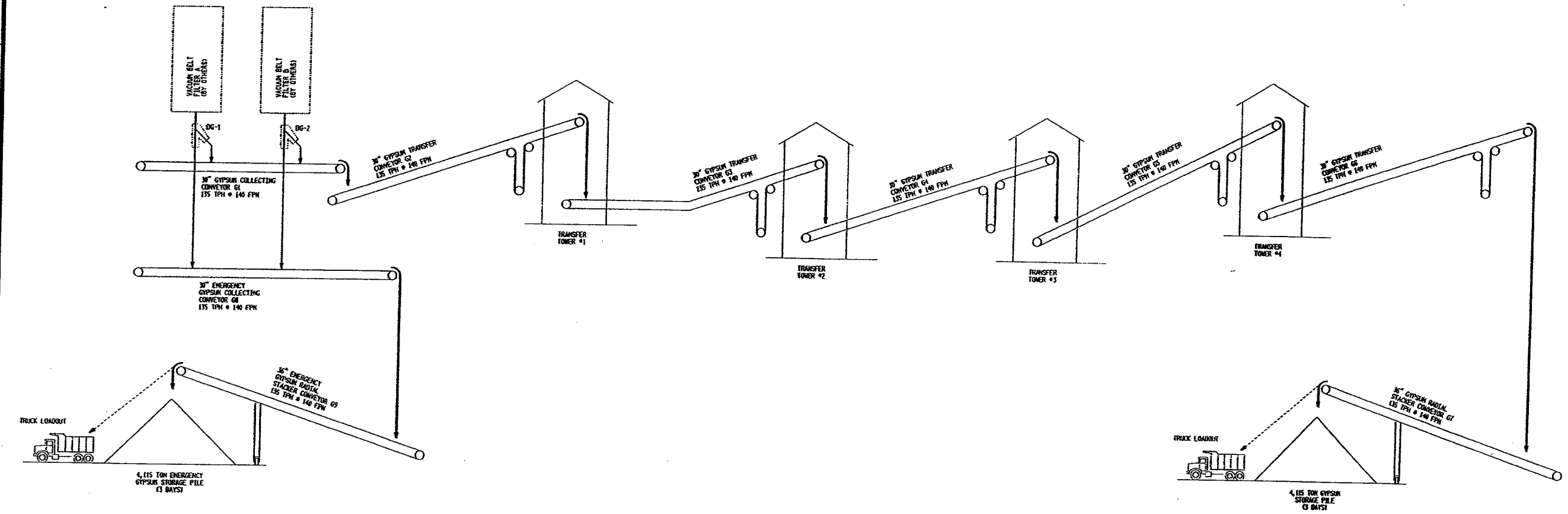
PARSONS E&C

ORDINARY STATUS DATE REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.
LDE H. J. SHIN 07/22/95
APPROVED STATUS DATE REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HOLD" RETAINS PRELIMINARY STATUS.
LDE
ORIGINATING PERSONNEL PROFESSIONAL ENGINEER'S SEAL
DRAWN BY SMH
CHECKED BY
LEAD DESIGNER B. PIASECKI
ENGINEER/TECH SPECIALIST J. COX
PROJECT ENGINEERING MANAGER E. L. BLANKENBILLER
PROJECT MANAGER F. G. NADEAU

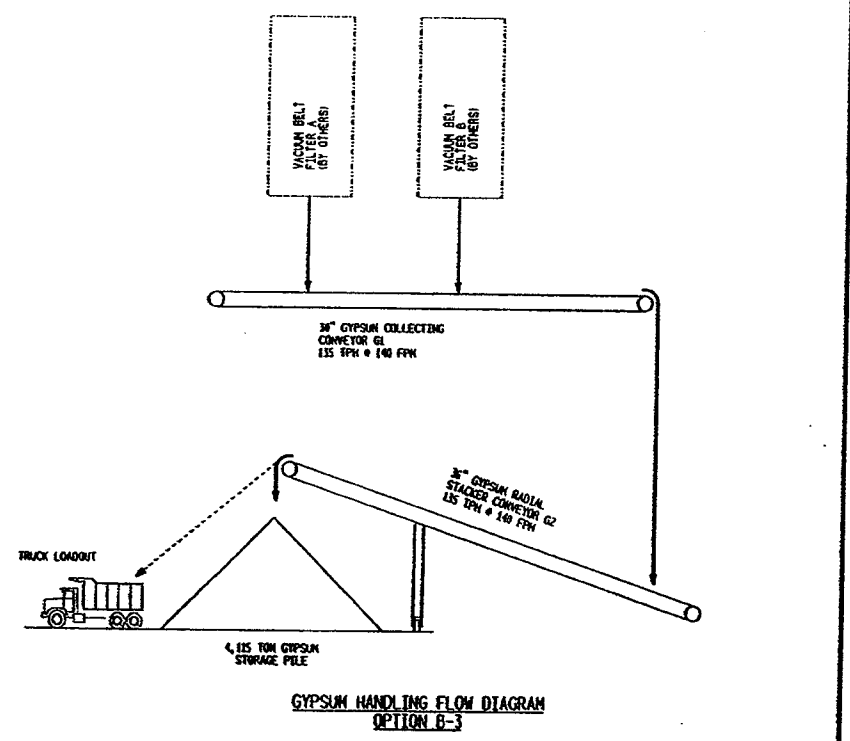
OHIO POWER COMPANY
BIG SANDY UNIT 2
BIG SANDY KENTUCKY
FLOW DIAGRAM
PROCESS SLURRY
OPTION B-2
DWG. NO. AEBS-2-SK-ZD-302-003
SCALE: MECHANICAL ENGINEERING DIVISION
DOCUMENT PREPARED BY PARSONS E&C
DATE: 12/16/95
BY: HJS
CHKD: BP
APPD: JC
ELB: HJS
FGN: ELB
PROJECT: BIG SANDY UNIT 2
SHEET: 1 OF 1



DWG. NO. AEBB-2-SK-ZB-302-005



GYPSUM HANDLING FLOW DIAGRAM
OPTION B-2



GYPSUM HANDLING FLOW DIAGRAM
OPTION B-3

PARSONS E&C

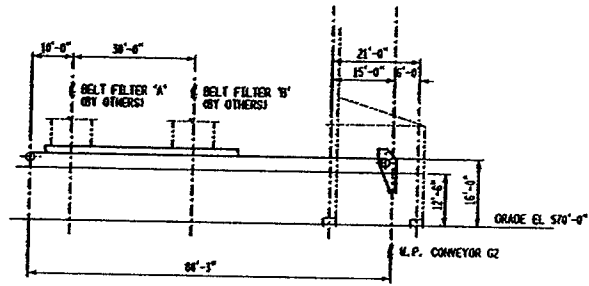
DESIGNED BY
H. J. SKIN
CHECKED BY
B. PIASECKI
IN CHARGE
M. P. FIELDER
PROJECT ENGINEER
EL. BLANKENBUELL
PROJECT MANAGER
J. C. MADEAU

REPRESENTS GENERAL DESIGN
CONCEPTS BASED ON ASSUMPTIONS
REVISIONS NOT CHECKED
REVISIONS REVIEWED AND APPROVED
BEFORE ANY FURTHER WORK
RETAINS PRELIMINARY STATUS

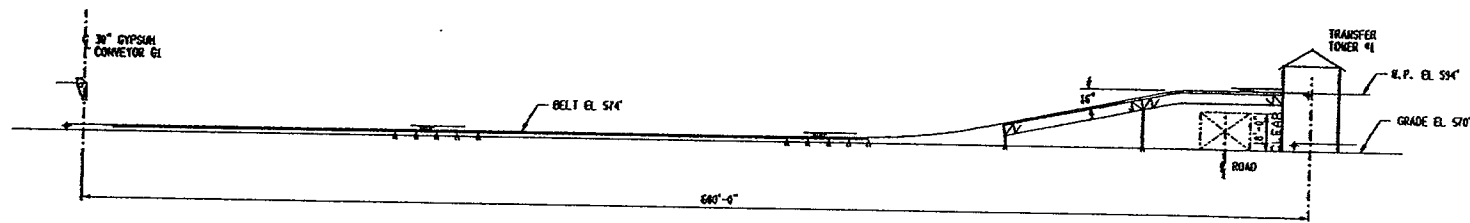
PROFESSIONAL ENGINEER'S SEAL

ISSUED FOR REVIEW AND COMMENTS									
REV	DATE	BY	CHK	APP	REV	DATE	BY	CHK	APP
REVISIONS									
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KENTUCKY POWER COMPANY BIG SANDY PLANT BIG SANDY KENTUCKY GYPSUM DEWATERING MATERIAL HANDLING FLOW DIAGRAM OPTION B-2&3 DWG. NO. AEBB-2-SK-ZB-302-005									
DOCUMENT PREPARED BY PARSONS E&C									
AEP SERVICE CORP. 3 WINDING PLAZA COLUMBUS, OH 43215									

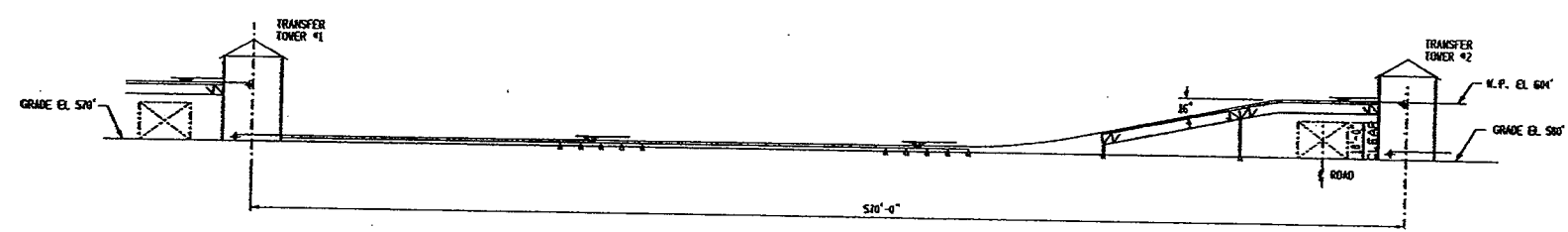
100-700-02-SK-Z-5837 ON 100



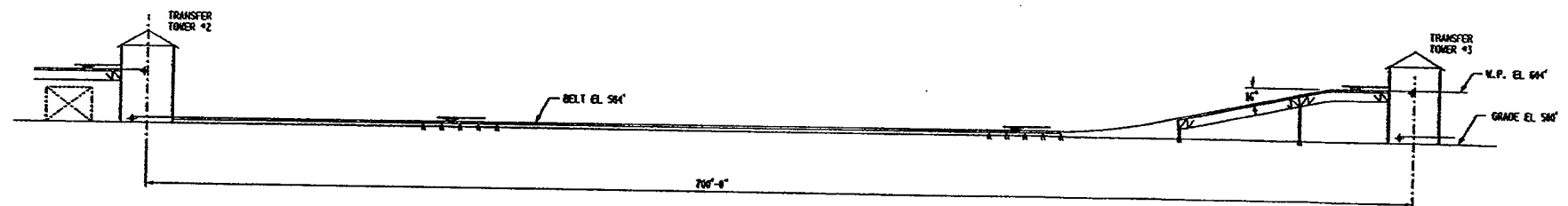
30" GYPSUM COLLECTING CONVEYOR G1 (OPTION B-2)
135 TPH @ 140 FPM
SCALE: 1/8" = 1'-0"



30" GYPSUM TRANSFER CONVEYOR G2 (OPTION B-2)
135 TPH @ 140 FPM
SCALE: 1/8" = 1'-0"



30" GYPSUM TRANSFER CONVEYOR G3 (OPTION B-2)
135 TPH @ 140 FPM
SCALE: 1/8" = 1'-0"



30" GYPSUM TRANSFER CONVEYOR G4 (OPTION B-2)
135 TPH @ 140 FPM
SCALE: 1/8" = 1'-0"

NOTES:
1. 30" EMERGENCY GYPSUM COLLECTING CONVEYOR
G5 TO BE SIMILAR TO GYPSUM CONVEYOR G1.



PARSONS E&C

PRELIMINARY STATUS: DATE: 7-11-85
DESIGNED BY: H.J. SHIN
CHECKED BY: B. PIASECKI
LEAD DESIGNER: B. PIASECKI
ENGINEER/TECH SPECIALIST: W.P. FIELDER
PROJECT ENGINEERING MANAGER: E.L. BLANKENBELLER
PROJECT MANAGER: C.G. MADEAU

REPRESENTS GENERAL DESIGN
CONCEPTS BASED ON ASSUMPTIONS.
REVIEWED BUT CHECKED.

REPRESENTS REVIEWED AND APPROVED
DESIGN. ANY FURTHER CHANGES
REQUIRE PRELIMINARY STATUS.

PROFESSIONAL ENGINEER'S SEAL

ISSUED FOR REVIEW AND COMMENTS

REV	DATE	BY	CHKD	APPD	REVISIONS

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OTHER THAN THAT FOR WHICH IT WAS
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REQUIRED."

KENTUCKY POWER COMPANY
BIG SANDY PLANT
BIG SANDY, KENTUCKY

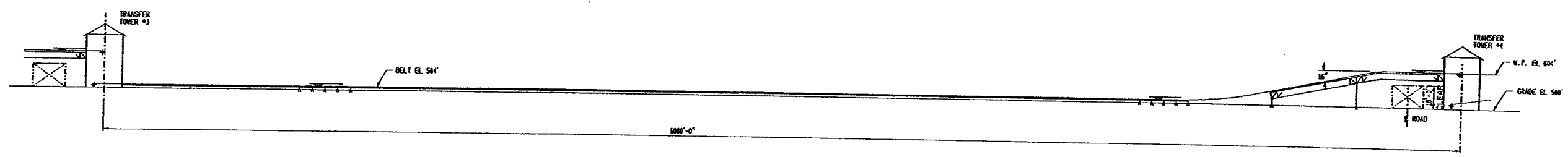
**GYPSUM DEWATERING
MATERIAL HANDLING
ELEVATIONS OPTION B-2**

DWG. NO. AERS-2-SK-ZB-002-001

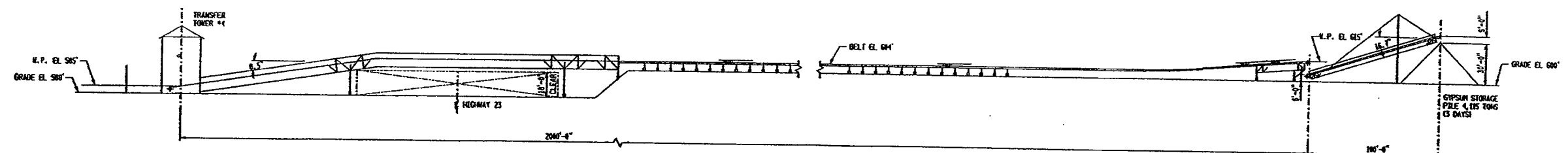
DESIGNED BY
PARSONS E&C

APP. SERVICE CORP.
1 AMERICAN PLAZA
COLUMBUS, OH 43260

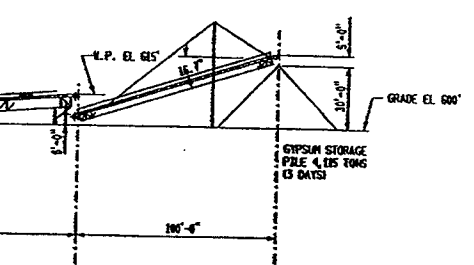
DWG. NO. AEBS-2-SK-ZB-002-002



30" GYPSUM TRANSFER CONVEYOR G5 (OPTION B-2)
135 TPH @ 140 FPM
SCALE: 1/2" = 1'-0"

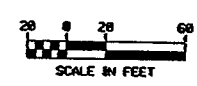


30" GYPSUM TRANSFER CONVEYOR G6 (OPTION B-2)
135 TPH @ 140 FPM
SCALE: 1/2" = 1'-0"



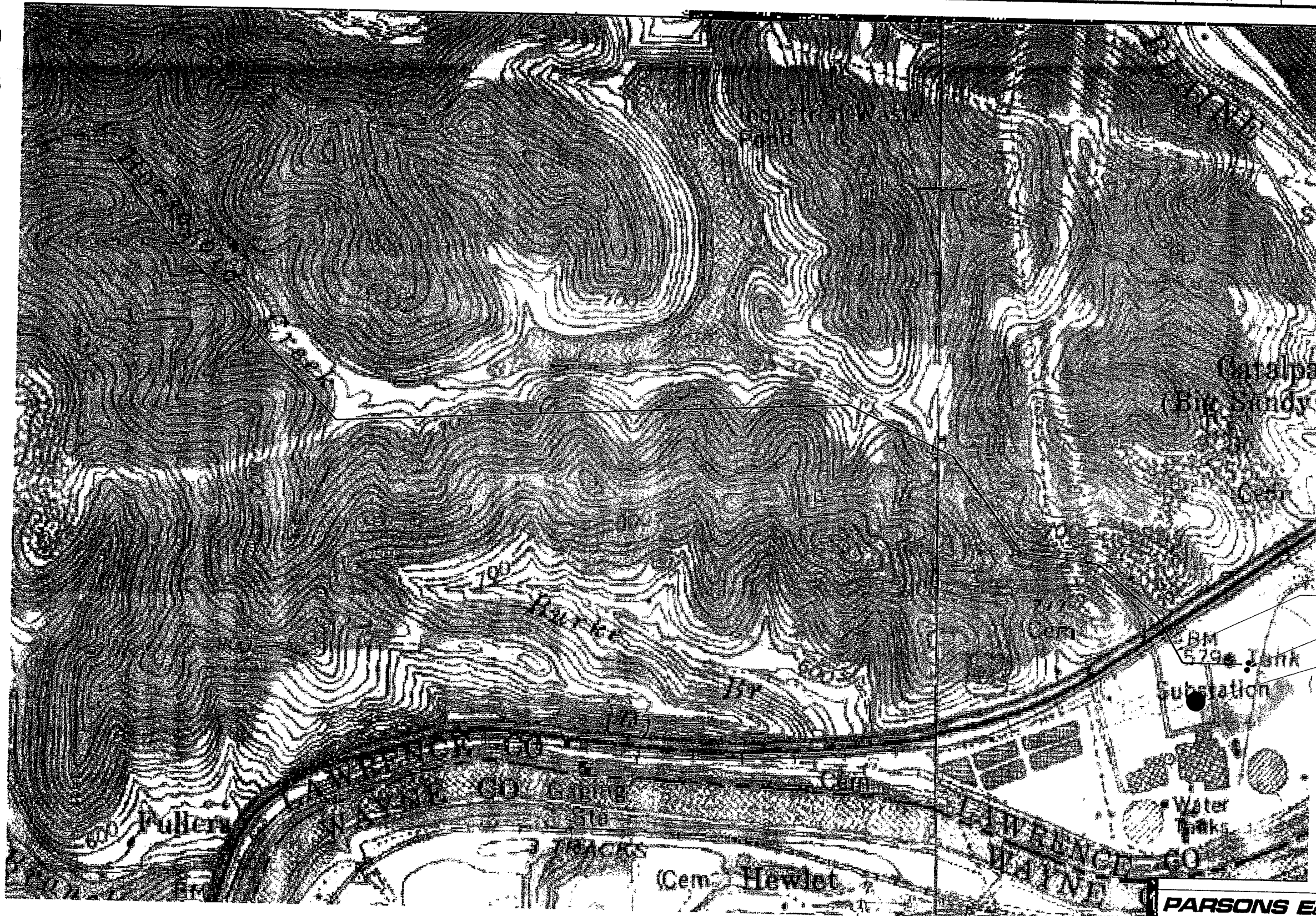
36" GYPSUM RADIAL STACKER G7 (OPTION B-2)
135 TPH @ 140 FPM
SCALE: 1/2" = 1'-0"

NOTES:
1. 36" EMERGENCY GYPSUM RADIAL STACKER G9 TO BE SIMILAR TO GYPSUM RADIAL STACKER G7.



PARSONS E&C	
DESIGNED BY HJ SHIM	DATE 7-24-05
CHECKED BY RAK	DATE
APPROVED BY B PEASECKI	DATE
PROJECT ENGINEER EL BLANKENHILLER	DATE
PROJECT MANAGER FG MADEAU	DATE

ISSUED FOR REVIEW AND COMMENTS	
DATE	REVISIONS
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KENTUCKY POWER COMPANY BIG SANDY PLANT BIG SANDY, KENTUCKY GYPSUM DEWATERING MATERIAL HANDLING ELEVATIONS OPTION B-2	
DWG. NO. AEBS-2-SK-ZB-002-002	
PREPARED BY PARSONS E&C	
AEP SERVICE CORP. 7 RIVERSIDE PLAZA COLUMBUS, OH 43260	



GIPOSL SLURRY
PIPELINE TO POND

REHYDRATION TANKS

JET BUBBLING REACTOR

ISSUED FOR REVIEW AND COMMENTS									
B	CL/CHK	RAK	DP	JFC	HLG	S.P	FOR		
ISSUED FOR REVIEW AND COMMENTS									
A	REV	DATE	CHKD	BY	JCN	HLG	ELB	FGH	
DATE	NO.	DESCRIPTION						APPRO.	
REVISIONS									
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KENTUCKY POWER COMPANY BIG SANDY PLANT BIG SANDY KENTUCKY GENERAL ARRANGEMENT GYPSUM DEWATERING OPTION A									
DWG. NO. AEBS-2-SK-ZB-002-003									
SCALE: 1"=200'									
DOCUMENT PREPARED BY PARSONS E&C									
APPROVED BY DATE:									
APPROVED BY DATE:									

PARSONS E&C

DESIGNED BY LOE HJ SHIN	DATE 7-11-05	REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.
CHECKED BY LOE	DATE	REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HOLD" RETAINING PRELIMINARY STATUS.
ORIGINATING PERSONNEL RAK	PROFESSIONAL ENGINEER'S SEAL	
LEAD DESIGNER B PIASECKI		
ENGINEER/ARCH SPECIALIST JS WHITE		
PROJECT ENGINEERING MANAGER EL BLANKENBILLER		
PROJECT MANAGER FG NADEAU		

300 0 300 600 900
SCALE IN FEET



RECLAIM WATER STORAGE TANKS
JET BUBBLING REACTOR
GYPSUM SLURRY STORAGE TANKS

ISSUED TO INCORPORATE AEP COMMENTS									
B	01/28/96	RAK	BP	JSM	HLS	SFC	SJP		
ISSUED FOR REVIEW AND COMMENTS									
A	01/22/95	RAK	BP	JSM	HLS	ELB	FGH		

REV	DATE	CHKD	APPROV	DESCRIPTION	APPROV

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KENTUCKY POWER COMPANY
BIG SANDY PLANT
BIG SANDY KENTUCKY
GENERAL ARRANGEMENT
GYPSUM DEWATERING
OPTION B-1

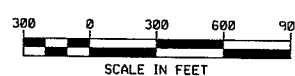
DWG. NO. AEBS-2-SK-ZB-002-004

SCALE: 1"=500'
DATE: 01/28/96
BY: RAK
CHECKED BY: BP
LEAD DESIGNER: B PIASECKI
ENGINEER/TECH SPECIALIST: JS WHITE
PROJECT ENGINEERING MANAGER: EL BLANKENBILLER
PROJECT MANAGER: FG NADEAU

APPROVED BY: [Signature]
DATE: 01/28/96
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PARSONS E&C

PRELIMINARY STATUS DATE 7-11-95
LSE HJ SHIN
APPROVED STATUS DATE 7-11-95
LSE HJ SHIN
ORIGINATING PERSONNEL PROFESSIONAL ENGINEER'S SEAL
DRAWN BY RAK
CHECKED BY BP
LEAD DESIGNER B PIASECKI
ENGINEER/TECH SPECIALIST JS WHITE
PROJECT ENGINEERING MANAGER EL BLANKENBILLER
PROJECT MANAGER FG NADEAU



SCALE IN FEET

GYPSUM SLURRY PIPELINE TO POND AND RECLAIM PIPELINE RETURN



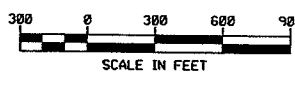
- GYPSUM Dewatering BUILDING
- RECLAIM WATER STORAGE TANKS
- JET BUBBLING REACTOR
- HYDROCYCLONE FEED TANKS

ISSUED FOR REVIEW AND COMMENTS									
REV	DATE	BY	CHKD	APPD	DESCRIPTION	DATE	BY	CHKD	APPD

KENTUCKY POWER COMPANY
BIG SANDY PLANT
BIG SANDY KENTUCKY
GENERAL ARRANGEMENT
GYPSUM DEWATERING
OPTION B-2
DWG. NO. AEBS-2-SK-ZB-002-005
SCALE: 1"=300'
DOCUMENT PREPARED BY
PARSONS E&C
APPROVED BY
DATE: 7-11-05
BY: B. PIASECKI
PROJECT ENGINEERING MANAGER
EL BLANKENBILLER
PROJECT MANAGER
FG NADEAU
APPROVED BY
DATE: 7-11-05
BY: B. PIASECKI
PROJECT ENGINEERING MANAGER
EL BLANKENBILLER
PROJECT MANAGER
FG NADEAU
APPROVED BY
DATE: 7-11-05
BY: B. PIASECKI
PROJECT ENGINEERING MANAGER
EL BLANKENBILLER
PROJECT MANAGER
FG NADEAU

PARSONS E&C

PRELIMINARY STATUS DATE 7-11-05
DESIGNED BY HJ SHIN
CHECKED BY RAK
LEAD DESIGNER B PIASECKI
ENGINEER/TECH SPECIALIST JS WHITE
PROJECT ENGINEERING MANAGER EL BLANKENBILLER
PROJECT MANAGER FG NADEAU
REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVISED NOT CHECKED.
REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "W.D." RETAINING PRELIMINARY STATUS.
PROFESSIONAL ENGINEER'S SEAL



SCALE IN FEET



- RECLAIM WATER STORAGE TANKS
- JET BUBBLING REACTOR
- GYPSUM SLURRY STORAGE TANKS

ISSUED FOR REVIEW AND COMMENTS									
A	REVISED	DATE	BY	CHKD	APP'D	REASON	DATE	BY	CHKD

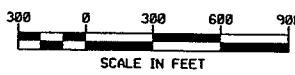
KENTUCKY POWER COMPANY
BIG SANDY PLANT
BIG SANDY KENTUCKY
**GENERAL ARRANGEMENT
GYPSUM DEWATERING
OPTION B-3**

DWG. NO. AEBS-2-SK-ZB-002-006

SCALE 1"=300'
DATE 11-11-65
BY JS WHITE
CHKD EL BLANKENBILLER
APP'D FG NADEAU
DOCUMENT PREPARED BY PARSONS E&C

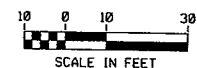
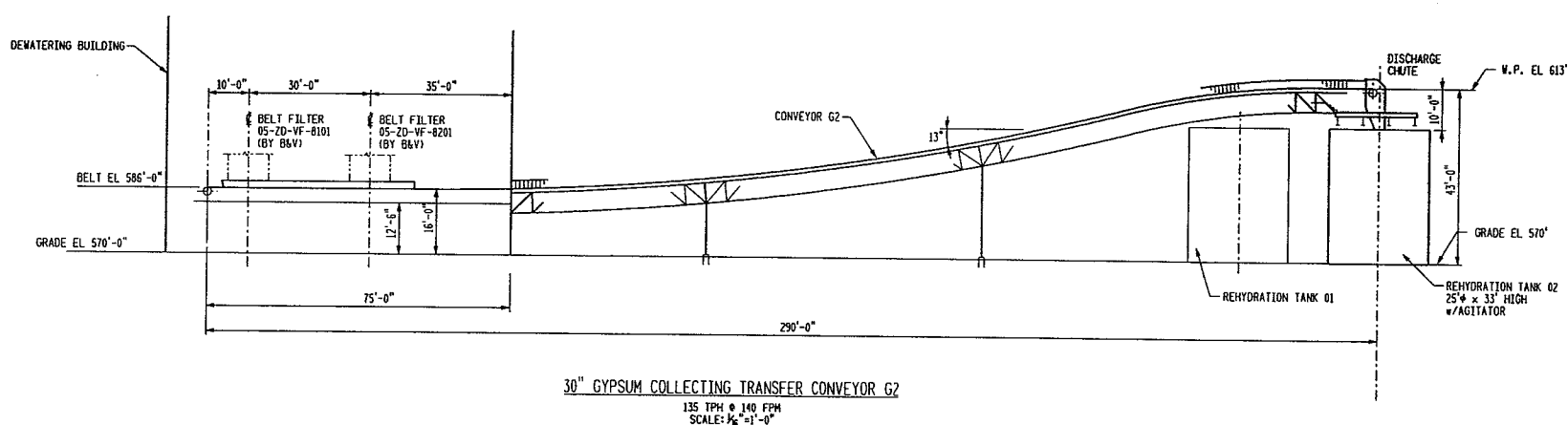
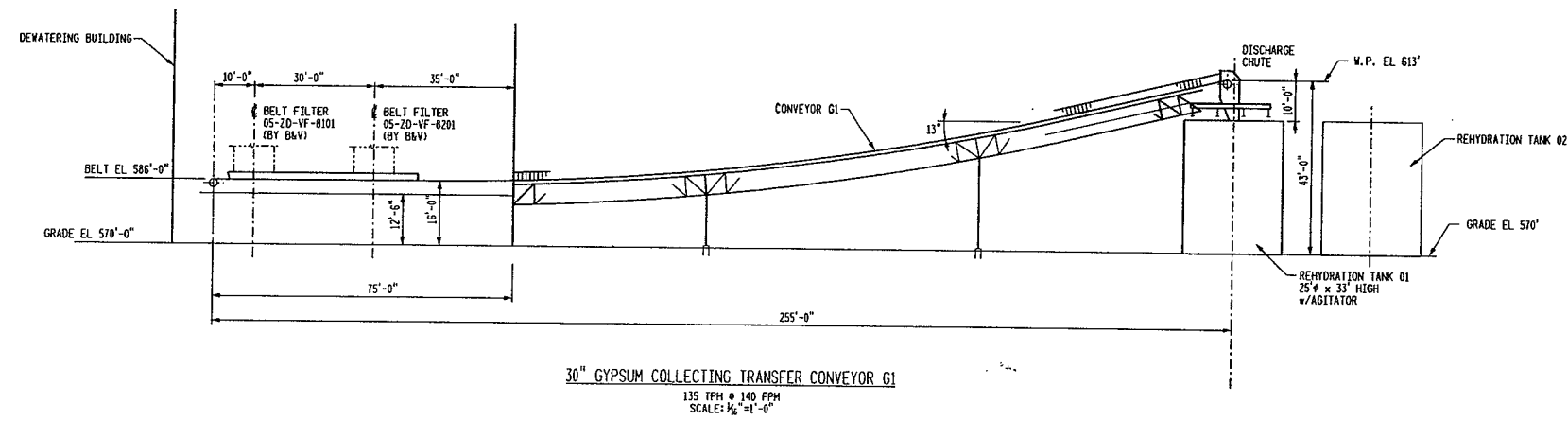
PARSONS E&C

DESIGNED BY	DATE	REPRESENTS GENERAL DESIGN
LOC HJ SHIN	7-11-65	CONCEPTS BASED ON ASSUMPTIONS.
APPROVED STAGE	DATE	REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HOLD" REMAINS PRELIMINARY STATUS.
ORIGINATING PERSONNEL	PROFESSIONAL ENGINEER'S SEAL	
DRAWN BY		
CHECKED BY		
LEAD DESIGNER		
ENGINEER/TECH SPECIALIST		
PROJECT ENGINEERING MANAGER		
EL BLANKENBILLER		
PROJECT MANAGER		
FG NADEAU		



SCALE IN FEET

GYPSUM SLURRY PIPELINE TO DEWATERING BUILDING AND RECLAIM PIPELINE RETURN



PARSONS E&C

PRELIMINARY STATUS	DATE	REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.
APPROVED STATUS	DATE	REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HOLD" RETAINS PRELIMINARY STATUS.
ORIGINATING PERSONNEL	PROFESSIONAL ENGINEER'S SEAL	
DRAWN BY		
CHECKED BY		
LEAD DESIGNER		
ENGINEER/TECH SPECIALIST		
PROJECT ENGINEERING MANAGER		
PROJECT MANAGER		

ISSUED TO INCORPORATE AEP COMMENTS									
B	11/16/05	RAK	BP	WPF	HJS	SFC	SJP		
ISSUED FOR REVIEW AND COMMENTS									
A	11/16/05	RAK	BP	WPF	HJS	ELB	FGN		
REV	DATE	DRAWN	CHECKED	DESIGNED	ENGINEER	TECH SPEC	LEAD DES	PROJECT MANAGER	PROJECT NUMBER
DATE	NO.	DESCRIPTION	APPRO.						
REVISIONS									
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KENTUCKY POWER COMPANY BIG SANDY PLANT BIG SANDY KENTUCKY GYPSUM DEWATERING MATERIAL HANDLING CONVEYORS G1 & G2, OPTION A DWG. NO. AEBS-2-SK-ZB-002-007 SCALE: 1/8"=1'-0" DATE: 11/16/05 DRAWN BY: RAK CHECKED BY: BP LEAD DESIGNER: B PIASECKI ENGINEER/TECH SPECIALIST: WPF PROJECT ENGINEERING MANAGER: SJ PROJECT MANAGER: FG NADEAU DOCUMENT PREPARED BY: PARSONS E&C AEP SERVICE CORP. 7 RIVERSIDE PLAZA COLUMBUS, OH 43226									

APPENDIX 2

PIPING AND EQUIPMENT LISTS FOR OPTIONS

BIG SANDY UNIT 2
GYPSUM DEWATERING/DISPOSAL
PIPING

12/6/2005

	Density lbs/ft ³	FLOW Rate GPM	Distance FT	No. of Lines	Material	Equivalent ft of fittings	Nominal Pipe Size in	Pipe ID in	Velocity ft/sec	Friction DP psi/100 ft	Friction DP PSI	Friction DP ft	Starting Elevation Fl	Ending Elevation Fl	Elevation Delta ft	Tank Height ft	Head Required ft	psi	w/Margin ft	REMARKS
OPTION A																				
Ash Water Storage Pond to Re-hydrating Tank Piping	63.02	2979	2500	2	SDR 7.3	150	18	12.87	7.35	0.4000	10.60	24.22	550	560	10	39	73.219	32.05	90	
Re-hydrating Tank to Top of Hill Piping	67.12	3453	5800	2	SDR 7.3	350	18	12.87	8.52	0.5573	34.27	73.53	560	715	155	0	228.535	106.52	260	
Top of Hill to Fly Ash Pond Piping	67.12	3453	5300	2	SDR 7.3	450	18	12.87	8.52	0.5573	32.04	68.75	715	665	-50	0	18.752	8.74	30	
OPTION B-1																				
Slurry (option B-1)	70.51	1115	6000	2	SDR 7.3	300	12	9.046	5.57	0.3782	23.83	48.66	560	700	140	0	188.659	92.38	210	
Filtrate Water Piping	63.02	835	6500	1	SDR 7.3	325	10	7.628	3.86	0.4550	31.05	70.95	700	560	-140	40	38.661	16.92	50	
Flush Water Piping	62.40	300	6500	1	SDR 7.3	325	8	6.120	3.27	0.2016	13.76	31.75	560	700	140	25	196.752	85.26	220	
OPTION B-2																				
Fire Water Piping	62.4	1000	6500	1	HDPE 200	325	12	8.889	5.17	0.30	20.48	47.25	560	700	140	25	212.250	91.98	240	
OPTION B-3																				
Slurry (option B-3)	70.51	1115	6000	2	SDR 7.3	300	12	9.046	5.57	0.3782	23.83	48.66	560	700	140	0	188.659	92.38	210	
Service/Flush Water Piping	62.4	300	6500	1	SDR 7.3	325	8	6.120	3.27	0.2016	13.76	31.75	560	700	140	25	196.752	85.26	220	
Potable Water Piping	62.4	50	200	1	SDR 7.3	325	3	2.4635	3.31	0.32	1.70	3.91	700	700	0	20	23.913	10.36	30	
Fire Water Piping	62.4	1000	6500	1	HDPE 200	325	12	8.889	5.17	0.30	20.48	47.25	560	700	140	25	212.250	91.98	240	
Service Air Piping	0.5	(100.00)	6500	1	CS	325	2	2.067	(9.56)	0.07	4.78	560	700	560	140	10		0.00		
Filtrate Water Piping	63.02	835	6500	1	SDR 7.3	325	10	7.628	5.86	0.4550	31.05	70.95	700	560	-140	40	38.661	16.92	50	
Sanitary Piping	62.4	25	100	1	SDR 7.3	325	3	2.44	1.72	0.23	0.99	2.30	700	690	-10	20	12.295	5.33	20	

**BIG SANDY UNIT 2
GYPSUM DEWATERING/DISPOSAL
EQUIPMENT AND ELECTRICAL LOAD LIST**

12/06/05

OPTION A

ASH POND EQUIPMENT

	Location	Flow GPM (ACFM)	Head ft	Motor NP Rating (HP)	BHP	eff	KW	Remarks
Bottom Ash Pond Pump A	BOTTOM ASH POND	2879	90	150	136	50%	111.9	
Bottom Ash Pond Pump B	BOTTOM ASH POND	2879	90	150	136	50%	111.9	
Total Installed				300			223.7	

FGD AREA EQUIPMENT

Byproduct Pump A	FGD AREA	3453	260	350	331	68.5%	261.0	EXTING BOTTOM ASH PUMP WITH NEW 4000 V MOTOR
Byproduct Pump B	FGD AREA	3453	260	350	331	68.5%	261.0	EXTING BOTTOM ASH PUMP WITH NEW 4000 V MOTOR
Byproduct Re-hydrating Tank A	FGD AREA							NEW - 25" ID X 33" H/ 121,200 gal.
Byproduct Re-hydrating Tank B	FGD AREA							NEW - 25" ID X 33" H/ 121,200 gal.
Byproduct Re-hydrating Tank A Agitator	FGD AREA			7.5			5.6	NEW
Byproduct Re-hydrating Tank B Agitator	FGD AREA			7.5			5.6	NEW
Total Installed				715			533.2	

BIG SANDY UNIT 2
GYPSUM DEWATERING/DISPOSAL
EQUIPMENT AND ELECTRICAL LOAD LIST

12/06/05

OPTION B-1

DEWATERING EQUIPMENT	Location	Flow GPM (ACFM)	Head ft	Motor NP Rating (HP)	BHP	eff	KW	Remarks
Filtrate Water Pump A	Slurry Pond	835	50	50	21	50%	37.3	NEW
Filtrate Water Pump B	Slurry Pond	835	50	50	21	50%	37.3	NEW
Filtrate Water Pump C	Slurry Pond	835	50	50	21	50%	37.3	NEW
Filtrate Water Pump D	Slurry Pond	835	50	50	21	50%	37.3	NEW
Filtrate Water Tank A Agitator	Slurry Pond			7.5			5.6	NEW
Filtrate Water Tank B Agitator	Slurry Pond			7.5			5.6	NEW
Filtrate Water Tank A	Slurry Pond							NEW - 31' 6" ID x 41' H / 181,700 gal.
Filtrate Water Tank B	Slurry Pond							NEW - 31' 6" ID x 41' H / 181,700 gal.
Flushing Filtrate Water Pump A	Slurry Pond	1000	100	75	51	50%	55.9	NEW
Flushing Filtrate Water Pump B	Slurry Pond	1000	100	75	51	50%	55.9	NEW
Flushing Filtrate Water Pump C	Slurry Pond	1000	100	75	51	50%	55.9	NEW
Flushing Filtrate Water Pump D	Slurry Pond	1000	100	75	51	50%	55.9	NEW
Flush Water Tank	Slurry Pond							NEW - D x H / 10,000 gal.
Flush Water Pump A	Slurry Pond	200	70	10	7.1	50%	7.5	NEW
Flush Water Pump B	Slurry Pond	200	70	10	7.1	50%	7.5	NEW
Total Installed					535.0		398.9	

PLANT EQUIPMENT

Flush Water Pump A	PLANT	300	220	50	33	50%	37.3	NEW
Flush Water Pump B	PLANT	300	220	50	33	50%	37.3	NEW
Gypsum Slurry Forwarding Pump A	PLANT	1115	210	150	118	50%	111.9	NEW
Gypsum Slurry Forwarding Pump B	PLANT	1115	210	150	118	50%	111.9	NEW
Gypsum Slurry Forwarding Pump C	PLANT	1115	210	150	118	50%	111.9	NEW
Gypsum Slurry Forwarding Pump D	PLANT	1115	210	150	118	50%	111.9	NEW
Total Installed					700.0		522.0	

BIG SANDY UNIT 2
GYPSUM DEWATERING/DISPOSAL
EQUIPMENT AND ELECTRICAL LOAD LIST

OPTION B-2	DEWATERING EQUIPMENT	Location	Flow GPM (ACFM)	Head ft	Motor NP Rating (HP)	BHP	eff	KW	Remarks	12/06/05
	Flow Water Booster Pump A	PLANT	1000	240	150	121.23	50%	111.9	NEW	
	Flow Water Booster Pump B	PLANT	1000	240	150	121.23	50%	111.9	NEW	
	Total Installed								223.7	

BIG SANDY UNIT 2
GYPSUM DEWATERING/DISPOSAL
EQUIPMENT AND ELECTRICAL LOAD LIST

OPTION B-3	DEWATERING EQUIPMENT	Location	Flow GPM (ACFM)	Head ft	Motor HP Rating (HP)	BHP	eff	KW	Remarks	12/6/2005
	Hydrocyclone Cluster 1A	Land Fill							From B&V Bid	
	Hydrocyclone Cluster 1B	Land Fill							From B&V Bid	
	Vacuum Belt Filler A	Land Fill							From B&V Bid	
	Vacuum Belt Filler B	Land Fill							From B&V Bid	
	Vacuum Pump A	Land Fill			250			186.4	From B&V Bid Electrical Load List	
	Vacuum Pump B	Land Fill			250			186.4	From B&V Bid Electrical Load List	
	Filtrate Pump A	Land Fill			15			11.2	From B&V Bid Electrical Load List	
	Filtrate Pump B	Land Fill			15			11.2	From B&V Bid Electrical Load List	
	Cake Wash Heater A	Land Fill			402			300	From B&V Bid Electrical Load List	
	Cake Wash Heater B	Land Fill			402			300	From B&V Bid Electrical Load List	
	Vacuum Filter Drive A	Land Fill			15			11.2	From B&V Bid Electrical Load List	
	Vacuum Filter Drive B	Land Fill			15			11.2	From B&V Bid Electrical Load List	
	Cloth Wash Pump A	Land Fill			2			1.5	From B&V Bid Electrical Load List	
	Cloth Wash Pump B	Land Fill			2			1.5	From B&V Bid Electrical Load List	
	Cloth Wash Tank	Land Fill							From B&V Bid	
	Cloth Wash Tank	Land Fill							From B&V Bid	
	Cake Wash Pump A	Land Fill			2			1.5	From B&V Bid Electrical Load List	
	Cake Wash Pump B	Land Fill			2			1.5	From B&V Bid Electrical Load List	
	Cake Wash Tank A	Land Fill							From B&V Bid	
	Cake Wash Tank B	Land Fill							From B&V Bid	
	Filler Belt Support Blower A	Land Fill			8			5.6	From B&V Bid Electrical Load List	
	Filler Belt Support Blower B	Land Fill			8			5.6	From B&V Bid Electrical Load List	
	Gear Reducing Fan A	Land Fill			0.5			0.4	From B&V Bid Electrical Load List	
	Gear Reducing Fan B	Land Fill			0.5			0.4	From B&V Bid Electrical Load List	
	Gear Reducing Fan C	Land Fill			0.5			0.4	From B&V Bid Electrical Load List	
	Gear Reducing Fan D	Land Fill			0.5			0.4	From B&V Bid Electrical Load List	
	Filtrate Storage Tank A Agitator	Dewatering Area			7.5			5.6	NEW - From B&V Bid Electrical Load List	
	Filtrate Storage Tank B Agitator	Dewatering Area			7.5			5.6	NEW - From B&V Bid Electrical Load List	
	Hydrocyclone Feed Tank A Agitator	Dewatering Area			25			18.6	NEW - From B&V Bid Electrical Load List	
	Hydrocyclone Feed Tank B Agitator	Dewatering Area			25			18.6	NEW - From B&V Bid Electrical Load List	
	Filtrate Water Pump A	Dewatering Area	1852	165	200	146.45	50%	149.1	NEW - From B&V Bid Electrical Load List	
	Filtrate Water Pump B	Dewatering Area	1852	155	200	146.45	50%	149.1	NEW - From B&V Bid Electrical Load List	
	Filtrate Water Pump C	Dewatering Area	1852	155	200	146.45	50%	149.1	NEW - From B&V Bid Electrical Load List	
	Filtrate Water Pump D	Dewatering Area	1852	155	200	146.45	50%	149.1	NEW - From B&V Bid Electrical Load List	
	Hydrocyclone Feed Tank A	Dewatering Area	N/A	N/A	N/A	N/A	N/A	N/A	NEW - From B&V Bid Electrical Load List	
	Hydrocyclone Feed Tank B	Dewatering Area	N/A	N/A	N/A	N/A	N/A	N/A	NEW - From B&V Bid Electrical Load List	
	Filtrate Storage Water Tank A	Dewatering Area	N/A	N/A	N/A	N/A	N/A	N/A	NEW 34'6" ID X 45' H/ 243,130 gals	
	Filtrate Storage Water Tank B	Dewatering Area	N/A	N/A	N/A	N/A	N/A	N/A	NEW 34'6" ID X 45' H/ 243,130 gals	
	Cartridge Filter A	Dewatering Area	N/A	N/A	N/A	N/A	N/A	N/A	NEW 31'6" ID X 41' H/ 181,700 gals	
	Cartridge Filter B	Dewatering Area	N/A	N/A	N/A	N/A	N/A	N/A	NEW 31'6" ID X 41' H/ 181,700 gals	
	Push Water Pump A	Dewatering Area	300	220	60	24.05	70%	37.3	NEW 200 GPM	
	Push Water Pump B	Dewatering Area	300	220	50	24.05	70%	37.3	NEW	
	Service Flush Water Storage Tank	Dewatering Area	N/A	N/A	N/A	N/A	N/A	N/A	NEW - 10,000 GAL	
Total Installed									1755.3	

BIG SANDY UNIT 2
GYPSUM DEWATERING/DISPOSAL
EQUIPMENT AND ELECTRICAL LOAD LIST

OPTION B-3	AREA EQUIPMENT	Location	Flow GPM (ACFM)	Head ft	Motor NP Rating (HP)	BHP	eff	KW	Remarks
	Gypsum Dewatering Area Sump Pump A	Land Fill			75.0			55.9	From B&V Bid Electrical Load List
	Gypsum Dewatering Area Sump Pump B	Land Fill			75.0			55.9	From B&V Bid Electrical Load List
	Dewatering Area Sump Agitator	Land Fill			10.0			7.5	From B&V Bid Electrical Load List
	Instrument Air Drier	Land Fill	50		1.3			1	NEW
	Instrument Air Drier	Land Fill	50		1.3			1	NEW
	Local Potable Water Well	Land Fill	N/A	N/A	N/A	N/A	N/A	N/A	NEW
	Life Station	Land Fill	25	100	1.2	1.26	90%	149	NEW, 2x100% duplication
			Total Installed		165			122.7	

	PLANT								
	Gypsum Slurry Forwarding Pump A	PLANT	1115	210	200	133.65	50%	149.1	From B&V Bid Electrical Load List
	Gypsum Slurry Forwarding Pump B	PLANT	1115	210	200	133.65	50%	149.1	From B&V Bid Electrical Load List
	Gypsum Slurry Forwarding Pump C	PLANT	1115	210	200	133.65	50%	149.1	From B&V Bid Electrical Load List
	Gypsum Slurry Forwarding Pump D	PLANT	1115	210	200	133.65	50%	149.1	From B&V Bid Electrical Load List
	Gypsum Slurry Storage Tank A	PLANT	N/A	N/A	N/A	N/A	N/A	N/A	From B&V 37' D X 48' H, 39,500 FT3
	Gypsum Slurry Storage Tank B	PLANT	N/A	N/A	N/A	N/A	N/A	N/A	From B&V 37' D X 48' H, 39,500 FT3
	Reclaim Water Pump A	PLANT			200			149.1	From B&V Bid Electrical Load List
	Reclaim Water Pump B	PLANT			200			149.1	From B&V Bid Electrical Load List
	Reclaim Water Pump C	PLANT			200			149.1	From B&V Bid Electrical Load List
	Reclaim Water Pump D	PLANT			200			149.1	From B&V Bid Electrical Load List
	Gypsum Slurry Storage Tank Agitator A	PLANT			25			18.6	From B&V Bid Electrical Load List
	Gypsum Slurry Storage Tank Agitator B	PLANT			25			18.6	From B&V Bid Electrical Load List
	Reclaim Water Storage Tank Agitator A	PLANT			7.5			5.6	From B&V Bid Electrical Load List
	Reclaim Water Storage Tank Agitator B	PLANT			7.5			5.6	From B&V Bid Electrical Load List
	Reclaim Water Storage Tank A	PLANT	N/A	N/A	N/A	N/A	N/A	N/A	From B&V 36' D X 47' H, 47,840 FT3
	Reclaim Water Storage Tank B	PLANT	N/A	N/A	N/A	N/A	N/A	N/A	From B&V 36' D X 47' H, 47,840 FT3
	Fire Water Booster Pump A	PLANT	1000	240	125	12.23	50%	93.2	NEW
	Fire Water Booster Pump B	PLANT	1000	240	125	12.23	50%	93.2	NEW
	Service Flush Water Booster Pump A	PLANT	300	300	50	45.46	80%	37.3	NEW
	Service Flush Water Booster Pump B	PLANT	300	300	50	45.46	80%	37.3	NEW
			Total Installed		2015			1502.4	

AEP-BIG SANDY UNIT 2 FGD
GYPSUM MATERIAL HANDLING SYSTEM EQUIPMENT LIST

GYPSUM	Equipment Req'd.	Qty.	Capacity	Belt Width	Speed	Motor HP	Length	Lift
Mixing Tank	Collecting Transfer Conv. G1	1	135 TPH	30"	140 fpm	25	260	27
Option	Collecting Transfer Conv. G2	1	135 TPH	30"	140 fpm	25	295	27

B. Fielder 11-14-05

APPENDIX 3

DETAILED ESTIMATES

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER		Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study		Present Day: 11/29/2005	
Location: Louisville, KY		Capacity: 1 @ 800 MW		Revision Number: 1	
Type: Wet FGD		Currency: USD		Estimate Coordinator:	
Seismic Zone: 1		Proposal Number: 53770801		Lead Estimator: Encke	
		Configuration: * GYPSUM DEWATERING STUDY * Rev'd		Checked By:	

User	User	PBS	Acct	Mat	Description	Quantity	U/M	Material	Labor	Crew	Rate	Material	Labor	Total	Manhours
1	Island	2	Code	Code	Stat			Unit	Unit			Cost	Cost	Cost	

Option A

140 FGD SYSTEM

15527 GYPSUM HANDLING-DISTRIBUTION FOUNDATIONS

1A 4G2	140	C04	15527	4022	35	Spoils, gypsum conveyor fdns	26.00	CY	0.00	0.060	C01CS	90.20	0	141	141	1.6
1A 4G2	140	C03	15527	4051	35	Excavation, gypsum conveyor fdns	164.00	CY	0.00	0.250	C01BS	84.97	0	3,484	3,484	41.0
1A 4G2	140	C03	15527	4055	35	Backfill & Compact, gypsum conveyor fdns	138.00	CY	0.00	0.250	C01BS	84.97	0	2,931	2,931	34.5
1A 4G2	140	F01	15527	4118	35	Rebar, gypsum conveyor fdns	1.24	TN	800.00	17.000	S01BS	84.61	992	1,784	2,776	21.1
1A 4G2	140	F01	15527	4120	35	Formwork, gypsum conveyor fdns	558.00	SF	2.31	0.200	S01AS	74.81	1,289	8,349	9,638	111.6
1A 4G2	140	F01	15527	4123	35	Concrete, gypsum conveyor fdns	25.00	CY	75.00	1.000	S01CS	97.26	1,875	2,432	4,307	25.0
Subtotal For PBS: 15527 GYPSUM HANDLING-DISTRIBUTION FOUNDATIONS									4,156	19,120		23,276				234.7

17622 GYPSUM DEWATERING BUILDING-FOUNDATIONS

1A 4G2	140	C04	17622	4022	35	Spoils, gypsum dewatering bldg fdn & equip Fdn	3,412.00	CY	0.00	0.060	C01CS	90.20	0	18,466	18,466	204.7
1A 4G2	140	C03	17622	4051	35	Excavate, gypsum dewatering bldg fdn & equip Fdn	4,265.00	CY	0.00	0.120	C01CS	90.20	0	46,164	46,164	511.8
1A 4G2	140	C03	17622	4055	35	Backfill & compact, gypsum dewatering bldg fdn & equip Fdn	853.00	CY	0.00	0.150	C01CS	90.20	0	11,541	11,541	128.0
1A 4G2	140	C14	17622	4056	35	Aggregate fill, between mat and slab, gypsum dewatering bldg fdn & equip Fdn	840.00	CY	19.95	0.400	C01CS	90.20	16,758	30,307	47,065	336.0
1A 4G2	140	F01	17622	4118	35	Rebar, gypsum dewatering bldg fdn & equip fdn	412.35	TN	800.00	15.000	S01BS	84.61	329,880	523,334	853,214	6,185.3
1A 4G2	140	F01	17622	4120	35	Formwork, gypsum dewatering bldg fdn & equip Fdn	13,670.00	SF	2.93	0.300	S01AS	74.81	40,053	306,796	346,849	4,101.0
1A 4G2	140	F01	17622	4122	35	Mud mat, gypsum dewatering bldg fdn & equip Fdn	119.00	CY	65.00	0.500	S01CS	97.26	7,735	5,787	13,522	59.5
1A 4G2	140	F01	17622	4123	35	Concrete, gypsum dewatering bldg fdn & equip Fdn	2,572.00	CY	75.00	1.200	S01CS	97.26	192,900	300,183	493,083	3,086.4
1A 4G2	140	F03	17622	4127	35	Embeds, gypsum dewatering bldg fdn & equip Fdn	2.85	TN	3,500.00	120.000	S01BS	84.61	9,975	28,937	38,912	342.0
1A 4G2	140	F01	17622	4190	35	Concrete coating, sumps & trenches, gypsum dewatering bldg & equip fdn	4,271.00	SF	22.00	0.000	C01CS	90.20	93,962	0	93,962	0.0
Subtotal For PBS: 17622 GYPSUM DEWATERING BUILDING-FOUNDATIONS									691,263	1,271,515		1,962,778				14,954.6

17623 GYPSUM DEWATERING BUILDING-SUPERSTRUCTURE

1A 4G2	140	S01	17623	4311	35	Str steel, x heavy, 80 to 120# / FT, gypsum dewatering bldg	105.00	TN	1,685.00	14.000	S03AS	114.64	176,925	168,521	345,446	1,470.0
1A 4G2	140	S01	17623	4312	35	Str steel, heavy, 40 to 79# / FT, gypsum dewatering bldg	299.00	TN	1,873.00	16.000	S03AS	114.64	560,027	548,438	1,108,465	4,784.0

12/2/2005 10:57:20 AM

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study Location: Louisa, KY Capacity: 1 @ 800 MW Type: Wet FGD										Present Day: 11/29/2005 Revision Number: 1 Estimate Coordinator: Lead Estimator: Ericke Checked By:										I-06
Currency: USD Seismic Zone: 1										Proposal Number: 53770801 Configuration: * GYPSUM DEWATERING STUDY * Rev'd										
User	Island	User	PBS	Acct	Mat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Rate	Material Cost	Labor Cost	Total Cost	Manhours				
1		2	Code	Code	Slat															

Option A

140 FGD SYSTEM

17623 GYPSUM DEWATERING BUILDING-SUPERSTRUCTURE																					
1A	4G2	140	S01	17623	4313	35	Str steel, medium, 20 to 39# / FT, gypsum dewatering bldg	147.00	TN				2,382.00	19,000	S03AS	114.64	350,154	320,190	670,344	2,793.0	
1A	4G2	140	S02	17623	4314	35	Str steel, light, 12 to 19# / FT, stair, stringers (C10x15.3), gypsum dewatering bldg (183')	1.40	TN				2,880.00	23,000	S03AS	114.64	4,032	3,691	7,723	32.2	
1A	4G2	140	S01	17623	4314	35	Str steel, light, 12 to 19# / FT, gypsum dewatering bldg	9.30	TN				2,880.00	23,000	S03AS	114.64	26,784	24,521	51,305	213.9	
1A	4G2	140	S01	17623	4314	35	Str steel, x light, 0 to 11# / FT (8% connections), gypsum dewatering bldg	44.82	TN				3,421.00	23,000	S03AS	114.64	153,329	118,178	271,507	1,030.9	
1A	4G2	140	S02	17623	4330	35	Stairs, treads, gypsum dewatering bldg	169.00	EA				39.73	0.530	S03BS	102.37	6,714	9,169	15,884	89.6	
1A	4G2	140	S02	17623	4330	35	Stairs, handrail, gypsum dewatering bldg	366.00	LF				52.51	0.340	S03BS	102.37	19,219	12,739	31,958	124.4	
1A	4G2	140	S02	17623	4330	35	Handrail and toepiate, 1-1/4" pipe, galv, gypsum dewatering bldg	717.00	LF				52.51	0.340	S03BS	102.37	37,650	24,956	62,605	243.8	
A	4G2	140	S02	17623	4330	35	Grating, 1-1/2", gypsum dewatering bldg	800.00	SF				11.40	0.210	S03BS	102.37	9,120	17,198	26,318	168.0	
A	4G2	140	S02	17623	4330	35	Grating, 2", trenches, gypsum dewatering bldg	1,015.00	SF				14.58	0.210	S03BS	102.37	14,799	21,820	36,619	213.2	
A	4G2	140	B05	17623	4950	35	Roll-up doors, 12' x 20', gypsum dewatering bldg	1.00	EA				5,000.00	20,000	S04BS	71.48	5,000	1,430	6,430	20.0	
A	4G2	140	B05	17623	4950	35	Roll-up door, 6'w x 12'h, hand chain lift, guides, gypsum dewatering bldg	1.00	EA				2,500.00	12,000	S04BS	71.48	2,500	858	3,358	12.0	
A	4G2	140	B05	17623	4950	35	Doors, 3'w x 7'-2" h, 1-3/4" thick, hollow metal, 16 ga, wire glass window, complete, gypsum dewatering bldg	16.00	EA				1,055.00	7,000	S04BS	71.48	16,880	8,006	24,886	112.0	
A	4G2	140	B02	17623	4960	35	8" CMU, gypsum dewatering bldg	5,492.00	SF				2.96	0.200	S04BS	71.48	16,256	78,514	94,770	1,098.4	
A	4G2	140	B04	17623	5022	35	Siding, insulated metal, 116' x 84' x 114'h, gypsum dewatering bldg	33,664.00	SF				20.00	0.000	S05BS	127.65	673,280	0	673,280	0.0	
A	4G2	140	B01	17623	5030	35	Roof, insulated metal, gypsum dewatering bldg	9,912.00	SF				20.00	0.000	S03BS	102.37	198,240	0	198,240	0.0	
								Subtotal For PBS: 17623 GYPSUM DEWATERING BUILDING-SUPERSTRUCTURE												3,629,137	12,405.3

17907 PUMP HOUSE STRUCTURE & FOUNDATIONS

1 A	4G2	140	C04	17907	4022	35	Spoils, gypsum re-hydration pump fdn	161.00	CY				0.00	0.060	C01CS	90.20	871	871	9.7
1 A	4G2	140	C03	17907	4051	35	Excavate, gypsum re-hydration pump fdn	248.00	CY				0.00	0.120	C01CS	90.20	2,684	2,684	29.8
1 A	4G2	140	C03	17907	4055	35	Backfill & compact, gypsum re-hydration pump fdn	87.00	CY				0.00	0.250	C01BS	84.97	1,848	1,848	21.8
1 A	4G2	140	F01	17907	4118	35	Rebar, gypsum re-hydration pump fdn	5.60	TN				800.00	15,000	S01BS	84.61	7,107	11,587	84.0
1 A	4G2	140	F01	17907	4120	35	Formwork, gypsum re-hydration pump fdn	1,100.00	SF				2.31	0.200	S01AS	74.81	16,458	18,999	220.0

12/2/2005 10:57:20 AM

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER
 Project Name: Big Sandy-Unit 2 - - Gypsum Dewatering Study
 Location: Louisa, KY
 Capacity: 1 @ 800 MW
 Type: Wet FGD
 Currency: USD
 Seismic Zone: 1
 User: PBS
 Island: 2
 Code: Mat
 Stat: 1
 Description: 1
 Quantity: 1
 U/M: 1
 Material Unit: 1
 Labor Unit: 1
 Crew: 1
 Crow Rate: 1
 Material Cost: 1
 Labor Cost: 1
 Total Cost: 1
 Manhours: 1
 Present Day: 11/29/2005
 Revision Number: 1
 Estimate Coordinator: 1
 Lead Estimator: Encke
 Checked By: 1

WorleyParsons Estimate Report: Unit x Island x PBS - Detail

Proposal Number: 53770801
 Configuration: * GYPSUM DEWATERING STUDY * Rev'd
 Partner(s):

User	Island	User	PBS	Code	Mat	Stat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Crew Rate	Material Cost	Labor Cost	Total Cost	Manhours
Option A																	
140 FGD SYSTEM																	
17907 PUMP HOUSE STRUCTURE & FOUNDATIONS																	
A	4G2	140	F01	17907	4122	35	Mud mat, gypsum re-hydration pump fdn	11.00	CY	65.00	0.500	S01CS	97.26	715	535	1,250	5.5
A	4G2	140	F01	17907	4123	35	Concrete, gypsum re-hydration pump fdn	112.00	CY	75.00	1.000	S01CS	97.26	8,400	10,893	19,293	112.0
A	4G2	140	F03	17907	4127	35	Embeds, gypsum re-hydration pump fdn	0.80	TN	3,500.00	120.000	S01BS	84.61	2,800	8,123	10,923	96.0
A	4G2	140	S02	17907	4330	35	Grating, 1-1/2" galv, gypsum re-hydration pump fdn	280.00	SF	11.40	0.210	S03BS	102.37	3,192	6,019	9,211	58.8
A	4G2	140	B04	17907	4910	35	Pre-engineered metal bldg, 30' x 28' x 12'h, gypsum re-hydration pumphouse	840.00	SF	90.00	0.000	S07AS	113.35	75,600	0	75,600	0.0

Subtotal For PBS: 17907 PUMP HOUSE STRUCTURE & FOUNDATIONS										97,728	54,539	152,267	637.5
Subtotal For Island: 140 FGD SYSTEM										3,064,056	2,703,402	5,767,458	28,232.1
630 POWER HOUSE ELECTRICAL EQUIPMENT & ROP													

62407 MEDIUM VOLTAGE POWER CABLE, 8KV TO 15KV																
A	4G2	630	E	62407	4624	33	13.8 kV Overhead Line	1.00	LS	980,900.00	0.000	E02AS	91.86	0	980,900	0.0
Subtotal For PBS: 62407 MEDIUM VOLTAGE POWER CABLE, 8KV TO 15KV												980,900	0	980,900	0.0	
62506 SWITCHGEAR, 601V AND ABOVE																

63101 SWITCHGEAR, 380V TO 600V																	
A	DW	630	E04	62506	0211	35	Switchgear Breakers, 5KV, 1200A	2.00	EA	19,600.00	24.000	E02BS	100.87	39,200	4,842	44,042	48.0
Subtotal For PBS: 62506 SWITCHGEAR, 601V AND ABOVE												39,200	4,842	44,042	48.0		
63101 SWITCHGEAR, 380V TO 600V																	
A	DW	630	E05	63101	0212	35	Switchgear Breakers, 480V, 800A	2.00	EA	8,400.00	16.000	E02BS	100.87	16,800	2,086	18,886	20.0

Subtotal For PBS: 63101 SWITCHGEAR, 380V TO 600V																16,800	3,228	20,028	32.0
63103 MOTOR CONTROL CENTERS, 380V TO 480V																			
A	PE	630	E05	63103	0232	35	MCC, 600V Vertical	4.00	EA	5,000.00	12.000	E02BS	100.87	4,842	24,842	48.0			
A	DW	630	E05	63103	0232	35	MCC, 600V Vertical	1.00	EA	5,000.00	12.000	E02BS	100.87	1,210	6,210	12.0			
A	DW	630	E	63103	4649	35	Fused Disconnect Switch, 300 A, 480 V	2.00	EA	500.00	14.000	E02BS	100.87	2,824	3,824	28.0			
Subtotal For PBS: 63103 MOTOR CONTROL CENTERS, 380V TO 480V																26,000	8,877	34,877	88.0

Subtotal For PBS: 63103 MOTOR CONTROL CENTERS, 380V TO 480V																26,000	8,877	34,877	88.0
64601 UNINTERRUPTIBLE POWER SUPPLY SYSTEM																			
A COM		630	E	64601	0231	35	UPS System, 5 KVA, transfer switch, inverter,	2.00	EA	20,000.00	120.000	E02BS	100.87	40,000	24,209	64,209	240.0		

batteries & charger, panelboard															
Subtotal For PBS: 64601 UNINTERRUPTIBLE POWER SUPPLY SYSTEM															
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WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER
 Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study
 Location: Louisa, KY
 Capacity: 1 @ 800 MW
 Type: Wet FGD
 Currency: USD
 Seismic Zone: 1
 User: 1
 Island: 2
 Code: 2
 Acct: 2
 Mat: 2
 Description: 2
 Quantity: 2
 U/M: 2
 Material Unit: 2
 Labor Unit: 2
 Crew: 2
 Rate: 2
 Material Cost: 2
 Labor Cost: 2
 Total Cost: 2
 Manhours: 2

WorleyParsons

Estimate Report: Unit x Island x PBS - Detail

Proposal Number: 53770801
 Configuration: * GYPSUM DEWATERING STUDY * Rev'd
 Present Day: 11/29/2005
 Revision Number: 1
 Estimate Coordinator:
 Lead Estimator: Ericke
 Checked By:

User	Island	Code	Mat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Rate	Material Cost	Labor Cost	Total Cost	Manhours
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Option A

630 POWER HOUSE ELECTRICAL EQUIPMENT & BOP														
68203 UNDERGROUND RACEWAY														
1 A	4G2	630	E01	68203	4815	35	Manhole, 8' x 8' x 8'	5.00	EA	3,200.00	32,000	E02AS	91.86	16,000
											106,320	960,856	1,067,176	10,460.0
68401 GROUNDING SYSTEM														
1 A	DW	630	E	68401	4619	35	Ground Rods	24.00	EA	25.72	3,125	E02AS	91.86	617
1 A	DW	630	E	68401	4619	35	Grounding terminations	48.00	EA	12.70	1,750	E02AS	91.86	610
1 A	4G2	630	E	68401	4620	35	Cable, 1/C #4/0 bare copper	6,200.00	LF	1.35	0.044	E02AS	91.86	8,370
1 A	4G2	630	E	68401	4620	35	Cable, 1/C #350 kmil bare copper	600.00	LF	5.47	0.058	E02AS	91.86	3,282
1 A	4G2	630	E	68401	4620	35	Cable, 1/C #2/0 bare copper	1,440.00	LF	0.89	0.038	E02AS	91.86	1,282
1 A	4G2	630	E	68401	4620	35	Cable, 1/C #350 kmil bare copper	800.00	LF	5.47	0.058	E02AS	91.86	4,376
											18,536	52,151	70,687	567.7
69100 DISTRIBUTED CONTROL SYSTEM														
1 A	COM	630	I02	69100	0510	35	DCS Equipment, (260 I/O, cabinets, patch panels, etc)	1.00	LT	130,000.00	78,000	E02BS	100.87	130,000
											7,868	137,868	78.0	
69500 PLANT COMMUNICATION SYSTEM														
1 A	COM	630	E09	69500	4665	35	Communication System, sub-contract	1.00	LT	25,000.00	0.000	E02AS	91.86	25,000
											0	25,000	0.0	
											25,000	0	25,000	0.0
											1,382,756	1,062,029	2,444,786	11,513.7
720 SORBENT HANDLING EQUIPMENT & BOP														
11100 SITE PREPARATION														
1 A	4G2	720	C05	11100	4009	35	Geotechnical investigation	1.00	LS	60,000.00	0.000	C01CS	90.20	60,000
1 A	4G2	720	C05	11100	4009	35	Topographical survey	1.00	LS	10,000.00	0.000	C01CS	90.20	10,000
1 A	4G2	720	C05	11100	4011	35	Embankment for pond (by others)	1.00	LS	0.00	0.000	C01CS	90.20	0
											70,000	0	70,000	0.0
11301 ROADS AND PARKING LOTS														
1 A	4G2	720	C13	11301	4010	35	Clear & grub, gravel road	0.00	AC	0.00	93,000	C01CS	90.20	0
1 A	4G2	720	C05	11301	4011	35	Site cut, gravel road	0.00	CY	0.00	0.035	C01CS	90.20	0
1 A	4G2	720	C05	11301	4023	35	Site fill, gravel road	0.00	CY	0.00	0.035	C01CS	90.20	0
1 A	4G2	720	C13	11301	4027	35	Silt fence, gravel road	7,500.00	LF	0.32	0.017	C01BS	84.97	2,400
											10,834	13,234	127.5	

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WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER
 Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study
 Location: Louisville, KY
 Capacity: 1 @ 800 MW
 Type: Wet FGD
 Currency: USD
 Seismic Zone: 1
 Proposal Number: 53770801
 Configuration: * GYPSUM DEWATERING STUDY * Rev'd
 Partner(s):
 Present Day: 11/29/2005
 Revision Number: 1
 Estimate Coordinator:
 Lead Estimator: Ericke
 Checked By:

1-06

User	1	User	2	PBS	Code	Mat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Crew Rate	Material Cost	Labor Cost	Total Cost	Manhours
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Option A

720 SORBENT HANDLING EQUIPMENT & BOP																	
11301 ROADS AND PARKING LOTS																	
1A	4G2	720	C13	11301	4061	35	Subgrade prep, gravel road	25,000.00	SY	0.00	0.009	C01CS	90.20	0	20,295	20,295	225.0
1A	4G2	720	C13	11301	4813	25	6" aggregate base course, gravel road	25,000.00	SY	6.25	0.012	C01CS	90.20	156,250	27,060	183,310	300.0
1A	4G2	720	C13	11301	4835	35	Geotextile (Amoco 2016), road	0.00	SY	1.88	0.002	C01BS	84.97	0	0	0	0.0

Subtotal For PBS: 11301 ROADS AND PARKING LOTS 158,650 58,189 216,839 652.5

15509 SORBENT HANDLING-MISC.																	
1A	4G2	720	C03	15509	4022	35	Spoils, gypsum re-hydration tank	114.00	CY	0.00	0.060	C01CS	90.20	0	617	617	6.8
1A	4G2	720	C03	15509	4051	35	Excavate, gypsum re-hydration tank	394.00	CY	0.00	0.120	C01CS	90.20	0	4,265	4,265	47.3
1A	4G2	720	C03	15509	4055	35	Backfill & compact, gypsum re-hydration tank	280.00	CY	0.00	0.250	C01BS	84.97	0	5,948	5,948	70.0
1A	4G2	720	F01	15509	4118	35	Rebar, gypsum re-hydration tank	5.70	TN	800.00	15.000	S01BS	84.61	4,560	7,234	11,794	85.5
1A	4G2	720	F01	15509	4120	35	Formwork, gypsum re-hydration tank	928.00	SF	2.31	0.200	S01AS	74.81	2,144	13,885	16,028	185.6
1A	4G2	720	F01	15509	4123	35	Concrete, gypsum re-hydration tank (2), 25'D x 33'H	114.00	CY	75.00	1.000	S01CS	97.26	8,550	11,088	19,638	114.0
1A	4G2	720	F03	15509	4127	35	Embeds, gypsum re-hydration tank	0.22	TN	3,500.00	120.000	S01BS	84.61	770	2,234	3,004	26.4

Subtotal For PBS: 15509 SORBENT HANDLING-MISC. 16,024 45,270 61,293 535.6

46106 MISC. SYSTEMS																	
1A	4G2	720	M01	46106	1550	35	Pump, Bottom Ash Pond - Pump A, 2979 gpm, 90 ft head, 150 HP motor	1.00	EA	30,800.00	100.000	M02AS	94.61	30,800	9,461	40,261	100.0
1A	4G2	720	M01	46106	1550	35	Pump, Bottom Ash Pond - Pump B, 2979 gpm, 90 ft head, 150 HP motor	1.00	EA	30,800.00	100.000	M02AS	94.61	30,800	9,461	40,261	100.0
1A	4G2	720	M01	46106	1550	35	Pump, FGD Byproduct - Pump A, 3453 gpm, 260 ft head, 350 HP motor; move existing pump, add new 4000 V Motor	1.00	EA	48,000.00	210.000	M02AS	94.61	48,000	19,868	67,868	210.0
1A	4G2	720	M01	46106	1550	35	Pump, FGD Byproduct - Pump B, 3453 gpm, 260 ft head, 350 HP motor; move existing pump, add new 4000 V Motor	1.00	EA	48,000.00	210.000	M02AS	94.61	48,000	19,868	67,868	210.0
1A	4G2	720	M01	46106	1550	35	Pump, FGD Byproduct - Pump C, 3453 gpm, 260 ft head, 350 HP motor (Warehouse Spare Only)	1.00	EA	0.00	0.000	M02AS	94.61	0	0	0	0.0
1A	4G2	720	M01	46106	1550	35	Pump, FGD Byproduct - Pump D, 3453 gpm, 260 ft head, 350 HP motor (Warehouse Spare Only)	1.00	EA	0.00	0.000	M02AS	94.61	0	0	0	0.0
1A	4G2	720	M14	46106	1931	35	Tank, Byproduct Re-hydrating - Tank A, w/ Agitator, 121,200 Gal., S/C	1.00	EA	441,200.00	0.000	M02AS	94.61	441,200	0	441,200	0.0

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WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER
 Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study
 Location: Louisa, KY
 Capacity: 1 @ 800 MW
 Type: Wet FGD
 Currency: USD
 Seismic Zone: 1
 Present Day: 11/29/2005
 Revision Number: 1
 Estimate Coordinator: Ericke
 Lead Estimator: Ericke
 Checked By:

WorleyParsons
 Estimate Report: Unit x Island x PBS - Detail
 Proposal Number: 53770801
 Configuration: * GYPSUM DEWATERING STUDY * Rev'd
 Partner(s):

1-06

User 1	User Island	PBS 2	Code	Acct Code	Mat Stat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Crew Rate	Material Cost	Labor Cost	Total Cost	Manhours
Option A																
720 SORBENT HANDLING EQUIPMENT & BOP																
46106 MISC. SYSTEMS																
A 4G2	720	M14	46106	1931	35	Tank, Byproduct Re-hydrating - Tank B, w/ Agitator, 121,200 Gal., S/C	1.00	EA	441,200.00	0.000	M02AS	94.61	441,200	0	441,200	0.0
A 4G2	720	4H01	46106	2060	35	G1 - Collecting Conveyor, 135 ton/hr, 25 hp motor, 30" belt x 255' l, w/ Primary and Secondary belt scrapers, screw take-up, covered and lined skirt boards, drive unit, safety switches, transition chute, and head chute. (I/H Cost based on FMC Quote)	1.00	EA	315,100.00	3,570.000	M02AS	94.61	315,100	337,758	652,858	3,570.0
A 4G2	720	4H01	46106	2060	35	G2 - Transfer Conveyor, 135 ton/hr, 25 hp motor, 30" belt x 290' l, w/ transition chute, and head chute. (I/H Cost based on FMC Quote)	* 1.00	EA	358,200.00	2,030.000	M02AS	94.61	358,200	192,058	550,258	2,030.0
A 4G2	720	4H01	46106	2060	35	Lot - Disch. Chutework to G2 Conveyor (I/H Cost based on FMC Quote)	1.00	LS	28,600.00	340.000	M02AS	94.61	28,600	32,167	60,767	340.0
A 4G2	720	M	46106	4210	35	Piping/Fittings, HDPE, 18 in, Class 125, SDR 7.3, O/G, Ash Water Storage pond to Re-hydrating Tank (2 lines)	5,000.00	LF	196.93	1.670	P02AS	94.49	984,650	788,992	1,773,642	8,350.0
A 4G2	720	M	46106	4210	35	Piping/Fittings, HDPE, 18 in, Class 125, SDR 7.3, O/G, Re-hydrating Tank to Top of Hill piping (2 lines)	11,600.00	LF	196.93	1.670	P02AS	94.49	2,284,388	1,830,460	4,114,848	19,372.0
A 4G2	720	M	46106	4210	35	Piping/Fittings, HDPE, 18 in, Class 125, SDR 7.3, O/G, Top of Hill to Fly Ash Pond (2 lines)	10,600.00	LF	196.93	1.670	P02AS	94.49	2,087,458	1,672,662	3,760,120	17,702.0
Subtotal For PBS: 46106 MISC. SYSTEMS							7,098,396 4,912,755 12,011,151 51,984.0									
Subtotal For Island: 720 SORBENT HANDLING EQUIPMENT & BOP							7,343,070 5,016,214 12,359,283 53,172.1									
820 YARD WATER SYSTEMS																
18100 CIVIL BULK MATERIALS																
A 4G2	820	C05	18100	4022	35	Trench spoils, on-grade piping	2,158.00	CY	0.00	0.060	C01CS	90.20	0	11,679	11,679	129.5
A 4G2	820	C03	18100	4050	35	Trench backfill & compact, on-grade piping	0.00	CY	0.00	0.150	C01BS	84.97	0	0	0	0.0
A 4G2	820	C03	18100	4054	35	Trench excavate, on-grade piping (11,100 LF)	2,158.00	CY	0.00	0.150	C01BS	84.97	0	27,505	27,505	323.7
A 4G2	820	C03	18100	4057	35	Sand bedding, on-grade piping	2,158.00	CY	15.70	0.400	C01CS	90.20	33,881	77,861	111,741	863.2
A 4G2	820	C03	18100	4840	35	Jack & bore, 48" casing, under RR tracks and Route 23	300.00	LF	157.00	5.333	C01BS	84.97	47,100	135,944	183,044	1,599.9
A 4G2	820	C03	18100	4890	35	Wooden ties, on-grade piping	3,300.00	LF	2.56	0.094	C01BS	84.97	8,448	26,358	34,806	310.2
Subtotal For PBS: 18100 CIVIL BULK MATERIALS							89,429 279,346 368,774 3,226.5									
Subtotal For Island: 820 YARD WATER SYSTEMS							89,429 279,346 368,774 3,226.5									

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER										WorleyParsons										Present Day: 11/29/2005				1-06	
Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study										Estimate Report: Unit x Island x PBS - Detail										Revision Number: 1					
Location: Louisa, KY										Proposal Number: 53770801										Estimate Coordinator:					
Capacity: 1 @ 800 MW										Configuration: * GYPSUM DEWATERING STUDY * Rev'd										Lead Estimator: Ericke					
Type: Wet FGD										Currency: USD										Checked By:					
										Seismic Zone: 1															
User		User		PBS		Acct		Mat		Description										Material		Labor		Total	
1		Island		2		Code		Stat												Unit		Unit		Cost	
																				Cost		Cost		Manhours	

Option A

872. OTHER ELECTRICAL

62509 MEDIUM VOLTAGE POWER CABLE, 2.3KV TO 7.2KV															
1 A	4G2	872	E01	62509	4625	35	5 kv Cable, 1/C #4/0	2.70	0.043	E02AS	91.86	4,860	7,110	11,970	77.4
Subtotal For PBS: 62509 MEDIUM VOLTAGE POWER CABLE, 2.3KV TO 7.2KV															
1 A	4G2	872	E01	62510	4630	35	5 kv Terminations, #4/0	46.00	4.000	E02AS	91.86	552	4,409	4,961	48.0
Subtotal For PBS: 62510 POWER CABLE TERMINATIONS, 2.3KV TO 7.2KV															
63107 POWER CABLE, 600V															
1 A	DW	872	E01	63107	4626	35	600V Cable wire, 3/C #10 w/ G	0.59	0.019	E02AS	91.86	354	1,047	1,401	11.4
1 A	DW	872	E01	63107	4626	35	600V Cable wire, 3/C #6 w/ G	0.91	0.026	E02AS	91.86	328	870	1,197	9.5
1 A	4G2	872	E01	63107	4626	35	600V Cable wire, 1/C 350 kemil	13,200.00	LF			48,180	55,777	103,957	607.2
1 A	PE	872	E01	63107	4626	35	600V Cable wire, 3/C #2 w/ G	1.84	0.036	E02AS	91.86	736	1,334	2,070	14.5
1 A	PE	872	E01	63107	4626	35	600V Cable wire, 1/C 350 kemil	2,400.00	LF			8,760	10,141	18,901	110.4
1 A	DW	872	E01	63107	4626	35	600V Cable wire, 1/C #750 kemil	3,600.00	LF			23,400	22,818	46,218	248.4
Subtotal For PBS: 63107 POWER CABLE, 600V															
63108 CONTROL CABLE, 600V															
1 A	COM	872	E01	63108	4626	35	600V Cable wire, 7/C #12	0.65	0.022	E02AS	91.86	109,525	340,525	450,050	3,707.0
Subtotal For PBS: 63108 CONTROL CABLE, 600V															
63109 POWER CABLE TERMINATIONS, 600V															
1 A	COM	872	E01	63109	4631	35	600V terminations #12	364.00	EA			182	9,162	9,344	99.7
1 A	4G2	872	E01	63109	4631	35	600V terminations 350 kemil	24.00	EA			216	3,483	3,699	37.9
1 A	DW	872	E01	63109	4631	35	600V terminations #10	16.00	EA			8	404	412	4.4
1 A	DW	872	E01	63109	4631	35	600V terminations #6	16.00	EA			16	698	714	7.6
1 A	PE	872	E01	63109	4631	35	600V terminations #2	16.00	EA			40	955	995	10.4
1 A	PE	872	E01	63109	4631	35	600V terminations 350 kemil	32.00	EA			288	4,644	4,932	50.6
1 A	DW	872	E01	63109	4631	35	600V terminations #750 kemil	24.00	EA			492	4,828	5,320	52.6
Subtotal For PBS: 63109 POWER CABLE TERMINATIONS, 600V															
68201 EXPOSED CONDUITS															
1 A	DW	872	E01	68201	4611	35	Conduit, 3/4" RGS	3.75	0.218	E02AS	91.86	1,350	7,209	8,559	78.5
1 A	COM	872	E01	68201	4611	35	Conduit, 3/4" RGS	3.75	0.218	E02AS	91.86	9,750	52,066	61,816	566.8
1 A	DW	872	E01	68201	4611	35	Conduit, 2" RGS	14.37	0.441	E02AS	91.86	20,693	58,335	79,028	635.0

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WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study Location: Louisville, KY Capacity: 1 @ 800 MW Type: Wet FGD Currency: USD Seismic Zone: 1 Proposal Number: 53770801 Configuration: * GYPSUM DEWATERING STUDY * Rev'd										Present Day: 11/29/2005 Revision Number: 1 Estimate Coordinator: Lead Estimator: Ericke Checked By:		1-06					
User 1	Island 2	User 2	PBS Code	Acct Code	Mat Stat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Rate	Material Cost	Labor Cost	Total Cost	Manhours	
Option A																	
872 OTHER ELECTRICAL																	
68201 EXPOSED CONDUITS																	
1 A	4G2	872	E01	68201	4611	35	Conduit, 1 1/4" RGS	300.00	LF	6.95	0.290	E02AS	91.86	2,085	7,992	10,077	87.0
1 A	4G2	872	E01	68201	4611	35	Conduit, 1 1/4" RGS	360.00	LF	6.95	0.290	E02AS	91.86	2,502	9,590	12,092	104.4
1 A	PE	872	E01	68201	4611	35	Conduit, 1 1/2" RGS	400.00	LF	7.65	0.320	E02AS	91.86	3,060	11,758	14,818	128.0
1 A	PE	872	E01	68201	4611	35	Conduit, 3" RGS	800.00	LF	27.89	0.738	E02AS	91.86	22,312	54,234	76,546	590.4
Subtotal For PBS: 68201 EXPOSED CONDUITS										61,752	201,184	262,936	2,190.1				
Subtotal For Island: 872 OTHER ELECTRICAL										259,688	669,392	929,080	7,287.1				
Subtotal For: Option A										12,138,999	9,730,382	21,869,381	103,431.5				

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER				WorleyParsons				Present Day: 11/29/2005			
Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study				Estimate Report: Unit x Island x PBS - Detail				Revision Number: 1			
Location: Louisa, KY				Proposal Number: 5370801				Estimate Coordinator:			
Capacity: 1 @ 800 MW				Configuration: * GYPSUM DEWATERING STUDY * Rev'd				Lead Estimator: Ericke			
Type: Wet FGD				Currency: USD				Checked By:			
Seismic Zone: 1				Partner(s):							

User	Island	User	PBS	Acct	Mat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Crew Rate	Material Cost	Labor Cost	Total Cost	Manhours
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Option B1																	
630 POWER HOUSE ELECTRICAL EQUIPMENT & BOP																	
62407 MEDIUM VOLTAGE POWER CABLE, 8KV TO 15KV																	
B1	4G2	630	E	62407	4624	35	13.8 kV Overhead Line	1.00	LS	379,800.00	0.000	E02AS	91.86	379,800	0	379,800	0.0
B1	DW	630	E01	62407	4625	35	Cable, 1/C #4/0, 15 kV	12,000.00	LF	3.14	0.050	E02AS	91.86	37,680	55,116	92,796	600.0
Subtotal For PBS: 62407 MEDIUM VOLTAGE POWER CABLE, 8KV TO 15KV														417,480	55,116	472,596	600.0
62408 POWER CABLE TERMINATIONS, 8KV TO 15KV																	
B1	DW	630	E01	62408	4631	35	Terminations, #4/0, 15 kV	12.00	EA	80.00	6.250	E02AS	91.86	960	6,890	7,850	75.0
Subtotal For PBS: 62408 POWER CABLE TERMINATIONS, 8KV TO 15KV														960	6,890	7,850	75.0
63102 UNIT SUBSTATION, 380V TO 600V																	
B1	DW	630	E02	63102	0213	35	Double Ended Substation w/ (2) 750 KVA, 13,800-480V Transformers, (2) 1600A Main Breakers, (1) 1600A Tie Breaker, (3) 800A Feeder Breaker	1.00	EA	157,000.00	240.000	E02BS	100.87	157,000	24,209	181,209	240.0
Subtotal For PBS: 63102 UNIT SUBSTATION, 380V TO 600V														157,000	24,209	181,209	240.0
63103 MOTOR CONTROL CENTERS, 380V TO 480V																	
B1	PE	630	E05	63103	0232	35	MCC, 600V Vertical	4.00	EA	5,000.00	12.000	E02BS	100.87	20,000	4,842	24,842	48.0
B1	DW	630	E05	63103	0232	35	MCC, 600V Vertical	6.00	EA	5,000.00	12.000	E02BS	100.87	30,000	7,263	37,263	72.0
Subtotal For PBS: 63103 MOTOR CONTROL CENTERS, 380V TO 480V														50,000	12,104	62,104	120.0
64601 UNINTERRUPTIBLE POWER SUPPLY SYSTEM																	
B1	COM	630	E	64601	0231	35	UPS System, 5 KVA, transfer switch, inverter, batteries & charger, panelboard	1.00	EA	20,000.00	120.000	E02BS	100.87	20,000	12,104	32,104	120.0
Subtotal For PBS: 64601 UNINTERRUPTIBLE POWER SUPPLY SYSTEM														20,000	12,104	32,104	120.0
68203 UNDERGROUND RACEWAY																	
B1	4G2	630	E01	68203	4652	35	Ductbank, complete	2,000.00	LF	45.16	5.150	E02AS	91.86	90,320	946,158	1,036,478	10,300.0
B1	4G2	630	E01	68203	4815	35	Manhole, 8' x 8' x 8'	5.00	EA	3,200.00	32.000	E02AS	91.86	16,000	14,698	30,698	160.0
Subtotal For PBS: 68203 UNDERGROUND RACEWAY														106,320	960,856	1,067,176	10,460.0
68401 GROUNDING SYSTEM																	
B1	DW	630	E	68401	4619	35	Ground Rods	26.00	EA	25.72	3.125	E02AS	91.86	669	7,464	8,132	81.3
B1	DW	630	E	68401	4619	35	Grounding terminations	52.00	EA	12.70	1.750	E02AS	91.86	660	8,359	9,020	91.0
B1	DW	630	E	68401	4620	35	Cable, 1/C #4/0 bare copper	4,000.00	LF	1.35	0.044	E02AS	91.86	5,400	16,167	21,567	176.0
B1	4G2	630	E	68401	4620	35	Cable, 1/C #2/0 bare copper	720.00	LF	0.89	0.038	E02AS	91.86	641	2,513	3,154	27.4
B1	4G2	630	E	68401	4620	35	Cable, 1/C #350 kcmil bare copper	800.00	LF	5.47	0.044	E02AS	91.86	4,376	3,233	7,609	35.2

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER		WorleyParsons		Present Day: 11/29/2005		1-06								
Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study		Estimate Report: Unit x Island x PBS - Detail		Revision Number: 1										
Location: Louisa, KY		Partner(s):		Estimate Coordinator:										
Capacity: 1 @ 800 MW		Seismic Zone: 1		Lead Estimator: Ericke										
Type: Wet FGD		Currency: USD		Checked By:										
User 1	Island 2	User PBS Code	Acct Stat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Crew Rate	Material Cost	Labor Cost	Total Cost	Manhours

Option B1														
630 POWER HOUSE ELECTRICAL EQUIPMENT & BOP														
68401 GROUNDING SYSTEM														
Subtotal For PBS: 68401 GROUNDING SYSTEM												11,746	37,737	49,483
69100 DISTRIBUTED CONTROL SYSTEM														
B1 COM	630	102	69100	0510	35	DCS Equipment, (180 I/O, cabinets, patch panels, etc)	1.00	LT	90,000.00	54,000	E02BS	100.87	5,447	95,447
Subtotal For PBS: 69100 DISTRIBUTED CONTROL SYSTEM												90,000	5,447	95,447
69500 PLANT COMMUNICATION SYSTEM														
B1 COM	630	E09	69500	4665	35	Communication System, sub-contract	1.00	LT	25,000.00	0.000	E02AS	91.86	0	25,000
Subtotal For PBS: 69500 PLANT COMMUNICATION SYSTEM												25,000	0	25,000
Subtotal For Island: 630 POWER HOUSE ELECTRICAL EQUIPMENT & B												878,506	1,114,463	1,992,969
720 SORBENT HANDLING EQUIPMENT & BOP														
11100 SITE PREPARATION														
B1 0D0	720	C05	11100	4009	35	Geotechnical investigation	1.00	LS	60,000.00	0.000	C01CS	90.20	0	60,000
B1 4G2	720	C05	11100	4009	35	Topographical survey	1.00	LS	10,000.00	0.000	C01CS	90.20	0	10,000
B1 4G2	720	C05	11100	4011	35	Embankment for pond (by others)	1.00	LS	0.00	0.000	C01CS	90.20	0	0
Subtotal For PBS: 11100 SITE PREPARATION												70,000	0	70,000
11200 SITE GRADING & DRAINAGE														
B1 4G2	720	C05	11200	4011	35	Site cut, tank area	8,470.00	CY	0.00	0.035	C01CS	90.20	0	26,740
B1 4G2	720	C05	11200	4023	35	Site fill, tank area	8,470.00	CY	0.00	0.035	C01CS	90.20	0	26,740
B1 4G2	720	C05	11200	4024	35	Gravel cover, 6" thick, tank area	807.00	CY	19.95	0.047	C01CS	90.20	3,421	19,521
Subtotal For PBS: 11200 SITE GRADING & DRAINAGE												16,100	56,901	73,000
11301 ROADS AND PARKING LOTS														
B1 4G2	720	C13	11301	4010	35	Clear & grub, gravel road	0.00	AC	0.00	93.000	C01CS	90.20	0	0
B1 4G2	720	C05	11301	4011	35	Site cut, gravel road	0.00	CY	0.00	0.035	C01CS	90.20	0	0
B1 4G2	720	C05	11301	4023	35	Site fill, gravel road	0.00	CY	0.00	0.035	C01CS	90.20	0	0
B1 4G2	720	C13	11301	4027	35	Silt fence, gravel road	0.00	LF	0.32	0.017	C01BS	84.97	0	0
B1 4G2	720	C13	11301	4061	35	Subgrade prep. gravel road	0.00	SY	0.00	0.009	C01CS	90.20	0	0
B1 4G2	720	C13	11301	4813	25	6" aggregate base course, gravel road	0.00	SY	6.25	0.012	C01CS	90.20	0	0
B1 4G2	720	C13	11301	4835	35	Geotextile (Amoco 2016), road	0.00	SY	1.88	0.002	C01BS	84.97	0	0
Subtotal For PBS: 11301 ROADS AND PARKING LOTS												0	0	0

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER
 Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study
 Location: Louisa, KY
 Capacity: 1 @ 800 MW
 Type: Wet FGD
 Currency: USD
 Seismic Zone: I

Present Day: 11/29/2005
 Revision Number: 1
 Estimate Coordinator: Ebricke
 Lead Estimator: Ebricke
 Checked By:

Proposal Number: 53770801
 Configuration: * GYPSUM DEWATERING STUDY * Rev'd

WorleyParsons
 Estimate Report: Unit x Island x PBS - Detail
 Partner(s):

User 1	Island	User 2	PBS Code	Acct Code	Mat Stat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Crew Rate	Material Cost	Labor Cost	Total Cost	Manhours
Option B1																
720 SORBENT HANDLING EQUIPMENT & BOP																
15109 SERVICE WATER PUMP FOUNDATION																
B1	4G2	720	C05	15109	4022	35 Spoils, filtrate water pumphouse	46.00	CY	0.00	0.060	C01CS	90.20	0	249	249	2.8
B1	4G2	720	C03	15109	4051	35 Excavate, filtrate water pumphouse	73.00	CY	0.00	0.120	C01BS	84.97	0	744	744	8.8
B1	4G2	720	C03	15109	4055	35 Backfill & compact, filtrate water pumphouse	27.00	CY	0.00	0.250	C01BS	84.97	0	574	574	6.8
B1	4G2	720	F01	15109	4118	35 Rebar, filtrate water pumphouse	3.50	TN	800.00	15.000	S01BS	84.61	2,800	4,442	7,242	52.5
B1	4G2	720	F01	15109	4120	35 Formwork, filtrate water pumphouse	455.00	SF	2.31	0.200	S01AS	74.81	1,051	6,808	7,859	91.0
B1	4G2	720	F01	15109	4123	35 Concrete, filtrate water pumphouse	69.00	CY	75.00	1.000	S01CS	97.26	5,175	6,711	11,886	69.0
B1	4G2	720	F03	15109	4127	35 Embeds, filtrate water pumphouse	0.10	TN	3,500.00	120.000	S01BS	84.61	350	1,015	1,365	12.0
B1	4G2	720	B04	15109	4910	35 Pre-engineered metal bldg, filtrate water pumphouse, 35' x 35' x 12'h	1,225.00	SF	78.00	0.000	S01BS	84.61	95,550	0	95,550	0.0

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER				Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study				Present Day: 11/29/2005			
Location: Louisville, KY				Currency: USD				Revision Number: 1			
Capacity: 1 @ 800 MW				Seismic Zone: 1				Estimate Coordinator:			
Type: Wet FGD				User: 1 Island 2				Lead Estimator: Ericke			
PBS Code				Acct Code				Checked By:			
Mat Stat				Description				Material Cost			
Labor Unit				Crew Rate				Labor Cost			
Manhours				Total Cost							

WorleyParsons

Estimate Report: Unit x Island x PBS - Detail

Proposal Number: 53770801

Configuration: * GYPSUM DEWATERING STUDY * Rev'd

User	1	Island	2	PBS Code	Acct Code	Mat Stat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew Rate	Material Cost	Labor Cost	Total Cost	Manhours
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Option B1

720 SORBENT HANDLING EQUIPMENT & BOP

46106 MISC. SYSTEMS

B1	4G2	720	M01	46106	1550	35	Pump, Filtrate Water - Pump B, 835 gpm, 50 ft head, 50 HP motor	1.00	EA	12,800.00	50.000	M02AS	94.61	12,800	4,731	17,531	50.0
B1	4G2	720	M01	46106	1550	35	Pump, Filtrate Water - Pump C, 835 gpm, 50 ft head, 50 HP motor	1.00	EA	12,800.00	50.000	M02AS	94.61	12,800	4,731	17,531	50.0
B1	4G2	720	M01	46106	1550	35	Pump, Filtrate Water - Pump D, 835 gpm, 50 ft head, 50 HP motor	1.00	EA	12,800.00	50.000	M02AS	94.61	12,800	4,731	17,531	50.0
B1	4G2	720	M01	46106	1550	35	Pump, Floating Filtrate Water - Pump A, 1000 gpm, 100 ft head, 75 HP motor	1.00	EA	14,300.00	75.000	M02AS	94.61	14,300	7,096	21,396	75.0
B1	4G2	720	M01	46106	1550	35	Pump, Floating Filtrate Water - Pump B, 1000 gpm, 100 ft head, 75 HP motor	1.00	EA	14,300.00	75.000	M02AS	94.61	14,300	7,096	21,396	75.0
B1	4G2	720	M01	46106	1550	35	Pump, Floating Filtrate Water - Pump C, 1000 gpm, 100 ft head, 75 HP motor	1.00	EA	14,300.00	75.000	M02AS	94.61	14,300	7,096	21,396	75.0
B1	4G2	720	M01	46106	1550	35	Pump, Floating Filtrate Water - Pump D, 1000 gpm, 100 ft head, 75 HP motor	1.00	EA	14,300.00	75.000	M02AS	94.61	14,300	7,096	21,396	75.0
B1	4G2	720	M01	46106	1550	35	Pump, Flush Water Dewatering - Pump A, 200 gpm, 70 ft head, 10 HP motor	1.00	EA	6,300.00	30.000	M02AS	94.61	6,300	2,838	9,138	30.0
B1	4G2	720	M01	46106	1550	35	Pump, Flush Water Dewatering - Pump B, 200 gpm, 70 ft head, 10 HP motor	1.00	EA	6,300.00	30.000	M02AS	94.61	6,300	2,838	9,138	30.0
B1	4G2	720	M01	46106	1550	35	Pump, Flush Water Plant - Pump A, 300 gpm, 220 ft head, 50 HP motor	1.00	EA	8,500.00	50.000	M02AS	94.61	8,500	4,731	13,231	50.0
B1	4G2	720	M01	46106	1550	35	Pump, Flush Water Plant - Pump B, 300 gpm, 220 ft head, 50 HP motor	1.00	EA	8,500.00	50.000	M02AS	94.61	8,500	4,731	13,231	50.0
B1	4G2	720	M01	46106	1550	35	Pump, Gypsum Slurry Forwarding - Pump A, 1115 gpm, 210 ft head, 150 HP motor	1.00	EA	22,000.00	100.000	M02AS	94.61	22,000	9,461	31,461	100.0
B1	4G2	720	M01	46106	1550	35	Pump, Gypsum Slurry Forwarding - Pump B, 1115 gpm, 210 ft head, 150 HP motor	1.00	EA	22,000.00	100.000	M02AS	94.61	22,000	9,461	31,461	100.0
B1	4G2	720	M01	46106	1550	35	Pump, Gypsum Slurry Forwarding - Pump C, 1115 gpm, 210 ft head, 150 HP motor	1.00	EA	22,000.00	100.000	M02AS	94.61	22,000	9,461	31,461	100.0
B1	4G2	720	M01	46106	1550	35	Pump, Gypsum Slurry Forwarding - Pump D, 1115 gpm, 210 ft head, 150 HP motor	1.00	EA	22,000.00	100.000	M02AS	94.61	22,000	9,461	31,461	100.0
B1	4G2	720	M14	46106	1931	35	Tank, Filtrate Water - Tank A, w/ Agitator, 181,700 Gal., S/C	1.00	EA	519,700.00	0.000	M02AS	94.61	519,700	0	519,700	0.0
B1	4G2	720	M14	46106	1931	35	Tank, Filtrate Water - Tank B, w/ Agitator, 181,700 Gal., S/C	1.00	EA	519,700.00	0.000	M02AS	94.61	519,700	0	519,700	0.0
B1	4G2	720	M14	46106	1932	35	Tank, Flush Water, 10,000 gal.	1.00	EA	62,700.00	30.000	M02AS	94.61	62,700	2,838	65,538	30.0

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER
 Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study
 Location: Louisa, KY
 Capacity: 1 @ 800 MW
 Type: Wet FGD
 Currency: USD
 Seismic Zone: 1
 User: 1
 Island: 2
 PBS: 2
 Code: 2
 Acct: 2
 Mat: 2
 Description: 2
 Quantity: 2
 U/M: 2
 Material Unit: 2
 Labor Unit: 2
 Crew: 2
 Rate: 2
 Material Cost: 2
 Labor Cost: 2
 Total Cost: 2
 Manhours: 2

WorleyParsons

Estimate Report: Unit x Island x PBS - Detail

Proposal Number: 5370801
 Configuration: * GYPSUM DEWATERING STUDY * Rev'd
 Partner(s):
 Present Day: 11/29/2005
 Revision Number: 1
 Estimate Coordinator:
 Lead Estimator: Ericke
 Checked By:

User	1	Island	2	PBS	Code	Mat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Rate	Material Cost	Labor Cost	Total Cost	Manhours
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Option B1

720 SORBENT HANDLING EQUIPMENT & BOP

46106 MISC. SYSTEMS

B1 4G2	720	M	46106	4210	35	Piping/Fittings, HDPE, 12 in, Class 125, SDR 7.3, O/G, Gypsum Slurry piping (2 lines)		12,000.00	LF	109.83	0.893	P02AS	94.49	1,317,960	1,012,555	2,330,515	10,716.0
B1 4G2	720	M	46106	4210	35	Piping/Fittings, HDPE, 10 in, Class 125, SDR 7.3, O/G, Filtrate Water (1 line)		6,500.00	LF	96.15	0.650	P02AS	94.49	624,975	399,220	1,024,195	4,225.0
B1 4G2	720	M	46106	4210	35	Piping/Fittings, HDPE, 8 in, Class 125, SDR 7.3, O/G, Flush Water (1 line)		6,500.00	LF	47.02	0.500	P02AS	94.49	305,630	307,093	612,723	3,250.0

Subtotal For PBS: 46106 MISC. SYSTEMS

Subtotal For Island: 720 SORBENT HANDLING EQUIPMENT & BOP

820 YARD WATER SYSTEMS

18100 CIVIL BULK MATERIALS

B1 4G2	820	C05	18100	4022	35	Trench spoils, all piping		2,835.00	CY	0.00	0.060	C01CS	90.20	0	15,343	15,343	170.1
B1 4G2	820	C03	18100	4050	35	Trench backfill & compact, all piping		5,032.00	CY	0.00	0.150	C01BS	84.97	0	64,135	64,135	754.8
B1 4G2	820	C03	18100	4054	35	Trench excavate, all piping (5900 LF)		7,867.00	CY	0.00	0.150	C01BS	84.97	0	100,269	100,269	1,180.1
B1 4G2	820	C03	18100	4057	35	Sand bedding, all piping		2,468.00	CY	15.70	0.400	C01BS	84.97	38,748	83,882	122,630	987.2
B1 4G2	820	C03	18100	4840	35	Jack & bore, 72" casing, under RR tracks and Route 23		300.00	LF	200.00	6.798	C01BS	84.97	60,000	173,288	233,288	2,039.4

Subtotal For PBS: 18100 CIVIL BULK MATERIALS

Subtotal For Island: 820 YARD WATER SYSTEMS

872 OTHER ELECTRICAL

63107 POWER CABLE, 600V

B1 DW	872	E01	63107	4626	35	600V Cable wire, 3/C #10 w/ G		360.00	LF	0.59	0.019	E02AS	91.86	212	628	841	6.8
B1 DW	872	E01	63107	4626	35	600V Cable wire, 3/C #6 w/ G		360.00	LF	0.91	0.026	E02AS	91.86	328	870	1,197	9.5
B1 4G2	872	E01	63107	4626	35	600V Cable wire, 1/C 350 kcmil		2,400.00	LF	3.65	0.057	E02AS	91.86	8,760	12,566	21,326	136.8
B1 DW	872	E01	63107	4626	35	600V Cable wire, 1/C #2/0		2,160.00	LF	1.92	0.028	E02AS	91.86	4,147	5,556	9,703	60.5
B1 DW	872	E01	63107	4626	35	600V Cable wire, 3/C #2 w/ G		720.00	LF	1.84	0.036	E02AS	91.86	1,325	2,401	3,726	26.1
B1 PE	872	E01	63107	4626	35	600V Cable wire, 3/C #2 w/ G		400.00	LF	1.84	0.036	E02AS	91.86	736	1,334	2,070	14.5

Subtotal For PBS: 63107 POWER CABLE, 600V

63108 CONTROL CABLE, 600V

B1 COM	872	E01	63108	4626	35	600V Cable wire, 7/C #12		65,500.00	LF	0.65	0.022	E02AS	91.86	42,575	132,370	174,945	1,441.0
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Subtotal For PBS: 63108 CONTROL CABLE, 600V

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER
 Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study
 Location: Louisa, KY
 Capacity: 1 @ 800 MW
 Type: Wet FGD
 Currency: USD
 Seismic Zone: 1
 Proposal Number: 53770801
 Configuration: * GYPSUM DEWATERING STUDY * Rev'd
 Present Day: 11/29/2005
 Revision Number: 1
 Estimate Coordinator:
 Lead Estimator: Ericke
 Checked By:

WorleyParsons Estimate Report: Unit x Island x PBS - Detail

Partner(s):
 * GYPSUM DEWATERING STUDY * Rev'd

1-06

User	1	User	2	PBS	Code	Mat	Description	Quantity	U/M	Material	Labor	Crew	Crew Rate	Material	Labor	Total	Manhours
		Island								Unit	Unit			Cost	Cost	Cost	

Option B1

872 OTHER ELECTRICAL

63109 POWER CABLE TERMINATIONS, 600V

B1 COM	872	E01	63109	4631	35	600V terminations #1/2	252.00	EA	0.50	0.274	E02AS	91.86	126	6,343	6,469	69.0
B1 PE	872	E01	63109	4631	35	600V terminations #2	16.00	EA	2.50	0.650	E02AS	91.86	40	955	995	10.4
B1 DW	872	E01	63109	4631	35	600V terminations #10	16.00	EA	0.50	0.275	E02AS	91.86	8	404	412	4.4
B1 DW	872	E01	63109	4631	35	600V terminations #6	16.00	EA	1.00	0.475	E02AS	91.86	16	698	714	7.6
B1 PE	872	E01	63109	4631	35	600V terminations 350 kcmil	32.00	EA	9.00	1.580	E02AS	91.86	288	4,644	4,932	50.6
B1 DW	872	E01	63109	4631	35	600V terminations #2/0	32.00	EA	4.50	0.813	E02AS	91.86	144	2,390	2,534	26.0
B1 DW	872	E01	63109	4631	35	600V terminations #2	32.00	EA	2.50	0.650	E02AS	91.86	80	1,911	1,991	20.8

68201 EXPOSED CONDUITS

B1 DW	872	E01	68201	4611	35	Conduit, 3/4" RGS	360.00	LF		3.75		0.218	E02AS	91.86	1,350	7,209	8,559	78.5
B1 COM	872	E01	68201	4611	35	Conduit, 3/4" RGS	1,800.00	LF		3.75		0.218	E02AS	91.86	6,750	36,046	42,796	392.4
B1 DW	872	E01	68201	4611	35	Conduit, 1 1/4" RGS	360.00	LF		6.95		0.290	E02AS	91.86	2,502	9,590	12,092	104.4
B1 PE	872	E01	68201	4611	35	Conduit, 1 1/2" RGS	400.00	LF		7.65		0.320	E02AS	91.86	3,060	11,758	14,818	128.0
B1 DW	872	E01	68201	4611	35	Conduit, 2" RGS	720.00	LF		14.37		0.441	E02AS	91.86	10,346	29,167	39,514	317.5
B1 DW	872	E01	68201	4611	35	Conduit, 1 1/2" RGS	720.00	LF		7.65		0.320	E02AS	91.86	5,508	21,165	26,673	230.4
B1 PE	872	E01	68201	4611	35	Conduit, 3" RGS	800.00	LF		27.89		0.738	E02AS	91.86	22,312	54,234	76,546	590.4

Subtotal For PBS: 68201 EXPOSED CONDUITS

														51,828	169,169	220,998	1,841.6
Subtotal For Island: 872 OTHER ELECTRICAL														110,613	342,240	452,853	3,725.7
Subtotal For: Option B1														4,876,101	3,837,119	8,713,220	41,609.7

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER
 Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study
 Location: Louisville, KY
 Capacity: 1 @ 800 MW
 Type: Wet FGD
 Currency: USD
 Seismic Zone: 1
 Present Day: 11/29/2005
 Revision Number: 1
 Estimate Coordinator:
 Lead Estimator: Ericke
 Checked By:

WorleyParsons
 Estimate Report: Unit x Island x PBS - Detail
 Proposal Number: 51770801
 Partner(s):
 Configuration: * GYPSUM DEWATERING STUDY * Rev'd

1-06

User	Island	User	PBS	Acct	Mat	Description	Quantity	U/M	Material	Labor	Crew	Crew	Rate	Material	Labor	Total	Manhours
1	1	2	Code	Code	Stat				Unit	Unit				Cost	Cost	Cost	
Option B2																	
140 FGD SYSTEM																	
17622 GYPSUM DEWATERING BUILDING-FOUNDATIONS																	
B2	4G2	140	C04	17622	4022	35	Spoils, gypsum dewatering bldg fdn & equip Fdn	3,412.00	CY	0.00	0.060	C01CS	90.20	0	18,466	18,466	204.7
B2	4G2	140	C03	17622	4051	35	Excavate, gypsum dewatering bldg fdn & equip Fdn	4,265.00	CY	0.00	0.120	C01CS	90.20	0	46,164	46,164	511.8
B2	4G2	140	C03	17622	4055	35	Backfill & compact, gypsum dewatering bldg fdn & equip Fdn	853.00	CY	0.00	0.150	C01CS	90.20	0	11,541	11,541	128.0
B2	4G2	140	C14	17622	4056	35	Aggregate fill, between mat and slab, gypsum dewatering bldg fdn & equip Fdn	840.00	CY	19.95	0.400	C01CS	90.20	16,758	30,307	47,065	336.0
B2	4G2	140	F01	17622	4118	35	Rebar, gypsum dewatering bldg fdn & equip fdn	412.35	TN	800.00	15.000	S01BS	84.61	329,880	523,334	853,214	6,185.3
B2	4G2	140	F01	17622	4120	35	Formwork, gypsum dewatering bldg fdn & equip Fdn	13,670.00	SF	2.93	0.300	S01AS	74.81	40,053	306,796	346,849	4,101.0
B2	4G2	140	F01	17622	4122	35	Mud mat, gypsum dewatering bldg fdn & equip Fdn	119.00	CY	65.00	0.500	S01CS	97.26	7,735	5,787	13,522	59.5
B2	4G2	140	F01	17622	4123	35	Concrete, gypsum dewatering bldg fdn & equip Fdn	2,572.00	CY	75.00	1.200	S01CS	97.26	192,900	300,183	493,083	3,086.4
B2	4G2	140	F03	17622	4127	35	Embeds, gypsum dewatering bldg fdn & equip Fdn	2.85	TN	3,500.00	120.000	S01BS	84.61	9,975	28,937	38,912	342.0
B2	4G2	140	F01	17622	4190	35	Concrete coating, sumps & trenches, gypsum dewatering bldg & equip fdn	4,271.00	SF	22.00	0.000	C01CS	90.20	93,962	0	93,962	0.0
Subtotal For PBS: 17622 GYPSUM DEWATERING BUILDING-FOUNDATIONS														691,263	1,271,515	1,962,778	14,954.6
17623 GYPSUM DEWATERING BUILDING-SUPERSTRUCTURE																	
B2	4G2	140	S01	17623	4311	35	Str steel, x heavy, 80 to 120# / FT, gypsum dewatering bldg	105.00	TN	1,685.00	14.000	S03AS	114.64	176,925	168,521	345,446	1,470.0
B2	4G2	140	S01	17623	4312	35	Str steel, heavy, 40 to 79# / FT, gypsum dewatering bldg	299.00	TN	1,873.00	16.000	S03AS	114.64	560,027	548,438	1,108,465	4,784.0
B2	4G2	140	S01	17623	4313	35	Str steel, medium, 20 to 39# / FT, gypsum dewatering bldg	147.00	TN	2,382.00	19.000	S03AS	114.64	350,154	320,190	670,344	2,793.0
B2	4G2	140	S02	17623	4314	35	Str steel, light, 12 to 19# / FT, stair, stringers (C10x15.3), gypsum dewatering bldg (183)	1.40	TN	2,880.00	23.000	S03AS	114.64	4,032	3,691	7,723	32.2
B2	4G2	140	S01	17623	4314	35	Str steel, light, 12 to 19# / FT, gypsum dewatering bldg	9.30	TN	2,880.00	23.000	S03AS	114.64	26,784	24,521	51,305	213.9
B2	4G2	140	S01	17623	4314	35	Str steel, x light, 0 to 11# / FT (8% connections), gypsum dewatering bldg	44.82	TN	3,421.00	23.000	S03AS	114.64	153,329	118,178	271,507	1,030.9
B2	4G2	140	S02	17623	4330	35	Stairs, treads, gypsum dewatering bldg	169.00	EA	39.73	0.530	S03BS	102.37	6,714	9,169	15,884	89.6

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER		WorleyParsons		Present Day: 11/29/2005	
Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study		Estimate Report: Unit x Island x PBS - Detail		Revision Number: 1	
Location: Louisa, KY		Partner(s):		Estimate Coordinator:	
Capacity: 1 @ 800 MW		Configuration: * GYPSUM DEWATERING STUDY * Rev'd		Lead Estimator: Eribe	
Type: Wet FGD		Currency: USD		Checked By:	
Seismic Zone: 1		Material Unit		Labor Cost	
User PBS		Acct Mat		Total Cost	
Island 2		Code Stat		Manhours	

Option B2		140 FGD SYSTEM															
		17623 GYPSUM DEWATERING BUILDING-SUPERSTRUCTURE															
B2 4G2	140	S02	17623	4330	35	Stairs, handrail, gypsum dewatering bldg	366.00	LF		52.51	0.340	S03BS	102.37	19,219	12,739	31,958	124.4
B2 4G2	140	S02	17623	4330	35	Handrail and toeplate, 1-1/4" pipe, galv, gypsum dewatering bldg	717.00	LF		52.51	0.340	S03BS	102.37	37,650	24,956	62,605	243.8
B2 4G2	140	S02	17623	4330	35	Grating, 1-1/2", gypsum dewatering bldg	800.00	SF		11.40	0.210	S03BS	102.37	9,120	17,198	26,318	168.0
B2 4G2	140	S02	17623	4330	35	Gratings, 2", trenches, gypsum dewatering bldg	1,015.00	SF		14.58	0.210	S03BS	102.37	14,799	21,820	36,619	213.2
B2 4G2	140	B05	17623	4950	35	Roll-up door, 6'w x 12'h, hand chain lift, guides, gypsum dewatering bldg	1.00	EA		2,500.00	12.000	S04BS	71.48	2,500	858	3,358	12.0
B2 4G2	140	B05	17623	4950	35	Roll-up doors, 12' x 20', gypsum dewatering bldg	1.00	EA		5,000.00	20.000	S04BS	71.48	5,000	1,430	6,430	20.0
B2 4G2	140	B05	17623	4950	35	Doors, 3'w x 7'-2"h, 1-3/4" thick, hollow metal, 16 ga, wire glass window, complete, gypsum dewatering bldg	16.00	EA		1,055.00	7.000	S04BS	71.48	16,880	8,006	24,886	112.0
B2 4G2	140	B02	17623	4960	35	8" CMU, gypsum dewatering bldg	5,492.00	SF		2.96	0.200	S04BS	71.48	16,256	78,514	94,770	1,098.4
B2 4G2	140	B04	17623	5022	35	Siding, insulated metal, 116' x 84' x 114'h,gypsum dewatering bldg	33,664.00	SF		20.00	0.000	S05BS	127.65	673,280	0	673,280	0.0
B2 4G2	140	B01	17623	5030	35	Roof, insulated metal, gypsum dewatering bldg	9,912.00	SF		20.00	0.000	S03BS	102.37	198,240	0	198,240	0.0
Subtotal For PBS: 17623 GYPSUM DEWATERING BUILDING-SUPERSTRUCTURE										2,270,909	1,358,228	3,629,137	12,405.3				
Subtotal For Island: 140 FGD SYSTEM										2,962,172	2,629,743	5,591,915	27,359.9				
630 POWER HOUSE ELECTRICAL EQUIPMENT & BOP																	
62407 MEDIUM VOLTAGE POWER CABLE, 8KV TO 15KV																	
B2 DW	630	E01	62407	4625	35	Cable, 1/C #4/0, 15 kV	12,000.00	LF		3.14	0.050	E02AS	91.86	37,680	55,116	92,796	600.0
Subtotal For PBS: 62407 MEDIUM VOLTAGE POWER CABLE, 8KV TO 15KV										37,680	55,116	92,796	600.0				
62408 POWER CABLE TERMINATIONS, 8KV TO 15KV																	
B2 DW	630	E01	62408	4631	35	Terminations, #4/0, 15 kV	12.00	EA		80.00	6.250	E02AS	91.86	960	6,890	7,850	75.0
Subtotal For PBS: 62408 POWER CABLE TERMINATIONS, 8KV TO 15KV										960	6,890	7,850	75.0				
62506 SWITCHGEAR, 601V AND ABOVE																	
B2 DW	630	E02	62506	0211	35	Switchgear, 15KV, (2) 1200A Feeder Breakers	1.00	EA		51,000.00	40.000	E02BS	100.87	51,000	4,035	55,035	40.0
Subtotal For PBS: 62506 SWITCHGEAR, 601V AND ABOVE										51,000	4,035	55,035	40.0				
63103 MOTOR CONTROL CENTERS, 380V TO 480V																	
B2 PE	630	E05	63103	0232	35	MCC, 600V Vertical	2.00	EA		5,000.00	12.000	E02BS	100.87	10,000	2,421	12,421	24.0
Subtotal For PBS: 63103 MOTOR CONTROL CENTERS, 380V TO 480V										10,000	2,421	12,421	24.0				

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER
 Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study
 Location: Louisville, KY
 Capacity: 1 @ 800 MW
 Type: Wet FGD
 Currency: USD
 Seismic Zone: 1
 User: 1
 Island: 2
 PBS: 2
 Code: 2
 Acct: 2
 Mat: 2
 Stat: 2

WorleyParsons
 Estimate Report: Unit x Island x PBS - Detail
 Proposal Number: 53770801
 Configuration: * GYPSUM DEWATERING STUDY * Rev'd
 Partner(s):
 Present Day: 11/29/2005
 Revision Number: 1
 Estimate Coordinator:
 Lead Estimator: Ericke
 Checked By:

1-06

User	Island	PBS	Code	Acct	Mat	Stat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Crew Rate	Material Cost	Labor Cost	Total Cost	Manhours
Option B2																	
630 POWER HOUSE ELECTRICAL EQUIPMENT & BOP																	
68203 UNDERGROUND RACEWAY																	
B2	DW	630	E01	68203	4652	35	Ductbank, complete	2,000.00	LF	17.37	2.100	E02AS	91.86	34,740	385,812	420,552	4,200.0
B2	DW	630	E01	68203	4815	35	Manhole, 8' x 8' x 8'	5.00	EA	3,200.00	32.000	E02AS	91.86	16,000	14,698	30,698	160.0
Subtotal For PBS: 68203 UNDERGROUND RACEWAY														50,740	400,510	451,250	4,360.0
68401 GROUNDING SYSTEM																	
B2	DW	630	E	68401	4620	35	Cable, 1/C #4/0 bare copper	4,000.00	LF	1.35	0.044	E02AS	91.86	5,400	16,167	21,567	176.0
B2	DW	630	E	68401	4620	35	Cable, 1/C #350 kmil bare copper	360.00	LF	2.24	0.058	E02AS	91.86	806	1,918	2,724	20.9
Subtotal For PBS: 68401 GROUNDING SYSTEM														6,206	18,085	24,292	196.9
69100 DISTRIBUTED CONTROL SYSTEM																	
B2	COM	630	I02	69100	0510	35	DCS Equipment, (20 I/O, cabinets, patch panels, etc)	1.00	LT	10,000.00	6.000	E02BS	100.87	10,000	605	10,605	6.0
Subtotal For PBS: 69100 DISTRIBUTED CONTROL SYSTEM														10,000	605	10,605	6.0
69500 PLANT COMMUNICATION SYSTEM																	
B2	COM	630	E09	69500	4665	35	Communication System, sub-contract	1.00	LT	25,000.00	0.000	E02AS	91.86	25,000	0	25,000	0.0
Subtotal For PBS: 69500 PLANT COMMUNICATION SYSTEM														25,000	0	25,000	0.0
Subtotal For Island: 630 POWER HOUSE ELECTRICAL EQUIPMENT & B														191,586	487,661	679,248	5,301.9
720 SORBENT HANDLING EQUIPMENT & BOP																	
11100 SITE PREPARATION																	
B2	4G2	720	C05	11100	4009	35	Geotechnical investigation	1.00	LS	25,000.00	0.000	C01CS	90.20	25,000	0	25,000	0.0
B2	4G2	720	C05	11100	4009	35	Topographical survey	1.00	LS	20,000.00	0.000	C01CS	90.20	20,000	0	20,000	0.0
B2	4G2	720	C05	11100	4011	35	Embankment for pond (by others)	1.00	LS	0.00	0.000	C01CS	90.20	0	0	0	0.0
Subtotal For PBS: 11100 SITE PREPARATION														45,000	0	45,000	0.0
11200 SITE GRADING & DRAINAGE																	
B2	4G2	720	C05	11200	4011	35	Site cut, radial stacker area	8,470.00	CY	0.00	0.035	C01CS	90.20	0	26,740	26,740	296.5
B2	4G2	720	C05	11200	4023	35	Site fill, radial stacker area	8,470.00	CY	0.00	0.035	C01CS	90.20	0	26,740	26,740	296.5
B2	4G2	720	C05	11200	4024	35	Gravel cover, 6" thick, radial stacker area	807.00	CY	19.95	0.047	C01CS	90.20	16,100	3,421	19,521	37.9
Subtotal For PBS: 11200 SITE GRADING & DRAINAGE														16,100	56,901	73,000	630.8
11301 ROADS AND PARKING LOTS																	
B2	4G2	720	C13	11301	4010	35	Clear & grub, gravel road	0.00	AC	0.00	93.000	C01CS	90.20	0	0	0	0.0
B2	4G2	720	C05	11301	4011	35	Site cut, gravel road	0.00	CY	0.00	0.035	C01CS	90.20	0	0	0	0.0

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER										WorleyParsons										Present Day: 11/29/2005				1-06											
Project Name: Big Sandy-Unit 2 - - Gypsum Dewatering Study										Estimate Report: Unit x Island x PBS - Detail										Revision Number: 1															
Location: Louisa, KY										Proposal Number: 53770801										Estimate Coordinator:															
Capacity: 1 @ 800 MW										Configuration: * GYPSUM DEWATERING STUDY * Rev'd										Lead Estimator: Ericke															
Type: Wet FGD										Currency: USD										Checked By:															
										Seismic Zone: 1																									
User		Island		2		User		PBS		Acct		Mat		Description		Quantity		U/M		Material Unit		Labor Unit		Crew		Crew Rate		Material Cost		Labor Cost		Total Cost		Manhours	

Option B2

720 SORBENT HANDLING EQUIPMENT & BOP

11301 ROADS AND PARKING LOTS

B2	4G2	720	C05	11301	4023	35	Site fill, gravel road	0.00	CY	0.00	0.035	C01CS	90.20	0	0	0	0.0
B2	4G2	720	C13	11301	4027	35	Silt fence, gravel road	0.00	LF	0.32	0.017	C01BS	84.97	0	0	0	0.0
B2	4G2	720	C13	11301	4061	35	Subgrade prep, gravel road	0.00	SY	0.00	0.009	C01CS	90.20	0	0	0	0.0
B2	4G2	720	C13	11301	4813	25	6" aggregate base course, gravel road	0.00	SY	6.25	0.012	C01CS	90.20	0	0	0	0.0
B2	4G2	720	C13	11301	4835	35	Geotextile (Amoco 2016), road	0.00	SY	1.88	0.002	C01BS	84.97	0	0	0	0.0
									Subtotal For PBS: 11301 ROADS AND PARKING LOTS								
									0								

15503 SORBENT HANDLING-STORAGE/STACKOUT & RECLAIM FOUNDATION

B2	4G2	720	C05	15503	4022	35	Spoils, onsite stockpile, Gypsum Transfer Tower Fdn (4)	145.00	CY	0.00	0.060	C01CS	90.20	0	785	785	8.7
B2	4G2	720	C03	15503	4051	35	Excavate, Gypsum Transfer Tower Fdn (4)	263.00	CY	0.00	0.120	C01CS	90.20	0	2,847	2,847	31.6
B2	4G2	720	C03	15503	4055	35	Backfill & compact, Gypsum Transfer Tower Fdn (4)	118.00	CY	0.00	0.250	C01BS	84.97	0	2,507	2,507	29.5
B2	4G2	720	F01	15503	4118	35	Rebar, Gypsum Transfer Tower Fdn (4)	7.90	TN	800.00	15.000	S01BS	84.61	6,320	10,026	16,346	118.5
B2	4G2	720	F01	15503	4120	35	Formwork, Gypsum Transfer Tower Fdn (4)	1,757.00	SF	2.31	0.200	S01AS	74.81	4,059	26,288	30,347	351.4
B2	4G2	720	F01	15503	4123	35	Concrete, Gypsum Transfer Tower Fdn (4)	145.00	CY	75.00	1.000	S01CS	97.26	10,875	14,103	24,978	145.0
B2	4G2	720	F01	15503	4127	35	Embeds, Gypsum Transfer Tower Fdn (4)	0.23	TN	3,500.00	120.000	S01BS	84.61	805	2,335	3,140	27.6
									Subtotal For PBS: 15503 SORBENT HANDLING-STORAGE/STACKOUT & REC								
									22,059								

15507 SORBENT HANDLING-DISTRIBUTION FOUNDATIONS

B2	4G2	720	C05	15507	4022	35	Spoils, onsite stockpile, gypsum conveyor piers	270.00	CY	0.00	0.060	C01CS	90.20	0	1,461	1,461	16.2
B2	4G2	720	C05	15507	4022	35	Spoils, onsite stockpile, gypsum sleepers	45.00	CY	0.00	0.060	C01CS	90.20	0	244	244	2.7
B2	4G2	720	C03	15507	4051	35	Excavate, gypsum conveyor piers	2,776.00	CY	0.00	0.250	C01CS	90.20	0	62,599	62,599	694.0
B2	4G2	720	C03	15507	4051	35	Excavate, gypsum sleepers	91.00	CY	0.00	0.120	C01CS	90.20	0	985	985	10.9
B2	4G2	720	C03	15507	4055	35	Backfill & compact, gypsum conveyor piers	2,506.00	CY	0.00	0.250	C01CS	90.20	0	56,510	56,510	626.5
B2	4G2	720	C03	15507	4055	35	Backfill & compact, gypsum sleepers	45.00	CY	0.00	0.250	C01BS	84.97	0	956	956	11.3
B2	4G2	720	F01	15507	4118	35	Rebar, gypsum conveyor piers	14.75	TN	800.00	15.000	S01BS	84.61	11,800	18,720	30,520	221.3
B2	4G2	720	F01	15507	4120	35	Formwork, gypsum conveyor piers	4,978.00	SF	2.31	0.200	S01AS	74.81	11,499	74,481	85,980	995.6
B2	4G2	720	F01	15507	4123	35	Concrete, gypsum conveyor piers	270.00	CY	75.00	1.000	S01CS	97.26	20,250	26,260	46,510	270.0
B2	4G2	720	F01	15507	4125	35	Precast concrete, gypsum sleepers, 1'w x 6'l x 1'ht	398.00	EA	125.00	0.600	S01CS	97.26	49,750	23,226	72,976	238.8
B2	4G2	720	F01	15507	4127	35	Embeds, gypsum conveyor piers	0.42	TN	3,500.00	120.000	S01BS	84.61	1,470	4,264	5,734	50.4

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER				WorleyParsons				Present Day: 11/29/2005			
Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study				Estimate Report: Unit x Island x PBS - Detail				Revision Number: 1			
Location: Louisa, KY				Proposal Number: 5370801				Estimate Coordinator:			
Capacity: 1 @ 800 MW				Partner(s):				Lead Estimator: Ericke			
Type: Wet FGD				Currency: USD				Checked By:			
Seismic Zone: 1				Configuration: * GYPSUM DEWATERING STUDY * Rev'd							

Option B2																	
720 SORBENT HANDLING EQUIPMENT & BOP																	
15507 SORBENT HANDLING-DISTRIBUTION FOUNDATIONS																	
B2	4G2	720	F01	15507	4127	35	Embeds, gypsum sleepers	0.13	TN	3,500.00	120.000	S01BS	84.61	455	1,320	1,775	15.6
													95,224	271,026	366,250	3,153.2	
46106 MISC. SYSTEMS																	
B2	4G2	720	4H01	46106	2060	35	G1 - Collecting Conveyor, 135 ton/hr, 10 hp motor, 30" belt x 90' l, w/ Primary and Secondary belt scrapers, screw take-up, covered and lined skirt boards, drive unit, safety switches, transition chute, and head chute. (U/H Cost based on FMC Quote)	1.00	EA	111,200.00	1,260.000	M02AS	94.61	111,200	119,209	230,409	1,260.0
B2	4G2	720	4H01	46106	2060	35	G2 - Transfer Conveyor, 135 ton/hr, 20 hp motor, 30" belt x 630' l, w/ transition chute, and head chute. (U/H Cost based on FMC Quote)	1.00	EA	778,300.00	5,040.000	M02AS	94.61	778,300	476,834	1,255,134	5,040.0
B2	4G2	720	4H01	46106	2060	35	G3 - Transfer Conveyor, 135 ton/hr, 20 hp motor, 30" belt x 780' l - 20 ft lift, w/ transition chute, and head chute. (U/H Cost based on FMC Quote)	1.00	EA	963,600.00	5,460.000	M02AS	94.61	963,600	516,571	1,480,171	5,460.0
B2	4G2	720	4H01	46106	2060	35	G4 - Transfer Conveyor, 135 ton/hr, 25 hp motor, 30" belt x 450' l - 80 ft lift, w/ transition chute, and head chute. (U/H Cost based on FMC Quote)	1.00	EA	555,900.00	2,800.000	M02AS	94.61	555,900	264,908	820,808	2,800.0
B2	4G2	720	4H01	46106	2060	35	G5 - Radial Stacker Conveyor, 135 ton/hr, 15 hp motor, 36" belt x 120' l - 35 ft lift. (U/H Cost based on FMC Quote)	1.00	EA	177,900.00	1,400.000	M02AS	94.61	177,900	132,454	310,354	1,400.0
B2	4G2	720	4H01	46106	2060	35	Radial Stacker Slewing Drives, 5 hp motor, Incl.	2.00	EA	0.00	0.000	M02AS	94.61	0	0	0	0.0
B2	4G2	720	4H01	46106	2060	35	G6 - Emergency Gypsum Collecting Conveyor, 135 ton/hr, 10 hp motor, 30" belt x 90' l, (U/H Cost based on FMC Quote)	1.00	EA	143,000.00	1,750.000	M02AS	94.61	143,000	165,568	308,568	1,750.0
B2	4G2	720	4H01	46106	2060	35	G7 - Emergency Gypsum Radial Stacker Conveyor, 135 ton/hr, 15 hp motor, 36" belt x 120' l - 35 ft lift. (U/H Cost based on FMC Quote)	1.00	EA	228,700.00	1,400.000	M02AS	94.61	228,700	132,454	361,154	1,400.0
B2	4G2	720	4H01	46106	2060	35	Emergency Stacker Slewing Drives, 5 hp motor, Incl.	2.00	EA	0.00	0.000	M02AS	94.61	0	0	0	0.0
B2	4G2	720	4H01	46106	2060	35	Transfer Tower #1, 30 x 30 x 45 high, (U/H Cost based on FMC Quote)	1.00	EA	191,000.00	1,458.000	M02AS	94.61	191,000	137,941	328,941	1,458.0

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER																
Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study																
Location: Louisiana, KY																
Capacity: 1 @ 800 MW																
Type: Wet FGD																
Currency: USD																
Seismic Zone: 1																
User 1 Island 2 PBS Code Act Mat																
Description																
Quantity U/M																
Material Unit																
Labor Unit																
Crew Rate																
Material Cost																
Labor Cost																
Total Cost																
Manhours																
Option B2																
720 SORBENT HANDLING EQUIPMENT & BOP																
57200 PLANT FIRE PROTECTION SYSTEM																
B2 4G2	720	M01	57200	1561	35	Pump, Fire Water Booster - Pump A, 1000 gpm, 240 ft head, 150 HP motor	1.00	EA	20,000.00	100.000	M02AS	94.61	20,000	9,461	29,461	100.0
B2 4G2	720	M01	57200	1561	35	Pump, Fire Water Booster - Pump A, 1000 gpm, 240 ft head, 150 HP motor	1.00	EA	20,000.00	100.000	M02AS	94.61	20,000	9,461	29,461	100.0
B2 4G2	720	M	57200	4209	35	Piping/Fittings, HDPE, 12 in, FM Class 200, O/G, Fire Water piping	6,500.00	LF	102.37	0.893	P02AS	94.49	665,405	548,467	1,213,872	5,804.5
B2 4G2	720	M	57200	4211	35	Piping/Fittings, Firewater, small bore runs, including nozzles, controls, and misc. hardware (Allowance)	1.00	LS	200,000.00	1,000.000	M02AS	94.61	200,000	94,610	294,610	1,000.0
Subtotal For PBS: 57200 PLANT FIRE PROTECTION SYSTEM																
Subtotal For Island: 720 SORBENT HANDLING EQUIPMENT & BOP																
872 OTHER ELECTRICAL																
63107 POWER CABLE, 600V																
B2 DW	872	E01	63107	4626	35	600V Cable wire, 1/C 350 kemil	1,800.00	LF	3.65	0.057	E02AS	91.86	6,570	9,425	15,995	102.6
Subtotal For PBS: 63107 POWER CABLE, 600V																
63108 CONTROL CABLE, 600V																
B2 COM	872	E01	63108	4626	35	600V Cable wire, 7/C #12	500.00	LF	0.65	0.022	E02AS	91.86	325	1,010	1,335	11.0
Subtotal For PBS: 63108 CONTROL CABLE, 600V																
63109 POWER CABLE TERMINATIONS, 600V																
B2 COM	872	E01	63109	4631	35	600V terminations #12	28.00	EA	0.50	0.274	E02AS	91.86	14	705	719	7.7
B2 DW	872	E01	63109	4631	35	600V terminations 350 kemil	16.00	EA	9.00	1.580	E02AS	91.86	144	2,322	2,466	25.3
Subtotal For PBS: 63109 POWER CABLE TERMINATIONS, 600V																
68201 EXPOSED CONDUITS																
B2 COM	872	E01	68201	4611	35	Conduit, 3/4" RGS	200.00	LF	3.75	0.218	E02AS	91.86	750	4,005	4,755	43.6
B2 PE	872	E01	68201	4611	35	Conduit, 3" RGS	360.00	LF	27.89	0.738	E02AS	91.86	10,040	24,405	34,446	265.7
Subtotal For PBS: 68201 EXPOSED CONDUITS																
Subtotal For Island: 872 OTHER ELECTRICAL																
Subtotal For: Option B2																

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER				WorleyParsons				Present Day: 11/29/2005			
Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study				Estimate Report: Unit x Island x PBS - Detail				Revision Number: 1			
Location: Louisa, KY				Proposal Number: 53770801				Estimate Coordinator:			
Capacity: 1 @ 800 MW				Partner(s):				Lead Estimator: Ericke			
Type: Wet FGD				Currency: USD				Checked By:			
Seismic Zone: 1				Configuration: * GYPSUM DEWATERING STUDY * Rev'd							

Option B3		140 FGD SYSTEM														
		17622 GYPSUM DEWATERING BUILDING-FOUNDATIONS														
B3	4G2	140	C04	17622	4022	35 Spoils, gypsum dewatering bldg fdn & equip Fdn	3,412.00	CY	0.00	0.060	C01CS	90.20	0	18,466	18,466	204.7
B3	4G2	140	C03	17622	4051	35 Excavate, gypsum dewatering bldg fdn & equip Fdn	4,265.00	CY	0.00	0.120	C01CS	90.20	0	46,164	46,164	511.8
B3	4G2	140	C03	17622	4055	35 Backfill & compact, gypsum dewatering bldg fdn & equip Fdn	853.00	CY	0.00	0.150	C01CS	90.20	0	11,541	11,541	128.0
B3	4G2	140	C14	17622	4056	35 Aggregate fill, between mat and slab, gypsum dewatering bldg fdn & equip Fdn	840.00	CY	19.95	0.400	C01CS	90.20	16,758	30,307	47,065	336.0
B3	4G2	140	F01	17622	4118	35 Rebar, gypsum dewatering bldg fdn & equip fdn	412.35	TN	800.00	15.000	S01BS	84.61	329,880	523,334	853,214	6,185.3
B3	4G2	140	F01	17622	4120	35 Formwork, gypsum dewatering bldg fdn & equip Fdn	13,670.00	SF	2.93	0.300	S01AS	74.81	40,053	306,796	346,849	4,101.0
B3	4G2	140	F01	17622	4122	35 Mud mat, gypsum dewatering bldg fdn & equip Fdn	119.00	CY	65.00	0.500	S01CS	97.26	7,735	5,787	13,522	59.5
B3	4G2	140	F01	17622	4123	35 Concrete, gypsum dewatering bldg fdn & equip Fdn	2,572.00	CY	75.00	1.200	S01CS	97.26	192,900	300,183	493,083	3,086.4
B3	4G2	140	F03	17622	4127	35 Embeds, gypsum dewatering bldg fdn & equip Fdn	2.85	TN	3,500.00	120.000	S01BS	84.61	9,975	28,937	38,912	342.0
B3	4G2	140	F01	17622	4190	35 Concrete coatings, sumps & trenches, gypsum dewatering bldg & equip fdn	4,271.00	SF	22.00	0.000	C01CS	90.20	93,962	0	93,962	0.0
Subtotal For PBS: 17622 GYPSUM DEWATERING BUILDING-FOUNDATIONS										691,263	1,271,515	1,962,778	14,954.6			
		17623 GYPSUM DEWATERING BUILDING-SUPERSTRUCTURE														
B3	4G2	140	S01	17623	4311	35 Str steel, x heavy, 80 to 120# / FT, gypsum dewatering bldg	105.00	TN	1,685.00	14.000	S03AS	114.64	176,925	168,521	345,446	1,470.0
B3	4G2	140	S01	17623	4312	35 Str steel, heavy, 40 to 79# / FT, gypsum dewatering bldg	299.00	TN	1,873.00	16.000	S03AS	114.64	560,027	548,438	1,108,465	4,784.0
B3	4G2	140	S01	17623	4313	35 Str steel, medium, 20 to 39# / FT, gypsum dewatering bldg	147.00	TN	2,382.00	19.000	S03AS	114.64	350,154	320,190	670,344	2,793.0
B3	4G2	140	S02	17623	4314	35 Str steel, light, 12 to 19# / FT, stair, stringers (C10x15.3), gypsum dewatering bldg (183')	1.40	TN	2,880.00	23.000	S03AS	114.64	4,032	3,691	7,723	32.2
B3	4G2	140	S01	17623	4314	35 Str steel, light, 12 to 19# / FT, gypsum dewatering bldg	9.30	TN	2,880.00	23.000	S03AS	114.64	26,784	24,521	51,305	213.9
B3	4G2	140	S01	17623	4314	35 Str steel, x light, 0 to 11# / FT (8% connections), gypsum dewatering bldg	44.82	TN	3,421.00	23.000	S03AS	114.64	153,329	118,178	271,507	1,030.9
B3	4G2	140	S02	17623	4330	35 Stairs, treads, gypsum dewatering bldg	169.00	EA	39.73	0.530	S03BS	102.37	6,714	9,169	15,884	89.6

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER															Present Day: 11/29/2005		1-06	
Project Name: Big Sandy-Unit 2 - - Gypsum Dewatering Study															Revision Number: 1			
Location: Louisiana, KY															Estimate Coordinator:			
Capacity: 1 @ 800 MW															Lead Estimator: Ericke			
Type: Wet FGD															Checked By:			
Currency: USD															Partner(s):			
Seismic Zone: 1															Configuration: * GYPSUM DEWATERING STUDY * Rev'd			
															Proposal Number: 53770801			
															WorleyParsons			
															Estimate Report: Unit x Island x PBS - Detail			
															Material Unit		Labor Unit	
															Quantity		U/M	
															Material Unit		Labor Unit	
															Crew		Crew Rate	
															Material Cost		Labor Cost	
															Total Cost		Manhours	

Option B3

140 FGD SYSTEM																
17623 GYPSUM DEWATERING BUILDING-SUPERSTRUCTURE																
B3 4G2	140	S02	17623	4330	35	Stairs, handrail, gypsum dewatering bldg	366.00	LF	52.51	0.340	S03BS	102.37	19,219	12,739	31,958	124.4
B3 4G2	140	S02	17623	4330	35	Handrail and toeplate, 1-1/4" pipe, galv, gypsum dewatering bldg	717.00	LF	52.51	0.340	S03BS	102.37	37,650	24,956	62,605	243.8
B3 4G2	140	S02	17623	4330	35	Grating, 1-1/2", gypsum dewatering bldg	800.00	SF	11.40	0.210	S03BS	102.37	9,120	17,198	26,318	168.0
B3 4G2	140	S02	17623	4330	35	Grating, 2", trenches, gypsum dewatering bldg	1,015.00	SF	14.58	0.210	S03BS	102.37	14,799	21,820	36,619	213.2
B3 4G2	140	B05	17623	4950	35	Roll-up doors, 12' x 20', gypsum dewatering bldg	1.00	EA	5,000.00	20.000	S04BS	71.48	5,000	1,430	6,430	20.0
B3 4G2	140	B05	17623	4950	35	Roll-up door, 6'w x 12'h, hand chain lift, guides, gypsum dewatering bldg	1.00	EA	2,500.00	12.000	S04BS	71.48	2,500	858	3,358	12.0
B3 4G2	140	B05	17623	4950	35	Doors, 3'w x 7'-2" h, 1-3/4" thick, hollow metal, 16 ga, wire glass window, complete, gypsum dewatering bldg	16.00	EA	1,055.00	7.000	S04BS	71.48	16,880	8,006	24,886	112.0
B3 4G2	140	B02	17623	4960	35	8" CMU, gypsum dewatering bldg	5,492.00	SF	2.96	0.200	S04BS	71.48	16,256	78,514	94,770	1,098.4
B3 4G2	140	B04	17623	5022	35	Siding, insulated metal, 116' x 84' x 114'h, gypsum dewatering bldg	33,664.00	SF	20.00	0.000	S05BS	127.65	673,280	0	673,280	0.0
B3 4G2	140	B01	17623	5030	35	Roof, insulated metal, gypsum dewatering bldg	9,912.00	SF	20.00	0.000	S03BS	102.37	198,240	0	198,240	0.0
Subtotal For PBS: 17623 GYPSUM DEWATERING BUILDING-SUPERSTRUCTURE													2,270,909	1,358,228	3,629,137	12,405.3
Subtotal For Island: 140 FGD SYSTEM													2,962,172	2,629,743	5,591,915	27,359.9
630 POWER HOUSE ELECTRICAL EQUIPMENT & BOP																
62407 MEDIUM VOLTAGE POWER CABLE, 8KV TO 15KV																
B3 4G2	630	E	62407	4624	35	13.8 kV Overhead Line	1.00	LS	492,900.00	0.000	E02AS	91.86	492,900	0	492,900	0.0
B3 DW	630	E01	62407	4625	35	Cable, 1/C 500 kcmil, 15 Kv	12,000.00	LF	5.77	0.075	E02AS	91.86	69,240	82,674	151,914	900.0
Subtotal For PBS: 62407 MEDIUM VOLTAGE POWER CABLE, 8KV TO 15KV													562,140	82,674	644,814	900.0
62408 POWER CABLE TERMINATIONS, 8KV TO 15KV																
B3 DW	630	E01	62408	4631	35	Terminations, 500 kcmil, 15 Kv	12.00	EA	101.00	5.750	E02AS	91.86	1,212	6,338	7,550	69.0
Subtotal For PBS: 62408 POWER CABLE TERMINATIONS, 8KV TO 15KV													1,212	6,338	7,550	69.0
63101 SWITCHGEAR, 380V TO 600V																
B3 DW	630	E02	63101	0212	35	Switchgear, 600V, (2) 800A Feeder Breakers (Installed in FGD Switchgear)	1.00	EA	26,000.00	40.000	E02BS	100.87	26,000	4,035	30,035	40.0
Subtotal For PBS: 63101 SWITCHGEAR, 380V TO 600V													26,000	4,035	30,035	40.0
63103 MOTOR CONTROL CENTERS, 380V TO 480V																
B3 DW	630	E05	63103	0232	35	MCC, 600V Vertical	4.00	EA	5,000.00	12.000	E02BS	100.87	20,000	4,842	24,842	48.0

WorleyParsons Proprietary Information

WorleyParsons

Estimate Report: Unit x Island x PBS - Detail

Client: AMERICAN ELECTRIC POWER		Present Day: 11/29/2005		1-06										
Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study		Revision Number: 1												
Location: Louisville, KY		Estimate Coordinator:												
Capacity: 1 @ 800 MW		Lead Estimator: Ericke												
Type: Wet FGD		Checked By:												
Currency: USD	Seismic Zone: 1	Configuration: * GYPSUM DEWATERING STUDY * Rev'd												
User	PBS	Acct	Mat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Rate	Material Cost	Labor Cost	Total Cost	Manhours
1	Island	2	Code	Stat										

Option B3

630 POWER HOUSE ELECTRICAL EQUIPMENT & BOP

63103 MOTOR CONTROL CENTERS, 380V TO 480V																		
B3	LF	630	E05	63103	0232	35	Motor Starters, Sz. 1 to be added to planned MCC's	3.00	EA		1,500.00	0.000	E02BS	100.87	4,500	0	4,500	0.0
B3	PE	630	E05	63103	0232	35	MCC, 600V Vertical	4.00	EA		5,000.00	12.000	E02BS	100.87	20,000	4,842	24,842	48.0
Subtotal For PBS: 63103 MOTOR CONTROL CENTERS, 380V TO 480V											44,500		9,684		54,184			96.0

68203 UNDERGROUND RACEWAY

B3 DW	630	E01	68203	4652	35	Ductbank, complete	2,000.00	LF	45.16	5.150	E02AS	91.86	90,320	946,158	1,036,478	10,300.0
B3 DW	630	E01	68203	4815	35	Manhole, 8' x 8' x 8'	5.00	EA	3,200.00	32.000	E02AS	91.86	16,000	14,698	30,698	160.0
Subtotal For PBS: 68203 UNDERGROUND RACEWAY													106,320	960,856	1,067,176	10,460.0

68401 GROUNDING SYSTEM

B3	DW	630	E	68401	4620	35	Cable, 1/C #500 kerril bare copper	4,000.00	LF		7.81	0.050	E02AS	91.86	31,240	18,372	49,612	200.0
B3	DW	630	E	68401	4620	35	Cable, 1/C #350 kerril bare copper	720.00	LF		5.47	0.044	E02AS	91.86	3,938	2,910	6,849	31.7
B3	PE	630	E	68401	4620	35	Cable, 1/C #350 kerril bare copper	400.00	LF		5.47	0.044	E02AS	91.86	2,188	1,617	3,805	17.6
Subtotal For PBS: 68401 GROUNDING SYSTEM											37,366	22,899		60,265			249.3	

69100 DISTRIBUTED CONTROL SYSTEM

B3	COM	630	102	69100	0510	35	DCS Equipment, (190 I/O, cabinets, patch panels, etc)	1.00	LT		95,000.00	57.000	E02BS	100.87	95,000	5,750	100,750	57.0
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Subtotal For PBS: 69100 DISTRIBUTED CONTROL SYSTEM

69500 PLANT COMMUNICATION SYSTEM

SUBTOTAL FOR COMMUNICATION SYSTEM																	
630	E09	69500	4665	35	Communication System, sub-contract	1.00	LT		25,000.00	0.000	E02AS	91.86	25,000	0	25,000	0.0	
Subtotal For PBS: 69500 PLANT COMMUNICATION SYSTEM																	

Subtotal For Island: 630 POWER HOUSE ELECTRICAL EQUIPMENT & B

720 SORBENT HANDLING EQUIPMENT & BOP

11100 SITE PREPARATION																		
B3	4G2	720	C05	11100	4009	35	Geotechnical investigation	1.00	LS		5,000.00	0.000	C01CS	90.20	5,000	0	5,000	0.0
B3	4G2	720	C05	11100	4009	35	Topographical survey	1.00	LS		5,000.00	0.000	C01CS	90.20	5,000	0	5,000	0.0
Subtotal For PBS: 11100 SITE PREPARATION											10,000	0		10,000			0.0	

11200 SITE GRADING & DRAINAGE

B3	4G2	720	C13	11200	4010	35	Clear & grub, gypsum dewatering area	11.20	AC		0.00	93.000	C01CS	90.20	0	93,952	93,952	1,041.6
B3	4G2	720	C05	11200	4011	35	Site cut, gypsum dewatering area	230,000.00	CY		0.00	0.035	C01CS	90.20	0	726,110	726,110	8,050.0
B3	4G2	720	C05	11200	4022	35	Spoils, gypsum dewatering area	230,000.00	CY		0.00	0.032	C01CS	90.20	0	663,872	663,872	7,360.0

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WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER				WorleyParsons				Present Day: 11/29/2005			
Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study				Estimate Report: Unit x Island x PBS - Detail				Revision Number: 1			
Location: Louisa, KY				Proposal Number: 53770801				Estimate Coordinator:			
Capacity: 1 @ 800 MW				Configuration: * GYPSUM DEWATERING STUDY * Rev'd				Lead Estimator: Erika			
Type: Wet FGD				Currency: USD				Checked By:			
Seismic Zone: 1				Material Unit				Labor Cost			
User				Quantity				Crew Rate			
Island				U/M				Material Cost			
PBS				Description				Labor Cost			
Acct				Unit				Total Cost			
Code				Stat				Manhours			

Option B3																	
720 SORBENT HANDLING EQUIPMENT & BOP																	
11200 SITE GRADING & DRAINAGE																	
B3	4G2	720	C13	11200	4027	35	Silt fence, gypsum dewatering area	500.00	LF	0.32	0.017	C01BS	84.97	160	722	882	8.5
B3	4G2	720	C05	11200	4816	35	Catch basins, precast concrete, with cover, 6' dia x 10' d	3.00	EA	3,000.00	38.000	C01CS	90.20	9,000	10,283	19,283	114.0
B3	4G2	720	C05	11200	4821	35	Hydroseeding, gypsum dewatering area (7.2 acres)	34,848.00	SY	0.27	0.003	C01CS	90.20	9,409	9,430	18,839	104.5
B3	4G2	720	C05	11200	4840	35	Culvert, 72" dia, RCP	500.00	LF	140.00	1.244	C01CS	90.20	70,000	56,104	126,104	622.0
Subtotal For PBS: 11200 SITE GRADING & DRAINAGE														88,569	1,560,474	1,649,043	17,300.6
11301 ROADS AND PARKING LOTS																	
B3	4G2	720	C13	11301	4061	35	Subgrade prep, road	5,334.00	SY	0.00	0.009	C01CS	90.20	0	4,330	4,330	48.0
B3	4G2	720	C13	11301	4812	35	4" Paving, wearing course, road	4,000.00	SY	6.95	0.021	C01BS	84.97	27,800	7,137	34,937	84.0
B3	4G2	720	C13	11301	4812	35	6" Paving, base course, road	4,000.00	SY	10.43	0.032	C01BS	84.97	41,720	10,876	52,596	128.0
B3	4G2	720	C13	11301	4813	25	6" aggregate base course, road	5,334.00	SY	6.25	0.012	C01CS	90.20	33,338	5,774	39,111	64.0
B3	4G2	720	C13	11301	4835	35	Geotextile (Amoco 2016), road	5,334.00	SY	1.88	0.002	C01BS	84.97	10,028	906	10,934	10.7
Subtotal For PBS: 11301 ROADS AND PARKING LOTS														112,885	29,024	141,909	334.7
15110 SERVICE WATER TANK FOUNDATION																	
B3	4G2	720	C05	15110	4022	35	Spoils, filtrate water tank (2)	86.00	CY	0.00	0.060	C01CS	90.20	0	465	465	5.2
B3	4G2	720	C05	15110	4022	35	Spoils, service water flush tank	9.00	CY	0.00	0.060	C01CS	90.20	0	49	49	0.5
B3	4G2	720	C03	15110	4051	35	Excavate, filtrate water tank (2)	122.00	CY	0.00	0.120	C01CS	90.20	0	1,321	1,321	14.6
B3	4G2	720	C03	15110	4051	35	Excavate, service water flush tank	13.00	CY	0.00	0.250	C01CS	90.20	0	293	293	3.3
B3	4G2	720	C03	15110	4055	35	Backfill & compact, filtrate water tank (2)	37.00	CY	0.00	0.250	C01BS	84.97	0	786	786	9.3
B3	4G2	720	C03	15110	4055	35	Backfill & compact, service water flush tank	4.00	CY	0.00	0.400	C01BS	84.97	0	136	136	1.6
B3	4G2	720	F01	15110	4118	35	Rebar, filtrate water tank (2)	6.80	TN	800.00	15.000	S01BS	84.61	5,440	8,630	14,070	102.0
B3	4G2	720	F01	15110	4118	35	Rebar, service water flush tank	0.80	TN	800.00	15.000	S01BS	84.61	640	1,015	1,655	12.0
B3	4G2	720	F01	15110	4120	35	Formwork, filtrate water tank (2)	850.00	SF	2.31	0.200	S01AS	74.81	1,964	12,718	14,681	170.0
B3	4G2	720	F01	15110	4120	35	Formwork, service water flush tank	82.00	SF	2.31	0.200	S01AS	74.81	189	1,227	1,416	16.4
B3	4G2	720	F01	15110	4123	35	Concrete, filtrate water tank (2), 31.5' dia x 41'h	136.00	CY	75.00	1.000	S01CS	97.26	10,200	13,227	23,427	136.0
B3	4G2	720	F01	15110	4123	35	Concrete, service water flush tank (10,000 gal)	16.00	CY	75.00	1.000	S01CS	97.26	1,200	1,556	2,756	16.0
B3	4G2	720	F01	15110	4127	35	Embeds, filtrate water tank (2), 36' dia x 47'h	0.24	TN	3,500.00	120.000	S01BS	84.61	840	2,437	3,277	28.8
B3	4G2	720	F01	15110	4127	35	Embeds, service water flush tank	0.02	TN	3,500.00	120.000	S01BS	84.61	70	203	273	2.4
Subtotal For PBS: 15110 SERVICE WATER TANK FOUNDATION														20,543	44,063	64,606	518.0

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER															1-06									
Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study															Present Day: 11/29/2005									
Location: Louisa, KY															Revision Number: 1									
Capacity: 1 @ 800 MW															Estimate Coordinator:									
Type: Wet FGD															Lead Estimator: Ericke									
Currency: USD															Checked By:									
Seismic Zone: 1															Partner(s):									
Proposal Number: 53770801															Configuration: * GYPSUM DEWATERING STUDY * Rev'd									
WorleyParsons															Estimate Report: Unit x Island x PBS - Detail									
Description															Quantity	U/M	Material Unit	Labor Unit	Crew	Crew Rate	Material Cost	Labor Cost	Total Cost	Manhours
User	1	Island	2	User	PBS	Code	Acct	Mat	Code	Stat														

Option B3

720 SORBENT HANDLING EQUIPMENT & BOP

15505 SORBENT HANDLING-PREPARATION FOUNDATIONS

B3 4G2	720	C05	15505	4022	35	Spoils, hydroclone feed tank (2)	99.00	CY	0.00	0.060	C01CS	90.20	0	536	536	5.9
B3 4G2	720	C03	15505	4051	35	Excavate, hydroclone feed tank (2)	141.00	CY	0.00	0.120	C01CS	90.20	0	1,526	1,526	16.9
B3 4G2	720	C03	15505	4055	35	Backfill & compact, hydroclone feed tank (2)	42.00	CY	0.00	0.250	C01BS	84.97	0	892	892	10.5
B3 4G2	720	F01	15505	4118	35	Rebar, hydroclone feed tank (2)	7.94	TN	800.00	15.000	S01BS	84.61	6,352	10,077	16,429	119.1
B3 4G2	720	F01	15505	4120	35	Formwork, hydroclone feed tank (2)	856.00	SF	2.31	0.200	S01AS	74.81	1,977	12,807	14,785	171.2
B3 4G2	720	F01	15505	4123	35	Concrete, hydroclone feed tank (2), 34.5' dia x 45"	157.00	CY	75.00	1.000	S01CS	97.26	11,775	15,270	27,045	157.0
B3 4G2	720	F01	15505	4127	35	Embeds, hydroclone feed tank (2)	0.24	TN	3,500.00	120.000	S01BS	84.61	840	2,437	3,277	28.8
Subtotal For PBS: 15505 SORBENT HANDLING-PREPARATION FOUNDATION									20,944			43,545	64,490		509.5	

15507 SORBENT HANDLING-DISTRIBUTION FOUNDATIONS

B3 4G2	720	C05	15507	4022	35	Spoils, onsite stockpile, gypsum conveyor piers	206.00	CY	0.00	0.060	C01CS	90.20	0	1,115	1,115	12.4
B3 4G2	720	C03	15507	4051	35	Excavate, gypsum conveyor piers	2,118.00	CY	0.00	0.250	C01CS	90.20	0	47,761	47,761	529.5
B3 4G2	720	C03	15507	4055	35	Backfill & compact, gypsum conveyor piers	1,912.00	CY	0.00	0.250	C01CS	90.20	0	43,116	43,116	478.0
B3 4G2	720	F01	15507	4118	35	Rebar, gypsum conveyor piers	11.25	TN	800.00	15.000	S01BS	84.61	9,000	14,278	23,278	168.8
B3 4G2	720	F01	15507	4120	35	Formwork, gypsum conveyor piers	3,798.00	SF	2.31	0.200	S01AS	74.81	8,773	56,826	65,599	759.6
B3 4G2	720	F01	15507	4123	35	Concrete, gypsum conveyor piers	206.00	CY	75.00	1.000	S01CS	97.26	15,450	20,036	35,486	206.0
B3 4G2	720	F01	15507	4127	35	Embeds, gypsum conveyor piers	0.32	TN	3,500.00	120.000	S01BS	84.61	1,120	3,249	4,369	38.4
Subtotal For PBS: 15507 SORBENT HANDLING-DISTRIBUTION FOUNDATION									34,343			186,380	220,723		2,192.6	

46106 MISC. SYSTEMS

B3 4G2	720	M01	46106	0751	35	Filter, Cartridge Type - Filter A, 200 gpm capacity (allowance)	1.00	EA	10,000.00	30.000	M02AS	94.61	10,000	2,838	12,838	30.0
B3 4G2	720	M01	46106	0751	35	Filter, Cartridge Type - Filter B, 200 gpm capacity (allowance)	1.00	EA	10,000.00	30.000	M02AS	94.61	10,000	2,838	12,838	30.0
B3 4G2	720	M01	46106	1550	35	Pump, Filtrate Water - Pump A, 1852 gpm, 155 ft head, 200 HP motor	1.00	EA	28,200.00	120.000	M02AS	94.61	28,200	11,353	39,553	120.0
B3 4G2	720	M01	46106	1550	35	Pump, Filtrate Water - Pump B, 1852 gpm, 155 ft head, 200 HP motor	1.00	EA	28,200.00	120.000	M02AS	94.61	28,200	11,353	39,553	120.0
B3 4G2	720	M01	46106	1550	35	Pump, Filtrate Water - Pump C, 1852 gpm, 155 ft head, 200 HP motor	1.00	EA	28,200.00	120.000	M02AS	94.61	28,200	11,353	39,553	120.0
B3 4G2	720	M01	46106	1550	35	Pump, Filtrate Water - Pump D, 1852 gpm, 155 ft head, 200 HP motor	1.00	EA	28,200.00	120.000	M02AS	94.61	28,200	11,353	39,553	120.0

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER				WorleyParsons				Present Day: 11/29/2005			
Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study				Estimate Report: Unit x Island x PBS - Detail				Revision Number: 1			
Location: Louisa, KY				Proposal Number: 53770801				Estimate Coordinator:			
Capacity: 1 @ 800 MW				Partner(s):				Lead Estimator: Ericke			
Type: Wet FGD				Configuration: * GYPSUM DEWATERING STUDY * Rev'd				Checked By:			
Currency: USD				Seismic Zone: 1							

User	Island	PBS	Acct	Mat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Crew Rate	Material Cost	Labor Cost	Total Cost	Manhours
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Option B3

720 SORBENT HANDLING EQUIPMENT & BOP

46106 MISC. SYSTEMS

B3	4G2	720	M01	46106	1550	35	Pump, Service/Flush Water Booster - Pump A, 300 gpm, 300 ft head, 50 HP motor	1.00	EA			8,300.00	50.000	M02AS	94.61	8,300	4,731	13,031	50.0
B3	4G2	720	M01	46106	1550	35	Pump, Flush Water Dewatering - Pump A, 300 gpm, 220 ft head, 50 HP motor	1.00	EA			8,300.00	50.000	M02AS	94.61	8,300	4,731	13,031	50.0
B3	4G2	720	M01	46106	1550	35	Pump, Service/Flush Water Booster - Pump B, 300 gpm, 300 ft head, 50 HP motor	1.00	EA			8,300.00	50.000	M02AS	94.61	8,300	4,731	13,031	50.0
B3	4G2	720	M01	46106	1550	35	Pump, Flush Water Dewatering - Pump B, 300 gpm, 220 ft head, 50 HP motor	1.00	EA			8,300.00	50.000	M02AS	94.61	8,300	4,731	13,031	50.0
B3	4G2	720	M14	46106	1931	35	Tank, Hydroclone Feed - Tank A, w/ Agitator, 243,130 Gal. (S/C)	1.00	EA			276,400.00	0.000	M02AS	94.61	276,400	0	276,400	0.0
B3	4G2	720	M14	46106	1931	35	Tank, Hydroclone Feed - Tank B, w/ Agitator, 243,130 Gal. (S/C)	1.00	EA			276,400.00	0.000	M02AS	94.61	276,400	0	276,400	0.0
B3	4G2	720	M14	46106	1931	35	Tank, Filtrate Water Storage - Tank A, w/ Agitator, 181,700 Gal., S/C	1.00	EA			219,600.00	0.000	M02AS	94.61	219,600	0	219,600	0.0
B3	4G2	720	M14	46106	1931	35	Tank, Filtrate Water Storage - Tank B, w/ Agitator, 181,700 Gal., S/C	1.00	EA			219,600.00	0.000	M02AS	94.61	219,600	0	219,600	0.0
B3	4G2	720	4H01	46106	2060	35	G1 - Collecting Conveyor, 135 ton/hr, 10 hp motor, 30" belt x 90' L, w/ Primary and Secondary belt scrapers, screw take-up, covered and lined skirt boards, drive unit, safety switches, transition chute, and head chute. (U/H Cost based on FMC Quote)	1.00	EA			111,200.00	1,260.000	M02AS	94.61	111,200	119,209	230,409	1,260.0
B3	4G2	720	4H01	46106	2060	35	G2 - Radial Stacker Conveyor, 135 ton/hr, 15 hp motor, 36" belt x 120' L - 35 ft lift. (U/H Cost based on FMC Quote)	1.00	EA			177,900.00	1,400.000	M02AS	94.61	177,900	132,454	310,354	1,400.0
B3	4G2	720	4H01	46106	2060	35	Radial Stacker Stewing Drives, 5 hp motor, Incl.	2.00	EA			0.00	0.000	M02AS	94.61	0	0	0	0.0
B3	4G2	720	4H01	46106	2060	35	Lot - Disch. Chute/work to G2 Conveyor (U/H Cost based on FMC Quote)	1.00	LS			28,600.00	340.000	M02AS	94.61	28,600	32,167	60,767	340.0
B3	4G2	720	4H01	46106	2060	35	Head Chute/work for G2 Conveyor (U/H Cost based on FMC Quote)	1.00	LS			47,700.00	400.000	M02AS	94.61	47,700	37,844	85,544	400.0
B3	4G2	720	M	46106	4210	35	Piping/Fittings, HDPE, 12 in. Class 125, SDR 7.3, U/G, Gypsum Slurry piping (2 lines)	12,000.00	LF			109.83	0.893	P02AS	94.49	1,317,960	1,012,555	2,330,515	10,716.0
B3	4G2	720	M	46106	4210	35	Piping/Fittings, HDPE, 10 in. Class 125, SDR 7.3, U/G, Filtrate Water	6,500.00	LF			96.15	0.650	M02AS	94.61	624,975	399,727	1,024,702	4,225.0

Subtotal For PBS: 46106 MISC. SYSTEMS

3,466,335 1,803,967 5,270,302 19,081.0

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WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study Location: Louisa, KY Capacity: 1 @ 800 MW Type: Wet FGD										WorleyParsons Estimate Report: Unit x Island x PBS - Detail Proposal Number: 53770801 Configuration: * GYPSUM DEWATERING STUDY * Rev'd										Present Day: 11/29/2005 Revision Number: 1 Estimate Coordinator: Lead Estimator: Ericke Checked By:										1-06
Currency: USD Seismic Zone: 1										Partner(s):																				
User 1 Island 2 User PBS Acct Mat Code Stat										Description										Quantity U/M Material Unit Labor Crew Rate Material Cost Labor Cost Total Cost Manhours										

Option B3

720 SORBENT HANDLING EQUIPMENT & BOP

52501 SERVICE WATER SYSTEM

B3	4G2	720	M	52501	4210	35	Piping/Fittings, HDPE, 8 in, Class 125, SDR 7.3, O/G, Service/Flush Water	6,500.00	LF	47.02	0.500	M02AS	94.61	305,630	307,483	613,113	3,250.0
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Subtotal For PBS: 52501 SERVICE WATER SYSTEM

54301 SERVICE AIR SYSTEM

B3	4G2	720	M	54301	4211	35	Piping/Fittings, CS, Sch 80, 2 in, A/G, Service Air	6,500.00	LF	18.48	0.654	P02AS	94.49	120,120	401,677	521,797	4,251.0
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Subtotal For PBS: 54301 SERVICE AIR SYSTEM

55301 HOISTS AND MONORAILS

B3	4G2	720	4H01	55301	1020	35	Hoist, allowance (1/H Cost based on FMC Quote)	1.00	EA	15,000.00	160,000	M02AS	94.61	15,000	15,138	30,138	160.0
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Subtotal For PBS: 55301 HOISTS AND MONORAILS

57200 PLANT FIRE PROTECTION SYSTEM

B3	4G2	720	M01	57200	1561	35	Pump, Fire Water Booster - Pump A, 1000 gpm, 240 ft head, 150 HP motor	1.00	EA	20,000.00	100,000	M02AS	94.61	20,000	9,461	29,461	100.0
B3	4G2	720	M01	57200	1561	35	Pump, Fire Water Booster - Pump A, 1000 gpm, 240 ft head, 150 HP motor	1.00	EA	20,000.00	100,000	M02AS	94.61	20,000	9,461	29,461	100.0
B3	4G2	720	M01	57200	1561	35	Pump, Fire Water Booster - Pump A, 1000 gpm, 240 ft head, 125 HP motor	1.00	EA	18,300.00	100,000	M02AS	94.61	18,300	9,461	27,761	100.0
B3	4G2	720	M01	57200	1561	35	Pump, Fire Water Booster - Pump A, 1000 gpm, 240 ft head, 125 HP motor	1.00	EA	18,300.00	100,000	M02AS	94.61	18,300	9,461	27,761	100.0
B3	4G2	720	M	57200	4209	35	Piping/Fittings, HDPE, 12 in, FM Class 200, U/G, Fire Water piping	6,500.00	LF	102.37	0.893	P02AS	94.49	665,405	548,467	1,213,872	5,804.5
B3	4G2	720	M	57200	4211	35	Piping/Fittings, Firewater, small bore runs, including nozzles, controls, and misc. hardware (Allowance)	1.00	LS	200,000.00	1,000,000	M02AS	94.61	200,000	94,610	294,610	1,000.0

Subtotal For PBS: 57200 PLANT FIRE PROTECTION SYSTEM

57700 POTABLE WATER SYSTEM

B3	4G2	720	M	57700	4210	35	Piping/Fittings, HDPE, 3 in, Class 125, SDR 7.3, O/G, Potable Water	200.00	LF	6.49	0.248	M02AS	94.61	1,298	4,693	5,991	49.6
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Subtotal For PBS: 57700 POTABLE WATER SYSTEM

57801 SANITARY SEWER SYSTEMS

B3	4G2	720	M	57801	4210	35	Piping/Fittings, HDPE, 3 in, Class 125, SDR 7.3, O/G, Sanitary piping	100.00	LF	6.49	0.248	M02AS	94.61	649	2,346	2,995	24.8
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Subtotal For PBS: 57801 SANITARY SEWER SYSTEMS

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WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER				WorleyParsons				Present Day: 11/29/2005			
Project Name: Big Sandy-Unit 2 - - Gypsum Dewatering Study				Estimate Report: Unit x Island x PBS - Detail				Revision Number: 1			
Location: Louisa, KY				Proposal Number: 53770801				Estimate Coordinator:			
Capacity: 1 @ 800 MW				Partner(s):				Lead Estimator: Eneke			
Type: Wet FGD				Currency: USD				Checked By:			
Seismic Zone: 1				Configuration: * GYPSUM DEWATERING STUDY * Rev'd							

User	1	Island	2	PBS	Code	Mat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Rate	Material Cost	Labor Cost	Total Cost	Manhours
Option B3																	
720 SORBENT HANDLING EQUIPMENT & BOP																	
Subtotal For Island: 720 SORBENT HANDLING EQUIPMENT & BOP																	
820 YARD WATER SYSTEMS																	
18100 CIVIL BULK MATERIALS																	
B3	4G2	820	C05	18100	4022	35	Trench spoils, all piping	5,888.00	CY	0.00	0.060	C01CS	90.20	0	31,866	31,866	353.3
B3	4G2	820	C03	18100	4050	35	Trench backfill & compact, all piping	7,223.00	CY	0.00	0.150	C01BS	84.97	0	92,061	92,061	1,083.5
B3	4G2	820	C03	18100	4054	35	Trench excavate, all piping (5900 LF)	13,111.00	CY	0.00	0.150	C01BS	84.97	0	167,106	167,106	1,966.7
B3	4G2	820	C03	18100	4057	35	Sand bedding, all piping	4,591.00	CY	15.70	0.400	C01BS	84.97	72,079	156,039	228,118	1,836.4
B3	4G2	820	C03	18100	4840	35	Jack & bore, 72" casing, under RR tracks and Route 23	300.00	LF	200.00	6.798	C01BS	84.97	60,000	173,288	233,288	2,039.4
Subtotal For PBS: 18100 CIVIL BULK MATERIALS																	
Subtotal For Island: 820 YARD WATER SYSTEMS																	

872 OTHER ELECTRICAL																	
63107 POWER CABLE, 600V																	
B3	DW	872	E01	63107	4626	35	600V Cable wire, 3/C #10 w/ G	360.00	LF	0.59	0.019	E02AS	91.86	212	628	841	6.8
B3	LF	872	E01	63107	4626	35	600V Cable wire, 3/C #10 w/ G	540.00	LF	0.59	0.019	E02AS	91.86	319	942	1,261	10.3
B3	DW	872	E01	63107	4626	35	600V Cable wire, 3/C #6 w/ G	360.00	LF	0.91	0.026	E02AS	91.86	328	870	1,197	9.5
B3	PE	872	E01	63107	4626	35	600V Cable wire, 3/C #6 w/ G	400.00	LF	0.91	0.026	E02AS	91.86	364	966	1,330	10.5
B3	DW	872	E01	63107	4626	35	600V Cable wire, 1/C 350 kcmil	2,160.00	LF	3.65	0.057	E02AS	91.86	7,884	11,310	19,194	123.1
B3	DW	872	E01	63107	4626	35	600V Cable wire, 3/C #2 w/ G	960.00	LF	1.84	0.036	E02AS	91.86	1,766	3,201	4,968	34.8
B3	PE	872	E01	63107	4626	35	600V Cable wire, 3/C #2 w/ G	400.00	LF	1.84	0.036	E02AS	91.86	736	1,334	2,070	14.5
B3	PE	872	E01	63107	4626	35	600V Cable wire, 1/C 350 kcmil	1,200.00	LF	3.65	0.057	E02AS	91.86	4,380	6,283	10,663	68.4
Subtotal For PBS: 63107 POWER CABLE, 600V																	
63108 CONTROL CABLE, 600V																	
B3	COM	872	E01	63108	4626	35	600V Cable wire, 7/C #12	5,000.00	LF	0.65	0.022	E02AS	91.86	3,250	10,105	13,355	110.0
Subtotal For PBS: 63108 CONTROL CABLE, 600V																	
63109 POWER CABLE TERMINATIONS, 600V																	
B3	COM	872	E01	63109	4631	35	600V terminations #12	280.00	EA	0.50	0.274	E02AS	91.86	140	7,047	7,187	76.7
B3	PE	872	E01	63109	4631	35	600V terminations #2	16.00	EA	2.50	0.650	E02AS	91.86	40	955	995	10.4
B3	DW	872	E01	63109	4631	35	600V terminations #6	16.00	EA	1.00	0.475	E02AS	91.86	16	698	714	7.6
B3	PE	872	E01	63109	4631	35	600V terminations 350 kcmil	16.00	EA	9.00	1.580	E02AS	91.86	144	2,322	2,466	25.3

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER

Project Name: Big Sandy-Unit 2 - Gypsum Dewatering Study

Location: Louisa, KY

Capacity: 1 @ 800 MW

Type: Wet FGD

Currency: USD

Seismic Zone: 1

Proposal Number: 53770801

Configuration: * GYPSUM DEWATERING STUDY * Rev'd

Partner(s):

WorleyParsons

Estimate Report: Unit x Island x PBS - Detail

Present Day: 11/29/2005

Revision Number: 1

Estimate Coordinator:

Lead Estimator: Erieka

Checked By:

1-06

User 1	Island	User 2	PBS Code	Acct Code	Mat Stat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Crew Rate	Material Cost	Labor Cost	Total Cost	Manhours
Option B3																
872 OTHER ELECTRICAL																
63109 POWER CABLE TERMINATIONS, 600V																
B3	PE	872	E01	63109	4631	35 600V terminations #6	16.00	EA	1.00	0.475	E02AS	91.86	16	698	714	7.6
B3	DW	872	E01	63109	4631	35 600V terminations 350 kemil	32.00	EA	9.00	1.580	E02AS	91.86	288	4,644	4,932	50.6
B3	DW	872	E01	63109	4631	35 600V terminations #10	16.00	EA	0.50	0.275	E02AS	91.86	8	404	412	4.4
B3	LF	872	E01	63109	4631	35 600V terminations #10	24.00	EA	0.50	0.275	E02AS	91.86	12	606	618	6.6
B3	DW	872	E01	63109	4631	35 600V terminations #2	32.00	EA	2.50	0.650	E02AS	91.86	80	1,911	1,991	20.8
Subtotal For PBS: 63109 POWER CABLE TERMINATIONS, 600V										744	19,287	20,031	210.0			
68201 EXPOSED CONDUITS																
B3	COM	872	E01	68201	4611	35 Conduit, 3/4" RGS	2,000.00	LF	3.75	0.218	E02AS	91.86	7,500	40,051	47,551	436.0
B3	LF	872	E01	68201	4611	35 Conduit, 3/4" RGS	540.00	LF	3.75	0.218	E02AS	91.86	2,025	10,814	12,839	117.7
B3	DW	872	E01	68201	4611	35 Conduit, 1 1/4" RGS	360.00	LF	6.95	0.290	E02AS	91.86	2,502	9,590	12,092	104.4
B3	PE	872	E01	68201	4611	35 Conduit, 1 1/4" RGS	400.00	LF	6.95	0.290	E02AS	91.86	2,780	10,656	13,436	116.0
B3	PE	872	E01	68201	4611	35 Conduit, 1 1/2" RGS	400.00	LF	7.65	0.320	E02AS	91.86	3,060	11,758	14,818	128.0
B3	DW	872	E01	68201	4611	35 Conduit, 1 1/2" RGS	960.00	LF	7.65	0.320	E02AS	91.86	7,344	28,219	35,563	307.2
B3	4G2	872	E01	68201	4611	35 Conduit, 3" RGS	720.00	LF	27.89	0.738	E02AS	91.86	20,081	48,811	68,892	531.4
B3	PE	872	E01	68201	4611	35 Conduit, 3" RGS	400.00	LF	27.89	0.738	E02AS	91.86	11,156	27,117	38,273	295.2
Subtotal For PBS: 68201 EXPOSED CONDUITS										56,448	187,016	243,464	2,035.9			
Subtotal For Island: 872 OTHER ELECTRICAL										76,431	241,942	318,373	2,633.8			
Subtotal For: Option B3										9,206,542	9,663,990	18,870,532	104,020.5			

WorleyParsons Proprietary Information

Client: AMERICAN ELECTRIC POWER Project Name: Big Sandy-Unit 2 - - Gypsum Dewatering Study Location: Louisa, KY Capacity: 1 @ 800 MW Type: Wet FGD		Seismic Zone: 1 Currency: USD		Proposal Number: 53770801 Configuration: * GYPSUM DEWATERING STUDY * Rev'd		Partner(s): Lead Estimator: Ericke Checked By:		Present Day: 11/29/2005 Revision Number: 1 Estimate Coordinator: Lead Estimator: Ericke Checked By:		I-06						
User	Island	User	PBS	Acct	Mat	Description	Quantity	U/M	Material Unit	Labor Unit	Crew	Crew Rate	Material Cost	Labor Cost	Total Cost	Manhours
1		2														
Grand Total													34,139,531	29,881,090	64,020,621	319,486.2

APPENDIX 4

LISTINGS BY OPTION OF MAJOR COMPONENTS AND MODIFICATIONS

OPTION A MAJOR COMPONENTS AND MODIFICATIONS

**Byproduct conveyors and foundations
Byproduct dewatering building and foundation
Byproduct pump house and foundation
Re-hydration tanks and foundation
Bottom ash pond water pumps
Byproduct pumps
Bottom ash pond water and byproduct piping
Jack and bore under railroad tracks and Route 23
Trenches for underground piping
Wooden ties for on-grade piping
Electrical cable, switchgear, and MCCs
Control cable
Ductbank
Road upgrade**

OPTION B-1 MAJOR COMPONENTS AND MODIFICATIONS

**Disposal area site preparation, grading, etc. for pump house and filtrate water tanks
Filtrate water pump house and foundation
Filtrate and flush water tanks and foundations
Floating filtrate water pumps
Filtrate water pumps
Flush water pumps
Byproduct forwarding pumps
Piping
Jack and bore under railroad tracks and Route 23
Trenches for underground piping
Electrical cable, switchgear, and MCCs
Control cable**

OPTION B-2 MAJOR COMPONENTS AND MODIFICATIONS

**Byproduct conveyors, transfer towers, radial stacker, and foundations
Disposal area site preparation, grading, etc. for radial stacker
Byproduct dewatering building and foundation
Piping
Electrical cable, switchgear, and MCCs
Control cable
Ductbank
Fire water booster pumps**

OPTION B-3 MAJOR COMPONENTS AND MODIFICATIONS

Byproduct dewatering area site preparation, grading, etc.
Byproduct dewatering building and foundation
Filtrate water tanks and foundation
Hydrocyclone feed tanks and foundation
Flush water tank and foundation
Byproduct conveyors, radial stacker, and foundations
Filtrate water pumps
Flush water pumps
Piping
Electrical cable, switchgear, and MCCs
Control cable
Ductbank
Fire water booster pumps
Instrument air dryers
Trenches for underground piping
Jack and bore under railroad tracks and Route 23
Road upgrade and paving