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Log # TXNB-10013

Ref. # 10 CFR 52

February 24, 2010

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555
ATTN: David B. Matthews, Director
Division of New Reactor Licensing

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 3 AND 4
DOCKET NUMBERS 52-034 AND 52-035
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING THE ENVIRONMENTAL REVIEW AND SUPPLEMENTAL INFORMATION FOR PREVIOUS ENVIRONMENTAL QUESTIONS

REFERENCE: Letter, M. Willingham to D. Woodlan, "Request for Additional Information Regarding the Environmental Review of the Combined License Application for Comanche Peak Nuclear Power Plant, Units 3 and 4," dated January 15, 2010 (ML093280707)

Dear Sir:

In Attachment 1, Luminant Generation Company LLC (Luminant) submits responses to the following questions provided by the NRC in the referenced letter:

AE-05	GEN-10	GEN-14	HYD-26	SOC-32
GEN-07	GEN-11	GEN-15	HYD-27	TE-20
GEN-08	GEN-12	HP-04	HYD-28	TE-21
GEN-09	GEN-13	HYD-25	HYD-29	

The responses for the two remaining questions from the referenced letter, ALT-03 and SOC-33, will be provided in a subsequent letter along with supplemental information for questions GEN-03 and TE-04.

In Attachment 2, Luminant submits supplemental information for the responses to questions HYD-13 and HYD-15 that were submitted in Luminant letter TXNB-09029 on August 10, 2009 (ML092360142).

Some of the electronic files provided on the enclosed CD are in their native format as required for use by the NRC. These native files do not meet the requirements of "Guidance for Electronic Submissions to the NRC, Revision 5

Should you have any questions regarding these responses and supplemental information, please contact Don Woodlan (254-897-6887, Donald.Woodlan@luminant.com) or me.

The only commitment in this letter is stated above regarding the two remaining responses for the referenced letter. Luminant is tracking this commitment as #7211.

D090
NRO

I state under penalty of perjury that the foregoing is true and correct.

Executed on February 24, 2010.

Sincerely,

Luminant Generation Company LLC

Donald R. Woodlan for

Rafael Flores

Attachment 1:	Response to Request for Additional Information Regarding the Environmental Review
Attachment 2:	Supplemental Response to Request for Additional Information Regarding the Environmental Review
Attachment 3:	List of Electronic Files Provided on the Enclosed CD
Enclosure:	CD Containing Files Supporting both Attachments

cc: Michael Willingham w/attachments and enclosure

Electronic distribution w/attachments only

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Attachment 1

Response to Request for Additional Information Regarding the Environmental Review

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak, Units 3 and 4

Luminant Generation Company LLC

Docket Nos. 52-034 and 52-035

RAI REGARDING THE ENVIRONMENTAL REVIEW

DATE OF RAI ISSUE: 1/25/2010

QUESTION NO.: AE-05 (2.4.2, 3.7, 4.1.2, 4.3.2)

Provide descriptions of any streams that would be crossed by the proposed pipelines between Lake Granbury and CPNPP Units 3 and 4, including their ecological and hydrological characteristics. Provide an estimate of the number of linear feet of streams that would be affected by the construction of Units 3 and 4 pipelines, as well as transmission lines. These data should be provided for each right-of-way (ROW).

ANSWER:

Background

During the public meeting held January 27, 2010, a representative from the U.S. Army Corps of Engineers clarified the information need for Question AE-05. Descriptions of any streams that would be crossed by the proposed pipelines between Lake Granbury and CPNPP Units 3 and 4 were requested as well as acreage of impact to the identified streams. For transmission lines, the information need focused on the impacts to streams from bridges or culverts that may be constructed in streambeds to facilitate transmission line construction and/or maintenance. An approximate acreage of impact at stream crossings from the required construction/maintenance infrastructure was requested.

Response

Pipelines

Additional cooling water intake and discharge pipelines are expected to be constructed for CPNPP Units 3 and 4 extending from the plant to Lake Granbury (ER Figure 1.1-4). The pipelines are expected to occupy an existing 50-ft ROW and are expected to run parallel to the existing water pipelines. Intake and discharge structures for CPNPP Units 3 and 4 are expected to be placed to the north of and adjacent to the existing Units 1 and 2 intake and discharge structures on Lake Granbury. As discussed in Subsection 2.4.1.2.2, no wetlands or habitat for threatened or endangered species are located on the pipeline ROW. Vegetation consists mainly of grassland and Ashe juniper. Land-use impacts to the ROW during construction are discussed in Subsection 4.1.2. Luminant intends to tunnel at all pipeline stream crossings to minimize or eliminate potential disturbance to streambeds and riparian areas during pipeline construction. Additionally, existing vehicular infrastructure in place at stream crossings from the construction of the existing pipeline is expected to be utilized for CPNPP Units 3 and 4 pipeline construction and maintenance. Streams encountered along the pipeline route and estimated ROW acreages at stream crossings are summarized in Table 1 and stream locations are shown on Figure 1.

Transmission Lines

Three single-circuit transmission lines are located on existing ROWs and use existing tower structures (ER Figure 1.1-5). Two double-circuit expansions require the construction of new towers on new or expanded transmission line ROW that is 160 ft wide. The first is a 45-mi line to Whitney and the second is a 17-mi line to DeCordova. No land-use impacts are anticipated from the transmission line construction activity located on existing or expanded ROWs as vegetation maintenance is already performed. Therefore, only new ROW that does not parallel an existing transmission ROW was analyzed for new impacts. Land use along the DeCordova ROW consists mainly of grassland, while the land use along the Whitney ROW consists of primarily grassland with some deciduous and evergreen forest. Updated Table 2.2-4, provided with the response to Question GEN-08, shows the land-use acreages in transmission line ROW.

The new DeCordova ROW parallels an existing ROW along its entire length. The new 45-mile Whitney transmission line from the CPNPP Site to Whitney includes approximately 18-miles of new ROW that does not parallel any existing ROW. This portion of the new ROW will extend from the CPNPP site to a point near the town of Walnut Springs in Bosque County. The remainder of the route will parallel existing transmission line ROW from Walnut Springs to Whitney.

No new construction of access bridges or culverts at transmission line stream crossings is expected along existing transmission line ROW. This infrastructure is assumed to be in place to service existing transmission lines. Any additional ROW to be obtained parallel to existing transmission lines would use existing stream crossing infrastructure during construction and/or maintenance.

Up to 0.51 acres of intermittent streams may be impacted from the installation of culverts at stream crossings to facilitate transmission line construction and maintenance. This acreage is based upon 23 transmission line stream crossings between the CPNPP site and the town of Walnut Springs and the assumption that a 20-ft wide culvert may be installed at each stream crossing. The Paluxy River was not considered because it was anticipated that existing bridges and crossings would be utilized and no additional culverts or bridges would be required. Stream widths were estimated using topographic maps and aerial photographs. The actual impacted acreage to streambeds will probably be lower than the estimate as the need for a culvert at each stream crossing is unlikely. Streams identified within the proposed ROW from the CPNPP site to Walnut Springs are summarized in Table 2 and identified on attached Figures 2a, 2b, and 2c.

The following paragraphs summarize Oncor's likely approach to address stream crossing impacts during the construction of new transmission lines associated with CPNPP Units 3 and 4. The information was obtained from the *Environmental Assessment and Alternative Route Analysis for TXU Delivery Company's Proposed Salado-Hutto 345 kV Transmission Line Project in Bell and William Counties, Texas* (March 2007).

To maximize the protection of both land and water resources, Oncor exercises special care when clearing near waterways. Vegetation on the stream banks will be left intact to the largest extent possible. If necessary, revegetation of these areas will take priority over less-critical areas. Transmission line right-of-ways are inspected both during and after construction to ensure that problem erosion areas are identified. In addition, Oncor will develop a Storm Water Pollution Prevention Plan (SWPPP), the implementation of which will also minimize the impacts associated with potential soil erosion and downstream sedimentation.

In cases where transmission line routes cross soils that are designated by the USDA as prime farmland, Oncor expects potential construction-related erosion limited to the physical occupation of small areas at the base of support structures. These impacts are mitigated by SWPPP, minimizing the impact to prime farmland soils.

Any stream that will be crossed by the proposed project will be spanned by the proposed transmission line and no supporting structures will be placed in the streambed of any surface drainage. The main potential impacts from any major construction project are siltation resulting from erosion and pollution resulting from spillage of petroleum products (e.g., fuel or lubricants) or other chemicals. Vegetation removal could result in increased erosion potential of the affected areas, so that slightly higher than normal sediment yields may be delivered to area streams following a heavy rainfall. However, these short-term effects should be minor as a result of the relatively small area to be disturbed at any particular time, the short duration of the construction activities, preservation of stream side vegetation where practical, Oncor's efforts to control runoff from construction areas, and implementation of the SWPPP.

If FEMA designated 100-year floodplains are identified along creeks and streams within the transmission line routes, it is possible that transmission line structures may be located within some of these floodplains. However, careful siting should eliminate the possibility of construction activities impacting obvious flood channels and thus should not significantly affect flooding. If it becomes necessary to locate transmission line structures within the floodplain, they will be designed and constructed so as not to impede the flow of water or create a hazard during flooding. Construction of the proposed project should not have significant impacts on the function of the floodplain, nor adversely affect adjacent or downstream properties. If structures are to be located within the floodplain, then Oncor will coordinate with the appropriate floodplain administrators.

The Clean Water Act (CWA) sets the basic framework for regulating discharges of pollutants to U.S. waters, and Section 404 of the CWA establishes a federal program to regulate the discharge of dredged and fill material into waters of the U.S., including wetlands, administered by the USACE. In the event that streams and associated wetlands could potentially be impacted by construction activities, the USACE would be consulted prior to commencement of the proposed project activities if wetland impacts occur.

Table 1

CPNPP Units 3 and 4 Pipeline Stream Crossings

Stream ID	Name	Type	Estimated Stream Width (Feet)	ROW Area at Stream Crossing (Acres)[2]
PSC-1	Unnamed	Intermittent	40	0.05
PSC-2	Unnamed	Intermittent	40	0.05
PSC-3	Unnamed	Intermittent	40	0.05
PSC-4	Unnamed	Intermittent	40	0.05
PSC-5	Unnamed	Intermittent	40	0.05
PSC-6	Unnamed	Intermittent	40	0.05
PSC-7	Squaw Creek	Intermittent[1]	50	0.06
PSC-8	Panther Branch	Intermittent	40	0.05
PSC-9	Panther Branch	Intermittent	40	0.05
PSC-10	Panther Branch	Intermittent	40	0.05
PSC-11	Panther Branch	Intermittent	40	0.05
Total Pipeline ROW Acreage at Stream Crossings				0.56

Notes

[1] Squaw Creek is depicted as an intermittent stream on the topographic map; however, continuous flow is provided downstream of SCR Dam in the area of the proposed pipeline crossing.

[2] Stream widths were estimated using topographic maps and aerial photographs. The actual impacted acreage to streambeds will likely be lower than the estimate as the need for a culvert at each stream crossing is unlikely.

Table 2

Whitney Transmission Line Stream Crossings along 18-mi of New ROW

Stream Crossing ID	Name	Type	Estimated Stream Width (Feet)	Impacted Area (Acres)
TSC-1	Panther Branch	Intermittent Stream	40	0.02
TSC-2	Unnamed	Intermittent Stream	40	0.02
TSC-3	Opossum Branch	Intermittent Stream	40	0.02
TSC-4	Opossum Branch	Intermittent Stream	40	0.02
TSC-5	Opossum Branch	Intermittent Stream	40	0.02
TSC-6	Opossum Branch	Intermittent Stream	40	0.02
TSC-7	Opossum Branch	Intermittent Stream	40	0.02
TSC-8	Opossum Branch	Intermittent Stream	40	0.02
TSC-9	Paluxy River	River	(1)	(1)
TSC-10	Unnamed	Intermittent Stream	40	0.02
TSC-11	Bowden Branch	Intermittent Stream	40	0.02
TSC-12	Bowden Branch	Intermittent Stream	40	0.02
TSC-13	Bowden Branch	Intermittent Stream	40	0.02
TSC-14	Barker Branch	Intermittent Stream	40	0.02
TSC-15	Barker Branch	Intermittent Stream	40	0.02
TSC-16	Barker Branch	Intermittent Stream	50	0.02
TSC-17	Barker Branch	Intermittent Stream	40	0.02
TSC-18	Barker Branch	Intermittent Stream	40	0.02
TSC-19	South Fork Hill Creek	Intermittent Stream	40	0.02
TSC-20	South Fork Hill Creek	Intermittent Stream	50	0.02
TSC-21	Mustang Creek	Intermittent Stream	40	0.02
TSC-22	Mustang Creek	Intermittent Stream	40	0.02
TSC-23	Steele Creek	Intermittent Stream	90	0.04
TSC-24	Steele Creek	Intermittent Stream	110	0.05
Total Impacted Acreage at Stream Crossings from Culvert Installation				0.51

(1) A culvert at the Paluxy River crossing is not anticipated because existing bridges and crossings will be utilized.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachments

Figure 1 – Pipeline Stream Crossing CPNPP Site to Lake Granbury

Figure 2a – Transmission Line Stream Crossing CPNPP Site to Walnut Springs

Figure 2b - Transmission Line Stream Crossing CPNPP Site to Walnut Springs

Figure 2c - Transmission Line Stream Crossing CPNPP Site to Walnut Springs

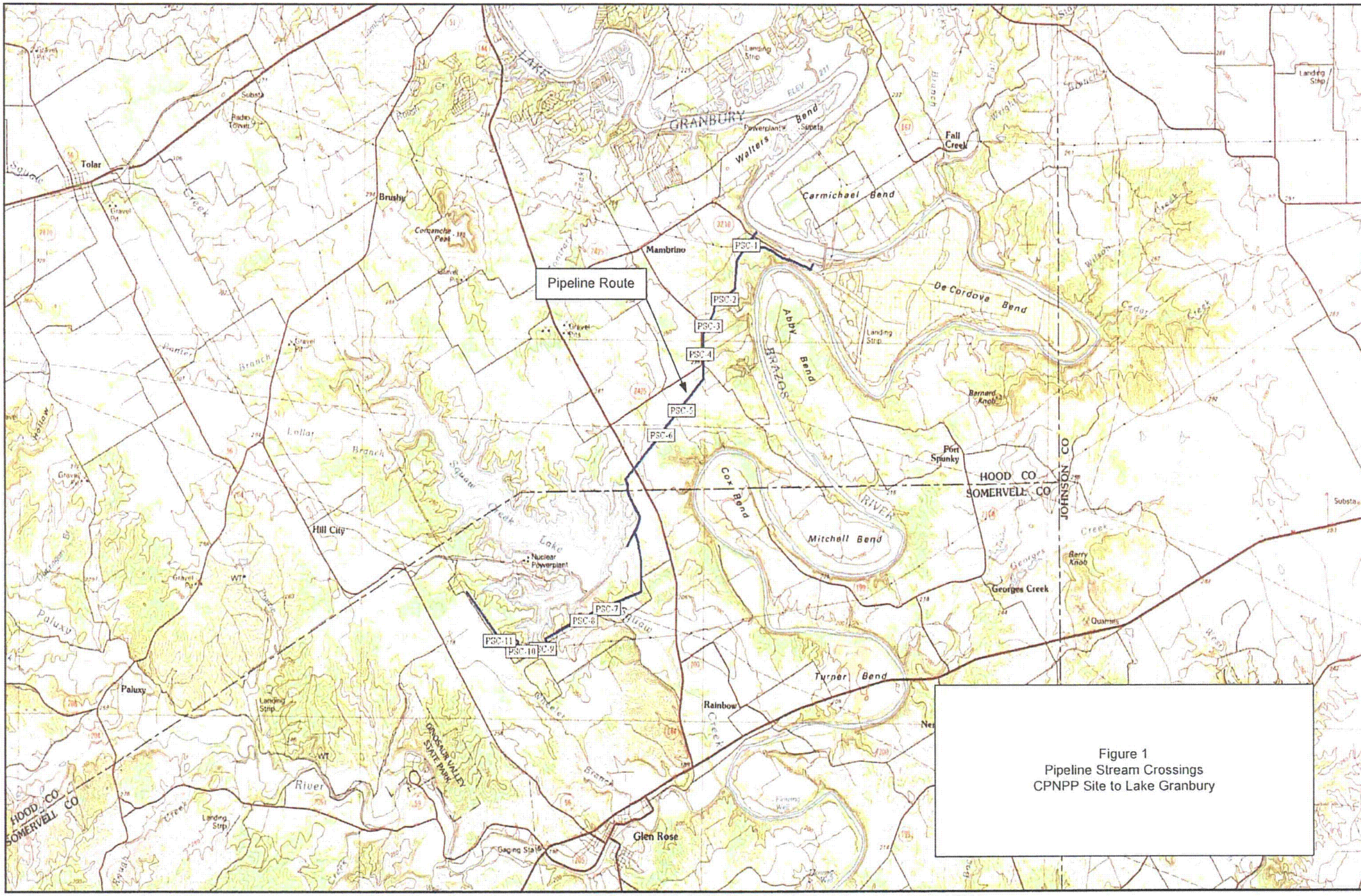


Figure 1
Pipeline Stream Crossings
CPNPP Site to Lake Granbury

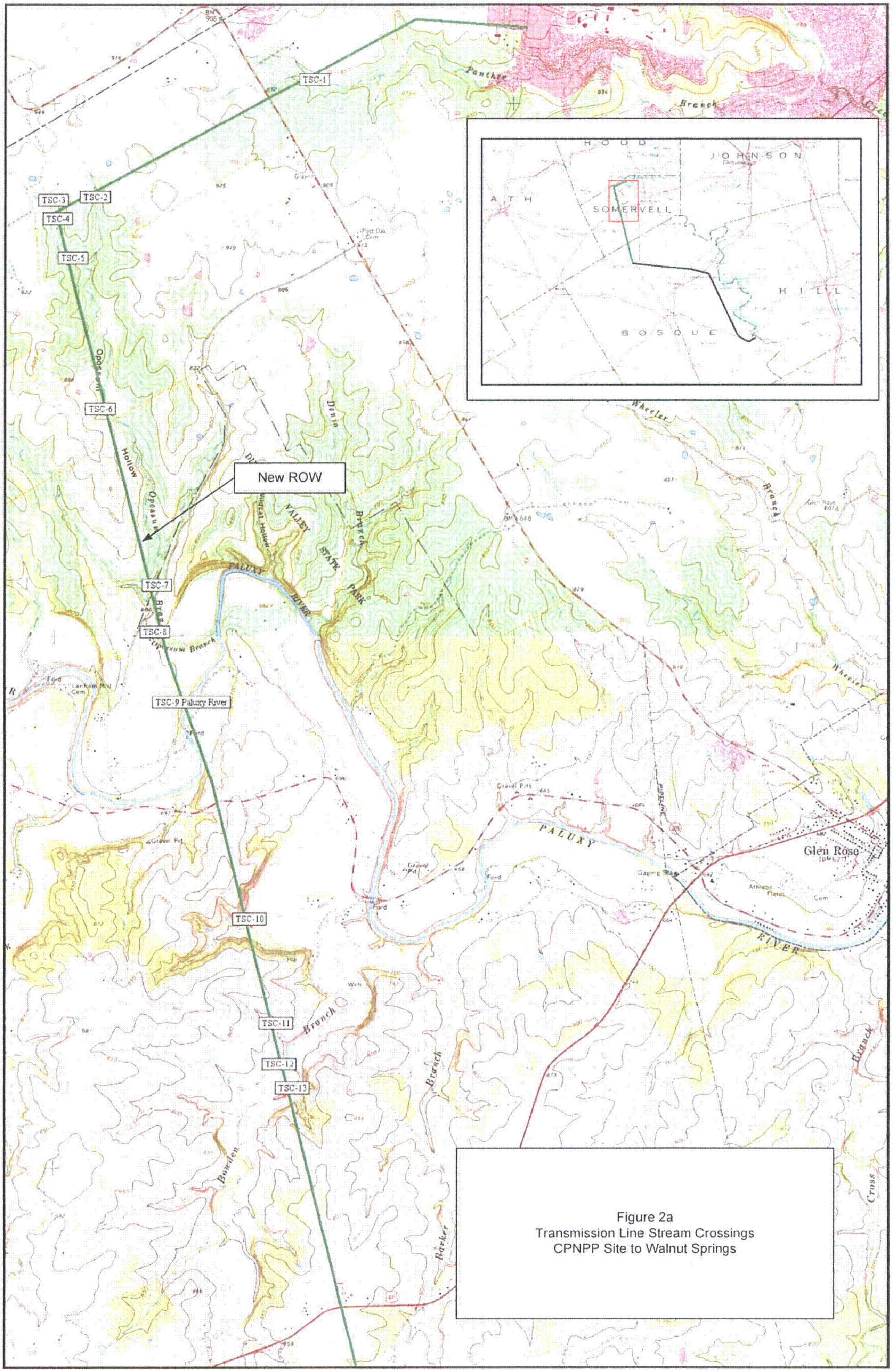


Figure 2a
Transmission Line Stream Crossings
CPNPP Site to Walnut Springs

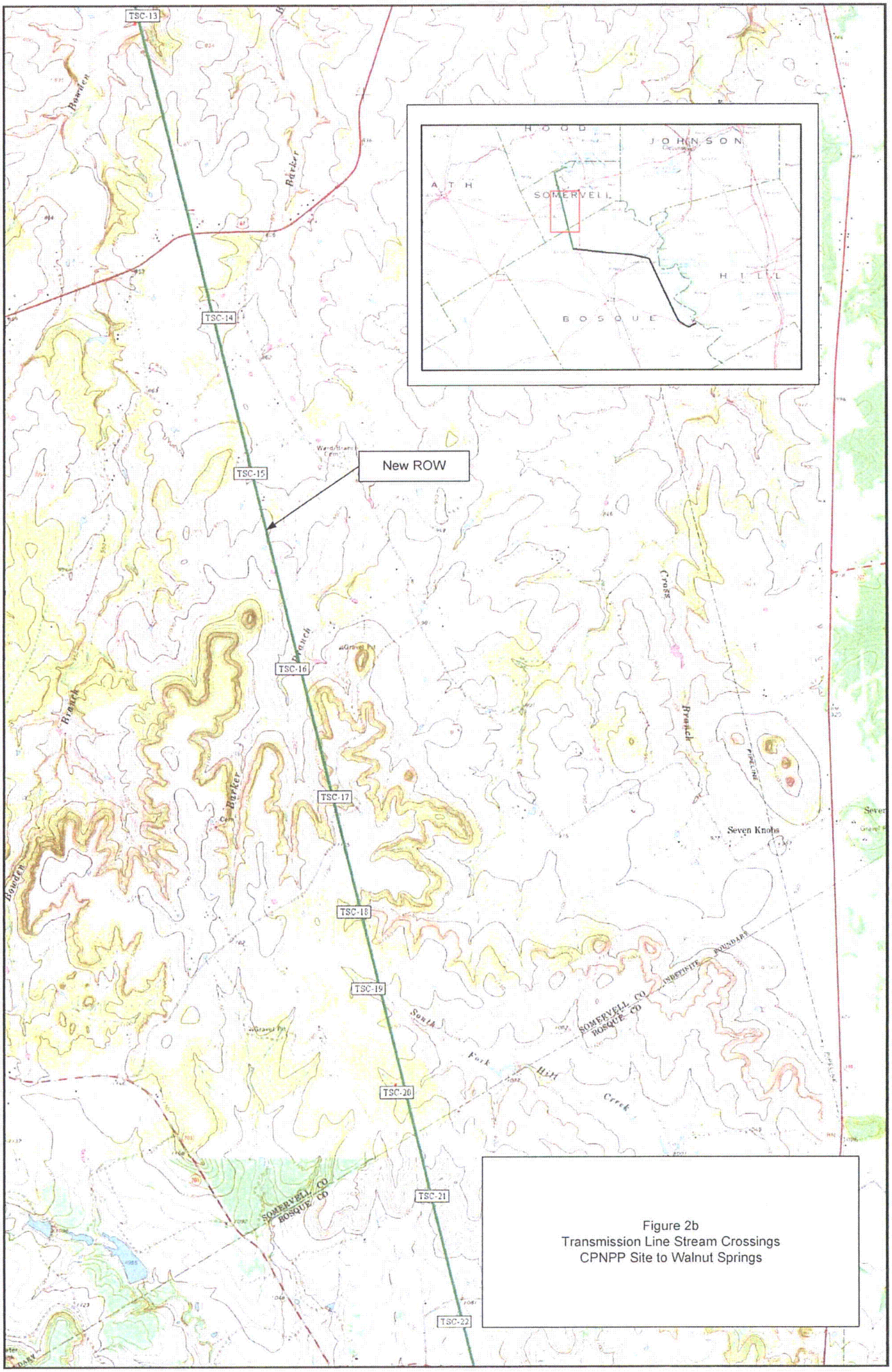


Figure 2b
Transmission Line Stream Crossings
CPNPP Site to Walnut Springs

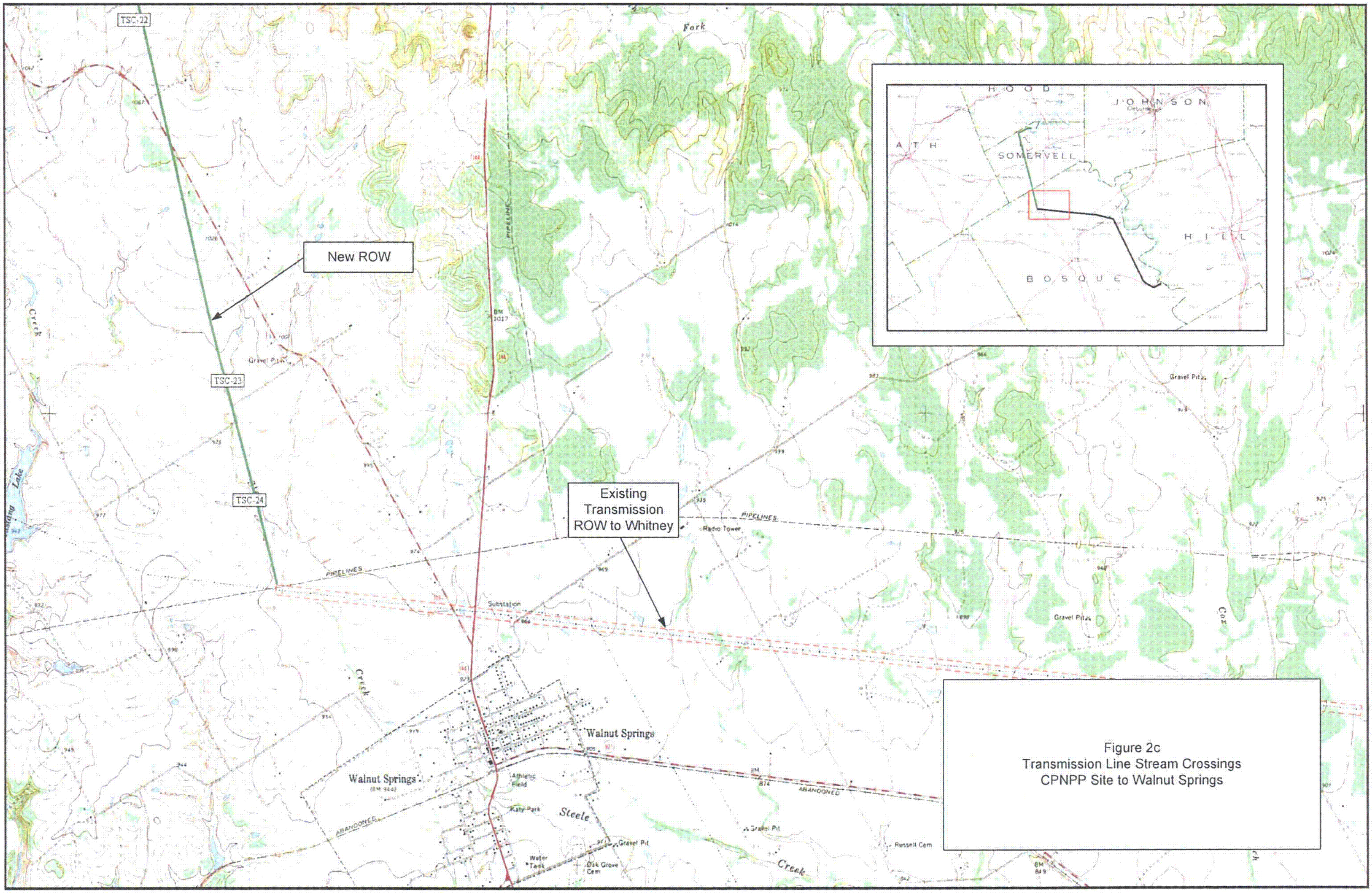


Figure 2c
Transmission Line Stream Crossings
CPNPP Site to Walnut Springs

QUESTION: GEN-07 (3.4)

Provide an updated version of ER figure 3.4-1 which shows a schematic representation of the proposed Comanche Peak Nuclear Power Plant (CPNPP) cooling system water use during normal operation. Specifically, the figure should include:

- All cooling loads;
- The cooling tower basin;
- The Blowdown Treatment Facility (BDTF) and all other cooling water treatment systems;
- Any and all water uses, in addition to cooling water, that add water to or withdraw water from the cooling water system.

It is unclear whether the ultimate heat sink (UHS) and circulating water system (CWS) share the same cooling towers and basins. Clarify the flow of water from the CWS and UHS to the cooling tower(s) and basin(s). If the UHS cooling towers are separate from the CWS cooling towers, revise figure 3.1-1, as well, to show the location of the UHS cooling towers.

Provide an updated version Figure 3.3-1 Water Balance for normal full-power operations. The figure should show all elements of the system, including components missing from the current version such as the cooling tower basin and BDTF. Accurately represent the relationship between components so that it is clear which components are shared, such as the cooling tower basin, and which serve only an individual unit. Include inputs and discharges to the water system for Units 1 & 2. For minor and intermittent water uses and discharges, provide sufficient information about rates and timing to allow the staff to estimate annual flows.

ANSWER:

Figure 3.1-1 has been revised to include an additional item in the legend (Item 45 UHS COOLING SYSTEM / ESW PUMP HOUSE) to indicate the location of the UHS cooling towers and the ESW pump house which are separate from the CWS cooling towers.

Figure 3.3-1 has been updated to include the BDTF. The cooling tower designations have been changed to be consistent with revised Figure 3.4-1. The supporting table (pages 2 & 3) has been revised to indicate single unit and two-unit flows; duration and flow; users/discharges associated with Unit 3 and 4 construction activities.

<u>Impact on R-COLA</u>

See attached marked-up ER Figures 3.1-1, 3.3-1 (3 sheets) and 3.4-1.

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

None.

RAI GEN-07

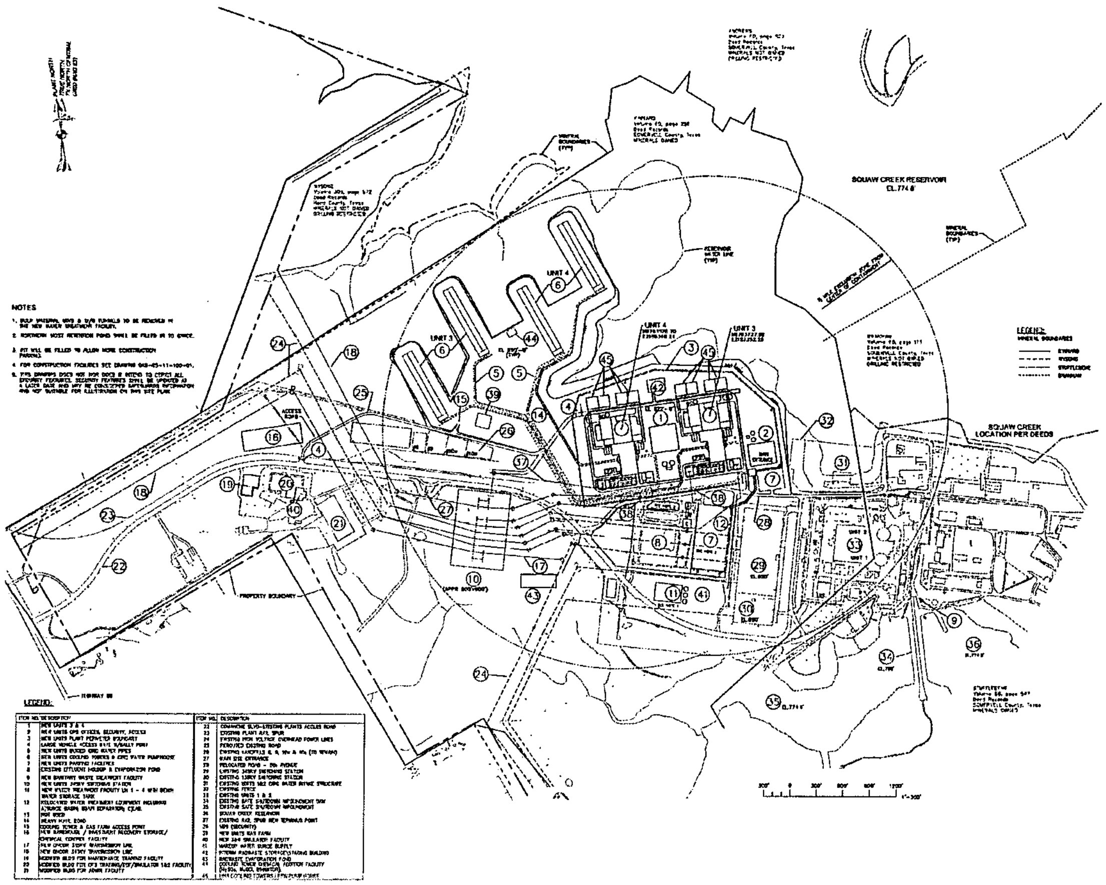


Figure 3.1-1 Site Plan

RAI GEN-07
RAI HYD-27

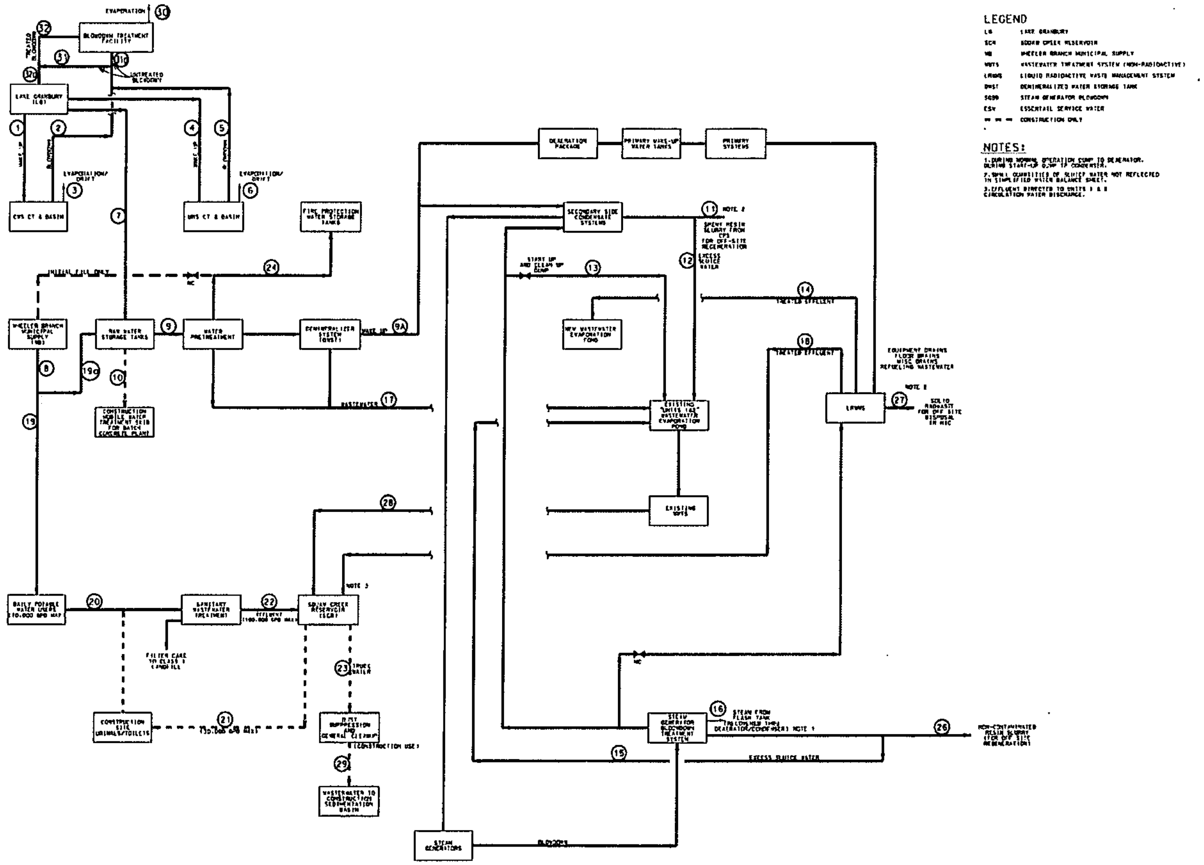


Figure 3.3-1 Water Balance (Sheet 1 of 3)

RAI GEN-07
RAI HYD-27

Steam	Description	Flow @ Max Power Operation[(a)]	Units	Waste Constituents	Comments and References
1	CWS Cooling Tower Makeup from Lake Granbury (LG)	31,200 per Unit	gpm		Secondary Side Water Cooling System Study Case1Ba (revised by RFI-0202) From Lake Granbury to Cooling Tower Section 5.0 Optimization Study SSCWS - Final Report dated 8/15/07
2	CWS Cooling Tower Blowdown	12,900 per Unit	gpm	TDS-2.4 times LG value.	Secondary Side Water Cooling System Study Case1Ba (revised by RFI-0202) From Cooling Tower to Lake Granbury (LG) Section 5.0 Optimization Study SSCWS - Final Report dated 8/15/07
3	CWS Cooling Tower Evaporation + Drift	18,300 per Unit	gpm		Secondary Side Water Cooling system Study Case1Ba(revised by RFI-0202)
4	UHS Cooling Tower Makeup from LG	274 per Unit	gpm		(revised by RFI-0202)
5	UHS Cooling Tower Blowdown	109 per Unit	gpm	TDS- 2.4 times LG value.	(revised by RFI-0202)
6	UHS Cooling Tower Evaporation + Drift	165 per Unit	gpm		(revised by RFI-0202)
7	Raw water from LG to raw water storage tanks	470- 1,100 total 2 Units	gpm		A blend of LG and potable water is expected. Minimum make-up for operation is estimated from Luminant at ~ 200 gpm per Unit. Maximum construction flushing is estimated at ~ 500 gpm per Unit.
8	Potable water from WB to CPNPP site	0 to 350 total 4 Units	gpm		Assumed a 350 gpm uninterruptible supply of potable water from Somervell County Water District (SCWD) will be made available to supply Units 1- 4.
9	Raw water to pretreatment	1,100 to 1,250 total 2 Units	gpm		Assume 80% recovery as demin water.
9A	Demineralized Make-up to Primary Water Tanks	200 to 500 per Unit			See 7 above.
10	Raw water to construction mobile treatment skid	250 total 2 Units	gpm		URS estimate. Assumed (2) shifts/day 8hr x 2 = 16 hrs/day. Necessary to support concrete batch plant during construction only
11	Spent resin slurry from CPS	85	gpd		Assumed one time per month for one hour. Demin volume is ~ 5,000 gal, ~ 85gpd for 1 hr, which is ~ 95% recycle.
12	Excess sluice water from CPS	85	gpd		Assumed one time per month for one hour. Demin volume is ~ 5,000 gal, ~ 85gpd for 1 hr, which is ~ 95% recycle.
13	SGBD blowdown wastewater to existing evaporation pond	1,165 per Units (see comment)	gpm		Assume during plant startup flow duration will be 4 hrs. Normal power operation flow duration is to be determined.
14	LRWMS effluent to new evaporation pond	1,500 total 2 Units	gals/day		Rad waste estimate. Assumed 60% of total released effluent from LRWMS.
15	Excess sluice water from SGBD treatment	N/A	gpm		Neglect for simplified balance
16	Evaporation from SGBD flash tank	N/A			Evaporated steam is condensed and recovered in the main condenser.
17	Water treatment wastewater to existing evaporation pond	100 to 250 total 2 Units	gpm	pH- 6 to 9; TDS- 5 times feed water TDS; resin regeneration salts- sodium sulfate, calcium sulfate and sodium chloride; suspended solids & silts- from filter back wash	URS estimate. Assumed 80% recovery of feed water as demineralized water.

Figure 3.3-1 Water Balance (Sheet 2 of 3)

RAI GEN-07
RAI HYD-27

Steam	Description	Flow @ Max Power Operation[(a)]	Units	Waste Constituents	Comments and References
18	LRWMS effluent to existing Unit 1 & 2 circulating water discharge	1,000 total 2 Units	gals/day		Rad waste estimate. Assumed 40% of total released effluent from LRWMS.
19	Potable water to daily potable water users	50 total 2 Units	gpm		URS estimate
19a	Potable water to raw water storage tank	300 max. total 2 units	gpm		250 gpm continuous for construction mobile treatment skid (refer to stream 10). After construction and Unit 1 & 2 tie-in, approx. 250 gpm would be available to supplement raw water supply from LG.
20	Sanitary wastewater from potable water toilets/urinals	70,000 total 2 Units	gals/day		Sanitary wastewater treatment system's COLA concept design report.
21	Non-potable water to construction toilets/urinals	30,000 total 2 Units	gals/day		Sanitary wastewater treatment system's COLA concept design report. During construction only estimate.
22	Sanitary wastewater treatment system effluent	100,000 total 2 Units	gals/day	Effluent will meet permit limits (see SWTS System Description for permit limits).	Sanitary wastewater treatment system's COLA concept design report
23	Dust suppression & general cleanup water	63,000 total 2 Units	gals/day		Trucked to user locations. During construction only estimate
24	Fire protection water storage tank makeup water	N/A			Neglect for simplified balance. Initial fill is from potable water supply.
25	Evaporation loss from fuel pool tanks	N/A			Neglect for simplified balance
26	Non-contaminated resin slurry from SGBD treatment system	N/A			Neglect for simplified balance
27	Solid radwaste for off site disposal in HIC	N/A			Neglect for simplified balance
28	Existing pond wastewater treatment system effluent	N/A			Neglect for simplified balance
29	Wastewater to construction sedimentation basin	63,000 total 2 Units	gals/day		URS during construction only estimate
30	Evaporation from Blowdown Treatment Facility (BDTF)	2,577 per Unit	gpm		Flow from BDTF to evaporation ponds is estimated at 2,577 gpm/unit, which includes ultrafiltration (UF) backwash and reverse osmosis (RO) reject water.
31	Untreated Blowdown to Lake Granbury (LG)	2,272 per Unit	gpm	8,402 mg/L TDS based upon Lake Granbury maximum concentrations	A portion of the cooling tower blowdown by-passes the BDTF.
31a	Blowdown to BDTF	10,737 per Unit	gpm	8,402 mg/L TDS based upon Lake Granbury maximum concentrations	Blowdown from Secondary Side and ESW cooling towers are combined for treatment in the BDTF.
32	Treated Blowdown to LG	8,160 per Unit	gpm	91.9 mg/L TDS	Treated blowdown flow is based upon UF system operating at 95% recovery and RO system operating at 80% recovery. Total input flow to BDTF is estimated at 10,737 gpm/unit.
32a	Total Combined Discharge to LG	10,432 per Unit	gpm	1,902 mg/L TDS	Untreated blowdown (31) and treated blowdown (32) are combined for discharge to LG based upon maintaining <2500 mg/L TDS and <1000 mg/L Cl in the combined discharge.

(a) Flow is assumed to be continuous.

Figure 3.3-1 Water Balance (Sheet 3 of 3)

RAI GEN-07

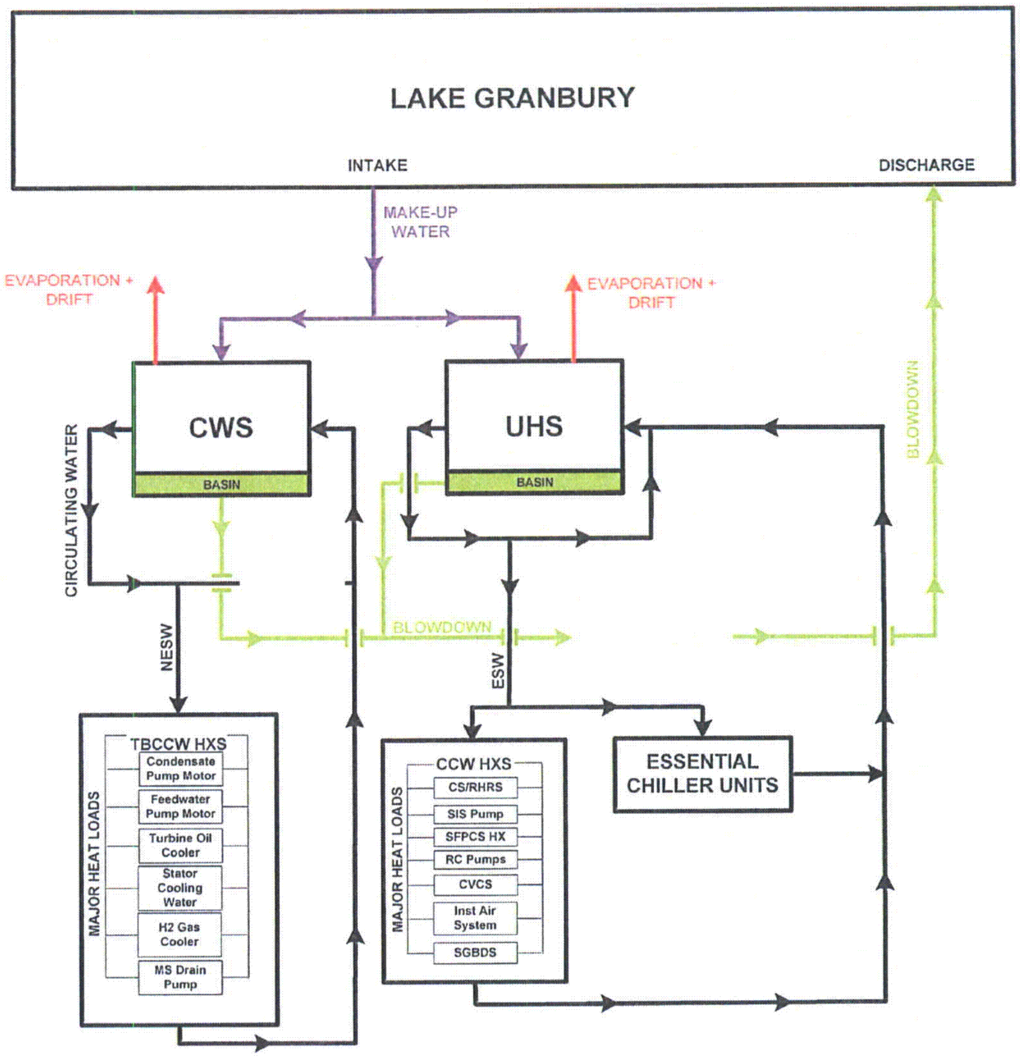


Figure 3.4-1 Simplified Water Use Diagram

QUESTION NO.: GEN-08 (2.2.2, 3.7.2, 4.1.2, 5.1.2)

In order for the staff to complete its review of cumulative impacts associated with new and existing transmission lines additional information is need in regards to the DeCordova transmission line. Provide the following information:

- Describe the route/alignment and cumulative width of the existing 185-kV and 345-kV DeCordova rights-of way (ROWs).
- Figure 1.1-5 and 3.7-4 indicate that the proposed ROW would either be adjacent to the existing ROWs or it would be built along a completely new ROW. Describe the cumulative width (i.e., the combined width of the three ROWs) and route/alignment if the new transmission line were built adjacent to the current ROWs.
- Provide an explanation and environmental implications for the differences between the MVA rating of the DeCordova circuit and other transmission line circuit MVA rating.

ANSWER:

The existing DeCordova transmission lines have a 230-ft ROW and their alignment is illustrated on ER Figures 3.7-4 and 1.1-5. The proposed line is anticipated to run adjacent to the existing lines, adding an additional ROW of 160 ft. This creates a cumulative ROW of 390 ft. The ER text, tables and figures have been revised.

The MVA rating of the new DeCordova line is a reflection of the substation at the other end. The higher MVA rating involves no additional materials and no changes in construction and maintenance of the lines and towers. There will be no additional impact to the environment due to the higher rating.

Impact on R-COLA

See attached marked-up ER Revision 1 pages 2.2-5, 2.2-13, 4.1-5 and Figure 1.1-5.

Impact on S-COLA

None.

Impact on DCD

None.

inside the city limits (Granbury 2007). The zoning designation of approximately 8987 ac of land inside city limits is shown in Table 2.2-3 (Granbury 2007).

Land use around Lake Grandbury consists primarily of developed land with residential development located close to the shore and commercial development located along the US 377 corridor. Undeveloped land consists of grasslands and agricultural cropland. Eleven smaller towns and unincorporated communities are located within the vicinity of CPNPP and are listed below. The distance to each is calculated from the CPNPP center point. Pecan Plantation is a census designated place (CDP), which is an area delineated to provide census data for settled concentrations of population that are identifiable by name but are not legally incorporated. The CDP boundaries may change from one census to the next.

City	**Distance and Direction**
Hill City	3.3 mi west
Rainbow	5.3 mi southeast
Neri	4.4 mi northeast
Glen Rose	5.2 mi south
Paluxy	7.0 mi south-southeast
Tolar	9.6 mi north-northwest
Brushy	6.1 mi north
Mambrino	5.7 mi north
Pecan Plantation CDP	7.9 mi east
Fort Spunky	8.8 mi east
Nemo	8.8 mi east-southeast

Glen Rose has zoning laws in place for all land inside city limits. The other listed towns and communities do not have zoning laws limiting development. Somervell and Hood counties do not have zoning laws limiting development in unincorporated areas.

2.2.2 TRANSMISSION CORRIDORS AND OFF-SITE AREAS

Three single-circuit transmission lines are located on existing ROWs and use existing tower structures (Figure 1.1-5). Two double circuit expansions require the construction of new towers on new or expanded transmission line ROW 160 ft wide. The first is a 45-mi line to Whitney and the second is a 17-mi line to DeCordova. The existing DeCordova ROW is 230 ft wide, creating a cumulative ROW of 390 ft. No land-use impacts are anticipated from the transmission line construction activity located on existing ROWs as vegetation maintenance is already performed. Land use along the cumulative DeCordova ROW, which includes acreage within the site boundary that was previously not accounted for, consists mainly of grassland~~,~~. ~~w~~While the land

RAI GEN-08

RAI GEN-08

TABLE 2.2-4
TRANSMISSION LINE LAND USE

	DeCordova		Whitney		Parker		Johnson		Everman		
Vegetation Type	Acreage	Percent	Acreage	Percent	Acreage	Percent	Acreage	Percent	Acreage	Percent	
Water	~~11.0~~41.5	~~7.4~~6.2	3.1	0.3	3.3	0.4	1.6	0.4	0.0	0.0	RAI GEN-08
Developed, Open	~~11.0~~67.7	~~7.4~~10.1	19.8	2.1	28.4	3.6	4.0	1.1	46.4	10.5	
Developed, Low Intensity	~~0.2~~6.7	~~0.2~~1.0	0.9	0.1	8.4	1.1	0.2	0.1	9.6	2.2	
Developed, Medium Intensity	~~0.4~~4.4	~~0.3~~0.7	0.0	0.0	0.9	0.1	0.0	0.0	0.2	0.1	
Developed, High Intensity	~~1.3~~3.6	~~0.9~~0.5	0.0	0.0	1.1	0.1	0.0	0.0	0.9	0.2	
Barren Land	~~0.9~~3.3	~~0.6~~0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Deciduous Forest	~~10.1~~92.7	~~6.8~~13.8	176.1	18.5	116.5	14.9	28.9	8.0	47.8	10.8	
Evergreen Forest	~~3.1~~51.3	~~2.1~~7.6	137.0	14.4	55.2	7.1	29.4	8.1	0.2	0.1	
Mixed Forest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Scrub/Shrub	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.7	
Grassland	~~107.5~~376.5	~~72.3~~56.2	550.0	57.7	520.2	66.7	266.4	73.5	262.9	59.4	RAI GEN-08
Pasture	~~1.3~~4.9	~~0.9~~0.7	35.8	3.8	31.9	4.1	22.5	6.2	63.8	14.4	
Cropland	~~0.0~~6.9	~~0.0~~1.0	7.6	0.8	3.1	0.4	5.8	1.6	7.1	1.6	
Woody Wetlands	~~1.6~~11.1	~~1.1~~1.7	22.9	2.4	10.4	1.3	3.8	1.0	0.9	0.2	
Total	~~148.7~~670.5	100.0	953.6	100.0	779.6	100.0	362.6	100.0	442.7	100.0	

by Oncor Electric Delivery Company LLC (Oncor). The plant connects to the transmission system through a 345-kv switchyard located on the CPNPP site.

Three single-circuit transmission lines are located on existing ROWs and use existing tower structures. Two double circuit expansions require the construction of new towers on new or expanded transmission line ROW 160 ft wide. The first is a 45-mi line to Whitney and the second is a 17-mi line to DeCordova. Figure 1.1-5 illustrates the location of the transmission lines and switchyards. No land-use impacts are anticipated from the transmission line construction activity located on existing ROWs as vegetation maintenance is already performed. Land use along the DeCordova ROW consists mainly of grassland, while the land use along the Whitney ROW consists of primarily grassland with some deciduous and evergreen forest. Table 2.2-4 shows land use within the proposed transmission line corridors. Approximately 954 ac is anticipated to be disturbed in the Whitney ROW and approximately ~~149~~671 in the DeCordova ROW is anticipated to be disturbed. Given the relatively little acreage involved and the nature of the land that will be committed, land-use impact from the expansion of the Whitney and DeCordova ROWs is expected to be SMALL. RAI GEN-08

The proposed transmission lines are 110 feet high and crosses through Bosque, Hood and Somervell Counties within the region. According to ONCOR, the Whitney line is approximately 45 miles long and the DeCordova line is approximately 17 miles long. The Whitney line traverses Dinosaur Valley State Park and is clearly visible throughout the park except in areas of low elevation. There are nine additional parks, Adair Spring Park, American Legion Park, Cleburne State Park, Ham Creek Park, Meridian State Park, Nolan River Park, Oakdale Park, Steele Creek Park, and Lake Whitney State Park within the proposed transmission line viewshed. The distances from these parks to the transmission lines are 5.2, 18.9, 9.7, 6.2, 13.3, 5.5, 4.2, 2.9 and 3.9, respectively. It is also anticipated that the DeCordova line will be visible from portions of Reunion Grounds located near Lake Granbury, approximately 5.7 miles away. Given the length of the proposed transmission lines and their prospective visibility from eleven state parks, the aesthetic impact from the expansion of the Whitney and DeCordova ROWs is anticipated to be SMALL to MODERATE.

4.1.3 HISTORIC PROPERTIES

This subsection focuses on the effects of CPNPP Units 3 and 4 construction activities on existing historic properties on the CPNPP site and within 10 mi of its boundary. According to 36 CFR 800 (l), historic properties are defined as those properties that are eligible for inclusion in the National Register of Historic Places (NRHP) or that are already listed on the NRHP. Aboveground historic properties and archaeological sites are among the entities that can be considered for NRHP inclusion. According to 36 CFR 60.4 aboveground historic properties can possess integrity individually or as contributing properties to historic districts. Furthermore, their significance depends on specific criteria of event, person, design/construction, or information potential, and integrity involves both architectural and aesthetic elements, including location, design, setting, materials, workmanship, feeling, and association. Archaeological sites can be affected directly by physical damage to surface features or subsurface deposits. Generally, noise-related effects are extraneous to archaeological sites because the integrity of site patterning is unaffected; likewise, aesthetic/visual effects on archaeological sites are extraneous because archaeological site integrity depends on the ability to address research questions that are independent of the preservation of site ambiance.

RAI GEN-08

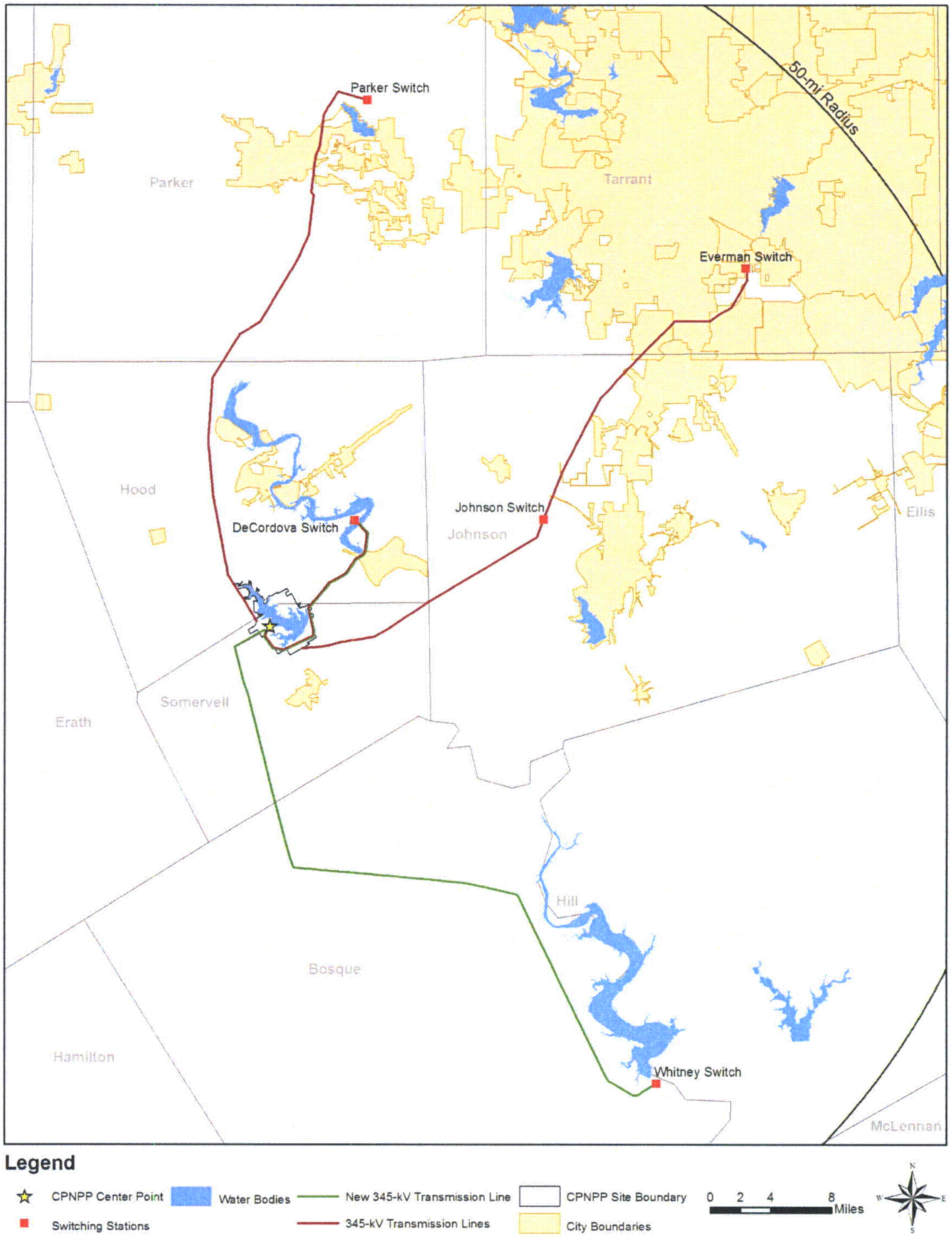


Figure 1.1-5 Electrical Transmission Corridors

QUESTION NO.: GEN-09 (3.3.2, 3.6.2, 4.2 and 5.2)

Provide a detailed explanation of the proposed sanitary wastewater system with a diagram illustrating the connections between the components, and explain the connections with the system for Units 1 and 2 and how it will be utilized.

Provide estimates of the quantities of dewatered sludge expected to be produced by the Unit 3 and 4 system during operations and during construction, and provide the annual quantities of dewatered sludge to be produced by the Unit 1 and 2 system during the same periods.

Lime and ferric chloride are proposed to be used as conditioners for filter press operation. Provide estimates of the quantities (mass) of each chemical to be added to the waste. Explain whether or not these quantities are included in the quantities of dewatered sludges reported per the above request.

Explain in detail the relationship between the Unit 1 and 2 sanitary wastewater system and the Unit 3 and 4 sanitary wastewater system. For instance, does the Unit 3 and 4 system utilize the Unit 1 and 2 system filter press, or is it only for "excess sludge"?

The ER notes that sludges are to be disposed of in a class 1 landfill. Identify the class 1 landfill that is used for disposal of Units 1 and 2 sludges and/or the class I landfills in the vicinity that are suitable for disposal of this waste.

In addition, the description of the sanitary wastewater system is not described in sufficient detail to allow the staff to perform an independent assessment of potential environmental impacts. The NRC staff need to understand the outputs of the SWWTS in relation to the inputs. Provide a detailed explanation that reports the magnitude of all inputs and outputs of the SWWTS.

ANSWER:

A process flow diagram of the sanitary wastewater treatment system with additional detail and clarification has been added to the FSAR as Figure 9.2.4-2R, which supplements FSAR as Figure 9.2.4-1R.

A table showing the inlet and discharge flow; inlet and discharge water quality; chemical usage; and sludge quantities for Unit 3 and 4 Construction, Unit 1 and 2 Operation; Unit 3 and 4 Operation, and Combined Unit 1 – 4 Operation is attached.

A new sanitary waste treatment plant will be installed as part of the Unit 3 and 4 construction project. The new system will include a filter press for sludge dewatering. Unit 1 and 2 sludge is presently dewatered using a bag filter system. The Unit 1 and 2 bag filter system will be decommissioned and replaced by the new Unit 3 and 4 filter press, which will have sufficient capacity to dewater sanitary waste sludge from all four units. During Unit 3 and 4 construction, the existing Unit 1 and 2 system will operate in parallel with the new treatment system since neither system alone will have sufficient capacity to treat the waste generated during construction. After completion of Unit 3 and 4 construction, the Unit 1 and 2 sanitary waste treatment system will be decommissioned and the combined sanitary waste from Units 1 – 4 will be treated by the new system.

CPNPP currently uses Allied Waste Landfill, 2559 FM 56, Itasca, Texas 76055. Dewatered sanitary sludge from CPNPP is deposited in the Class I Industrial Waste section of this landfill. Other similar Class I Industrial Waste landfills may be used in the future.

Impact on R-COLA

See attached marked-up FSAR Revision 1 Figure 9.2.4-1R and 9.2.4-2R

See attached marked-up ER Revision 1 pages 3.6-11, 3.6-12 and 3.6-13

Impact on S-COLA

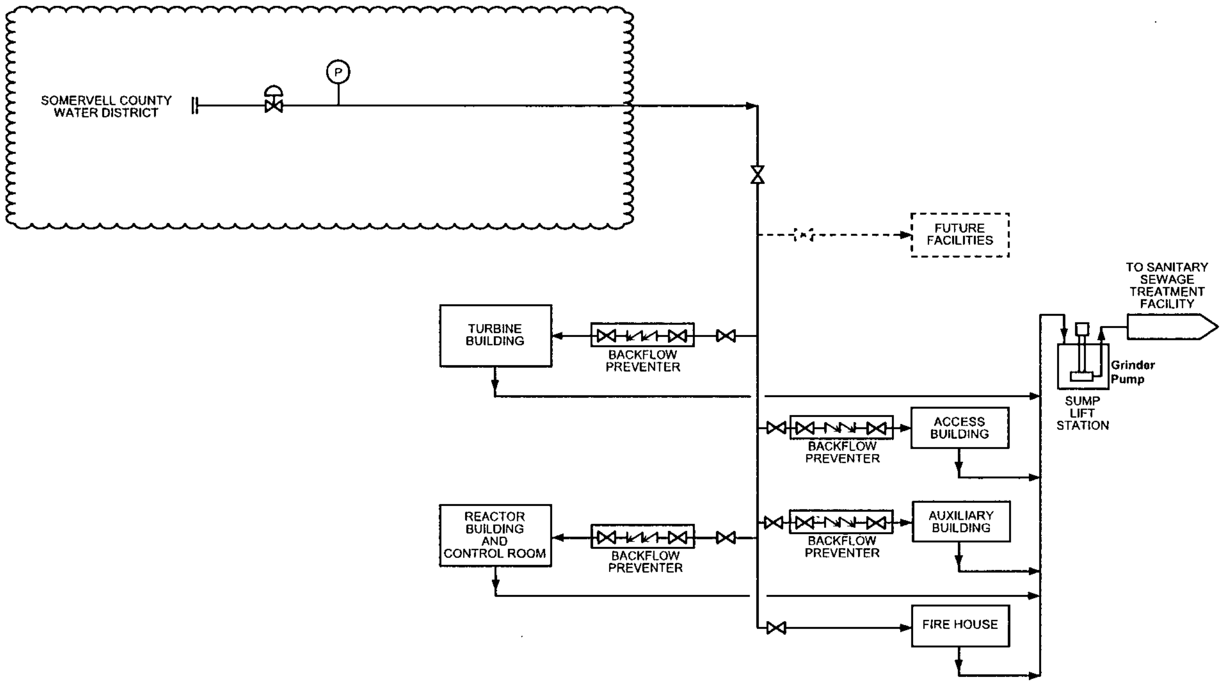
None.

Impact on DCD

None.

Attachment (on CD)

CPNPP Sanitary Waste Treatment – Estimated Chemical Consumption and Sludge Production

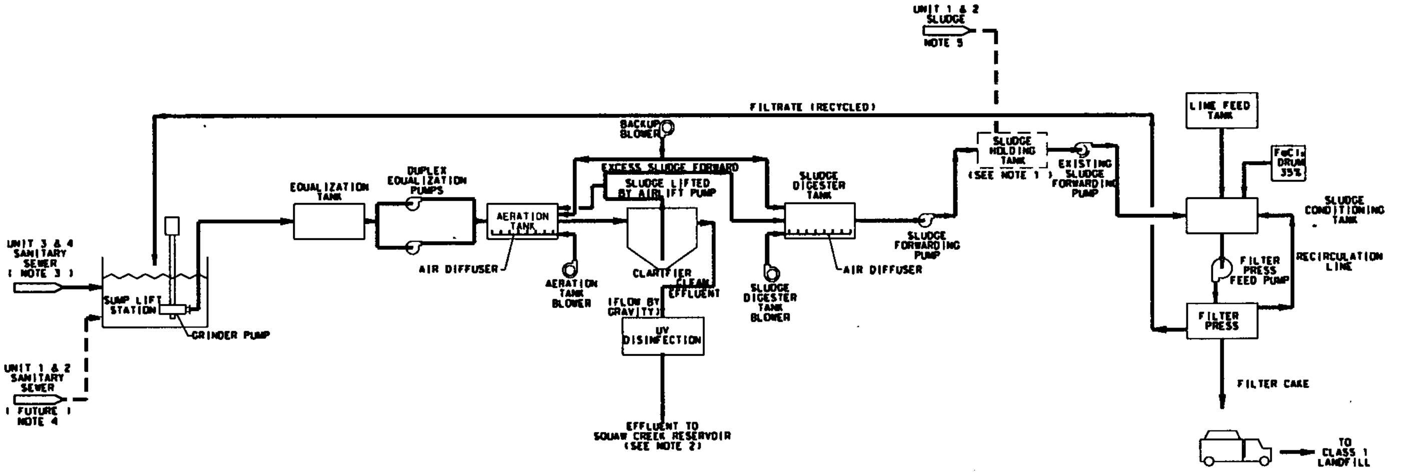


CP COL 9.2(11)

Figure 9.2.4-1R Potable and Sanitary Water System Flow Diagram (Sheet 1 of 2)

RAI GEN-09

RAI GEN-09



NOTES:

1. THE COMBINED SLUDGE OF UNITS 1 THRU 4 SHALL BE FED TO THE FILTER PRESS SYSTEM.
2. THE EFFLUENT TO SQUAW CREEK RESERVOIR SHALL MEET THE PERMIT LIMIT REQUIREMENT AS DISCUSSED IN SOD SECTION 2.0.
3. SANITARY SEWER COLLECTION AND TRANSFER PIPING DETAILS WILL BE SHOWN DURING THE DETAIL DESIGN PHASE. CONSTRUCTION PHASE SANITARY WASTEWATER COLLECTION SUMPS AND LIFT STATIONS ALSO WILL BE SHOWN LATER DURING THE DETAIL DESIGN.
4. THE EXISTING UNIT 1 & 2 SANITARY WASTE WATER TREATMENT SYSTEM WILL REMAIN IN SERVICE DURING THE CONSTRUCTION OF UNITS 3 & 4 AFTER CONSTRUCTION IS COMPLETED. THE EXISTING SYSTEM WILL BE DECOMMISSIONED. AND UNIT 1 & 2 SANITARY SEWER WILL BE TIED INTO THE NEW TREATMENT PLANT.
5. SLUDGE FROM THE EXISTING UNIT 1 & 2 SANITARY WASTE WATER TREATMENT SYSTEM WILL BE CONVEYED TO THE NEW SLUDGE DEWATERING EQUIPMENT AS SOON AS THE SYSTEM IS AVAILABLE FOR SERVICE.

CP COL 9.2(11)

Figure 9.2.4-2R Potable and Sanitary Water System Flow Diagram (Sheet 2 of 2)

It is expected that the solid waste will be transported from the site to the landfills using approved trucks and/or rail in accordance with state and federal regulations. Typically, it is expected to be dry. If the solids are wet they will be transported in water tight containers to be processed at the landfill facility to meet the landfill requirements. RAI GEN-03 RAI HYD-23 RAI LU-03

Another disposal option is injection of the salt waste into a Class I or Class V well. In order to consider this option the solid salt waste would need to be mixed with a fluid, additional characterization of the liquid salt waste would be required before disposal. In order to consider injection into a Class I injection well only if the waste is considered a non-hazardous desalination concentrate or non-hazardous drinking water treatment residuals. This determination would be made by the TCEQ. The disposal of the salt waste as an injection fluid for disposal would be regulated and permitted by the TCEQ. The owner/operator of the commercial disposal/injection well would be responsible for the permitting requirements.

3.6.2 SANITARY SYSTEM EFFLUENTS

This section describes the nature and quantity of the sanitary waste contribution, and the treatment facilities during construction and operation of the plant. The primary purpose of the sanitary wastewater treatment system (SWWTS) is to collect sanitary waste from various plant areas such as restrooms, locker rooms, etc., for processing through the treatment facility, and to produce high-quality effluent that is acceptable for discharge to the environment. The sanitary wastewater facility consists of a SWWTS and a filter press system for sludge dewatering.

The SWWTS is a 100,000-gallon per day (gpd) wastewater treatment plant (WWTP) with a ~~15 cubic foot (cu ft)~~ filter press system designed to process sanitary waste and sludge dewatering, respectively, generated during construction and normal operations of the proposed project. RAI GEN-09

A new sanitary waste treatment plant will be installed as part of the Unit 3 and 4 construction project. The new system will include a filter press for sludge dewatering. Unit 1 and 2 sludge is presently dewatered using a bag filter system. The Unit 1 and 2 bag filter system will be decommissioned and replaced by the new Unit 3 and 4 filter press, which will have sufficient capacity to dewater sanitary waste sludge from all four Units. During Unit 3 and 4 construction, the existing Unit 1 and 2 system will operate in parallel with the new treatment system since neither system alone will have sufficient capacity to treat the waste generated during construction. After completion of Unit 3 and 4 construction, the Unit 1 and 2 sanitary waste treatment system will be decommissioned and the combined sanitary waste from Units 1 - 4 will be treated by the new system. RAI GEN-09

The WWTP is comprised of several major components such as an equalization tank, aeration chamber, clarifier, sludge digester tank and post ultraviolet (UV) disinfection treatment, feed and transfer pumps, and air blowers. Sanitary wastewater collected in the sanitary lift stations from construction and operating buildings of the proposed project is lifted by grinder pumps to the equalization chamber where the wastewater is stored with a retention time then pumped forward. The sanitary wastewater is airlifted by two duplex equalization pumps to the aeration chamber that uses the extended aeration technique of using a blower for biological oxygen demand (BOD) reduction. The effluent from the aeration chamber then flows to the clarifier for solids removal. The clarifier effluent is passed through the UV disinfection system via a booster pump, to disinfect water and oxidize chemicals in process streams. The effluent is discharged to SCR directly, without dilution from any other source. The treated effluent meets the following permit discharge limit requirements:

- pH – 6 – 9.
- TSS – 20 parts per million (ppm) monthly average, 45 ppm daily maximum.
- BOD – 20 ppm monthly average, 45 ppm daily maximum.
- Coliform Count – 200 per 100 ml monthly average, 400 daily maximum.

No nutrients or pH adjustment chemical are needed for the treatment of sanitary wastewater. After the UV disinfection, there is no need to add any chemical to the effluent to SCR.

The chemical concentration within effluent streams from this facility is controlled through engineering and operational/administrative controls in order to meet the TPDES requirements at the time of construction and operation. The TPDES permit for CPNPP Units 3 and 4 is discussed in Section 1.2.

A portion of the settled sludge of the clarifier is returned to the aeration chamber via two airlift pumps. Any excess sludge from the clarifier bottom would be lifted by an airlift pump to the sludge digester tank for further reduction. The digester tank is expected to be an aerated chamber type. Digested sludge from the holding tank is airlifted to the sludge conditioning tank of the filter press system for sludge dewatering. Future connections are expected to be established to transfer the excess sludge via a sludge discharge pump to the existing CPNPP Units 1 and 2 sludge holdup tank, which collects the sludge of the existing CPNPP Units 1 and 2. This sludge would then be pumped via the sludge forwarding pump into the sludge conditioning tank of the filter press system.

The ~~15 cu ft filter press system for~~ sludge dewatering system consists of a filter press, filter press feed pump, lime feed tank and feed pump, sludge conditioning tank, ferric chloride drum and feed pump, and cake carts. Sanitary sludge from the sludge digester tank is transferred to the sludge conditioning tank. Lime and ferric chloride is added to the sludge conditioning tank. These two admixture chemicals tend to improve the sludge dewatering flow rate through the filter press and the filter cake characteristic. The sludge from the conditioning tank is fed to the filter press by the filter press feed pump. The dry sludge is discharged and collected on a mobile cake cart below the filter press, which is then transferred to a dumpster for disposal to a Class 1 landfill. RAI GEN-09

The sanitary drainage system collects sanitary waste from various plant areas such as restrooms, locker rooms, etc., and carries the wastewater for processing to the treatment facility. The sanitary drainage system does not serve any facilities in the radiologically-controlled areas.

Preconstruction and construction activities of the plant include portable toilets supplied and serviced by an off-site contracted vendor that may be used to accommodate approximately 1000 construction personnel. These portable toilets are used until the sanitary system is functional.

The existing sanitary wastewater treatment plant (SWTP) data indicate that the sanitary wastewater generation is approximately 50 gallons (gal) per person per 24-hr shift. Based on this and the numbers of construction and plant personnel forecasted during the construction phase of CPNPP Units 3 and 4, a maximum of 100,000 gpd of new sanitary wastewater is expected to be generated by the construction personnel. This is in addition to 25,000 – 50,000 gpd of sanitary wastewater generated from CPNPP Units 1 and 2. Therefore, during the construction of CPNPP Units 3 and 4, approximately 125,000 – 150,000 gpd of sanitary wastewater is anticipated to be produced for the entire site. Thus the operation of both the existing SWTP and the new WWTP is expected to be required during construction because the upper design treatment limit of the existing SWTP is 90,000 – 100,000 gpd.

CPNPP currently uses Allied Waste Landfill, 2559 FM 56, Itasca, Texas 76055. Dewatered sanitary sludge from CPNPP is deposited in the Class I Industrial Waste section of this landfill. Other similar Class I Industrial Waste landfills may be used in the future. RAI GEN-09

3.6.3 OTHER EFFLUENTS

This section includes the identification and quantification of other miscellaneous nonradioactive gaseous, liquid, and solid effluents that are discharged to the environment.

3.6.3.1 Gaseous Effluents

Each unit contains four Class 1E gas turbine generators (GTG), two non-Class 1E GTGs as alternate alternating current (AC) power sources, two auxiliary boilers, and one diesel-driven fire pumps. During normal operation of the plant, the operation of this equipment is used infrequently and is typically limited to periodic testing. There is no treatment of the gaseous emissions from the GTGs or diesel driven fire pump. The equipment will meet applicable U.S. Environmental Protection Agency (EPA) emission standards for new equipment.

Six on-site GTG units, each furnished with its own support subsystems, provide power to the selected plant AC loads. The GTG units are housed in the emergency power supply building. Each engine's exhaust gas circuit consists of the engine exhaust gas discharge pipes from the turbocharger outlets to a single vertically mounted outdoor silencer that discharges to the atmosphere at an approximate elevation of 855 ft.

The primary fuel storage for each GTG and its associated transfer pumps is located in the yard area and is below grade within a substantial concrete vault confinement. Potential fuel leaks or spills from the storage tanks are confined within the compartment surrounding the tanks. Each GTG day tank located within its GTG room is provided with a spill confinement enclosure capable of holding 110 percent of the day tank capacity.

The auxiliary boilers provide auxiliary steam during plant startup and shutdown. The auxiliary steam boilers are oil-fired package boilers with storage tanks capable of storing 300,000 gal of oil and day tanks storing 12,000 gal. The auxiliary boiler and associated equipment are located outside in the yard. The steam converter and associated equipment are located in the turbine building and the common equipment is located in the auxiliary building. The exhaust for the auxiliary boiler and the vent(s) for the auxiliary boiler oil storage tank have not been located at

QUESTION NO.: GEN-10 (3.6.3)

Additional information is needed regarding the discussion in Section 3.9.3.4 of the ER in order for the staff to describe the construction process adequately to perform an independent assessment of potential construction impacts.

Provide estimates of the sources and quantities of materials supplied to the construction site for establishing the utility services and for providing the services during construction. Describe the types of wastes disposed of in establishing and providing construction utilities, and provide estimates of the quantities of each. Describe the disposal of these wastes. Explain which wastes will be burned and which will be or sent to landfills. Identify and quantify any other materials that will not be disposed of by burning or landfill, and explain how they will be disposed of.

ANSWER:

Since the construction planning details for CPNPP Units 3 and 4 have not been completed, quantity takeoffs for temporary construction materials and takeoffs for materials that will not remain as part of the permanent plant have not been performed. In addition, materials to be brought on site by subcontractors and their employees are not accounted for in the planning since subcontractors will then remove the components and tools that they brought on site and use them on other projects. From general experience in the construction of large power plant projects, it is customary to allot several (5-10) acres to collect construction waste materials of all types. The materials collected in this area are sorted for those that can be reclaimed, either as recyclable material, reusable material or as investment recovery, or the remaining material that will be shipped to appropriate landfills. These materials may include but are not limited to wood products for utility poles, concrete forms and crating; electrical cable to route temporary power or excess cable material from installation of permanent plant cable; temporary piping for potable and sanitary water facilities and to the concrete batch plant; paint and spray cans for various construction and housekeeping services; plastics from containers and protective coverings. Of these, other than every day food wastes and certain plastic products which will be shipped to landfills, all are expected to be recycled, reused or reclaimed as investment recovery. The amount of personal trash and packing wastes to be shipped to landfills is expected to average 4 – 5 truckloads per day.

Luminant does not intend to burn any waste.

Materials resulting from the operation of CPNPP Units 1 and 2 that are being recycled include lube oil, metal drums, plastic drums, lithium batteries, nickel-cadmium batteries, alkaline batteries, lead acid batteries, light bulbs, spent diesel, aerosol cans, oil filters, aluminum soft drink cans, capacitors, cardboard, wood, scrap metal, and paper. The quantities of each recycled material category are tracked on a monthly basis. Refer to the attached table for the quantities that were recycled during 2009.

Luminant has a contract with IESI for disposal of non-recyclable General Plant Trash. This waste is transported to the IESI Transfer Facility in Glen Rose, Texas where it is then transferred to the IESI Landfill in Weatherford, Texas, which is a for Class II landfill.

<u>Impact on R-COLA</u>

None.

<u>Impact on S-COLA</u>

None.

Impact on DCD

None.

Attachment

CPNPP Units 1 and 2 Recycle Shipments in 2009

GEN-10 ATTACHMENT

CPNPP Units 1 and 2 Recycle Shipments (2009)
(Pounds)

Month	Lube Oil	Metal Drums	Plastic Drums	Lithium Batteries	NiCad Batteries	Alkaline Batteries	Lead Batteries	Light Bulbs	Spent Diesel	Aerosol Cans	Oil Filters	Aluminum Cans	Capacitors	Total
Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feb	1,200	280	400	0	0	0	8,000	0	0	400	0	0	0	10,280
Mar	1,200	400	320	0	0	0	0	0	800	200	0	0	0	2,920
Apr	4,000	160	400	0	0	0	3,000	0	0	0	1,000	0	0	8,560
May	400	240	320	0	0	0	0	200	400	600	0	0	0	2,160
Jun	0	0	0	0	0	0	0	0	0	0	0	78	0	78
Jul	4,400	40	560	0	0	0	3,000	0	800	0	0	0	0	8,800
Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sep	17,200	640	880	0	0	0	2,400	200	0	200	0	0	0	21,520
Oct	2,800	360	400	0	0	32	3,000	0	0	600	0	0	0	7,192
Nov	6,800	1,160	920	0	0	144	0	0	4,000	0	2,800	0	0	15,824
Dec	1,200	160	160	100	200	0	100	100	1,200	200	0	0	400	3,820
Annual Total	**39,200**	**3,440**	**4,360**	**100**	**200**	**176**	**19,500**	**500**	**7,200**	**2,200**	**3,800**	**78**	**400**	**81,154**

Cardboard	38,000
Wood	120,000
Scrap metal	489,080
Paper	196,000
Total	**924,234**

QUESTION NO.: GEN-11 (3.6.3, 4.1.1, 4.4.1)

Additional information is needed regarding the discussion in Section 3.9.3.7 of the ER in order for the staff to describe the construction process adequately to perform an independent assessment of potential construction impacts.

Provide the quantities of materials that will be burned or chipped as described in Sections 4.3.1.1 of the ER.

In Chapter 4 of the ER provide the following:

- For the option of burning vegetation, provide an assessment of the air quality effects of burning the waste wood.
- For the chipping option, provide an assessment of the land use and ecological effects of spreading the wood chips.

ANSWER:

ER Subsection 4.3.1.1 states that approximately 101 acres of Ashe juniper forest and 17 acres of mixed hardwoods exist within the proposed construction area. Felled trees, stumps, and other woody material will be disposed of by chipping/mulching. No vegetation will be disposed of by burning and ER text has been revised accordingly. To identify any environmental impacts of this process, we converted the acres of forest to dry weight of wood chips.

According to Mark D. Norris (Attachment 1), a 35 year old forest will produce 114,100 kg/ha of biomass. Harvesting onsite acreages of Ashe juniper and mixed hardwood forest to mulch is anticipated to create approximately twelve million pounds of mulch. The resulting wood chips will be utilized on site for mulch, landscaping, and erosion control.

Luminant's BMP Guidance document (Attachment 2) indicates mulch can be used for soil erosion prevention. According to the guidance, the recommended standard mulch application utilizes up to 4000 lb/acre (Page 1-52). The onsite construction area to be disturbed, not including building footprints, is approximately 193 acres. Per application, the mulch required to cover this onsite construction area is approximately 772,000 lbs. Using this calculation, creating twelve million pounds of mulch provides about fifteen mulch applications. With each application lasting 2 to 6 months, mulch will be available for 30 to 90 months (Page 1-8). In relation, the construction period is expected to last approximately 72 months.

<u>Impact on R-COLA</u>

See attached marked-up ER Revision 1 pages 4.3-3 and 4.3-4.

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

None.

Attachments (on CD)

1. Norris M. et al.,"*Assessing changes in biomass, productivity, and C and N stores following Juniperus virginiana forest expansion into tallgrass prairie*" Can. J. For. Res. (2001)
2. Luminant's BMP Guidance, Chapter 1

4.3.1.1 Terrestrial Vegetation

Anticipated effects of construction at CPNPP for the proposed project would include temporary and long-term alteration and loss of vegetative cover, loss of wildlife habitat, increased erosion, and increased interaction between humans and wildlife. Approximately 100 ac of Ashe juniper forest, about three percent of the Ashe juniper habitat presently on the site; 18 ac of mixed hardwood forests, about four percent; 60 ac of grassland, about nine percent; 0.3 ac wetland, about 0.5% of on-site wetlands are located within the proposed core construction area. The remaining acreages are in areas previously disturbed by original construction associated with CPNPP Units 1 and 2.

Pre-construction of the BDTF is anticipated to permanently affect a total of 400 acres. Approximately 313 acres of Ashe juniper habitat (10 percent of the Ashe juniper habitat on-site), 34 acres grassland (5 percent of on-site grassland habitat), and 45 acres mixed hardwood (9 percent of mixed hardwood on-site) have been identified within the 400 ac BDTF. Seven acres of developed area is also expected to be disturbed by constructing the BDTF. In addition to habitat alterations associated with construction of the BDTF, approximately 5882 linear feet of ephemeral stream exists within the 400 ac BDTF and would also be affected by pre-construction activities.

Construction and support areas shown on Figure 4.3-1 contain no old growth timber, unique or sensitive plants, or unique or sensitive plant communities. Because the vegetation communities within the CPNPP boundary are common throughout Somervell and Hood counties, the affected area at CPNPP would be a very small percentage of the total acreage of these cover types in the general area. Construction on the site would not noticeably reduce the local diversity of plants, plant communities, or the wildlife species that inhabit them.

Clearing activities are performed in compliance with federal and state regulations, and permit requirements during pre-construction. In the Ashe juniper and mixed hardwood forests, contractors would clear the construction area of woody vegetation, and where necessary, fill and grade the site to create a level surface. If it exists in sufficient quantity to attract a buyer, merchantable timber within these areas may be harvested for commercial sale. Remaining trees and other vegetation would then be felled. Stumps, shrubs, and saplings would be grubbed, and groundcover and leaf litter would be cleared to prepare the land surface for grading.

Felled trees, stumps, and other woody material would be disposed of by ~~burning,~~ chipping~~,~~ or spreading the wood chips. Areas for waste disposal have yet to be finalized. These areas may be on- or off-site. Opportunities to recycle woody material for use elsewhere on the site may also be considered. Recycling opportunities could include cutting logs into firewood, using wood chips to mulch landscaped areas, using logs to line pathways, and piling logs and brush in open areas to enhance terrestrial wildlife habitat. RAI GEN-11

Mulch not in use will be stored onsite within areas previously identified to be disturbed, until they are needed for application. Leachate from rain percolating through stored mulch at a construction site is considered under State required permits for stormwater. The site specific Stormwater Pollution Prevention Plan will include best management practices that may include structural confinement of mulch to avoid discharges of leachate to Squaw Creek Reservoir. Ecological impacts are nullified by best management practices employed to prevent stormwater runoff. RAI GEN-11

Large mulch piles are at risk for spontaneous combustion as the wood pulp decays. Periodically turning the pile or creating several smaller piles rather than one large pile will circulate air through the mulch and reduce heat build up. RAI GEN-11

Little additional fill or grading is needed in non-forested grasslands and previously disturbed areas during pre-construction. Heavy equipment would be used to scalp vegetation at ground level, leaving the plant rootstock largely intact. Most non-woody vegetation within construction zones is destroyed by the equipment operating there and by stockpiling or disposing of excess soil. There are no opportunities for recycling non-woody vegetation, nor is additional area needed either on- or off-site to dispose of the residual material.

After the ground is free of vegetative cover, erosion, sedimentation, and fugitive dust are expected. These factors are controlled by implementing good construction practices and BMPs. BMPs seek primarily erosion control to keep soil in place then employ sediment control to capture any sediment moved by stormwater before it leaves the site or enters SCR. The measures to be employed at the CPNPP site would be incorporated in a site-specific SWP3 using appropriate state or local specifications prior to initiating construction. Among the general measures to be considered for inclusion in the SWP3 are:

- Minimize the area to be disturbed by protecting vegetated buffers using silt fences or other sediment controls.
- Phase construction activity to minimize the duration of soil exposure and stabilizing exposed soil as quickly as possible after construction. Temporary cover BMPs include temporary seeding, mulches, matrices, and blankets and mats while permanent cover BMPs include permanent seeding and planting, placing sod, channel stabilization, and vegetative buffer strips.
- Control stormwater flowing through the site by diversion ditches or berms to direct runoff away from unprotected slopes and direct sediment-laden runoff to sediment-trapping structures such as holding ponds. The use of retention ponds for sediment control is discussed more fully in Subsection 4.2.1.1.7.
- Establish perimeter controls such as vegetative buffer strips supplemented with silt fences and fiber rolls around the perimeter of SCR to help prevent soil erosion and stop sediment from entering the reservoir.
- Establish stabilized construction entrances to and exits from the site to limit the amount of sediment tracked onto public roads.
- Control fugitive dust by watering access roads and the construction site as needed.
- Schedule periodic and regular inspection and maintenance of all BMPs put into place.

Following construction, contractors would seed all temporary work spaces, such as laydown areas or temporary parking lots, with herbaceous plants or grass, as was done upon completing CPNPP Units 1 and 2. In some cases, native shrubs and trees would be replanted according to a

QUESTION NO.: GEN-12 (3.4.2, 3.6.3, 4.1.2, 4.3.1)

ER Section 3.9.3.10 lists activities related to intake/discharge coffer dams and piling installation, but does not provide information about the magnitude of the activities or their duration.

Regarding the intake and discharge structures, provide estimates of the duration of proposed construction activities, the areas affected as it relates to the intake structure and laydown areas, the quantities of construction materials consumed, the quantities of dredged material that would be disposed of, and discuss the potential fate of dredge materials based on its waste classification.

Provide a figure that shows the exterior dimensions of the intake structure with reference to the existing intake and other man-made structures in the immediate vicinity, and displays both the areas that would be disturbed during construction and areas permanently committed to the intake.

ANSWER:

Based on the current preliminary design of the Makeup Water Intake Structure and return piping, it is expected that construction of the intake structure and return will take 12 to 18 months. It is not expected to require the installation of cofferdams. Dredging is also not expected other than the collateral movement of loose surface material as a result of drilling. Drilling into the rock is required to install the caissons and sheet piling that make up the foundation and boundary of the intake structure. No material is expected to be removed. This minimal disturbance will occur around the immediate periphery of the intake structure, estimated to be 80 feet long and 40 feet wide, nominally, or approximately 3,200 ft^2. The Units 3 and 4 Intake structure is adjacent (to the west) of the Units 1 and 2 Intake Structure. The Wolf Hollow intake is located about 200 feet further downstream from the Units 1 and 2 intake. The nearest boat docks are several hundred feet away from this site.

The discharge piping design has considered three different approaches to the installation. Each will disturb the same amount of lake bottom, nominally about three times the pipe diameter (the pipe itself and one diameter on each side for installation or approximately 12 feet wide for the 82-foot length of each pipe). Least intrusive is to lay the pipe on the lake bottom and anchor it with rip-rap. Essentially no dredging is required for this method, but approximately one foot layer of rip-rap will be laid on the pipe to prevent it from lifting due to buoyant forces.

Preliminary design drawings of the intake structure and discharge piping arrangement are attached.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

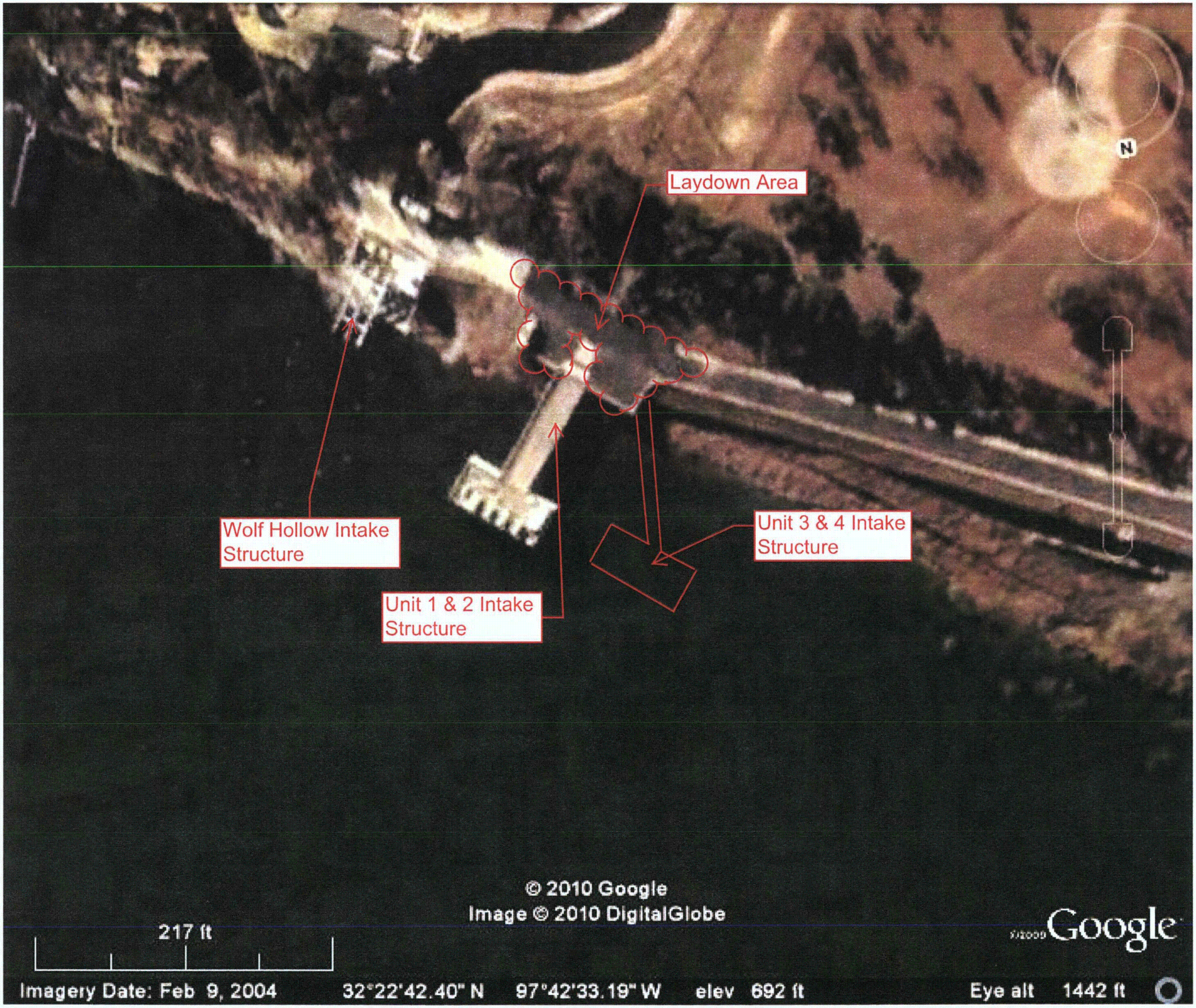
Attachments

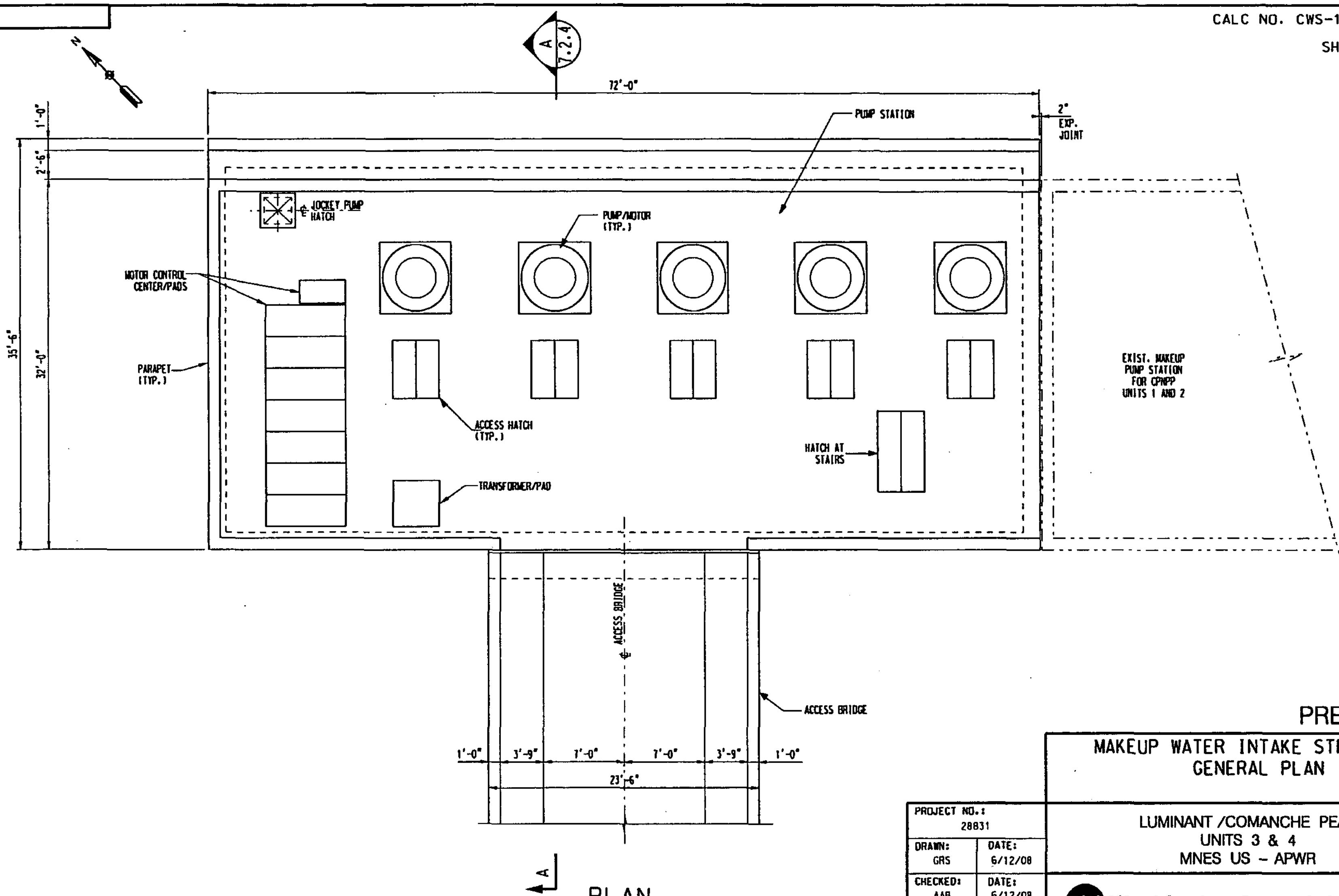
LG intake (Google Earth)

Figure 7.2.1 Rev. E

Figure 7.2.4 Rev. E

Figure 7.3.1 Rev. F


Laydown Area
Wolf Hollow Intake Structure
Unit 1 & 2 Intake Structure
Unit 3 & 4 Intake Structure
© 2010 Google
Image © 2010 DigitalGlobe
Google
217 ft
Imagery Date: Feb 9, 2004
32°22'42.40" N
97°42'33.19" W
elev 692 ft
Eye alt 1442 ft
N



PLAN

PRELIMINARY

MAKEUP WATER INTAKE STRUCTURE
GENERAL PLAN

PROJECT NO.: 28831	
DRAWN: GRS	DATE: 6/12/08
CHECKED: AAB	DATE: 6/12/08
SCALE: 1/8"=1'-0"	

LUMINANT /COMANCHE PEAK
UNITS 3 & 4
MNES US - APWR

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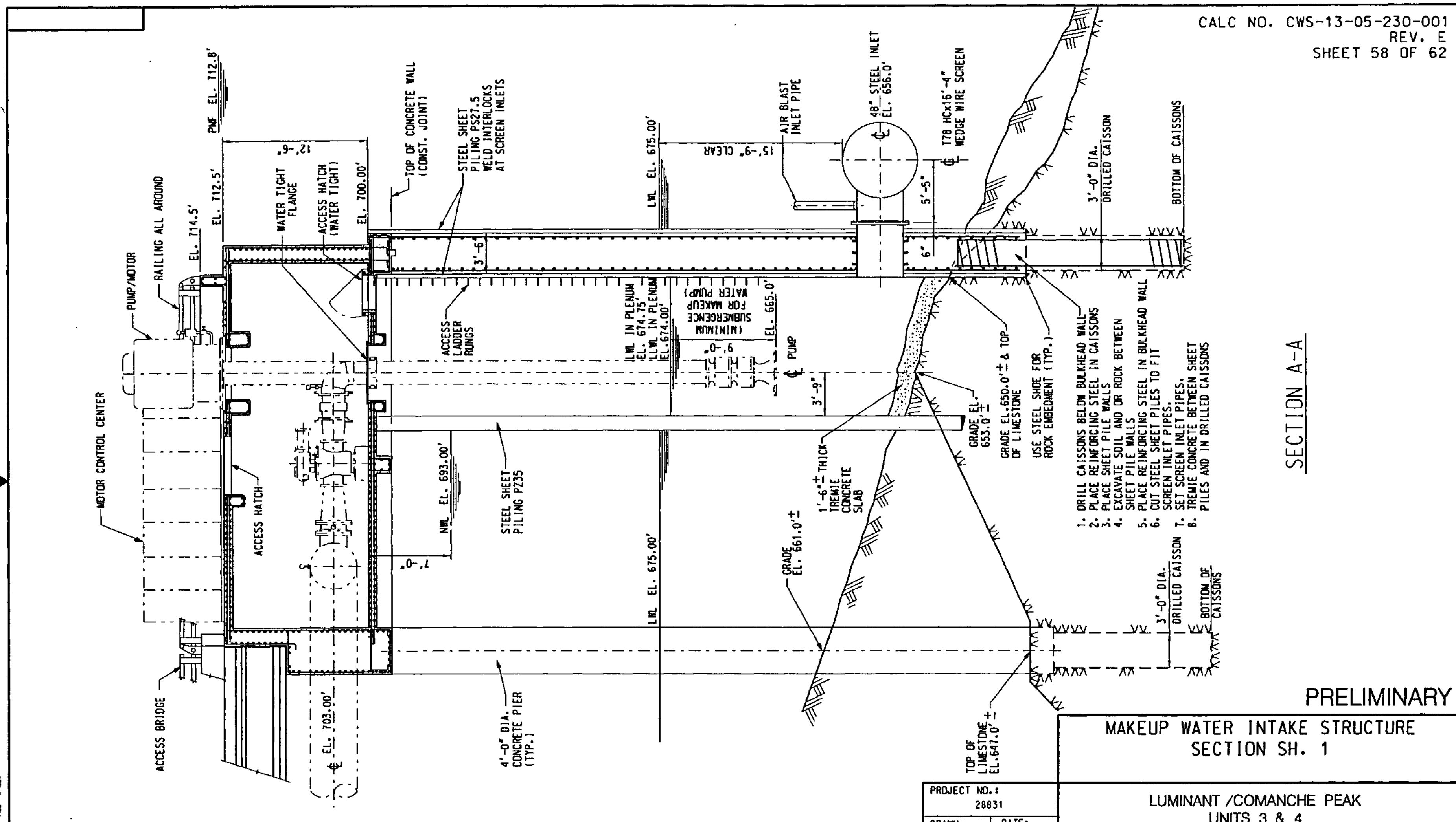
FIGURE 7.2.1

REV E

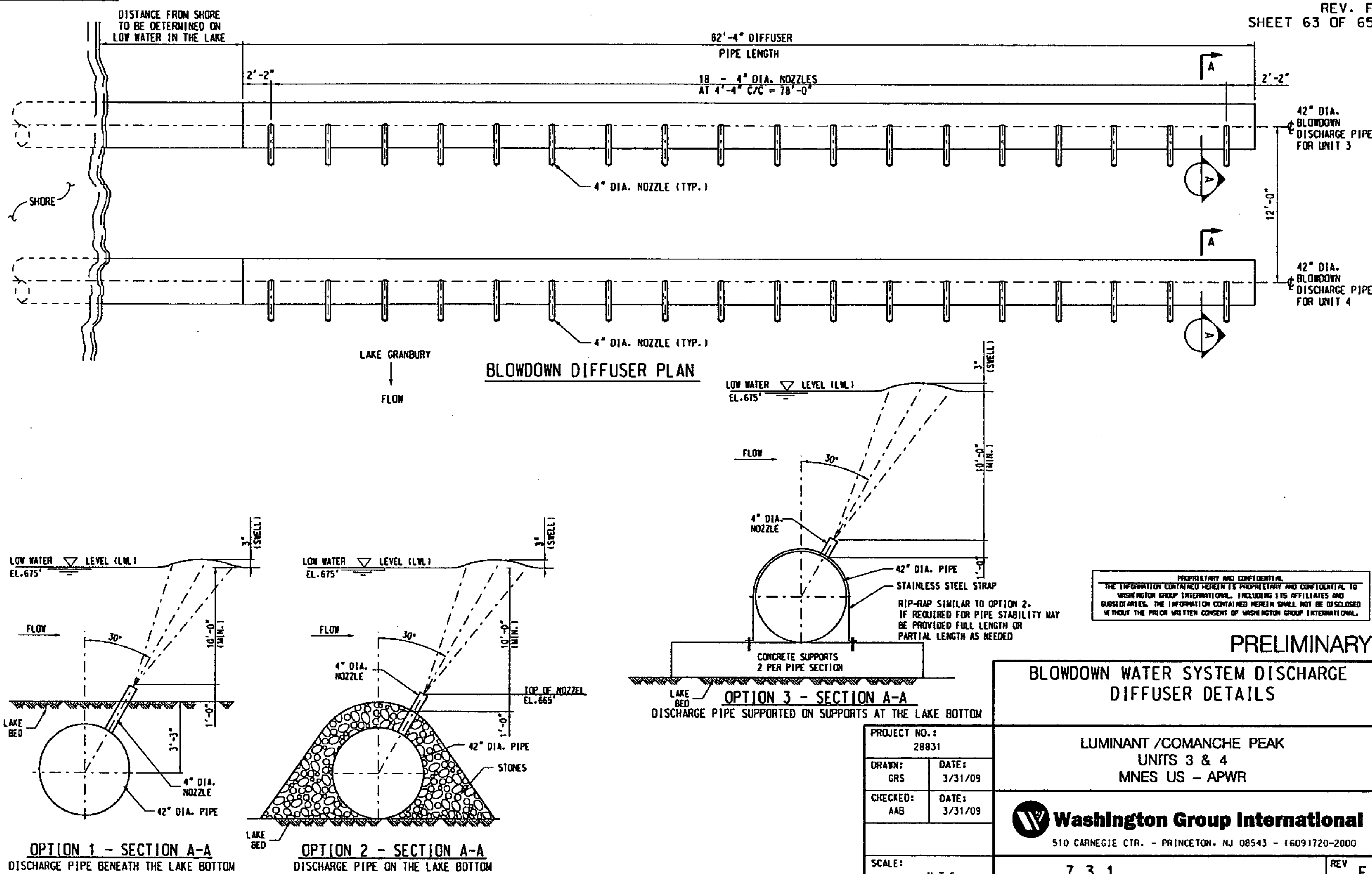


PRELIMINARY

MAKEUP WATER INTAKE STRUCTURE
SECTION SH. 1

PROJECT NO.: 28831		LUMINANT /COMANCHE PEAK UNITS 3 & 4 MNES US - APWR
DRAWN: GRS	DATE: 6/12/08	
CHECKED: AAB	DATE: 6/12/08	Washington Group International 510 CARNEGIE CTR. - PRINCETON, NJ 08543 - (609)720-2000
SCALE: 1/8"=1'-0"		FIGURE 7.2.4 REV E

CALC NO. CWS-13-05-230-001
REV. F
SHEET 63 OF 65



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THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND CONFIDENTIAL TO WASHINGTON GROUP INTERNATIONAL, INCLUDING ITS AFFILIATES AND SUBSIDIARIES. THE INFORMATION CONTAINED HEREIN SHALL NOT BE DISCLOSED WITHOUT THE PRIOR WRITTEN CONSENT OF WASHINGTON GROUP INTERNATIONAL.

PRELIMINARY

BLOWDOWN WATER SYSTEM DISCHARGE DIFFUSER DETAILS

LUMINANT /COMANCHE PEAK
UNITS 3 & 4
MNES US - APWR

PROJECT NO.: 28831	
DRAWN: GRS	DATE: 3/31/09
CHECKED: AAB	DATE: 3/31/09
SCALE: N.T.S.	

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7.3.1 REV F

QUESTION NO.: GEN-13 (2.2.2, 3.7, 4.1.2, and 4.4.2)

Provide a description of the process of constructing transmission line towers. At a minimum, provide typical values for the duration of construction activities at the site, the number of construction workforce involved, the number of loads of materials transported to the construction site, the number of acres disturbed by construction excluding access roads, and the number of acres revegetated after construction.

Provide the information above on a per mile of transmission line basis.

ANSWER:

The following estimate is for a green field project or where no line exists. All estimated values are rough averages and not necessarily indicative of any particular route. The final values will depend greatly on the ultimate route of the line, terrain, weather and schedule. The route must be proposed by Oncor and ultimately approved by the Texas Public Utility Commission (PUC).

The duration of construction activities is based on approximately 10 miles of double-circuit 345kV per month using about 70 crew members. The number of loads of materials transported is anticipated to be 20 truck loads per mile of double-circuit 345kV. The number of acres disturbed by construction, excluding access roads, will vary from less than one to ten acres per mile. Every effort is made to impact the least amount of land while safely and efficiently constructing the transmission line. Oncor complies with all state and federal laws regarding re-vegetation of disturbed earth. Typical requirements are to actively revegetate a disturbed area until 70 percent of the original vegetation has been restored.

Based upon the information estimated above, one mile of transmission requires 3 days with a crew of 70 and approximately 20 truckloads of material. The number of acres disturbed per mile will vary from less than 1 to 10. At a revegetation rate of 70 percent, between 0.5 and 7 acres will be restored after construction.

<u>Impact on R-COLA</u>

None.

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

None.

QUESTION NO.: GEN-14 (3.6.3)

Provide the annual emissions of reportable pollutants under the Clean Air Act which could be discharged from the auxiliary boilers. Revise ER Table 3.6-6 to include regulated criteria pollutants.

ANSWER:

Table 3.6-6 has been revised to include additional pollutants in the auxiliary boiler emissions. The values in the table were computed using a representative boiler with a load of 100%. It assumes 72 hours of run time per boiler per year using 0.3 percent sulfur content fuel.

The values in the table are based on vendor information. Particulate matter data were provided on a 10 μm or less basis and not broken down into smaller increments. Therefore, the value for particulate matter is conservative relative to the National Air Ambient Quality Standard (NAAQS) limit of 2.5 μm since it would be included in the 10 μm or less basis. In addition, values for ozone are not included since ozone is not a product of combustion.

<u>Impact on R-COLA</u>

See attached marked-up ER Revision 1 page 3.6-14.

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

None.

TABLE 3.6-6
EMISSION RATES FROM AUXILIARY BOILERS

Pollutant Discharged	Emissions
	Two Auxiliary Boilers (lb/yr)
CO_2	~~1,555,895~~173,432
H_2O	~~1,664,131~~185,498
N_2	~~9,957,727~~1,109,970
O_2	~~338,238~~37,702
SO_2	~~0.04~~52
CO	2,288
NO_x	3,564
SO_x	9,208
Volatile Organic Compounds	148
Particulate Matter (PM_{10})*	1,486
Particulate Matter ($PM_{2.5}$)**	

RAI GEN-14

Based on three start ups per cycle with a maximum boiler run~~ning~~ time of 24 hours per start up, for a total boiler run~~ning~~ time of 72 hours per year per boiler.

*PM_{10} are all particular matter that are equal to or less than 10 µm.

**$PM_{2.5}$ totals are included in the PM_{10} total.

QUESTION NO.: GEN-15

Provide electronic copies of latest revisions to the references listed below:

- The Document, "Construction Environmental Controls Plan", as cited in Section 3.9.1.1 of the ER
- Area Plan BDTF GAS-05-11-100-007 Rev. A
- Blowdown Treatment Process Diagram BDT-21-11-130-001 Rev. A
- Blowdown Treatment Facility Equipment Layout BDT-11-13-400-002 Rev. A

Note: Because the copy of the report is not completely legible, the numbers listed in this item may not be exactly correct.

ANSWER:

ER Subsection 3.9.1.1 simply outlines the different features of the document, "Construction Environmental Controls Plan." The document will be drafted according to the features cited in the ER and will be available at a later date. All other requested documents are attached.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

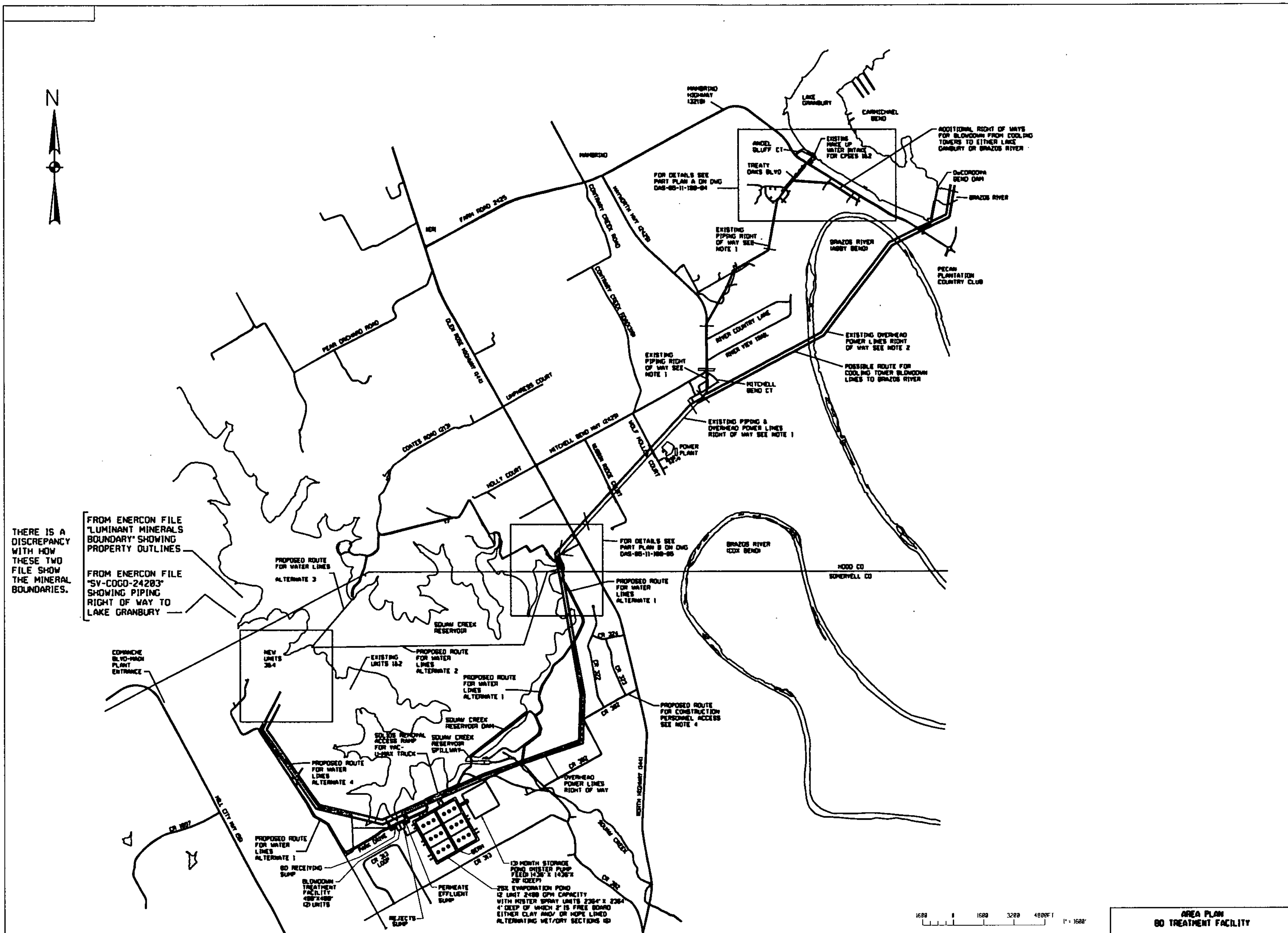
None.

Attachments

Area Plan BDTF, GAS-05-11-100-007 Rev. A

Blowdown Treatment Process Diagram, BDT-21-11-130-001 Rev. B

Blowdown Treatment Facility Equipment Layout, BDT-11-13-400-002 Rev. B



AREA PLAN
BD TREATMENT FACILITY

LUMINANT / COMANCHE PEAK
UNITS 3 & 4
MNES US APWR

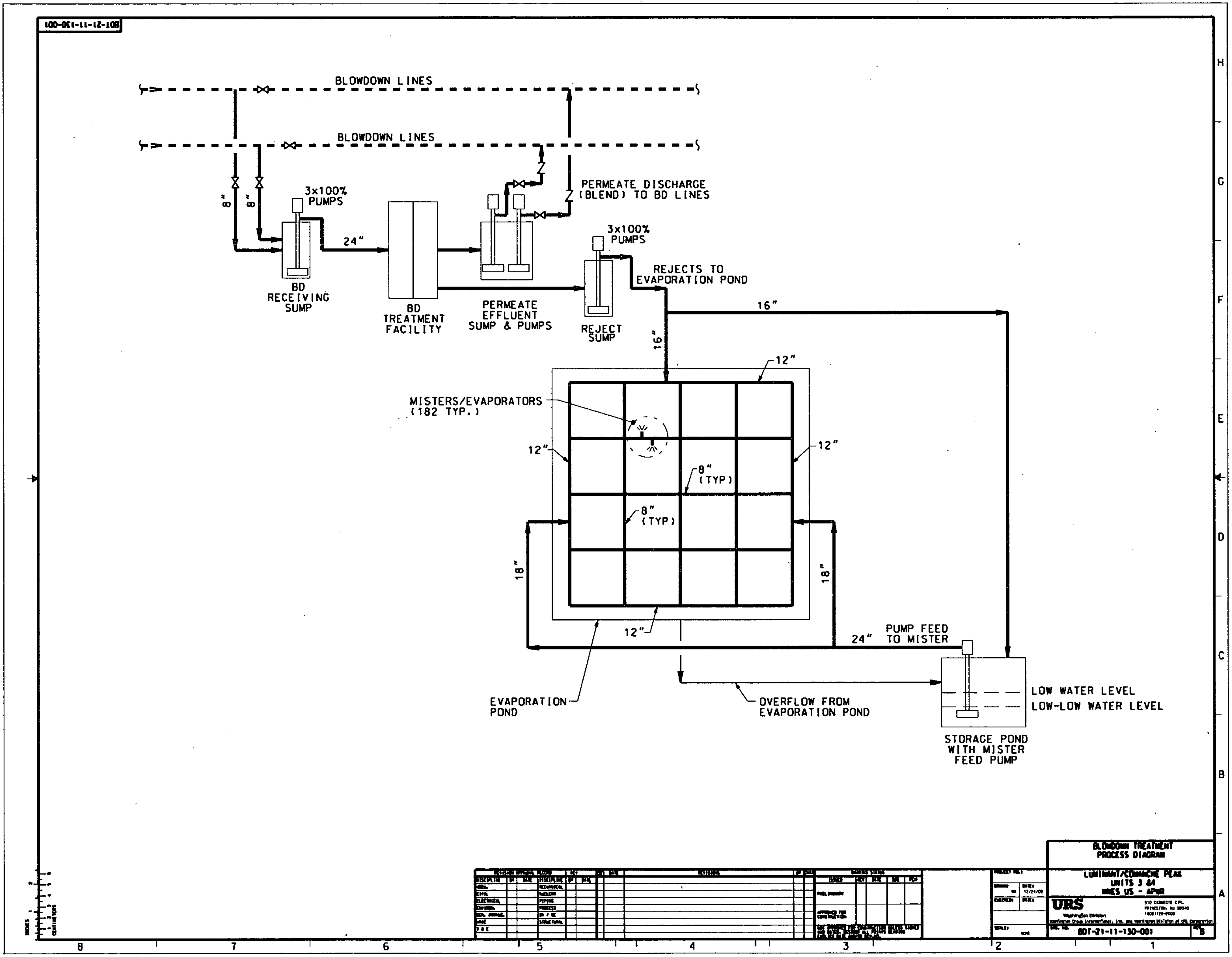
Washington Group International

REV	DATE	REVISIONS	BY	CHKR
A	5/30/08	TCMNO REQUEST TO SHOW EVAPORATION PONDS & BD TREATMENT FACILITY	CMS	RB

DRAWN: CMS DATE: 5/30/08

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. DESTROY ALL PRINTS BEARING EARLIER DATE &/OR REVISION.

DWG. NO. GAS-05-11-100-007 REV A


BDT-21-11-130-001
BLOWDOWN LINES
BLOWDOWN LINES
8"
8"
3x100% PUMPS
24"
BD RECEIVING SUMP
BD TREATMENT FACILITY
PERMEATE DISCHARGE (BLEND) TO BD LINES
PERMEATE EFFLUENT SUMP & PUMPS
3x100% PUMPS
REJECTS TO EVAPORATION POND
REJECT SUMP
16"
16"
12"
MISTERS/EVAPORATORS (182 TYP.)
12"
12"
8" (TYP)
8" (TYP)
18"
18"
12"
24"
PUMP FEED TO MISTER
EVAPORATION POND
OVERFLOW FROM EVAPORATION POND
LOW WATER LEVEL
LOW-LOW WATER LEVEL
STORAGE POND WITH MISTER FEED PUMP
BLOWDOWN TREATMENT PROCESS DIAGRAM
LUMINANT/COMANCHE PEAK UNITS 3 &4
MHI US - APWR
URS
Washington Division
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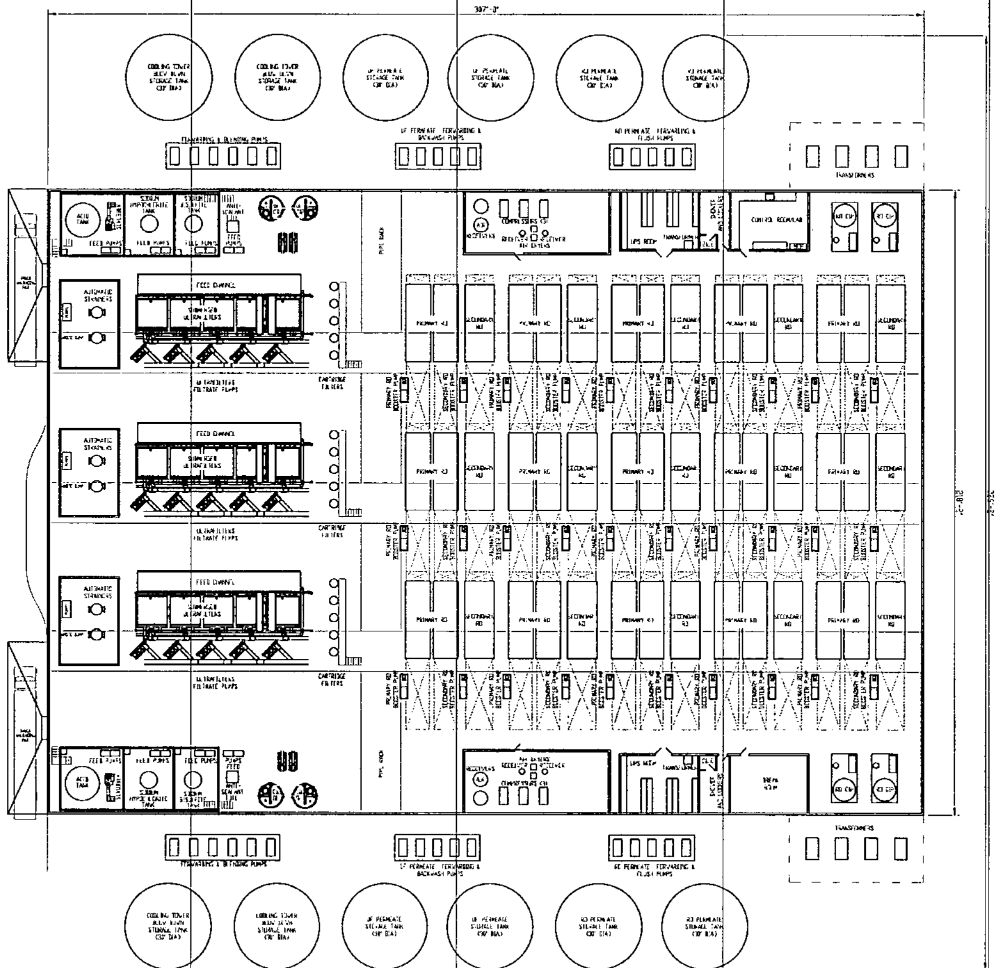
PRINCETON, NJ 08540
12/24/09
BDT-21-11-130-001
B



REVISION APPROVAL RECORD				REV		REV NO	DATE	REVISIONS	BY	CHKR
DISCIPLINE	BY	DATE	DISCIPLINE	BY	DATE	B	2/11/10	DRAWING REDRAWN & UPDATED FOR 2009 FEASIBILITY STUDY	WN	RV
ARCH.			MECHANICAL							
CIVIL			NUCLEAR							
ELECTRICAL			PIPING							
ENVIRON.			PROCESS							
GEN. ARRANG.			QA / QC							
HVAC			STRUCTURAL							
I & C										

DRAWING STATUS				
ISSUED	REV	DATE	SDE	PEN
PRELIMINARY				
APPROVED FOR CONSTRUCTION				

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED AND DATED. DESTROY ALL PRINTS BEARING EARLIER DATE AND/OR REV.NO.

PROJECT NO.:

DRAWN: WN DATE: 2/10/10

CHECKED: RV DATE: 2/11/10

SCALE: 1/16"=1'-0"

LUMINANT/COMANCHE PEAK UNITS 3 & 4

BLOWDOWN TREATMENT FACILITY EQUIPMENT LAYOUT

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Washington Group International, Inc. dba Washington Division of URS Corporation

DWG. NO. BDT-11-13-400-002 REV B

QUESTION NO.: HP-04 (5.3.4)

Provide information regarding the potential for the BDTF evaporation ponds to increase the growth of thermophilic microorganisms, including etiological agents. An assessment of potential human health effects associated with the BDTF evaporation ponds is needed.

ANSWER:

Bacteria pathogenic to humans usually thrive at temperatures of 99°F, are ubiquitous in the environment, and only affect immunologically compromised individuals. Thermophilic microorganisms generally occur at temperatures ranging from 77°F to 176°F, but growth and reproduction is maximized at 122°F – 140°F.

ER Subsection 5.3.4.1 has been revised to address this issue.

Impact on R-COLA

See attached marked-up ER Revision 1 pages 5.3-16 and 5.3-17.

Impact on S-COLA

None.

Impact on DCD

None.

Attachment (on CD)

(Singleton 1982) – Singleton, et. al., "Effects of Temperature and Salinity on *Vibrio cholerae* Growth," Applied and Environmental Microbiology, November 1982, Vol. 44, No. 5, p. 1047-1058.

5.3.4 IMPACTS TO MEMBERS OF THE PUBLIC

This subsection describes the potential health impacts associated with the cooling system for the proposed project. Impacts to human health from thermophilic microorganisms and from noise resulting from operation of the cooling system are addressed.

5.3.4.1 Thermophilic Microorganisms

The NRC designated impacts to public health from thermophilic microorganisms a Category 2 issue requiring plant-specific attention due to possible public health impacts associated with pathogen contact. The plant ultimately discharges into a reservoir system, but a portion is diverted into the BDTF. It is necessary to determine whether discharge characteristics promote survival and reproduction of pathogenic thermophilic microorganisms in either location. Organisms of concern include enteric pathogens *Salmonella* and *Shigella*, the *Pseudomonas aeruginosa* bacterium, thermophilic *Actinomycetes* (fungi), the many species of *Legionella* bacteria, and pathogenic strains of the free-living *Naegleria* amoeba. RAI HP-04

Bacteria pathogenic to humans usually thrive at temperatures of 99°F, are ubiquitous in the environment, and only affect immunologically compromised individuals. Thermophilic microorganisms generally occur at temperatures ranging from 77°F to 176°F, but growth and reproduction is maximized at 122°F – 140°F. Two existing units at CPNPP with once-through cooling currently discharge into a cove on the south end of Squaw Creek Reservoir, where temperatures above 100°F have been measured occasionally near the discharge. Even though this area was a favorite location for recreational fishing according to local blogs when the reservoir was open to the public, illness associated with thermophilic bacteria was never reported. RAI HP-04

Recreational swimming in Texas reservoirs is generally considered a safe activity with regard to pathogen exposure. Although Texas reservoirs do not appear to have major problems due to high levels of pathogens, in 2007, the Texas Department of State Health Services confirmed a death attributed to primary amoebic meningoencephalitis (PAM). Thirty-five (35) PAM infections have been reported in Texas since 1972 and have involved children and adults who had been swimming in lakes (TDSHS 2007). The amoeba responsible for PAM thrives in warm, stagnant water and soil. A combination of lower water levels, high water temperature and stagnant or slow moving water produces higher concentrations of the amoeba in the water (BRA 2007).

The CPNPP Units 3 and 4 are planned to each utilize two banks of mechanical-draft cooling towers to employ a closed-loop cooling system and reduce heated discharge to Lake Granbury. Two gravity-drain 42-in discharge pipelines (one from Unit 3 and one from Unit 4) with multi-port diffusers are planned to be located approximately 600 ft upstream from DeCordova Bend Dam in the vicinity of the existing discharge pipe (Subsection 4.2.1.1.7). Average discharge through the dam is 28 cfs (Subsection 2.3.1.2.2). During low flow conditions, release may decrease to below 28 cfs. Constant flow provides continuous mixing and cooling of the blowdown discharge (Section 2.3).

The maximum temperature of water discharged into the reservoir is 93°F, at which point mixing and cooling begin immediately. Subsection 5.3.2.1 details the thermal plume expected from cooling tower blowdown in Lake Granbury. In theory, thermal additions to these water bodies could support thermophilic microorganisms. Thermophilic microorganisms thrive and reproduce at temperatures ranging from 122°F to 140°F. Although thermophilic microorganisms may be present in the thermal plume, expected temperatures are well below optimal temperature ranges for growth and reproduction. Impacts to public health from thermophilic microorganisms are not expected.

The BDTF is anticipated to carry a moderate heat load during winter months, but during summer months temperatures in the BDTF are near or cooler than ambient. Water temperatures from the cooling tower basin are designed at a maximum of 88.5°F; therefore, growth of thermophilic bacteria growth is not expected. Additionally, the salt concentration in the BDTF has been calculated at 29,500 ppm. Even the salinity tolerant Acanthamoeba amoeba has an upper salt tolerance level of 12 ppt. However, Vibrio cholerae, the bacteria responsible for cholera outbreaks, does grow in moderate temperatures and high salinity. Singleton et al. (1982) indicates V. cholerae thrives at salinity concentrations of 25-35 ppt and temperatures of 20-25°C (68-77°F). Twenty five degrees Celsius was the highest temperature tested in this study. V. cholerae can probably withstand higher temperatures. It is possible the BDTF would provide suitable habitat for V. cholerae for much if not the entire year. RAI HP-04

V. cholerae has not been identified in the Lake Granbury source water. It has been hypothesized the bacteria is an autochthonous constituent of brackish water and estuaries. Although CPNPP is not located near the ocean, and inoculation of the BDTF with V. cholerae is unlikely, monitoring for the bacteria will be performed if required by Texas State authorities.

Human disease resulting from any potential thermophilic pathogens in the lake will require an exposure pathway that is not reasonable given the environment surrounding the discharge pipe and the characteristics of the heat plume. The water will not be warm long enough to support a reproducing pathogen community, and swimmers and boaters are barred from the dam area, which includes the area surrounding the discharge pipe. Exposure risks are not present beyond those found in background conditions.

5.3.4.2 Noise

The proposed units are anticipated to produce noise from the operation of pumps, mechanical draft cooling towers, transformers, turbines, generators, switchyard equipment, and loudspeakers. In NUREG-1555, the NRC states that the principal sources of noise include cooling towers and pumps that supply the cooling water. The U.S. Department of Housing and Urban Development (HUD) has established noise impact guidelines for residential areas based on day-night average sound levels (Ldn). For the purpose of this document, noise impacts are assessed using the Ldn of 60 – 65 dBA A-weighted decibels (dBA) as the level below which noise levels would be considered acceptable for residential and outdoor recreational uses.

Impacts of operational noise on the public are expected to be small. Operational noise including distance to the nearest residence is further discussed in Section 5.8.

QUESTION NO.: HYD-25 (2.3.2, 4.2.2, 5.2.2)

In order for the NRC staff to complete the review of water uses that could affect or be affected by the construction and operation of the proposed project the NRC staff requests the following information:

- Provide information on the water rights that the Applicant holds or expects to obtain to authorize withdrawals to supply existing Units 1 and 2 and proposed Units 3 and 4, including the permitting or adjudicating agency(ies), appropriation date, priority status, type of permit/claim (regular, seasonal, term, or emergency), water volume, withdrawal/diversion location, permit term (if any), and any other specifications (for example, whether the entire water right can be exercised any time during the year or is subject to daily or monthly withdrawal limits) associated with each water rights permit/claim.
- Provide information on other water rights in the Brazos River system that could affect or be affected by the Applicant's exercise of its water rights. Specifically, indicate how many acre-feet of water rights are ahead of the Applicant's rights in priority (i.e., more senior users), how many acre-feet are behind the Applicant in priority (i.e., less senior users), and how the set of more senior users and the set of less senior users break out in terms of their purposes and uses for the water (municipal, agricultural irrigation, etc.).
- Provide information on how and when water rights priorities could be modified in a time when water availability is constrained. What provisions are there in the state water law that might allow the Applicant to move ahead of another water-rights holder or allow another user to move ahead of the Applicant?
- Provide historical information on all time periods when restrictions have been placed on exercise of water rights in the Brazos River system since the modern water rights adjudication system has been in place (approximately 1986), including for each such period the dates when rights were suspended and the classes of water rights holders whose rights were suspended.

ANSWER:

Each bulleted portion of this question is answered in the Freese and Nichols Memorandum included as Attachment 1. Attachment 1 refers to Attachments A and B, which are also included.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachments (on CD)

Attachment 1 – Memorandum, J. S. Albright to B. Turner, "HYD-25 Water Laws and Water Rights," February 8, 2010

Attachment A – Water Rights Associated with the Comanche Peak Nuclear Power Plant

Attachment B – List of Brazos Basin Water Rights in Priority Order

QUESTION NO.: HYD-26 (2.3, 4.2, 5.2)

In order for the NRC staff to complete its review of surface water impacts relating to the Wheeler Branch Reservoir (MBR) that could affect or be affected by the construction and operation of the proposed project the NRC Staff requests the following information:

- Provide maps of sufficient detail to show the relationship of the WBR to the CPNPP site and City of Glen Rose;
- Provide a quantitative and qualitative description of WBR;
- Provide variations in inflows, outflows, water surface elevations, and storage volumes and retention time;
- Summary of statutory and other legal restrictions relating to water use or specific water-body restrictions on water use imposed by Federal or State regulations;
- For the Paluxy River, which feeds WBR, provide the following information: mean flow, peak and minimum flows, and 7Q10 values and determined by USGS; follow rates of discharges from the WBR dam; and an anaysis of how proposed CPNPP withdrawals from WBR would affect water quantity and aquatic habitat in the reservoir and the Paluxy River, both at normal flow and during low-flow periods;
- Provide clarification on the quantity of water that would be used from WBR based on the Somervell County Water Supply Project phases noted in the June 2006 amendment to the Brazos River Region G Water Plan.

ANSWER:

Each bulleted portion of this question is answered in the Freese and Nichols' Memorandum provided as Attachment 1. Attachment 1 refers to Attachments A through Attachment D, which are also included.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachments (on CD)

Attachment 1 – Memorandum, J. S. Albright to B. Turner, "HYD-26 Wheeler Branch Reservoir," February 4, 2010

Attachment A – Wheeler Branch Operation - Full Demand Operation

Attachment B – Operation Study Files (native files)

Attachment C – Wheeler Branch Water Right

Attachment D – Wheeler Branch Operation Study without Luminant Demand

QUESTION NO.: HYD-27 (3.3.1, 3.3.6, 3.6)

Provide clarification on water requirements for facility operation, as listed in Table 3.3-1, Figure 3.3-1 and the text of the ER. Clarify apparent inconsistencies and revise Table 3.3-1 as appropriate.

To assist the staff in its review, for each of the water requirements listed, indicates whether the value is per unit, or for Units 3 and 4 combined or for the entire CPNPP site. (For example it is currently unclear whether there are one or two fire water systems for Units 3 and 4, or one or two raw water treatment systems. It is also unclear whether there will be one potable water system for the combination of Units 3 and 4, or a single potable water system for the entire site.)

If any value given for "normal flow" in Table 3.3-1 or section 3.4-1 does not represent a continuous withdrawal, indicate the expected frequency and duration of the withdrawal requirement. Also, (1) clarify whether construction water would be used during operation and (2) supply the missing information in row 9 of the table on sheet 2 of Figure 3.3-1.

ANSWER:

Figure 3.3-1 has been extensively revised to display additional elements on Sheet 1. The corresponding item numbers on Sheets 2 and 3 have been revised to more clearly indicate whether the values are per unit, for two units or for the whole site (four units). In addition, a note has been added to Sheets 2 and 3 to indicate all flows are continuous. The notes on the column on the far right side of Sheets 2 and 3 have been extensively revised. Since some of the values from Figure 3.3-1 are used on Table 3.3-1 and elsewhere in the text, additional revisions have been made.

One fire loop serves Units 3 and 4. One potable water system will ultimately serve all four units.

Construction water will not be used once both Units 3 and 4 are operational.

<u>Impact on R-COLA</u>

See attached marked-up ER Revision 1 pages 3.3-5, 3.4-5 and Figure 3.3-1 (3 sheets).

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

None.

TABLE 3.3-1
PLANT WATER USE

	Normal Flow Per Unit (gpm)	*Maximum Flow Per Unit (gpm)*	
Circulating Water System	1,317,720	1,317,720	
Evaporation Rate	18,292[c]	18,292[c]	
Blowdown Rate	~~12,900~~13,009	~~12,900~~13,009	RAI HYD-27
CWS Makeup Rate	31,200	31,200	
Essential Service Water System	24,000[a]	48,000[a]	
Evaporation Rate	165	735	
Blowdown Rate	109	515	
ESWS Makeup Rate	274	1260	
Raw Water (for Demineralized Water)	1,100[b]	1,100[b]	
Fire Water Makeup Rate	125[b]	125[b]	
Potable Water	~~50~~25	~~50~~25	RAI HYD-27

a) ESWS normal flow based on two ESWS trains continuous operation. Maximum ESWS flow based on four ESWS trains operation during cooldown by CS/RHRS for duration of 4 hours.

b) Fire Water makeup flow of 125 gpm is included in the Raw Water flow of 1,100 gpm.

c) Evaporation rate of 18,292 gpm ~~is~~ include~~d~~s ~~in~~ the drift loss of 132 gpm. RAI HYD-27

Non-Essential and Essential Service Water Systems

The NESWS is in operation during the startup, power operation, and shutdown modes of plant operation. During each of these modes of operation, the NESWS requires makeup water from Lake Granbury via the CWS. The MWS must provide sufficient capacity to supply the NESWS with makeup for cooling tower losses due to evaporation, drift, and blowdown. The cooling tower losses provide the major discharge source to the atmosphere via evaporation. The blowdown system provides a discharge path to Lake Granbury via the CWS cooling tower basin.

The ESWS is in operation during all six modes of plant operation and requires makeup water from Lake Granbury. The MWS must provide sufficient capacity to supply the ESWS with makeup for UHS cooling tower losses due to evaporation, drift, and blowdown. Evaporation from the cooling tower to the atmosphere is the major consumptive water use. The blowdown operations provide a discharge to Lake Granbury. The amount of water supplied by the system from Lake Granbury along with the discharge quantities for each of the six modes is provided in Table 3.4-2.

Makeup Water System

During normal operation, Lake Granbury provides 31,200 gpm makeup to the CWS, and 274 gpm as makeup for the ESWS, for a total of 31,474 gpm per unit, plus 1,100 gpm to the raw water storage tanks~~, or a total of 65,400 gpm for both units~~ . The estimated monthly water need RAI HYD-27 from Lake Granbury is 2.83×10^9 gallons (gal) to operate both CPNPP Units 3 and 4. Normal operation is at 100 percent power operation, which is at a maximum makeup demand; therefore, the maximum is approximated to be the same as the normal need. The minimum demand is during an outage when the only flow being pulled from Lake Granbury for that unit is the ESWS makeup (331 gpm per unit). The estimated monthly minimum water demand from Lake Granbury is 1.43×10^7 gal per unit. Therefore, the minimum demand occurs when one unit is in an outage and the other is in power operation.

During normal operation, Wheeler Branch supplies up to ~~300~~350 gpm This water supply includes RAI HYD-27 up to 50 gpm for daily potable water use for the entire site and from 0 to ~~250~~300 gpm to the raw water storage tanks, which in turn supply water to the demineralized water system (DWS). The amount of water needed from Wheeler Branch is bounded by the maximum need of ~~300~~350 gpm, with the estimated monthly maximum being ~~1.3~~1.51 x 10^7 gal. RAI HYD-27

3.4.2 COMPONENT DESCRIPTIONS

CPNPP Units 3 and 4 are designed with a common intake structure that supplies the necessary raw water to the plant. The MWS consists of approximately 13 miles (mi) of 42-inch prestressed reinforced concrete piping, valves, and instrumentation. This system is described in Subsection 3.4.2.1.

CPNPP Units 3 and 4 are also designed with two discharge systems, one per unit. For each unit, approximately 13 mi of 42-inch piping runs to Lake Granbury. The discharge system is described in Subsection 3.4.2.2.

RAI GEN-07
RAI HYD-27

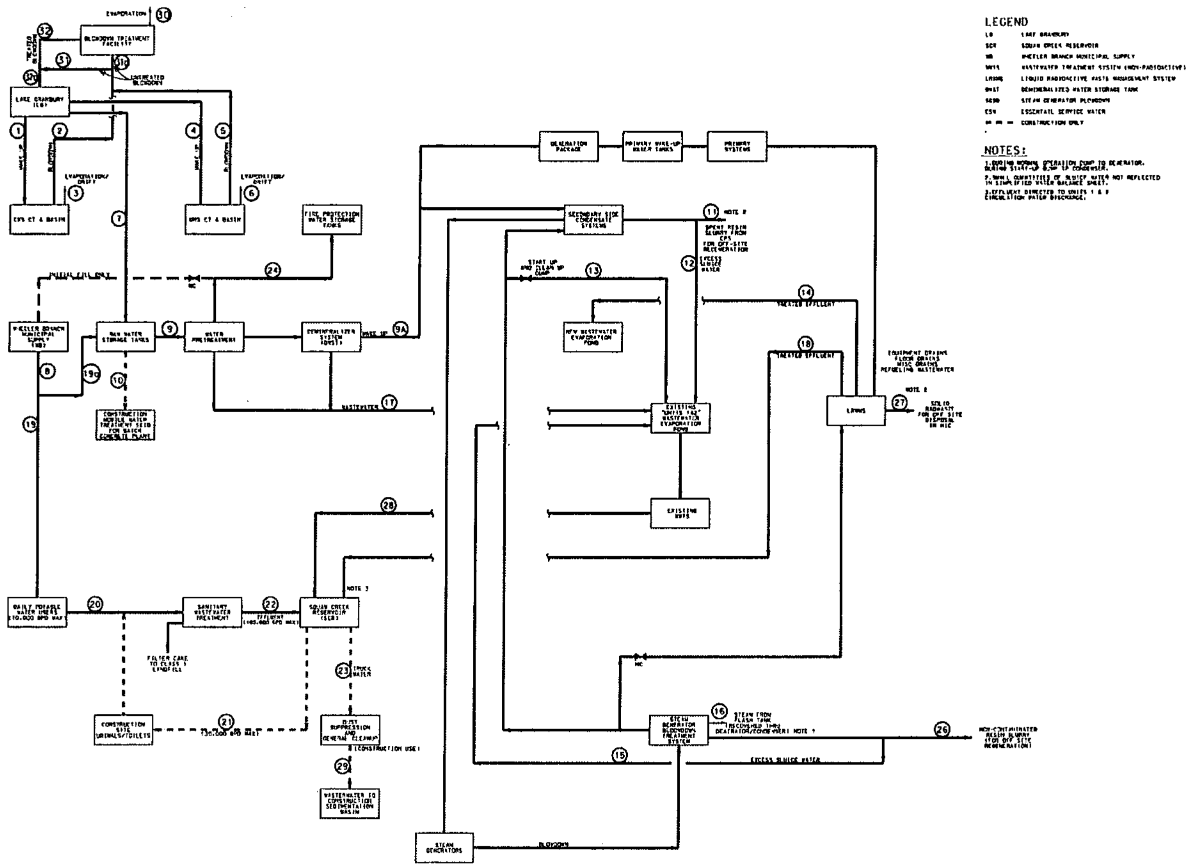


Figure 3.3-1 Water Balance (Sheet 1 of 3)

RAI GEN-07
RAI HYD-27

Steam	Description	Flow @ Max Power Operation[(a)]	Units	Waste Constituents	Comments and References
1	CWS Cooling Tower Makeup from Lake Granbury (LG)	31,200 per Unit	gpm		Secondary Side Water Cooling System Study Case1Ba (revised by RFI-0202) From Lake Granbury to Cooling Tower Section 5.0 Optimization Study SSCWS - Final Report dated 8/15/07
2	CWS Cooling Tower Blowdown	12,900 per Unit	gpm	TDS-2.4 times LG value.	Secondary Side Water Cooling System Study Case1Ba (revised by RFI-0202) From Cooling Tower to Lake Granbury (LG) Section 5.0 Optimization Study SSCWS - Final Report dated 8/15/07
3	CWS Cooling Tower Evaporation + Drift	18,300 per Unit	gpm		Secondary Side Water Cooling system Study Case1Ba(revised by RFI-0202)
4	UHS Cooling Tower Makeup from LG	274 per Unit	gpm		(revised by RFI-0202)
5	UHS Cooling Tower Blowdown	109 per Unit	gpm	TDS- 2.4 times LG value.	(revised by RFI-0202)
6	UHS Cooling Tower Evaporation + Drift	165 per Unit	gpm		(revised by RFI-0202)
7	Raw water from LG to raw water storage tanks	470- 1,100 total 2 Units	gpm		A blend of LG and potable water is expected. Minimum make-up for operation is estimated from Luminant at ~ 200 gpm per Unit. Maximum construction flushing is estimated at ~ 500 gpm per Unit.
8	Potable water from WB to CPNPP site	0 to 350 total 4 Units	gpm		Assumed a 350 gpm uninterruptible supply of potable water from Somervell County Water District (SCWD) will be made available to supply Units 1- 4.
9	Raw water to pretreatment	1,100 to 1,250 total 2 Units	gpm		Assume 80% recovery as demin water.
9A	Demineralized Make-up to Primary Water Tanks	200 to 500 per Unit			See 7 above.
10	Raw water to construction mobile treatment skid	250 total 2 Units	gpm		URS estimate. Assumed (2) shifts/day 8hr x 2 = 16 hrs/day. Necessary to support concrete batch plant during construction only
11	Spent resin slurry from CPS	85	gpd		Assumed one time per month for one hour. Demin volume is ~ 5,000 gal, ~ 85gpd for 1 hr, which is ~ 95% recycle.
12	Excess sluice water from CPS	85	gpd		Assumed one time per month for one hour. Demin volume is ~ 5,000 gal, ~ 85gpd for 1 hr, which is ~ 95% recycle.
13	SGBD blowdown wastewater to existing evaporation pond	1,165 per Units (see comment)	gpm		Assume during plant startup flow duration will be 4 hrs. Normal power operation flow duration is to be determined.
14	LRWMS effluent to new evaporation pond	1,500 total 2 Units	gals/day		Rad waste estimate. Assumed 60% of total released effluent from LRWMS.
15	Excess sluice water from SGBD treatment	N/A	gpm		Neglect for simplified balance
16	Evaporation from SGBD flash tank	N/A			Evaporated steam is condensed and recovered in the main condenser.
17	Water treatment wastewater to existing evaporation pond	100 to 250 total 2 Units	gpm	pH- 6 to 9; TDS- 5 times feed water TDS; resin regeneration salts- sodium sulfate, calcium sulfate and sodium chloride; suspended solids & silts- from filter back wash	URS estimate. Assumed 80% recovery of feed water as demineralized water.

Figure 3.3-1 Water Balance (Sheet 2 of 3)

RAI GEN-07
RAI HYD-27

Steam	Description	Flow @ Max Power Operation[a]	Units	Waste Constituents	Comments and References
18	LRWMS effluent to existing Unit 1 & 2 circulating water discharge	1,000 total 2 Units	gals/day		Rad waste estimate. Assumed 40% of total released effluent from LRWMS.
19	Potable water to daily potable water users	50 total 2 Units	gpm		URS estimate
19a	Potable water to raw water storage tank	300 max. total 2 units	gpm		250 gpm continuous for construction mobile treatment skid (refer to stream 10). After construction and Unit 1 & 2 tie-in, approx. 250 gpm would be available to supplement raw water supply from LG.
20	Sanitary wastewater from potable water toilets/urinals	70,000 total 2 Units	gals/day		Sanitary wastewater treatment system's COLA concept design report.
21	Non-potable water to construction toilets/urinals	30,000 total 2 Units	gals/day		Sanitary wastewater treatment system's COLA concept design report. During construction only estimate.
22	Sanitary wastewater treatment system effluent	100,000 total 2 Units	gals/day	Effluent will meet permit limits (see SWTS System Description for permit limits).	Sanitary wastewater treatment system's COLA concept design report
23	Dust suppression & general cleanup water	63,000 total 2 Units	gals/day		Trucked to user locations. During construction only estimate
24	Fire protection water storage tank makeup water	N/A			Neglect for simplified balance. Initial fill is from potable water supply.
25	Evaporation loss from fuel pool tanks	N/A			Neglect for simplified balance
26	Non-contaminated resin slurry from SGBD treatment system	N/A			Neglect for simplified balance
27	Solid radwaste for off site disposal in HIC	N/A			Neglect for simplified balance
28	Existing pond wastewater treatment system effluent	N/A			Neglect for simplified balance
29	Wastewater to construction sedimentation basin	63,000 total 2 Units	gals/day		URS during construction only estimate
30	Evaporation from Blowdown Treatment Facility (BDTF)	2,577 per Unit	gpm		Flow from BDTF to evaporation ponds is estimated at 2,577 gpm/unit, which includes ultrafiltration (UF) backwash and reverse osmosis (RO) reject water.
31	Untreated Blowdown to Lake Granbury (LG)	2,272 per Unit	gpm	8,402 mg/L TDS based upon Lake Granbury maximum concentrations	A portion of the cooling tower blowdown by-passes the BDTF.
31a	Blowdown to BDTF	10,737 per Unit	gpm	8,402 mg/L TDS based upon Lake Granbury maximum concentrations	Blowdown from Secondary Side and ESW cooling towers are combined for treatment in the BDTF.
32	Treated Blowdown to LG	8,160 per Unit	gpm	91.9 mg/L TDS	Treated blowdown flow is based upon UF system operating at 95% recovery and RO system operating at 80% recovery. Total input flow to BDTF is estimated at 10,737 gpm/unit.
32a	Total Combined Discharge to LG	10,432 per Unit	gpm	1,902 mg/L TDS	Untreated blowdown (31) and treated blowdown (32) are combined for discharge to LG based upon maintaining <2500 mg/L TDS and <1000 mg/L Cl in the combined discharge.

(a) Flow is assumed to be continuous.

Figure 3.3-1 Water Balance (Sheet 3 of 3)

QUESTION NO.: HYD-28 (4.2.2)

The NRC staff is seeking to resolve apparent inconsistencies in the ER (and to avoid misinterpretations of the application). Section 4.2.1.3 provides daily water consumption for construction related activities in gallons per minute (gpm). However, this does not provide an accurate description of the quantity of water that will be used during construction on a daily or yearly basis. The staff requests the following information:

- Provide the estimate daily consumption of water from the Wheeler Branch Reservoir for construction activities.
- Provide the estimated daily consumption of water from Squaw Creek Reservoir during construction.

ANSWER:

Background

Revision 1 of the ER indicates a construction demand average of 300 gpm from Wheeler Branch Reservoir. This demand represents approximately 484-acre feet per year from Wheeler Branch Reservoir, which is the amount considered for steam electric use in the June 2006 amendment to the Brazos Region G Water Plan.

Revision 1 of the ER indicates a construction demand average of 22-gpm from Squaw Creek Reservoir; however, estimated daily consumption was not provided.

Response

Environmental Report Subsections 4.2.1.3 and 4.4.2.3 have been updated to reflect the availability of water from Wheeler Branch. Figure 1 (attached) provides a simplified water use diagram for the construction period.

Impact on R-COLA

See attached marked-up ER Revision 1 pages 4.2-5, 4.2-6, 4.2-9, 4.4-16 and 4.4-17.

Impact on S-COLA

None.

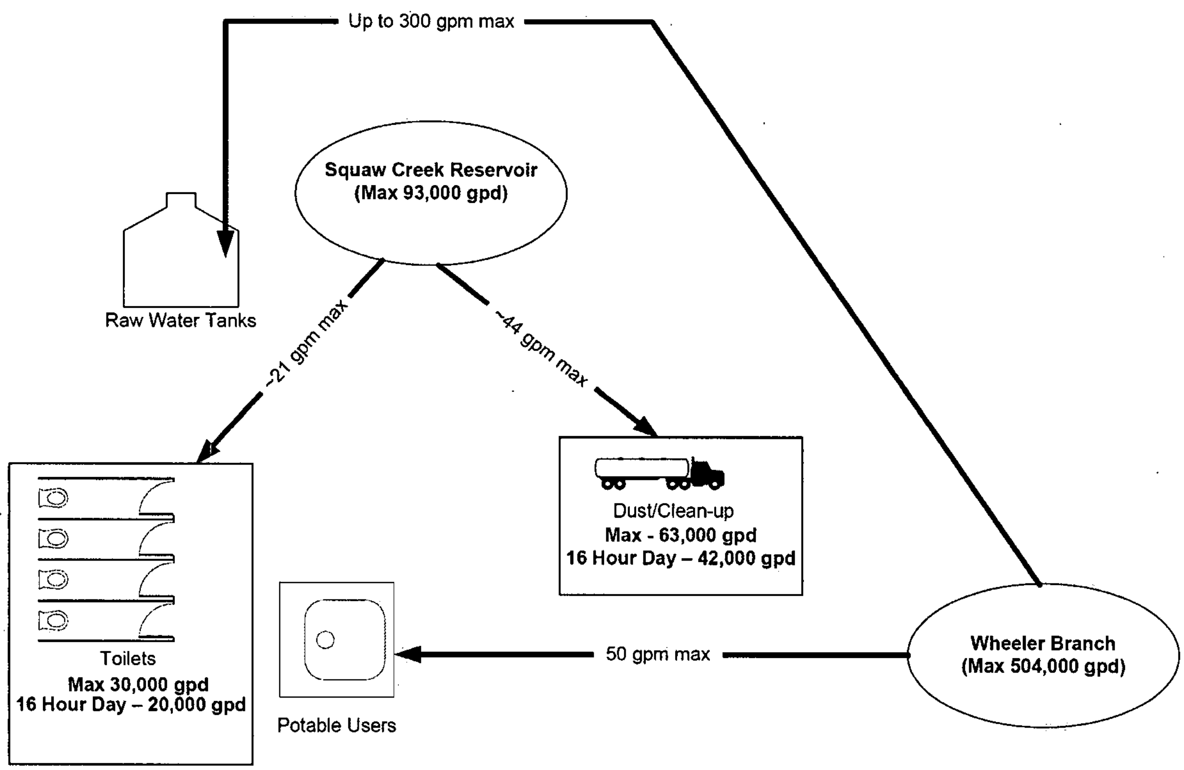
Impact on DCD

None.

Attachment

Figure 1 – Wheeler Branch Reservoir and Squaw Creek Reservoir Simplified Construction Water Use Diagram

Figure 1
Wheeler Branch Reservoir and Squaw Creek Reservoir
Simplified Construction Water Use Diagram



Notes:

1 – Raw water from Lake Granbury to raw water storage tanks will require 470 to 1,100 gpm withdrawal. Maximum construction flushing is estimated at ~500 gpm per unit.

2 – Daily consumptive use of water withdrawn from Squaw Creek Reservoir was determined by applying the maximum daily use to a 16 hour work day.

The source of construction water for concrete batch plant operations, concrete curing, and system startup is expected to be supplied from an on-site raw water storage supply from Somervell County Water District (SCWD), a future municipal water supplier or Lake Granbury. SCR was determined to be unsuitable for these uses due to salinity concentrations. Water for dust suppression and general clean up is expected to be withdrawn from SCR (Subsection 4.2.1.3).

Construction activities on Lake Granbury are expected to be conducted in compliance with Texas Commission on Environmental Quality (TCEQ) and the U.S. Army Corps of Engineers (USACE) permit requirements, and are not expected to affect long-term water quality.

Construction plans do not call for dewatering activities that could affect groundwater aquifer flow and quality. Groundwater should not be utilized to support construction. Therefore, there would be no impact to groundwater aquifer availability.

4.2.1.3 Water Source and Use Rates

~~Water for construction of CPNPP Units 3 and 4 is planned to be obtained from the SCWD via a pipeline from Wheeler Branch Reservoir, a future municipal water supplier, or Lake Granbury. A construction water intake structure is not anticipated on SCR. Also, potable water for domestic and sanitary needs is anticipated to be supplied from SCWD, with the existing on site water supply wells completed in the Twin Mountains Formation being utilized as a backup emergency potable water supply, if required. Construction activities for the CPNPP Units 3 and 4 facilities are expected to require an estimated average and maximum potable/treated water amount of approximately 300 and 1300 gpm, respectively. An estimated average and maximum amount of water withdrawn from SCR for dust suppression and general clean up during construction is 22 gpm and 44 gpm, respectively.~~ RAI HYD-28

~~The maximum demand is anticipated to include system initial fills and flushes, concrete batch plant, crafts demand, fire protection (FP) test/fill and dust suppression. Concrete batch plant operation and concrete curing is expected to obtain water from the municipal supplier (SCWD and/or Lake Granbury) and water is expected to be withdrawn from SCR for dust suppression and general cleanup.~~Water for construction of CPNPP Units 3 and 4 is expected to be obtained from Wheeler Branch Reservoir, Lake Granbury, and SCR. Existing onsite water supply wells completed in the Twin Mountains Formation would be utilized as a backup emergency potable water supply, if required. Potable water demands of up to 350 gpm (504,000 gpd) are expected from the SCWD (Wheeler Branch Reservoir), and raw water demands of 470 gpm (676,800 gpd) to 1,100 gpm (1,584,000 gpd) are expected from Lake Granbury. Non-potable water demands of up to 93,000 gpd are expected from Squaw Creek Reservoir during construction. The demands from each source are dependent upon specific construction needs and will vary during construction. Maximum demands are anticipated during the initial fills and flushes of pipelines and onsite raw water tanks.

The recommended planning number for drinking water consumption for workers in hot climates is 3 gpd for each worker or approximately 5 – 7 oz every 15 – 20 min (NIOSH 1986). Based on the anticipated maximum construction worker population of 4300 people (Section 4.4), the potable water consumptive use is estimated at 12,900 gpd. ~~The quantities of water obtained from Lake Granbury, SCR, the SCWD, and the Twin Mountains Formation are expected to have little effect~~ RAI HYD-28

~~on the availability of water for other users and are considered a SMALL impact.~~The quantities of water obtained from the SCWD (Wheeler Branch Reservoir), Lake Granbury, SCR, and the Twin Mountains Formation are expected to have little effect on the availability of water for other users and are considered a SMALL impact. RAI HYD-28

4.2.1.4 Water Bodies Receiving Effluents

Construction is expected to result in permanent structures occupying about 275 ac of the site (Figure 2.1-1). Because the CPNPP Units 3 and 4 construction is located on a peninsula of SCR, this water body could potentially be affected by site construction activities and stormwater runoff. Additionally, because makeup water and blowdown system intake and discharge structures for Units 3 and 4 are required on Lake Granbury, this water body could potentially be affected by intake/discharge construction activities. The potential construction effects on SCR and Lake Granbury are expected to be temporary, and because of the volume and flow of the surface water bodies and the use of BMPs, the effects should dissipate rapidly. Therefore, the impact to surface water bodies is expected to be SMALL.

4.2.1.4.1 Intake and Discharge Structure

The makeup water and blowdown system intake and discharge designs are described in Sections 3.3 and 3.4, including the estimated withdrawal of Lake Granbury water required for the CPNPP Units 3 and 4 plant operations, the maximum expected discharge flow rate and water temperature, and the estimated withdrawal of SCR water required for dust suppression and general construction cleanup. Section 4.3 provides a detailed discussion of the ecological impacts of construction of the intake structures, intake pipelines, and discharge pipelines. Impacts of water intake and discharge structures are presented in Section 5.3.

The intake and discharge structures for Units 3 and 4 plant operations are to be located approximately 7.13 mi north-northeast of the CPNPP site on Lake Granbury (Figure 4.2-2). Dredging may be required in the vicinity of the intake and discharge structures, and the appropriate TCEQ permits are expected to be acquired prior to commencing dredging activities. Makeup water and blowdown system is expected to be withdrawn by an intake structure located approximately 1.31 mi upstream from the DeCordova Bend Dam. The makeup water is pumped to the CPNPP Units 3 and 4 cooling system through pipelines, and the blowdown water from the CWS and UHS is discharged through separate pipelines back to Lake Granbury about 1.14 mi downstream from the intake structure. Emergency safe shutdown of the reactor does not rely on an external source of makeup water.

The cooling tower effluent is anticipated to be discharged from the outfall, located approximately 0.17 mi upstream from the DeCordova Bend Dam, through engineered diffusers designed to assure compliance with TPDES requirements and numerical limits imposed by the station's TPDES wastewater permit (TCEQ 2004). A temporary increase in turbidity could occur in Lake Granbury near the discharge structure during construction and dredging activities. The additional turbidity from these construction activities is expected to be minimal, because these activities are expected to be localized and of short duration. Details of the discharge system are presented in Subsections 5.2.1.6 and 5.3.2.

Lake Granbury near the CPNPP intake are not expected to be impaired for their designated uses. In addition, constructing intake structures requires USACE and TCEQ permits.

Potable water is planned to be supplied by SCWD, ~~along with temporary fire protection, concrete batching, and other construction water uses. Water for dust suppression and general cleanup would be obtained from SCR.~~raw water is expected to be supplied from Lake Granbury, and non-potable water from SCR. Except for backup potable supply, groundwater is not expected to be used during construction. Environmental impacts to surface and groundwater would be SMALL and are managed under the provisions of applicable state regulatory programs. RAI HYD-28

4.2.1.9 Effects of Alterations on Terrestrial or Aquatic Ecosystems

The greatest potential water-related impacts during construction are expected to be from runoff that may contain higher than normal concentrations of silt and clay. Construction area runoff would be managed using BMPs established by the SWP3, and if necessary, would be directed to settling ponds prior to discharge to minimize this threat. TPDES limitations on physical and chemical parameters are met during construction activities, and the impacts to terrestrial and aquatic ecosystems are considered SMALL.

4.2.1.10 Construction Stormwater Control and Other Minimizing Actions

The impacts from stormwater runoff during construction are considered SMALL and should be effectively managed by development and implementation of a site-specific construction SWP3. The construction SWP3 is expected to address employee training and installation of soil erosion measures such as silt fences, straw bales, slope breakers, and other soil erosion prevention measures. The SWP3 also contains preventive maintenance procedures for construction equipment to prevent leaks and spills, procedures for storage of chemicals and waste materials, spill control practices, revegetation plans, procedures for regular inspections of soil erosion control measures, and procedures for visual inspections of discharges that could create an impact on water quality. Much of the proposed Units 3 and 4 site footprint is located within areas where construction was previously completed, and established stormwater drainage systems and roadways already exist.

The TCEQ requires construction projects that impact five ac or greater to obtain authorization under the TPDES General Permit prior to start of construction. The current TPDES permit (TCEQ 2003) requires BMPs for soil and erosion control, stabilization practices, structural controls, materials management, inspections, etc. In addition, the U.S. Environmental Protection Agency (EPA) has issued BMP guidance for soil and erosion control (EPA 2007), and for development of SWP3s. Because construction of Units 3 and 4 is estimated to require approximately 659 ac, coverage under the TPDES General Permit is required.

4.2.2 WATER-USE IMPACTS

This subsection is a discussion of water-use impacts that includes surface water and groundwater environments during the construction phase of the project. Measures to eliminate or reduce construction impacts are discussed in Subsection 4.2.1.10.

The increase in population due to peak construction leaves the water treatment plants of Somervell County, Cleburne, Fort Worth, and Stephenville below 50 percent of total capacity. Hood County increases to just over half at 55 percent. The city most impacted is Walnut Springs, which is estimated to increase to 93 percent of capacity. Walnut Springs relies solely on groundwater, so it is likely that additional public or private wells would be y\used to meet demand.

There are two wastewater treatment plants associated with the cities in Hood County. The Tolar Wastewater Treatment Plant has a capacity of 100,000 gpd and is currently operating at 70 percent capacity. Plans for expansion of the plant are expected to be made within the next few years. The Granbury Wastewater Treatment Plant has a maximum capacity of 2,000,000 gpd and is operating at 48 percent capacity. If the total projected water use for Hood County is processed through the plants, the usage increases to 1,278,098 gpd or 61 percent of the total capacity.The Somervell County Wastewater Treatment Plant that serves Glen Rose and the rest of Somervell County has a maximum capacity of 600,000 gpd and is operating at 53 percent capacity. During peak construction, the wastewater usage increases to 442,049 gpd or 74 percent of maximum capacity. In Cleburne, the wastewater usage increases to 6,670,885 gpd or 89 percent of maximum capacity. The wastewater treatment plant in Fort Worth is barely affected, with utilization increasing by 53,164 gpd to 65 percent of maximum capacity. Wastewater usage in Stephenville increases by 35,443 gpd, with total wastewater usage of 92,535 gpd or 77 percent of the maximum capacity. Cleburne is the only case where the projected utilization of the wasterwater treatment plants exceed 77 percent and plans are in place to expand the plants in Cleburne and Somervell County. Therefore, the wastewater treatment plants are able to accommodate the expected increase in population.

~~Potable water for construction is expected to be obtained from the newly created Wheeler Branch Reservoir, which also supplies water for construction needs including concrete curing. The reservoir has a capacity of 1.3 billion gal with an annual yield of approximately 651,700,000 gal (SCWD 2007). The SCR supplies water for general cleanup, fire protection and dust control. An estimated 6560 gpd of potable water are expected to be used during peak construction, with an additional 184,000 gpd of general service water. Wastewater treatment is provided on site. The physical impacts of on site construction activity on water and wastewater treatment services are expected to be SMALL, with no mitigation required.~~ Potable water for construction is expected to be obtained from the newly-created Wheeler Branch Reservoir. The SCWD has evaluated the potential water demands for all users within the district and has indicated that 350 gpm (565 ac-ft per year) will be available from Wheeler Branch Reservoir to the CPNPP site during Units 3 and 4 construction and operation. The 565 ac-ft per year allocation is expected to be included in the 2011 Brazos Region G Water Plan that is currently being drafted. Raw water during construction is expected to be supplied from Lake Granbury and non-potable water is expected to be supplied from SCR. RAI HYD-28

Potable water from SCWD (Wheeler Branch Reservoir) will either be blended with water from Lake Granbury and stored in on-site raw water storage tanks for retreatment and construction use, or be conveyed to daily potable water users at the site. Wheeler Branch Reservoir has a capacity of 1.3 billion gal with an annual yield of approximately 651,700,000 gal (SCWD 2007). The daily water use from Wheeler Branch Reservoir is assumed to be the maximum available water supply from the SCWD to the CPNPP Site (504,000 gpd).

Non-potable water from Lake Granbury will be blended with potable water from SCWD and stored in on-site raw water storage tanks for treatment and construction use. Construction estimates include withdrawals of 470 gpm (676,800 gpd) to 1,100 gpm (1,584,000 gpd) from Lake Granbury. The demands from Lake Granbury are dependent upon specific construction needs (i.e. initial system fills and flushing, crafts demand, fire protection test/fill, and concrete batching) and will vary during construction. RAI HYD-28

Non-potable water from SCR will be used for construction sanitary restrooms, dust suppression and general clean-up. Daily consumptive use of water withdrawn from Squaw Creek Reservoir was determined by applying the maximum estimated daily use (93,000 gpd) to a 16-hour work day. The resulting daily use from Squaw Creek Reservoir is 62,000 gpd. Wastewater treatment is provided on-site. It should be noted that all wastewater treatment is performed onsite and up to 100,000 gpd of treated sanitary wastewater will be discharged to SCR through permitted outfalls; therefore, a net gain in SCR may occur. The physical impacts of onsite construction activity on water and wastewater treatment services are expected to be SMALL, with no mitigation required.

As discussed in Subsection 2.5.2.7.2, there are 68 police officers in Hood County, and 19 police officers and 40 firefighters in Somervell County. The national average ratio of full-time police officers per 1000 residents was 2.5 in 2003. The estimated population of Hood County in 2006 is 49,238 (Census 2006). The average number of officers per 1000 residents for a population that size is 1.8 (BJS 2003). Hood County had a ratio of 1.4 in 2006. Somervell County had an estimated population of 7773 in 2006 (Census 2006). The average number of officers per 1000 residents for a population that size is 2.2 (BJS 2003). Somervell County had a ratio of 2.4 in 2006. In 2014, the year of peak construction, due to population growth and the incoming workforce, the ratio in Hood County decreases to 1.3 and the ratio in Somervell County decreases to 2.0. This puts both counties below the national average for communities of their respective sizes. However, Hood County is already below the average based on the 2006 population.

In 2008, the national average number of firefighters per 1000 in population served was 1.6 (Senter 2009). As discussed in Subsection 2.5.2.7.2, there are 250 firefighters in Hood County and 40 firefighters in Somervell County. The ratio of firefighters per population served in both Hood and Somervell counties in 2006 was 5.1 and 5.2, respectively. By 2014, the influx of construction workers and continuing population growth decrease the ratio in Hood County to 4.8 and the ratio in Somervell County to 4.3. Both of these numbers are still well above the national average. The CPNPP employs its own fire brigade who responds to all on-site emergencies however; CPNPP uses local firefighters when necessary for on-site emergencies.

Increases in population in the remaining counties of the economic region are not as large. The ratio of police officers per 1000 in population served in 2006 in Stephenville is 2.2. This decreases to 1.9 by peak construction with the incoming construction workers. The average number of officers for a city that size is 2.0, so police services in Stephenville remain at average levels (BJS 2003). The ratio in Cleburne decreases from 1.9 to 1.6. The average number of officers for a city the size of Cleburne is 1.8, so police staffing falls to slightly below average (BJS 2003). Walnut Springs does not have a police department but is serviced by the Bosque County Sheriff's Office. The city is pursuing a grant to form a police department of its own. The city has less than 1000 residents before the in-migration of workers, but has 1143 residents with the workers. The average number of police officers per 1000 residents for a city of just over 1000

QUESTION NO.: HYD-29 (3.3.1, 3.3.2, 3.4, 3.6, 5.2, 5.3)

Provide reference citations for the "Texas Commission on Environmental Quality (TCEQ) Criteria for Specific Metals in Water for the Protection of Aquatic Life", "Human Health Criteria in Water", and "Screening levels for nutrient parameters" listed in spreadsheets supplied in Luminant letter dated April, 27, 2009 in response to RAI HYD-09.

Provide an explanation of the basis for selecting these criteria for comparison with projected effluent concentrations.

ANSWER:

All of the various listed criteria are from the TCEQ's "2008 Guidance for Assessing and Reporting Surface Water Quality in Texas," March 19, 2008. The criteria for "Specific Metals in Water for the Protection of Aquatic Life" are contained in Table 3.3 of the referenced document. "Human Health Criteria in Water" and "Screening Levels for Nutrient Parameters" are contained in Tables 3-11 and 3-10, respectively. The TCEQ guidance is in compliance with Sections 305(b) and 303(d) of the Federal Clean Water Act and the criteria were selected as potential screening levels to provide a conservative comparison with projected effluent concentrations.

The values and analysis under discussion concern the periods in which the Blowdown Treatment Facility (BDTF) is not in operation. All of the reference citations for the Compounds Measured in Lake Granbury spreadsheet have been added and Revision 1 of the spreadsheet is attached. In addition, the screening value for copper was revised on two tables in Chapter 2 of the ER to be consistent with the copper screening level of 0.027 mg/l provided on the Compounds Measured in Lake Granbury spreadsheet that was submitted in response to Questions HYD-09 and HYD-31. Tables 2.3-26 and 2.3-46 have been revised and corresponding text has been added to Subsection 5.2.3.4.

Impact on R-COLA

See attached marked-up ER Revision 1 pages 2.3-114, 2.3-173, and 5.2-15.

Impact on S-COLA

None.

Impact on DCD

None.

Attachment (on CD)

Compounds Measured in Lake Granbury, Rev. 1

TABLE 2.3-26 (Sheet 2 of 3)
SAMPLE RESULTS FROM LAKE GRANBURY SURFACE WATER MONITORING EVENTS (2007 – 2008)

Parameter		Sulfate	Total Mercury	Dissolved Mercury	pH	Total Coliform	Fecal Coliform	Fecal Streptococci	Total Sodium	Total Potassium	Total Calcium	Total Magnesium	Total Arsenic	Total Barium	Total Cadmium	Total Chromium	Total Lead	Total Selenium	Total Silver	Total Nickel	Total Zinc	Silica	Total Copper
Units		mg/L	mg/L	mg/L	S.U.	col/100mL	col/100mL	col/100mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Mg/L
Screening Level		600.0	0.0013	N/A	N/A	N/A	400	N/A	N/A	N/A	N/A	N/A	0.190	2.000	0.0021	0.373	0.008	0.005	N/A	0.338	0.225	N/A	~~0.507~~ 0.027
Sample Description	Date																						
LG-101 (0.3 ft.)	4/25/2007	168.0	<0.0002	<0.0002	6.95	320	28	40	232	5.99	58.0	12.3	<0.005	0.096	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.023	14.0	0.013
	7/26/2007	143.0	<0.0002	<0.0002	8.31	3300	<10	<1	229	6.75	82.8	18.5	<0.005	0.114	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	10.6	0.010
	10/23/2007	86.5	<0.0002	<0.0002	8.30	11000	10	<1	142	6.10	63.6	13.9	<0.005	0.101	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	15.3	0.007
	1/15/2008	99.8	<0.0002	<0.0002	8.31	560	<1	<1	151	6.28	69.4	15.6	<0.005	0.108	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.010	10.1	0.007
LG-102 (40 ft.)	4/25/2007	232.0	<0.0002	<0.0002	7.14	20000	600	80	368	7.30	99.7	23.7	<0.005	0.164	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.024	17.1	0.018
	7/26/2007	151.0	<0.0002	<0.0002	7.96	6500	500	<1	240	6.74	86.5	19.7	<0.005	0.124	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.018	11.9	0.010
	10/23/2007	94.1	<0.0002	<0.0002	8.31	5000	100	<1	138	6.16	63.7	14.0	<0.005	0.101	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.008	15.1	0.006
	1/15/2008	104.0	<0.0002	<0.0002	8.28	300	20	<1	150	6.34	70.6	15.5	<0.005	0.109	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.009	12.9	0.007
LG-103 (0.3 ft.)	4/25/2007	120.0	<0.0002	<0.0002	7.36	240	<10	<10	227	5.61	62.0	<0.5	<0.005	0.103	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.022	13.3	0.015
	7/26/2007	139.0	<0.0002	<0.0002	8.32	5800	750	6	228	6.84	82.0	18.6	<0.005	0.117	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.013	14.5	0.010
	10/23/2007	88.7	<0.0002	<0.0002	8.29	23000	600	<1	141	6.26	65.8	14.3	<0.005	0.105	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.007	14.6	0.007
	1/15/2008	103.0	<0.0002	<0.0002	8.41	220	10	<1	157	6.23	70.2	15.3	<0.005	0.109	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.010	9.3	0.007
LG-104 (10 ft.)	4/25/2007	123.0	<0.0002	<0.0002	7.43	1600	36	24	213	5.62	62.3	13.5	<0.005	0.105	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.019	15.0	0.012
	7/26/2007	141.0	<0.0002	<0.0002	8.30	3200	1100	5	227	6.85	81.8	18.9	<0.005	0.120	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.014	17.6	0.010
	10/23/2007	87.8	<0.0002	<0.0002	8.28	19000	300	<1	140	6.20	63.8	13.9	<0.005	0.105	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.009	14.9	0.007
	1/15/2008	103.0	<0.0002	<0.0002	8.40	560	<10	<1	152	6.38	70.4	15.7	<0.005	0.100	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.009	9.8	0.007
LG-105 (0.3 ft.)	4/25/2007	131.0	<0.0002	<0.0002	7.54	5000	16	<10	231	5.56	63.0	13.6	<0.005	0.105	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.019	15.2	0.012
	7/26/2007	143.0	<0.0002	<0.0002	8.44	3500	<10	4	228	6.71	80.7	18.7	<0.005	0.116	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.012	14.1	0.010
	10/23/2007	91.2	<0.0002	<0.0002	8.27	20000	90	<1	142	6.14	64.0	13.7	<0.005	0.104	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.009	13.6	0.007
	1/15/2008	108.0	<0.0002	<0.0002	8.43	430	40	<1	152	6.38	70.7	15.3	<0.005	0.109	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.009	9.8	0.007
LG-106 (35 ft.)	4/25/2007	160.0	<0.0002	<0.0002	7.43	2500	225	60	288	6.12	76.5	17.1	<0.005	0.124	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.014	18.3	0.013
	7/26/2007	147.0	<0.0002	<0.0002	7.96	4100	20	1	248	6.61	82.9	20.4	<0.005	0.129	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.013	13.9	0.010
	10/23/2007	90.4	<0.0002	<0.0002	8.27	25000	<10	<1	135	6.20	63.8	14.0	<0.005	0.103	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.008	15.7	0.007
	1/15/2008	99.9	<0.0002	<0.0002	8.34	1000	30	<1	152	6.34	69.1	15.6	<0.005	0.109	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.008	9.7	0.007
LG-107 (0.3 ft.)	4/25/2007	127.0	<0.0002	<0.0002	7.51	2000	16	12	245	5.58	61.7	13.5	<0.005	0.104	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.015	17.0	0.012
	7/26/2007	138.0	<0.0002	<0.0002	7.98	4600	700	6	232	6.79	84.0	19.2	<0.005	0.118	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.011	13.9	0.010
	10/23/2007	91.0	<0.0002	<0.0002	8.32	18000	20	<1	138	6.19	65.0	14.1	<0.005	0.104	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.009	14.0	0.007
	1/15/2008	102.0	<0.0002	<0.0002	8.44	180	10	<1	153	6.33	69.5	15.1	<0.005	0.107	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.009	10.0	0.006
LG-108 (0.3 ft.)	4/25/2007	131.0	<0.0002	<0.0002	7.54	1400	40	<10	235	5.68	65.2	14.4	<0.005	0.109	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.014	15.6	0.013
	7/26/2007	139.0	<0.0002	<0.0002	7.81	6400	80	1	232	6.74	83.5	19.1	<0.005	0.118	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.013	14.5	0.009
	10/23/2007	87.7	<0.0002	<0.0002	8.25	22000	20	<1	139	6.06	63.8	13.8	<0.005	0.103	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.008	14.0	0.006
	1/15/2008	103.0	<0.0002	<0.0002	8.41	460	<10	<1	148	6.32	70.3	15.5	<0.005	0.107	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.010	10.0	0.007
LG-109 (50 ft.)	4/25/2007	166.0	<0.0002	<0.0002	7.49	1200	25	<10	260	6.22	78.2	16.5	<0.005	0.130	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.017	17.7	0.015
	7/26/2007	143.0	<0.0002	<0.0002	7.82	8000	40	<1	227	6.86	85.0	19.4	<0.005	0.122	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.014	17.1	0.009
	10/23/2007	92.1	<0.0002	<0.0002	8.25	20000	<10	<1	134	6.04	63.3	13.6	<0.005	0.102	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.009	13.8	0.006
	1/15/2008	103.0	<0.0002	<0.0002	8.23	260	<10	<1	156	6.36	69.8	15.4	<0.005	0.107	<0.0010	<0.005	<0.005	<0.005	<0.001	<0.005	0.012	12.6	0.007
AVERAGE		121.6	0.0001	0.0001	8.03	6851	152	7	195	6.30	71.7	15.6	0.003	0.112	0.0005	0.003	0.003	0.003	0.001	0.003	0.012	13.8	0.009
MAX		232.0	0.0001	0.0001	8.44	25000	1100	80	368	7.30	99.7	23.7	0.003	0.164	0.0005	0.003	0.003	0.003	0.001	0.003	0.024	18.3	0.018
MIN		86.5	0.0001	0.0001	6.95	180	1	1	134	5.56	58.0	0.3	0.003	0.096	0.0005	0.003	0.003	0.003	0.001	0.003	0.003	9.3	0.006
STANDARD DEVIATION		31.4	0.0000	0.0000	0.42	8063	271	17	56	0.41	9.6	3.7	0.0000	0.012	0.0000	0.000	0.000	0.000	0.000	0.000	0.005	2.5	0.003

RAI HYD-29

TABLE 2.3-46 (Sheet 3 of 6)
SAMPLE RESULTS FROM CPNPP VICINITY SURFACE WATER MONITORING EVENTS (2007)

Parameter		Sulfate	Total Mercury	Dissolved Mercury	pH	Total Coliform	Fecal Coliform	Fecal Streptococci	Total Sodium	Total Potassium	Total Calcium	Total Magnesium	Total Arsenic	Total Barium	Total Cadmium	Total Chromium	Total Lead	Total Selenium	Total Silver	Total Nickel	Total Zinc	Silica	Total Copper
Units		mg/L	mg/L	mg/L	S.U.	col/100mL	col/100mL	col/100mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Screening Level		600.0	0.0013	N/A	N/A	N/A	400	N/A	N/A	N/A	N/A	N/A	0.190	2.0000	0.00210	0.373	0.008	0.00500	N/A	0.33800	0.22500	N/A	~~0.50700~~ 0.027
Sample Description	Date																						
SW-101 (0.3 ft)	1/25/2007	722.0	<0.0002	<0.0002	7.81	260	51	<10	398.10	32.10	59.3	52.8	<0.002	0.1920	<0.00100	<0.003	<0.004	0.00318	0.0120	<0.00200	0.01460	N/A	<0.00800
	4/17/2007	345.0	<0.0002	<0.0002	6.72	944	20	10	222.80	17.90	66.8	46.4	<0.002	1.3400	<0.00100	<0.003	0.056	<0.00200	<0.0010	<0.00200	0.04900	1.740	<0.00800
	7/24/2007	34.7	<0.0002	<0.0002	8.02	3800	170	28	26.50	4.06	77.4	21.4	<0.005	0.0790	<0.00100	<0.005	<0.005	<0.00500	<0.0010	<0.00500	0.01400	11.300	<0.00500
	10/24/2007	344.0	<0.0002	<0.0002	8.54	60000	<10	<1	546.00	12.90	172.0	50.6	0.005	0.1960	<0.00100	<0.005	<0.005	<0.00500	<0.0010	<0.00500	0.00900	6.200	0.02300
SW-102 (0.3 ft)	1/25/2007	688.0	<0.0002	<0.0002	7.16	200	10	<10	305.40	33.50	59.1	53.0	<0.002	0.2040	<0.00100	0.003	<0.004	<0.00200	<0.0010	<0.00200	0.00777	N/A	<0.00800
	4/17/2007	523.0	<0.0002	<0.0002	7.43	160	12	<10	851.00	18.60	231.0	64.8	<0.002	0.2010	<0.00100	<0.003	<0.004	<0.00200	<0.0010	<0.00200	<0.00300	1.460	<0.00800
	7/24/2007	404.0	<0.0002	<0.0002	8.78	40	<10	1	706.00	15.10	173.0	59.9	<0.005	0.2090	<0.00100	<0.005	<0.005	<0.00500	<0.0010	<0.00500	0.01300	7.100	0.02500
	10/24/2007	441.0	<0.0002	<0.0002	8.86	51000	<10	<1	696.00	15.70	198.0	58.0	0.007	0.2110	<0.00100	<0.005	<0.005	<0.00500	<0.0010	<0.00500	0.00900	6.900	0.02900
SW-103 (20 ft)	1/25/2007	693.0	<0.0002	<0.0002	7.34	220	15	<10	216.50	31.40	59.6	51.8	<0.002	0.2170	0.00116	0.007	<0.004	<0.00200	0.0250	0.00296	0.01210	N/A	<0.00800
	4/17/2007	546.0	<0.0002	<0.0002	7.51	416	32	<10	942.40	48.10	75.2	61.7	<0.002	0.2030	<0.00100	<0.003	0.021	<0.00200	<0.0010	0.00263	0.00448	2.260	<0.00800
	7/24/2007	391.0	<0.0002	<0.0002	8.80	40	<10	3	720.00	15.30	174.0	61.4	0.006	0.2120	<0.00100	<0.005	<0.005	<0.00500	<0.0010	<0.00500	0.01300	6.700	0.02400
	10/24/2007	442.0	<0.0002	<0.0002	8.87	48000	<10	<1	686.00	15.80	193.0	58.8	0.007	0.2100	<0.00100	<0.005	<0.005	<0.00500	<0.0010	<0.00500	0.00700	6.400	0.02900
SW-104 (0.3 ft)	1/25/2007	794.0	<0.0002	<0.0002	7.77	360	21	<10	237.50	33.40	58.7	52.1	<0.002	0.2080	0.00104	<0.003	<0.004	0.00580	<0.0010	0.01400	0.02440	N/A	0.07100
	4/17/2007	512.0	<0.0002	<0.0002	7.22	256	<10	<10	852.00	18.90	233.0	60.6	<0.002	0.1820	<0.00100	<0.003	<0.004	<0.00200	<0.0010	<0.00200	<0.00300	1.260	<0.00800
	7/24/2007	400.0	<0.0002	<0.0002	8.79	90	<10	<1	732.00	15.40	178.0	61.6	0.006	0.2110	<0.00100	<0.005	<0.005	<0.00500	<0.0010	<0.00500	0.01200	5.600	0.02400
	10/25/2007	445.0	<0.0002	<0.0002	8.74	59000	300	<1	696.00	16.20	193.0	60.2	0.007	0.2110	<0.00100	<0.005	<0.005	<0.00500	<0.0010	<0.00500	0.01500	7.300	0.03000
SW-105 (48 ft)	1/25/2007	792.0	<0.0002	<0.0002	7.49	820	91	<10	194.70	33.00	58.7	52.2	0.006	0.2300	<0.00100	<0.003	<0.004	<0.00200	<0.0010	0.05500	0.03850	0.039	0.06500
	4/17/2007	522.0	<0.0002	<0.0002	7.61	1660	160	<10	832.00	18.50	232.0	58.4	<0.002	0.1880	<0.00100	<0.003	<0.004	<0.00200	<0.0010	0.00787	0.18900	1.520	0.01140
	7/24/2007	400.0	<0.0002	<0.0002	8.77	80	<10	<1	734.00	15.20	177.0	60.3	0.006	0.2080	<0.00100	<0.005	<0.005	<0.00500	<0.0010	<0.00500	0.01200	5.200	0.02400
	10/25/2007	439.0	<0.0002	<0.0002	8.76	70000	<10	<1	710.00	16.30	196.0	60.4	0.007	0.2100	<0.00100	<0.005	<0.005	0.00500	<0.0010	<0.00500	0.00800	5.400	0.03000
SW-106 (0.3 ft)	1/25/2007	795.0	<0.0002	<0.0002	7.62	300	37	<10	275.60	34.00	59.5	53.2	0.005	0.2310	<0.00100	<0.003	<0.004	<0.00200	<0.0010	<0.00200	0.00862	N/A	0.01620
	4/17/2007	513.0	<0.0002	<0.0002	7.39	224	<10	<10	855.00	18.90	232.0	48.5	<0.002	0.1880	<0.00100	0.003	<0.004	<0.00200	<0.0010	0.00337	0.08970	0.816	0.02640
	7/24/2007	392.0	<0.0002	<0.0002	8.72	230	<10	<1	714.00	15.20	178.0	59.3	0.006	0.2080	<0.00100	0.007	<0.005	<0.00500	<0.0010	<0.00500	<0.00500	5.000	0.02500
	10/24/2007	443.0	<0.0002	<0.0002	8.81	132000	20	<1	686.00	15.80	195.0	58.6	0.007	0.2140	<0.00100	<0.005	<0.005	<0.00500	<0.0010	<0.00500	0.00700	9.000	0.02900
SW-107 (95 ft)	1/25/2007	794.0	<0.0002	<0.0002	7.52	960	113	<10	327.10	35.20	59.4	53.2	0.002	0.2370	<0.00100	<0.003	<0.004	<0.00200	<0.0010	<0.00200	0.00822	N/A	<0.00800
	4/17/2007	506.0	<0.0002	<0.0002	7.46	820	32	<10	852.00	18.70	231.0	43.3	<0.002	0.1860	0.00118	0.012	0.053	<0.00200	<0.0010	0.00432	<0.00300	0.958	<0.00800
	7/24/2007	405.0	<0.0002	<0.0002	8.64	180	10	<1	727.00	15.30	178.0	60.5	0.006	0.2090	<0.00100	<0.005	<0.005	<0.00500	<0.0010	<0.00500	0.01200	4.800	0.02400
	10/24/2007	449.0	<0.0002	<0.0002	8.80	96000	<10	<1	681.00	15.80	197.0	57.8	0.007	0.2110	<0.00100	<0.005	<0.005	<0.00500	<0.0010	<0.00500	0.00900	8.600	0.02900

RAI HYD-29

case to the ambient water temperature prior to simulating the discharge effects. The mixing-zone temperature excess for the discharge was then re-defined by decreasing the maximum allowable 3°F difference by the water temperature increase due to the discharge component; the discharge 93°F isotherm (only applicable for the max-T case) was defined based on the discharge-blowdown temperature and the ambient temperature incremented as described.

The two and a half-cycle (i.e., cycles of concentration) low-reservoir-temperature modeling scenario results in the largest mixing zone. Even for this case, the mixing zone is demonstrably small. Allowing for a maximum cross-stream diffuser extent of approximately 74 ft, less than four percent of the lake width is impacted by the mixing zone and discharge structure. See Subsection 5.3.2 for further details regarding the thermal plume's mixing zone.

5.2.3.4 Wastewater Discharge

Cooling Tower Blowdown

Maximum blowdown from the cooling towers is discharged into Lake Granbury at a rate of approximately 26,076 gpm for the site total (Table 3.4-2) (Subsection 3.4.2.2).

Details related to water quality of Lake Granbury are presented in Subsection 2.3.3. Three conditions were evaluated for concentration levels: at 2.4 cycles of concentration, diluted effluent at low flow, and diluted effluent at annual mean flow. Within each of these three conditions there are two evaluations: mean and maximum. Most of the mean and maximum trace metals concentrations are below the TCEQ Criteria for Specific Metals in Water for Protection of Aquatic Life. RAI HYD-29

The copper concentration is expected to be below the screening criteria for the mean concentration of 2.4 cycles of concentration and below the criteria for mean concentration when diluted at low flow. In addition, copper concentration is expected to be below the screening criteria for both maximum and mean concentrations at the annual mean flow. However, copper has the potential to exceed the TCEQ Criteria for Specific Metals in Water for the Protection of Aquatic Life as a result of the 2.4 cycle cooling tower operation for the maximum concentration. In addition, copper could exceed the screening level for maximum concentrations when mixed with Lake Granbury at low flow (based upon a very conservative projection.) The occurrences during which the screening level for copper may be exceeded are expected to be infrequent and brief and have no lasting effect. RAI HYD-29

Selenium was not detected above the detection limit for the TCEQ Criteria for Specific Metals in Water for Protection of Aquatic Life (0.005 mg/L). When half the detection limit was used to estimate concentrations that would result from CPNPP Units 3 and 4 2.4-cycle cooling tower operation, selenium was estimated to exceed the TCEQ Criteria for Specific Metals in Water for Protection of Aquatic Life and also for both the mean and maximum concentrations when mixed with Lake Granbury at low flow. However, selenium is expected to be reduced to concentrations less than the TCEQ standards for Specific Metals in Water for Protection of Aquatic Life at the edge of the mixing zone in Lake Granbury during the annual mean flow for both mean and maximum concentrations.

QUESTION NO.: TE-20 (5.3.3.2, 5.6.1)

Provide a description of the shoreline vegetation communities, and extent of each community type, along Lake Granbury and Possum Kingdom Reservoir. State what impacts are expected on these communities, and why, from the withdrawal of water to operate Units 3 and 4.

ANSWER:

Riparian vegetation grows in moist soils around bodies of water. Changes to the flow regime can negatively impact vegetation growing in marginal habitat. Vegetation around Possum Kingdom Lake has been characterized as riparian woodlands, savannahs, pasture, and emergent wetland (BRA 1988). In 1988, riparian woodland trees consisted of pecan, cedar elm, Texas sugarberry, black willow, cottonwood, and honey mesquite. Savannahs occur in upland areas and are dominated by grasses with an open crown cover of scattered trees. Trees in savannahs are Ashe juniper, honey mesquite, post oak, and cedar elm. Predominant grasses in pasture land are little bluestem, side oats grama and coastal Bermuda grass (BRA 1988).

A desktop survey was performed using aerial and infrared aerial photography. Hardwoods are discerned from Ashe juniper stands in infrared aerial photography as the hardwoods reflect a different frequency than do Ashe juniper. Regular aerial photography was used to discern developed areas and pasture. Savannah areas appeared to be few and may be disappearing as Ashe juniper density increases. Much of the riparian habitat appeared to be dense stands of Ashe juniper.

Because this desktop survey is an estimation, habitat types are ranked by abundance rather than quantified. Developed areas dominate the Possum Kingdom shoreline followed by hardwoods, Ashe juniper and then to a lesser extent grasses and savannah habitat. Emergent wetlands were impossible to pick out with the available maps but (BRA 1988) indicates emergent wetland areas are limited along the reservoir because the shoreline is steep and rocky.

Lake Granbury is much more developed than Possum Kingdom Lake (estimated 85% from aerial photography). The remaining riparian areas are comprised of what appears to be hardwood, Ashe juniper and some pasture or grassland habitat. Similar to Possum Kingdom Lake, the banks are steep and rocky, which are not conducive to fringe wetlands. Wetland areas are more likely in coves, which are few given the length of Lake Granbury.

With the two new units on line, drawdown has been predicted to be 1.3 feet lower on average in Possum Kingdom Lake. The maximum modeled change during periods of drought is 12.6 feet. Average drawdown in Lake Granbury is 0.4 feet. The maximum modeled change during periods of extreme drought in Lake Granbury is 2.5 feet.

Generally, cove areas are first affected by drawdown as coves tend to be shallower than the main portion of the lake. Ashe juniper habitat will not be affected by drawdown because junipers are drought resistant, upland trees. Hardwood trees such as pecans and cottonwoods may be minimally affected along the periphery of the riparian zone; however, the roots of trees tend to be very deep and they will be largely unaffected by temporary drawdown in the lake.

Wetland areas would be most affected by drawdown but as previously stated, emergent wetland areas are limited along the reservoir. In areas where wetlands do occur, drawdown will shift the littoral zone, which will allow aquatic macrophytes to colonize areas that were once too deep for light to reach. Although some wetland plants are likely to desiccate, no net decrease would be realized.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachments (on CD)

(BRA 1988) – "Environmental Assessment, Federal Energy Regulatory Commission, Office of Hydropower Licensing, Division of Project Review – Morris Sheppard Dam Water Power Project," FERC Project No. 1490-003—Texas, December 22, 1988

QUESTION NO.: TE-21 (5.1.1, 5.3.3.2, 5.6.1)

Potential terrestrial ecological and land-use impacts of the proposed BDTF, given that it could employ an evaporative spray system, might be similar to the proposed cooling towers with respect to salt drift, fogging, and icing. Consequently, the level of analysis to be conducted with respect to salt drift, fogging, and icing for the BDTF should be similar to that provided for the cooling towers.Therefore, provide an analysis of impacts for the BDTF similar to that provided in Section 5.3 of the ER. Specifically, the level of detail necessary (according to the ERSP Sections 5.1.1 and 5.3.3.2) includes with respect to salt, icing, and fogging:

- Isopleths of salt deposition at ground levels on a seasonal basis. Isopleths should extend to values at least as low as 1 kg/ha/mo
- A list and description of the important terrestrial species and habitats that may be affected by the BDTF
- Descriptions of natural and managed plant communities on the site and within offsite isopleths above 20 kg/ha/yr, including information on sensitivity of these communities to salt drift and deposition
- Annual precipitation and its dissolved solid concentration within the drift field
- Prediction of increased frequency and distribution of fog and icing

ANSWER:

Habitat in the area of the BDTF is predominately a low density Ashe juniper habitat. As defined by the ESRP, important habitat or species are not present in the area of the BDTF. All 400 acres of the BDTF are anticipated to be affected by the facility construction and operation. With a wind speed of 10 mph, salt drift has been measured to travel 1300 feet from the misting units (DOI 2004). Judicious placement of the misting units can leave a buffer of 1300 feet within the 400 acre BDTF. A 5-meter salt fence of shade cloth will line the BDTF perimeter to ensure salt drift is contained within the BDTF. A study performed in India by Turbomist, found that salt passing through shade cloth netting fell out within one meter of the net barrier (Turbomist 2010). Therefore, within the 400 acre BDTF, salt deposition will be above 20 kg/ha/yr, but outside the 400 acres, salt deposition is anticipated to be zero.

Salt deposition inside the 400 acre BDTF is anticipated in excess of 20 kg/ha/yr. Salt deposition outside the BDTF is anticipated to be 0 kg/ha/yr. In terms of salt deposition isopleths, the isopleth inside the BDTF will be over 20 kg/ha/yr and the isopleths outside the BDTF will be less than 1 kg/ha/yr. Because vegetation within the 400 acre BDTF will be removed during construction and salt deposition is not expected outside of the BDTF, no natural or managed plant communities will be affected by salt deposition during the operation phase. Dissolved solid concentration of annual precipitation within the drift field will not further affect the ecology of the BDTF because no plant communities are expected within the BDTF.

Fog is produced when warm saturated air is cooled. Cooler air does not support the same moisture concentration as warm air, so water condenses in small droplets. Conventional cooling towers produce visible plumes because the cooling tower exit flow is both saturated and warmer than ambient air. Lakes can produce "steam fog" by both warming and saturating air directly above the lake surface. As this air mixes with colder air, it cools and fog forms. This is the same mechanism as visible breath on cold days. Using the Fog Excess Water (FEW) Index, see Hicks, Argonne National Laboratory (Hicks, 1978), as a measure of the likelihood of steam fog to occur, it is evident that the potential for fog development is a function of the difference in temperature between the saturated pond vapor and the ambient background air. Data used to substantiate the FEW Index indicate that greater temperatures differences, typically exceeding 20°C (36°F), produce a greater degree of fogging. Water within the BDTF is expected to be warmer than ambient dry bulb temperatures during winter months. Models indicate the water will be at most 29°F above the ambient air temperature (MNES 2009). However, implying temperature is the only factor in fog formation is a bit of a generalization because humidity, dew point, and wind speed also affect steam fog formation.

The existence of the evaporation pond can produce steam fog even if the misters are not being operated. However, this fog is typically thin. The evaporation rate is modest because there is minimal waste heat as would be found in cooling ponds or cooling towers to drive evaporation. While the evaporation misters are in service, the rate of evaporation is as high as 5200 gpm. This evaporation requires a significant amount of energy, which is drawn from the lake water and the nearby air. The misters will saturate the local air, but they will also cool the air by evaporative cooling. After leaving the pond during mister operation, the saturated air will be warmed by ambient conditions, which will not cause fog. Therefore, the qualitative conclusion is drawn that mister operation will not cause fog.

This RAI requests a qualitative "prediction of increased frequency and distribution of fog and icing." For deposition from evaporation pond plumes and fogging, an attempt was made to bound the consequences using the cooling tower plume code SACTI (NUREG-1555 references papers by Carhart and Policastro that form the basis for SACTI).

Trial and error and evaluation of the source code for SACTI, shows that SACTI requires waste heat to avoid mathematic errors and successfully produce output. The SACTI code PREP.FOR produces warm, saturated exit flows that are more likely to produce visible plumes and fogging than the cold, saturated air expected from an evaporation pond. Therefore, the SACTI code is bounding and conservative for this purpose. However, use of a small waste heat (50 MW is the smallest that can be applied to this large surface area) produces too little evaporation (on the order of just 280 gpm instead of 5200 gpm). To match the desired evaporation rate requires around 900 MW and a large air flow rate (10,000 kg/s was used). The resulting plume is about 17°F warmer than the ambient air. This does provide plume predictions that are bounding, but believed to be unrealistic.

The results on an annual basis, using site meteorology and key assumptions are:

- an exit height of 1 m (0 m produced a mathematical error),
- 813 m diameter exit (to provide a surface area equivalent to a 2364 ft by 2364 ft square pond),
- 900 MW waste heat (to drive about 5200 gpm evaporation),
- 10,000 kg/s air flow (calculated by assuming a 5-mph wind and 10-foot high air layer over the 2364-ft wide pond), and
- 250,000 g/s of drift (calculated by assuming half of the non-evaporated water, or about 4000 gpm, becomes airborne drift).

The annual prediction of visible plumes is as follows. The small percentages of longer plumes are artifices of the assumed large heat rejection (no plumes longer than 100 m exist for the 50 MW waste heat case). Approximately 98 percent of the plumes are defined by category 1, 2 and 3 type plumes listed below.

Summary of Plume Predictions

98 Percent Freq Plumes; 900 MW Waste Heat Assumption

Category	Plume Length (m)	Plume Height (m)	Plume Radius (m)
1	98.40	47.9	18.70
2	414.10	108.4	27.10
3	138.90	109.7	45.60

Because the plume heights minus radius never equal zero, the SACTI code actually predicts zero fogging or icing (the plumes are lofted above the ground). Similarly, the total deposition of water and salt is predicted to be zero, even within the first 100 m. The 50 MW sensitivity case had a maximum plume length of 89 m. It also predicted zero fogging or icing, and zero deposition.

Summary of Plume Predictions

All Plumes; 50 MW Waste Heat Assumption

Category	Plume Length (m)	Plume Height (m)	Plume Radius (m)
1	48.80	10.2	5.60
2	88.20	17.5	6.40
3	89.20	43.0	11.90

The conclusion from the SACTI analysis is that plume formations are predicted within the first 500 m, but it is believed that the waste heat assumption necessary to generate sufficient evaporation rates cause the code to unrealistically over-estimate plume formation. At the same time, the heat assumption causes the warm plumes to rise, and the SACTI code predicts zero fogging, icing, or salt deposition from the plumes. With 50 MW assumed heat, the SACTI code under predicts evaporation and all visible plumes terminate within 90 m.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachments (on CD)

(Hicks 1978) – Hicks B.B. On the Prediction of Local Effects of Proposed Cooling Ponds. 2nd Conference on Waste Heat Management and Utilization. Miami Beach, Florida

(MNES 2009) – Temperature, Flow, Total Dissolved Solids, Thermal Stratification Impacts, and Aquatic Life Impacts in Lake Granbury During Winter Low Flow Conditions. Internal Report.

(DOI 2004) – Dept. of Interior, Bureau of Reclamation and Salton Sea Authority, "Salton Sea Salinity Control Research Project," August 2004

(Turbomist 2010) – "Setup Variables – Salt Drift and Netting Waste Water Evaporation Treatment Water Mister System," http://www.turbomister.com/setup/salt-drift-netting.php, printed February 8, 2010

QUESTION NO.: SOC-32 (4.4.1, 5.8.1, 5.8.2)

Provide the following information on recreation and property values:

- The approximate number of boat ramps and fixed boat docks and piers (public and private) on Lake Granbury and Possum Kingdom Lake.
- The range of water level elevations on Lake Granbury and Possum Kingdom Lake at which the existing boat ramps and fixed boat docks and piers (public and private) would become inaccessible for recreational use (i.e., "high and dry").
- The extent to which the water levels of Lake Granbury and Possum Kingdom Lake would be affected by the extraction of cooling water from Lake Granbury and how that would affect recreational and residential uses and property values along the shorelines of both lakes.

Provide information about the distribution of people, buildings, roads, and recreational facilities that are vulnerable to impact by plant operation

ANSWER:

- There are 6 public boat ramps and approximately 33 private boat ramps located on Lake Granbury, as well as 3,137 residential boat docks and 23 commercial marinas. There are 35 public boat ramps located on Possum Kingdom Lake, but the number of private boat ramps is unknown. There are also 1,995 residential boat docks and 56 commercial marinas on Possum Kingdom Lake.
- Modeling performed by Freese & Nichols (attached) addresses simulated lake elevations and exceedance frequency for Lake Granbury and Possum Kingdom Lake. The memo was included in Luminant letter TXNB-09087 submitted to the NRC on December 18, 2009 (ML093620032) in response to Question HYD-15. In September 2009, Lake Granbury reached an elevation of 688.9 ft msl, which was the lowest elevation of the lake since 1984. Three of the six public boat ramps were in operation with the lake at that elevation. Beyond the 2009 event, there is no data available to assess the impact on the docks and boat ramps. On Possum Kingdom Lake, many of the docks are floating docks and will be impacted less than the docks on Lake Granbury, which are generally of fixed construction.
- The Freese & Nichols modeling addresses the lake levels, but does not examine the affects of lake level on recreational and residential uses. Recreational use of Lake Granbury continued with only three of the six public boat ramps available during the lowest water level since 1984. No additional studies are available that specifically analyze the impact on recreational and residential uses during severe low water levels.

  Property values along the shorelines of both lakes are subject to many variables, including the recent significant downturn in the economy. It would be inappropriate and purely speculative to project what changes, if any, that the potential changes in lake water levels might have on property values.

During the public meeting on January 27, 2010, it was agreed between the NRC and Luminant that the last sentence in the question about the distribution of people, buildings, roads, and recreational facilities was extremely broad and did not require a specific answer.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachment (on CD)

Memorandum, J. S. Albright to B. Turner, Supplemental Information for NRC Request," December 15, 2009

Attachment 2

Supplemental Response to Request for Additional Information Regarding the Environmental Review

SUPPLEMENTAL RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak, Units 3 and 4

Luminant Generation Company LLC

Docket Nos. 52-034 and 52-035

RAI REGARDING THE ENVIRONMENTAL REVIEW

DATE OF RAI ISSUE: 6/29/2009

QUESTION NO.: HYD-13

The notes on the drawings CVL-12-11-101-001, CVL-12-11-102-001, CVL-12-11-103-001, CVL-12-11-104-001, CVL-12-11-105-001, CVL-12-11-106-001 and CVL-12-11-107-001 created some confusion and need to be closed out.

SUPPLEMENTAL INFORMATION:

These notes are no longer relevant to CVL-12-11-101-001 and have been removed from that drawing. Revision G of all other drawings associated with CVL-12-11-101-001 is provided for information only, because these drawings are issued as a package; so although the other drawings were not revised, they were elevated to Revision G.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachments

CVL-12-11-100-001, Revision G

CVL-12-11-101-001, Revision G

CVL-12-11-102-001, Revision G

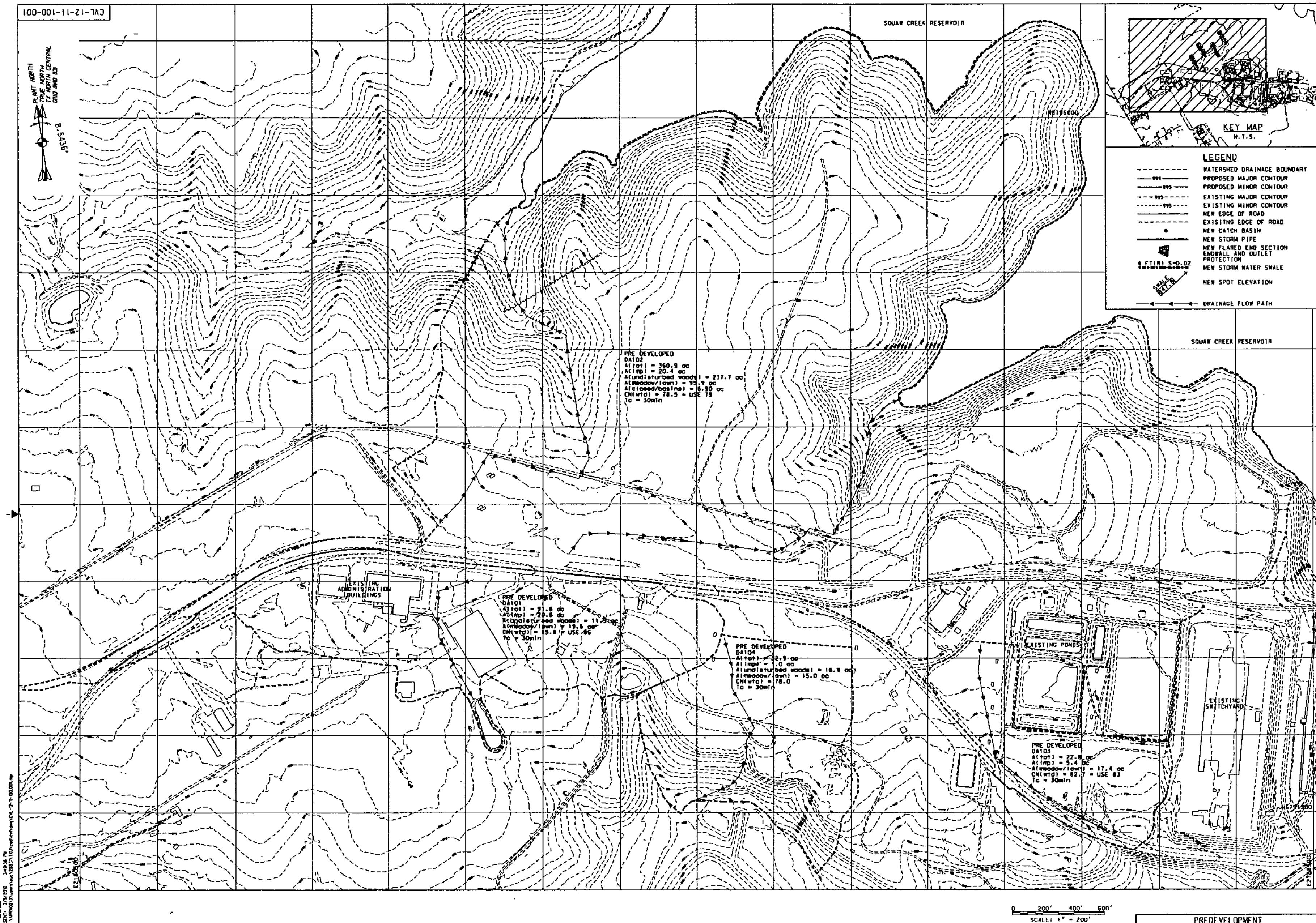
CVL-12-11-103-001, Revision G

CVL-12-11-104-001, Revision G

CVL-12-11-105-001, Revision G

CVL-12-11-106-001, Revision G

CVL-12-11-107-001, Revision G



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REVISION APPROVAL RECORD					
DISCIPLINE	BY	DATE	DISCIPLINE	BY	DATE
ARCH.			MECHANICAL		
CIVIL			NUCLEAR		
ELECTRICAL			PIPING		
ENVIRON.			PROCESS		
GEN. ARRANG.			QA / QC		
HVAC			STRUCTURAL		
I & C					

REV	DATE	REVISIONS	BY	CHKD
G	2/09/2010	REVISED PER E.B. AUDIT	NG	ERH
F	8/15/2008	ISSUED FOR FSAR	NG	ERH
E	7/10/2008	ISSUED FOR FSAR	NG	ERH
D	5/20/2008	REVISED CONCEPTUAL DESIGN	NG	ERH
C	9/14/2007	ISSUED FOR CONCEPTUAL DESIGN	NG	ERH
B	8/30/2007	ISSUED FOR CALCULATION SUBMISSION	NG	ERH
A	8/22/2007	ISSUED FOR IN-HOUSE REVIEW	NG	ERH

DRAWING STATUS				
ISSUED	REV	DATE	SUP	PEM
PRELIMINARY	6			
APPROVED FOR CONSTRUCTION				

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. DESTROY ALL PRINTS BEARING EARLIER DATE &/OR REV.NO.

PROJECT NO.: 28631
DRAWN: N.GANDHI DATE: 6/20/2007
CHECKED: H.HENDRICKS DATE: 7/10/2008
SCALE: 1"=200'

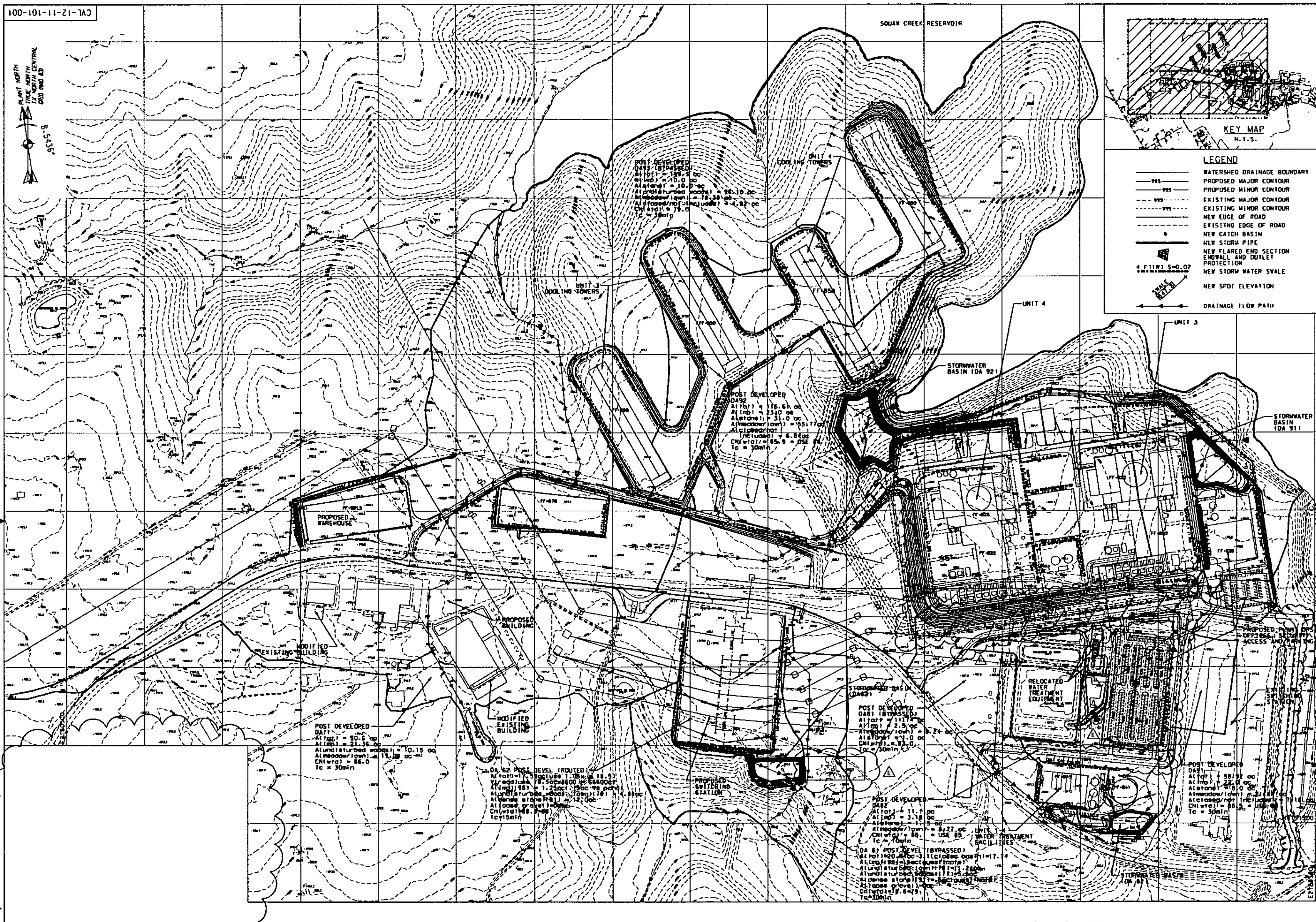
PREDEVELOPMENT DRAINAGE AREA MAP

LUMINANT / COMANCHE PEAK UNITS 3 & 4 MNES US - APWR

Washington Group International

DWG. NO. CVL-12-11-100-001 REV G

8 7 6 5 4 3 2 1



0 200' 400' 600'
SCALE: 1" = 200'

POST DEVELOPMENT DRAINAGE AREA MAP

LUMINANT /COMANCHE PEAK
UNITS 3 & 4
MNES US - APWR

Washington Group International

PROJECT NO.:	28031
DRAWN: N. GANDHI	DATE: 8/20/2007
CHECKED: R. HENDRICKS	DATE: 7/10/2008
SCALE:	1"=200'
DWG. NO.	CVL-12-11-101-001
REV	G

REVISION APPROVAL RECORD

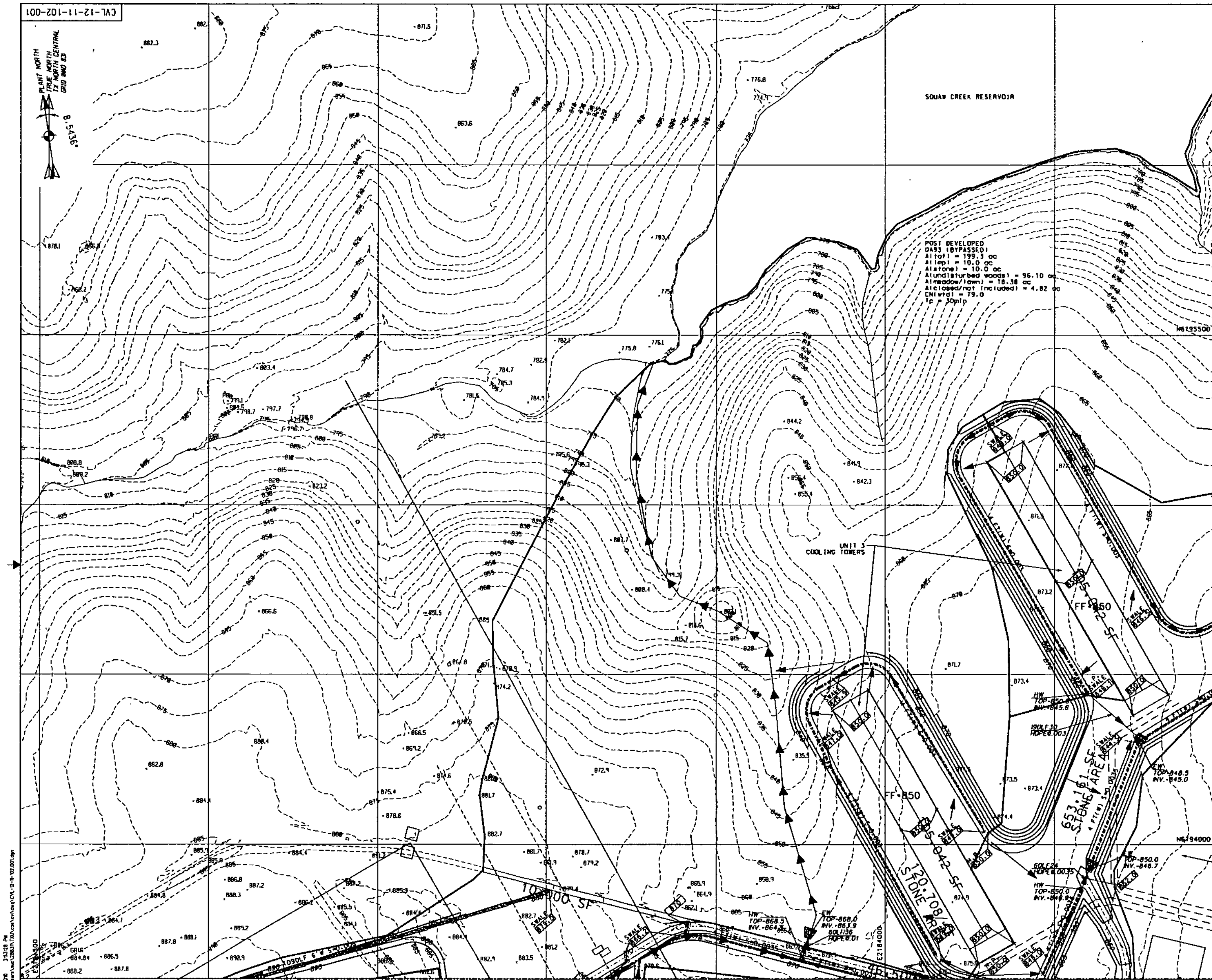
DISCIPLINE	BY	DATE	DISCIPLINE	BY	DATE
ARCH.			MECHANICAL		
CIVIL			NUCLEAR		
ELECTRICAL			PIPING		
ENVIRON.			PROCESS		
GEN. ARRANG.			QA / QC		
HVAC			STRUCTURAL		
I & C					

REV	DATE	REVISIONS	BY	CHKR
G	2/09/2010	REVISED PER E.R. AUDIT	NG	ERH
F	8/05/2008	ISSUED FOR FSAR	NG	ERH
E	7/10/2008	ISSUED FOR FSAR	NG	ERH
D	3/20/2008	REVISED CONCEPTUAL DESIGN	NG	ERH
C	9/14/2007	ISSUED FOR CONCEPTUAL DESIGN	NG	ERH
B	9/14/2007	ISSUED FOR CALCULATION SUBMISSION	NG	ERH
A	8/22/2007	ISSUED FOR IN-HOUSE REVIEW	NG	ERH

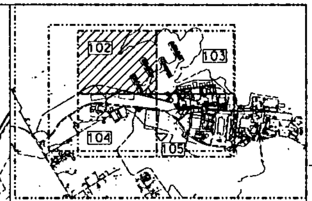
DRAWING STATUS

ISSUED	REV	DATE	SDE	PEM
PRELIMINARY	G			
APPROVED FOR CONSTRUCTION				

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. DESTROY ALL PRINTS BEARING EARLIER DATE &/OR REV.NO.



MATCHLINE - REFER TO DWG CVL-12-11-104-001



KEY MAP
N.T.S.

LEGEND

- WATERSHED DRAINAGE BOUNDARY
- 995 PROPOSED MAJOR CONTOUR
- 999 PROPOSED MINOR CONTOUR
- 995 EXISTING MAJOR CONTOUR
- 999 EXISTING MINOR CONTOUR
- NEW EDGE OF ROAD
- EXISITNG EDGE OF ROAD
- NEW CATCH BASIN
- NEW STORM PIPE
- NEW FLARED END SECTION ENDWALL AND OUTLET PROTECTION
- 4 FT(W) S=0.02 NEW STORM WATER SWALE
- SWALE 847.0 NEW SPOT ELEVATION
- DRAINAGE FLOW PATH

0 100' 200' 300'
SCALE: 1" = 100'

REVISION APPROVAL RECORD							REV	DATE	REVISIONS	BY	CHKD
DISCIPLINE	BY	DATE	DISCIPLINE	BY	DATE						
ARCH.			MECHANICAL								
CIVIL			NUCLEAR				G	2/05/2010	REVISED PER E.R. AUDIT	NG	ERH
ELECTRICAL			PIPING				F	8/05/2008	ISSUED FOR FSAR	NG	ERH
ENVIRON.			PROCESS				E	7/10/2008	ISSUED FOR FSAR	NG	ERH
GEN. ARRANG.			QA / QC				D	3/20/2008	REVISED CONCEPTUAL	NG	ERH
HVAC			STRUCTURAL				C	9/14/2007	ISSUED FOR CONCEPTUAL DESIGN	NG	ERH
I & C							B	8/30/2007	ISSUED FOR CALCULATION SUBMISSION	NG	ERH
							A	8/22/2007	ISSUED FOR IN-HOUSE REVIEW	NG	ERH

DRAWING STATUS				
ISSUED	REV	DATE	SOE	PEW
PRELIMINARY	G			
APPROVED FOR CONSTRUCTION				

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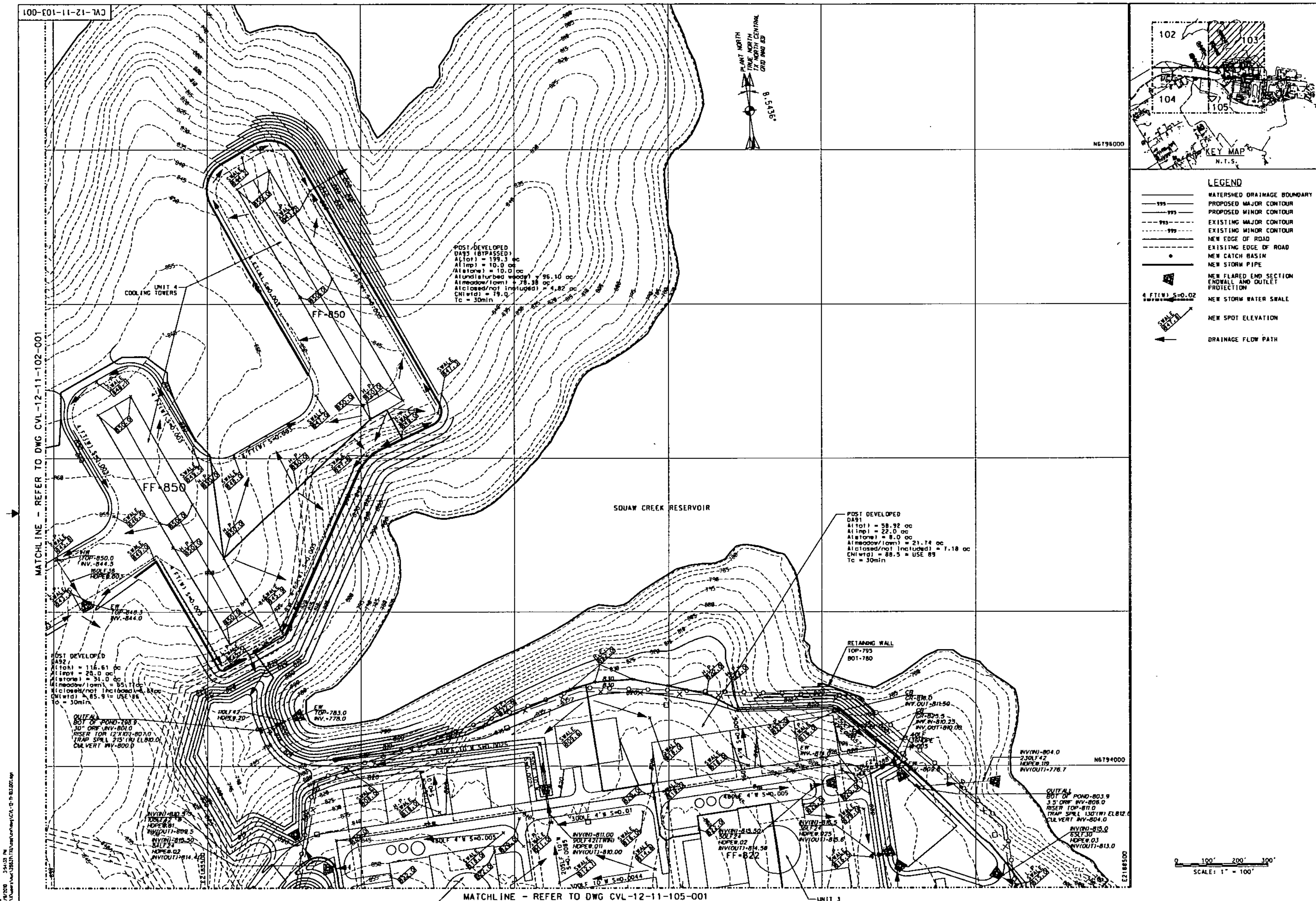
PROJECT NO.: 28031
DRAWN: N.GANDHI DATE: 8/21/2007
CHECKED: R.HENDRICKS DATE: 7/10/2008
SCALE: 1" = 100'

GRADING AND DRAINAGE PLAN
SHEET 1 OF 4

LUMINANT /COMANCHE PEAK
UNITS 3 & 4
MNES US - APWR

Washington Group International

DWG. NO. CVL-12-11-102-001 REV G



REVISION APPROVAL RECORD				REV	
DISCIPLINE	BY	DATE	DISCIPLINE	BY	DATE
ARCH.			MECHANICAL		
CIVIL			NUCLEAR		
ELECTRICAL			PIPING		
ENVIRON.			PROCESS		
GEN. ARRANG.			QA / QC		
HVAC			STRUCTURAL		
I & C					

REV	DATE	REVISIONS	BY	CHKR
G	2/09/2010	REVISED PER E.R. AUDIT	NG	ERH
F	8/06/2008	ISSUED FOR FSAR	NG	ERH
E	1/10/2008	ISSUED FOR FSAR	NG	ERH
D	3/20/2008	REVISED CONCEPTUAL DESIGN	NG	ERH
C	9/14/2007	ISSUED FOR CONCEPTUAL DESIGN	NG	ERH
B	8/30/2007	ISSUED FOR CALCULATION SUBMISSION	NG	ERH
A	8/22/2007	ISSUED FOR IN-HOUSE REVIEW	NG	ERH

DRAWING STATUS				
ISSUED	REV	DATE	SPE	PEM
PRELIMINARY	G			
APPROVED FOR CONSTRUCTION				

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PROJECT NO.: 28631

DRAWN: N.GANDHI DATE: 8/22/2007

CHECKED: R.HENDRICKS DATE: 7/10/2008

SCALE: 1" = 100'

GRADING AND DRAINAGE PLAN
SHEET 2 OF 4

LUMINANT /COMANCHE PEAK
UNITS 3 & 4
MNES US - APWR

Washington Group International

DWG. NO. CVL-12-11-103-001 REV G

LEGEND

———	WATERSHED DRAINAGE BOUNDARY
——995———	PROPOSED MAJOR CONTOUR
———995———	PROPOSED MINOR CONTOUR
- - - 995 - - -	EXISTING MAJOR CONTOUR
- - - - - 995 - - -	EXISTING MINOR CONTOUR
———	NEW EDGE OF ROAD
- - - - - -	EXISTING EDGE OF ROAD
•	NEW CATCH BASIN
━━━	NEW STORM PIPE
	NEW FLARED END SECTION ENDWALL AND OUTLET PROTECTION
4 FT(W) S=0.02	NEW STORM WATER SWALE
SWALE 847.8	NEW SPOT ELEVATION
←	DRAINAGE FLOW PATH

0 100' 200' 300'
SCALE: 1" = 100'

REV	DATE	REVISIONS	BY	CHKD
G	2/09/2010	REVISED PER E.B. AUDIT	NG	ERH
F	8/05/2008	ISSUED FOR FSAR	NG	ERH
E	7/18/2008	ISSUED FOR FSAR	NG	ERH
D	3/20/2008	REVISED CONCEPTUAL DESIGN	NG	ERH
C	8/14/2007	ISSUED FOR CONCEPTUAL DESIGN	NG	ERH
B	8/30/2007	ISSUED FOR CALCULATION SUBMISSION	NG	ERH
A	8/22/2007	ISSUED FOR IN-HOUSE REVIEW	NG	ERH

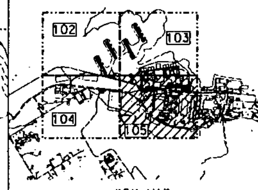
GRADING AND DRAINAGE PLAN
SHEET 3 OF 4

LUMINANT /COMANCHE PEAK
UNITS 3 & 4
MNES US - APWR

Washington Group International

PROJECT NO.: 29031
DRAWN: N.GANDHI DATE: 8/22/2007
CHECKED: R.HENDRICKS DATE: 7/10/2008
SCALE: 1" = 100'
DWG. NO. CVL-12-11-104-001 REV G

DRAWING STATUS: PRELIMINARY G
APPROVED FOR CONSTRUCTION
NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. DESTROY ALL PRINTS BEARING EARLIER DATE &/OR REV.NO.



KEY MAP
N.T.S.

LEGEND

- WATERSHED DRAINAGE BOUNDARY
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- NEW EDGE OF ROAD
- EXISTING EDGE OF ROAD
- NEW CATCH BASIN
- NEW STORM PIPE
- NEW FLARED END SECTION ENDWALL AND OUTLET PROTECTION
- 4 FT(W) S=0.02 — NEW STORM WATER SWALE
- NEW SPOT ELEVATION
- NEW SPOT ELEVATION

SCALE: 1" = 100'

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REVISION APPROVAL RECORD				REV	
DISCIPLINE	BY	DATE	DISCIPLINE	BY	DATE
ARCH.			MECHANICAL		
CIVIL			NUCLEAR		
ELECTRICAL			PIPING		
ENVIRON.			PROCESS		
GEN. ARRANG.			QA / QC		
HVAC			STRUCTURAL		
I & C					

REV	DATE	REVISIONS	BY	CHKD
G	2/09/2010	REVISED PER E.R. AUDIT	NG	ERH
F	8/05/2008	ISSUED FOR FSAR	NG	ERH
E	7/10/2008	ISSUED FOR FSAR	NG	ERH
D	3/20/2008	REVISED CONCEPTUAL DESIGN	NG	ERH
C	9/14/2007	ISSUED FOR CONCEPTUAL DESIGN	NG	ERH
B	8/30/2007	ISSUED FOR CALCULATION SUBMISSION	NG	ERH
A	8/22/2007	ISSUED FOR IN-HOUSE REVIEW	NG	ERH

DRAWING STATUS				
ISSUED	REV	DATE	SHE	PEN
PRELIMINARY	G			
APPROVED FOR CONSTRUCTION				

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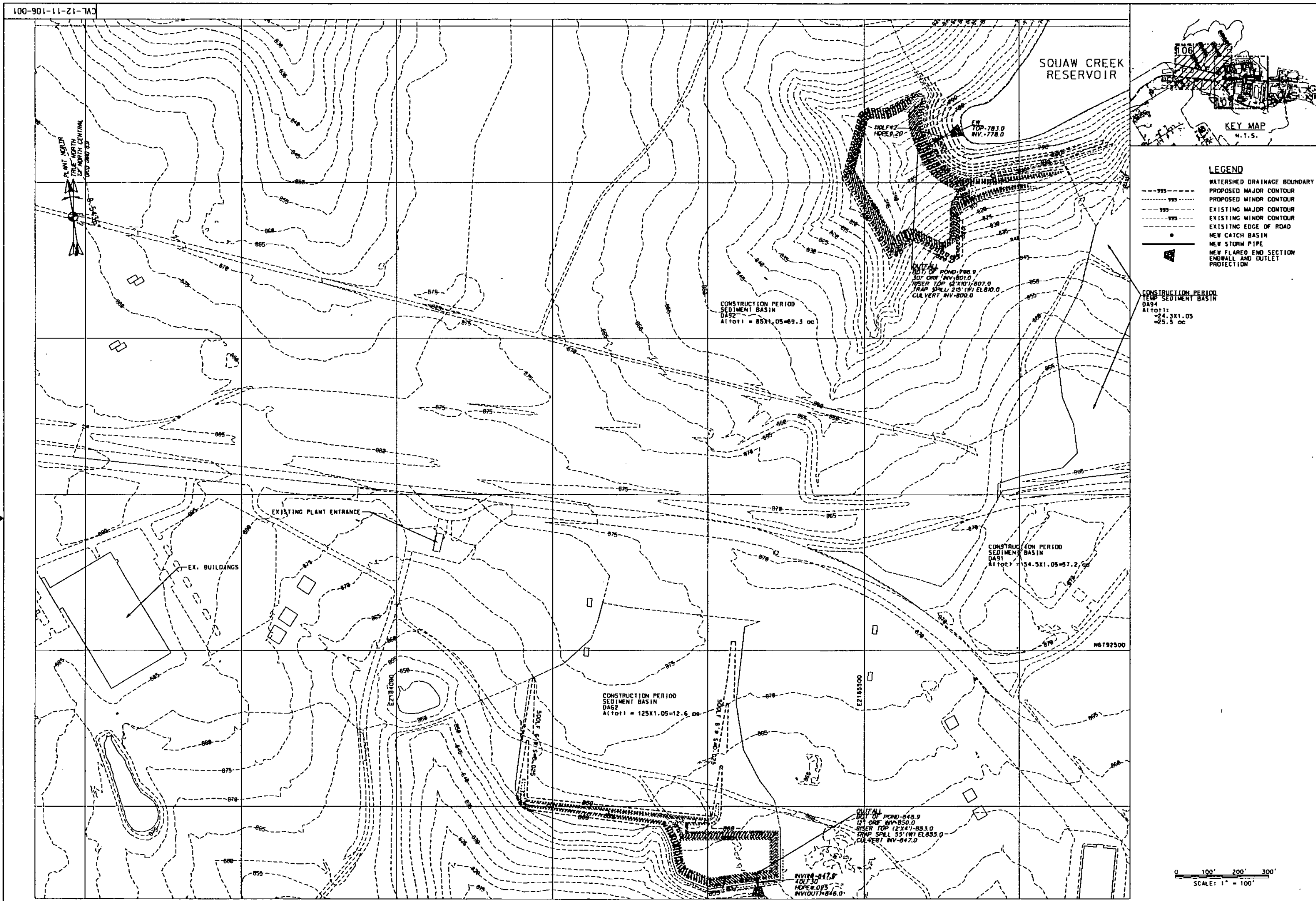
PROJECT NO.: 28831
DRAWN: N.GANDHI DATE: 8/22/2007
CHECKED: R.HENDRICKS DATE: 7/10/2008
SCALE: 1" = 100'

GRADING AND DRAINAGE PLAN
SHEET 4 OF 4

LUMINANT /COMANCHE PEAK
UNITS 3 & 4
MNES US - APWR

Washington Group International

DWG. NO. CVL-12-11-105-001 REV G



REVISION APPROVAL RECORD				REV		REV NO.	DATE	REVISIONS	BY	CHKR
DISCIPLINE	BY	DATE	DISCIPLINE	BY	DATE					
ARCH.			MECHANICAL							
CIVIL			NUCLEAR			G	2/05/2010	REVISED PER C.R. AUDIT	NG	ERH
ELECTRICAL			PIPING			F	8/05/2008	ISSUED FOR FSAR	NG	ERH
ENVIRON.			PROCESS			E	7/18/2008	ISSUED FOR FSAR	NG	ERH
GEN. ARRANG.			QA / QC			D	3/20/2008	REVISED CONCEPTUAL DESIGN	NG	ERH
HVAC			STRUCTURAL			C	9/14/2007	ISSUED FOR CONCEPTUAL DESIGN	NG	ERH
I & C						B	8/30/2007	ISSUED FOR CALCULATION SUBMISSION	NG	ERH
						A	6/22/2007	ISSUED FOR IN-HOUSE REVIEW	NG	ERH

DRAWING STATUS				
ISSUED	REV	DATE	SDE	PEM
PRELIMINARY	G			
APPROVED FOR CONSTRUCTION				

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PROJECT NO.: 28031

DRAWN: W.CARCHI — DATE: 6/22/2007

CHECKED: R.HENDRICKS — DATE: 7/18/2008

SCALE: 1"=100'

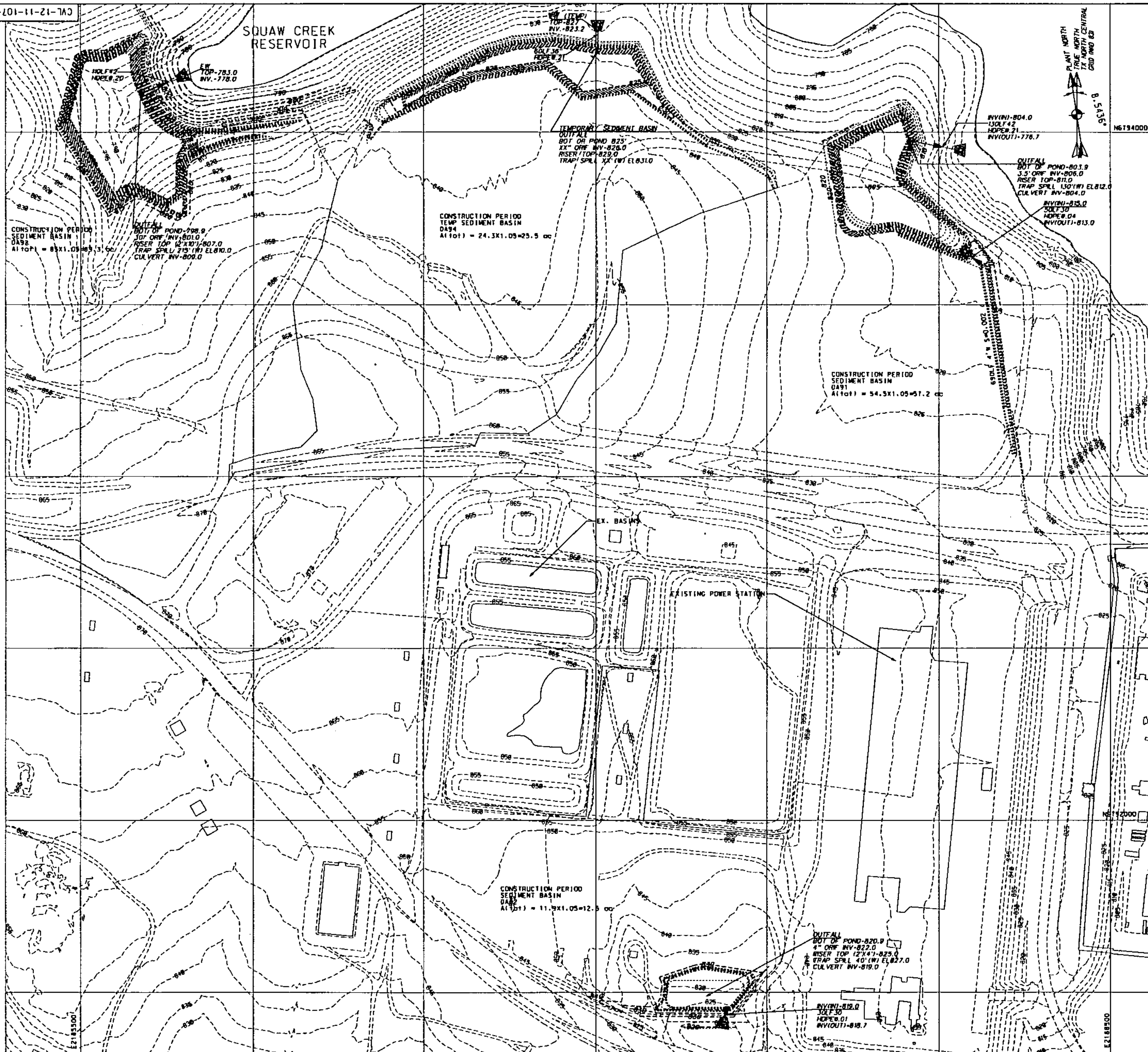
CONSTRUCTION PERIOD GRADING AND DRAINAGE PLAN

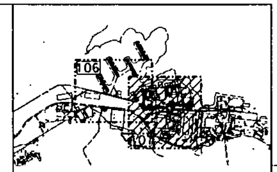
SHEET 1 OF 2

LUMINANT / COMANCHE PEAK
UNITS 3 & 4
MNES US - APWR

Washington Group International

DWG. NO. CVL-12-11-106-001 — REV G





KEY MAP
N.T.S.

LEGEND

- WATERSHED DRAINAGE BOUNDARY
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING EDGE OF ROAD
- NEW CATCH BASIN
- NEW STORM PIPE
- NEW FLARED END SECTION ENDWALL AND OUTLET PROTECTION

0 100' 200' 300'
SCALE: 1" = 100'

REVISION APPROVAL RECORD				REV	
DISCIPLINE	BY	DATE	DISCIPLINE	BY	DATE
ARCH.			MECHANICAL		
CIVIL			NUCLEAR		
ELECTRICAL			PIPING		
ENVIRON.			PROCESS		
GEN. ARRANG.			QA / QC		
HVAC			STRUCTURAL		
I & C					

NO.	DATE	REVISIONS	BY	CHKR
G	2/09/2010	REVISED PER E.R. AUDIT	NG	ERH
F	8/05/2008	ISSUED FOR FSAR	NG	ERH
E	7/10/2008	ISSUED FOR FSAR	NG	ERH
D	3/20/2008	REVISED CONCEPTUAL DESIGN	NG	ERH
C	9/14/2007	ISSUED FOR CONCEPTUAL DESIGN	NG	ERH
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A	8/22/2007	ISSUED FOR IN-HOUSE REVIEW	NG	ERH

DRAWING STATUS				
ISSUED	REV	DATE	SUP.	PEM
PRELIMINARY	G			
APPROVED FOR CONSTRUCTION				

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. DESTROY ALL PRINTS BEARING EARLIER DATE &/OR REV. NO.

PROJECT NO.: 26031
DRAWN: N.GANDHI DATE: 8/22/2007
CHECKED: R.HENDRICKS DATE: 7/10/2008
SCALE: 1"=100'

CONSTRUCTION PERIOD GRADING AND DRAINAGE PLAN

SHEET 2 OF 2

LUMINANT /COMANCHE PEAK
UNITS 3 & 4
MNES US - APWR

Washington Group International

DWG. NO. CVL-12-11-107-001 REV G

QUESTION: HYD-15

Output files have short hand (i.e. acronyms) that the NRC cannot figure out. They would like a glossary of the short hand used. They also need guidance on which input files correspond to which scenarios. The request was expanded during the January 27, 2010 Public Meeting held in the NRC's Rockville, MD offices.

SUPPLEMENTAL INFORMATION:

This question is answered in the Freese and Nichols Memorandum provided as Attachment 1. Attachment 1 refers to Attachments A, B, and C, which are also included.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachments (on CD)

Attachment 1 – Memorandum, J. S. Albright to B. Turner, "Additional Information on FNI Modeling," February 18, 2010

Attachment A – WAM Files (native)

Attachment B – Historical Outflows from Lake Granbury

Attachment C – Net Reservoir Evaporation Rates

Attachment 3

List of Files Provided on the Enclosed CD

List of Files Provided on the Enclosed CD

ER Question	File Extension Name	Name of Document	Type of Document
ATTACHMENT 1			
GEN-09	SANITARY WASTE CHEM USE_REV 1 02_18_2010.PDF	Comanche Peak Power Plant - Sanitary Waste Treatment, Estimated Chemical Composition and Sludge Production	Spreadsheet
GEN-11	Attachment 1.pdf	Assessing changes in biomass, productivity, and C and N stores following Juniperus virginiana forest expansion into tall grass prarie	Report
	Attachment 2.pdf	Temporary Best Management Practices	Summary
HP-04	Singleton 1982	Effects of Temperature and Salinity on Vibrio cholera Growth	Report
HYD-25	Attachment 1.pdf	HYD-25 Water Laws and Water Rights	Memorandum
	Attachment A.pdf	Water Rights Associated with CPNPP	Certificate
	Attachment B.pdf	List of Brazos Basin Water Rights in Priority Order	Summary Table
HYD-26	Attachment 1.pdf	HYD-26 Wheeler Branch Reservoir	Memorandum
	Attachment A.pdf	Wheeler Branch Operation Study at Full Demand	Data Tables
	Attachment B.zip	Operation Study Files	Input Files (Native Files)
	Attachment C.pdf	Wheeler Branch Water Right	TCEQ Permit to Appropriate State Water
	Attachment D.pdf	Wheeler Branch Operation Study without Luminant Demand	Data Tables
HYD-29	Comanche Peak Water Quality Data.pdf	Compounds Measured in Lake Granbury, Rev. 1	Two page excel spreadsheet evaluation
TE-20	BRA 1988	Environmental Assessment, Federal Energy Regulatory Commission, Office of Hydropower Licensing, Division of Project Review	Report
TE-21	Hicks 1978	Hicks B.B. On the Prediction of Local Effects of Proposed Cooling Ponds	Conference report
	MNES 2009	Temperature, Flow, Total Dissolved Solids, Thermal Stratification Impacts, and Aquatic Life Impacts in Lake Granbury During Winter Low Flow Conditions	Internal report
	DOI 2004	Salton Sea Salinity Control Research Project	Report
	Turbomist 2010	Set-up Variables - Salt Drift and Netting Waste Water Evaporation Treatment Water Mister System	Website Information
SOC-32	Memorandum Dec 15.pdf	F&N Supplemental Information for NRC Request, December 15, 2009	Memorandum
ATTACHMENT 2			
HYD-15	Attachment 1.pdf	F&N Additional Information on FNI Modeling Feb.18, 2010	Memorandum
	Attachment A.zip	Att A cut off Model Used for RiverWare Input Att A No Units 3 and 4 Model Used in Ward Report	WAM Files (Native Files)
	Attachment B.pdf	Historical Outflows from Lake Granbury	Data Tables
	Attachment C.pdf	Net Resevior Evaporation Rates	Data Tables