Tennessee Valley Authority
Regulatory Submittal for Kingston Fossil Plant

Documents submitted:
Mechanical Dewatering for Treatment of Ash Pond Fines Work Plan
Geosyntec concurrence with Work Plan

Date Submitted:
12/11/2009

Submitted to whom
Leo Francendese

Concurrence

Received	Not Applicable	TVA
☒	☐	Mike Scott
☐	☒	Steve McCracken
☒	☐	Kathryn Nash
☒	☐	Dennis Yankee
☒	☐	Michelle Cagley
☒	☐	Tim Russ
☒	☐	Steve Cherry

Received	Not Applicable	Jacobs
☐	☒	John Moebes
☐	☒	Julie Pfeffer
☒	☐	Bob Lewis
☐	☐	_____
☐	☐	_____
☐	☐	_____

Approvals

TVA Michael T Scott Date 12/11/09

EPA Leo F Date 12/11/09

Consulted w/ TDEC

cc:

- ☒ Anda Ray, TVA
- ☒ Barbara Scott, TDEC
- ☒ Leo Francendese, EPA
- ☒ Mike Scott, TVA
- ☒ Dennis Yankee, TVA
- ☒ Kathryn Nash, TVA
- ☒ Cynthia Anderson, TVA
- ☒ Steve McCracken, TVA
- ☒ EDM
- ☒ Julie Pfeffer, Jacobs
- ☒ David Stephenson, TVA
- ☒ Michelle Cagley, TVA
- ☒ Greg Signer, TVA
- ☒ KIF Incident Document Control
- ☒ Katie Kline, TVA
- ☒ Gretchen Wahl, Jacobs
- ☒ Dannena Bowman, EPA
- ☒ Jeff Gary, Jacobs
- ☒ Robert Pullen, Jacobs

WORK PLAN

Mechanical Dewatering for Treatment of Ash Pond Fines

1.0 Purpose of Work

This plan is to describe the work required to construct and operate facilities for mechanical dewatering. Two mechanical dewatering methods have been selected to treat the TVA Ash Pond fines coming from a 10", 12" and 14" TVA dredges. Both methods will be mobilized in modular units and require site preparation prior to mobilization. Both systems will be operated but the operation may vary with time. One may be used preferentially over another or both may be operated concurrently.

2.0 Design

The filter press operation authorized for the project is designed to process between approximately 2000 and 4000 cy a day. At times, operations may be 24 hours a day. Based on two sets of treatability studies run and based on the contractor's experience, the presses will produce a filter cake with a solids content averaging between 70 and 72%. These plate and frame presses will be placed in the southern end of the ballfield. The effluent pipe from the dredge will be pumped to the influent tanks. The filters will be operated in sequence so some are pressing while others are being cleaned. The filter cake will typically be offloaded directly into stockpiles in the ballfield that are considered ready for loading. Wash water and effluent from the presses will be directed back into the rim ditch or sluice trench for treatment. A mass balance and simple flow diagram for the filter press system is attached.

Genesis [Genesis Fluid Solutions, Inc. Rapid Dewatering System (RDS)] is a modular system that separates out large particles, then feeds a polymer treatment into the flow to coagulate the solids and then dewaters the solids on a traveling screen. One 5-module unit, the system authorized for the project, can handle a dredge flow of about 3000 gallons per minute (gpm), returning about 2500 gpm from the unit back to the end of the sluice trench. The sludge coming off the RDS unit is expected to be about 50% solids, with sufficient additional water draining from it over a 24-36 hour period to increase the solids content to about 75%. This material will be stored near other material requiring additional processing by Sevenson. The water draining from that material would be collected and conveyed back to the Sluice Trench, as will water coming off the RDS unit. As with the filter presses, the Genesis unit will be placed in the southern end of the ballfield. A flow diagram for the Genesis system is attached.

The location of the two dewatering systems is illustrated in a third attachment. The Genesis System requires a space of approximately 150' X 150'. The filter presses will require an area of approximately 225' X 250'. An underlying foundation will be placed. The area will require grading and placement of stone for foundation.. Improvements to the surrounding ditches will be constructed. An access road for polymer and fuel will be installed between the perimeter ditch and dewatering systems as shown on the drawing. The elevation of the "working base" of the ball field is to be modified to effect drainage and to achieve foundation strength requirements for each of the modular treatment components.

The proposed design for the foundation supporting the Genesis RDS and the filter press system consists of geotextile fabric, geogrid, and 24” of crushed stone compacted in 8” lifts per attached sketch. Part of the pad under the filter presses will be paved with asphalt.

Because the systems are being placed on ash, an analysis of the underlying ash stability has been conducted by the engineer of record, Geosyntec. That analysis showing no concern with placing the units on the ash has been conducted. An e-mail from the engineer showing concurrence with the selection of the site is attached. The stability analysis calculations are available upon request.

3.0 Construction

The abundance of activity in the area will require close coordination among all contractors. In addition to the regular traffic associated with ash processing and movement, delivery of the stone for the construction will add to the density of traffic and other movement of equipment.

Grading and a base will be conducted first and the drainage corrected. It is anticipated that the filter presses will be installed first, followed by the Genesis. Pipelines will be laid once the systems are in place. Power will be supplied by several portable generators that will be fueled with an onsite fuel truck.

4.0 Maintenance

The ditches and pipes that are constructed for drainage will be routinely maintained to allow positive drainage. The road will also be periodically regraded, as needed. Polymer for the Genesis system will be stored at the site and refilled from a periodic delivery truck. The Genesis has minimal moving parts but will be maintained by the onsite personnel. The filter presses have agitators, fast feed pumps, press rams, and conveyors that will require periodic maintenance. An onsite mechanic will be available to maintain the moving parts of the filter press system.

5.0 Schedule

The work outlined began on 12-07-09 with geogrid and rock placement being authorized via e-mail. The work will be completed and the systems will be operational by early January 2010.

6.0 Waste Management

The primary waste generated from dewatering activities is the effluent from the dewatering systems as well as any wash water. This water is anticipated to be fairly low in solids but it will be discharged into the sluice trench for settling.

7.0 Health and Safety

All construction and operation activities will be done in accordance with site wide Health and Safety Plan. As noted above, increase in activity throughout the ball field during construction will require very close coordination among the participants. Foot traffic in and around the area will increase significantly requiring a greater awareness on the part of the equipment operators. Work in close proximity of the operating equipment will be specifically addressed in the Job Safety Analysis

Sediment Processing Using De-sanders Followed By Filter Presses
Sevenson Environmental Services, Inc

Project Name: TVA Ash Pond Fine Removal
Date: 10/14/2009
Revision: 1

RECESSED FILTER PRESS OPTION

11 Weeks
66 Days

Insitu Material

Volume, cubic yards	**270,900**	3,225
Oven Dry Solids, %	32.00%	
Specific Gravity	1.22	
Density, tons per cubic yard	**1.025**	
Silt and Finer Mass, dry weight	**99.50%**	
Sand and Coarser Mass, dry weight	**0.50%**	

Filter Press Inputs

Silt and Finer Mass, Dry tons	88,394	
Cake Oven Dry Solids, %	**72.27%**	
Cake Density, tons per cubic yard	**1.43**	
Cycle Time, minutes	**90**	
On- Line Factor, %	85%	Total CF
Press Size, cubic feet per drop	**219.00**	2,628
Number of Presses	**12.00**	
Feed Oven Dry Solids, %	**15.00%**	
Available Operating Hours, hours/day	24	
Available Operating Days, days/week	6	
Dry Additives, lbs per gallon	0	
Filtrate Solids, ppm	50	

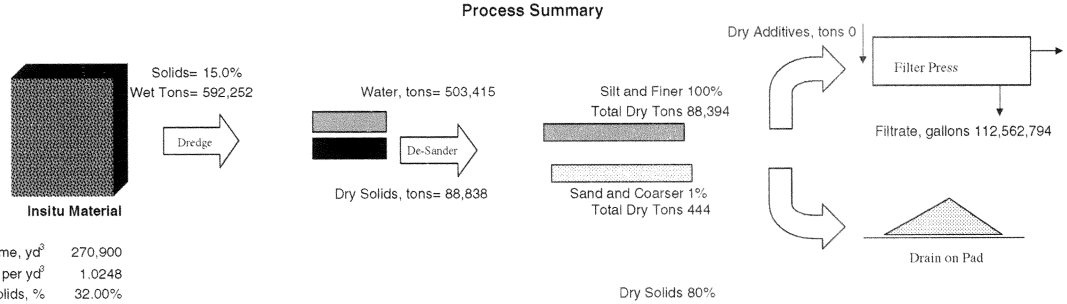
Process Calculations

		Daily	Weekly
De-sander Material Removal, dry tons	444	Offsite	Offsite
Gravity Drained Sand Dry Solids, %	80%	T & D	T & D
De-sander Material Removal, wet tons	555	9	43
Filter Cake Production, total wet tons	122,310	1890	9451
Filter Cake Production, tons/operating day	**1,890**	**1,899**	**9,494**
Operating Days, days	65	3.24	Months
Job Production Duration, weeks	10.78	0.54	Years
Filtrate Drain Water Prod, gallons per day	1,739,644		
Filtrate Drain Water Production total gallons	112,562,794		
Average Filtrate Drain Water Prod (gpm)	1,421	**Average CY/HR Dredged**	
Designed WWT Water Production (gpm)	**5000**	**20Hrs**	**24 Hrs**
CY / Day Insitu	**4187**	**209**	174
Dry Tons / Day	**1373**	Assume 75% Dredge Up Time	
CY / Week Insitu	**20,934**		

T&D FOR BIDING	122,866 Tons
Total Cake & Sand	86,022 CY
Filter Cake	**85,651** CY
Sand	**370** CY

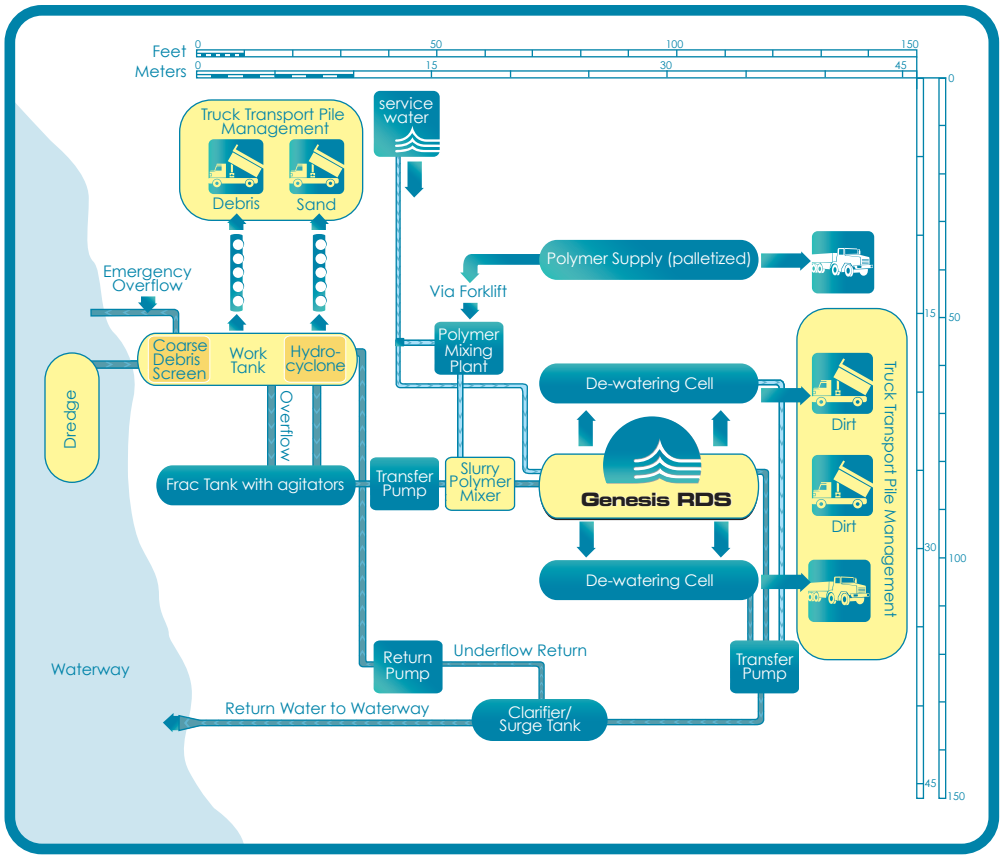
T&D NO Contingenc **122,866 Tons**

Process Summary



Insitu Material

Volume, yd^3	270,900
Density, tons per yd^3	1.0248
Dry Solids, %	32.00%
Dry Solids, tons	88,838
Sediment Mass, wet tons	277,618


Feet
Meters
0
50
100
150
0
15
30
45
Truck Transport Pile Management
Debris
Sand
service water
Emergency Overflow
Dredge
Coarse Debris Screen
Work Tank
Hydro-cyclone
Overflow
Frac Tank with agitators
Transfer Pump
Slurry Polymer Mixer
Polymer Mixing Plant
Via Forklift
Polymer Supply (palletized)
De-watering Cell
Genesis RDS
De-watering Cell
Dirt
Dirt
Truck Transport Pile Management
Transfer Pump
Return Pump
Underflow Return
Clarifier/ Surge Tank
Return Water to Waterway
Waterway
15
30
45
0
50
100
150

From: Pfeffer, Julie
Sent: Thursday, December 10, 2009 5:00 PM
To: McDermott, Mary F
Subject: FW: WORK PLAN-BALLFIELD-1.docx

From: RBachus@Geosyntec.com [RBachus@Geosyntec.com]
Sent: Wednesday, December 09, 2009 7:11 AM
To: rdenton@tva.gov
Cc: Howard, Jack
Subject: Re: WORK PLAN-BALLFIELD-1.docx

Jack and Randy: I was unable to get to a "real" internet connection last night and this morning. I will send a more formal e-mail this afternoon when back in the office. However, based on review of the Work Plans for the dewatering systems and the information provided to us regarding the anticipated loading, we have performed geotechnical analyses (slope stability, bearing capacity, and settlement) for placing the proposed systems at the southern end of the Ball Field site. Geosyntec concurs with this site location, as the calculation results indicate that the subsurface conditions provide adequate resistance and can safely support the proposed components and systems. I will follow up with a more formal acknowledgment this afternoon.
Bob

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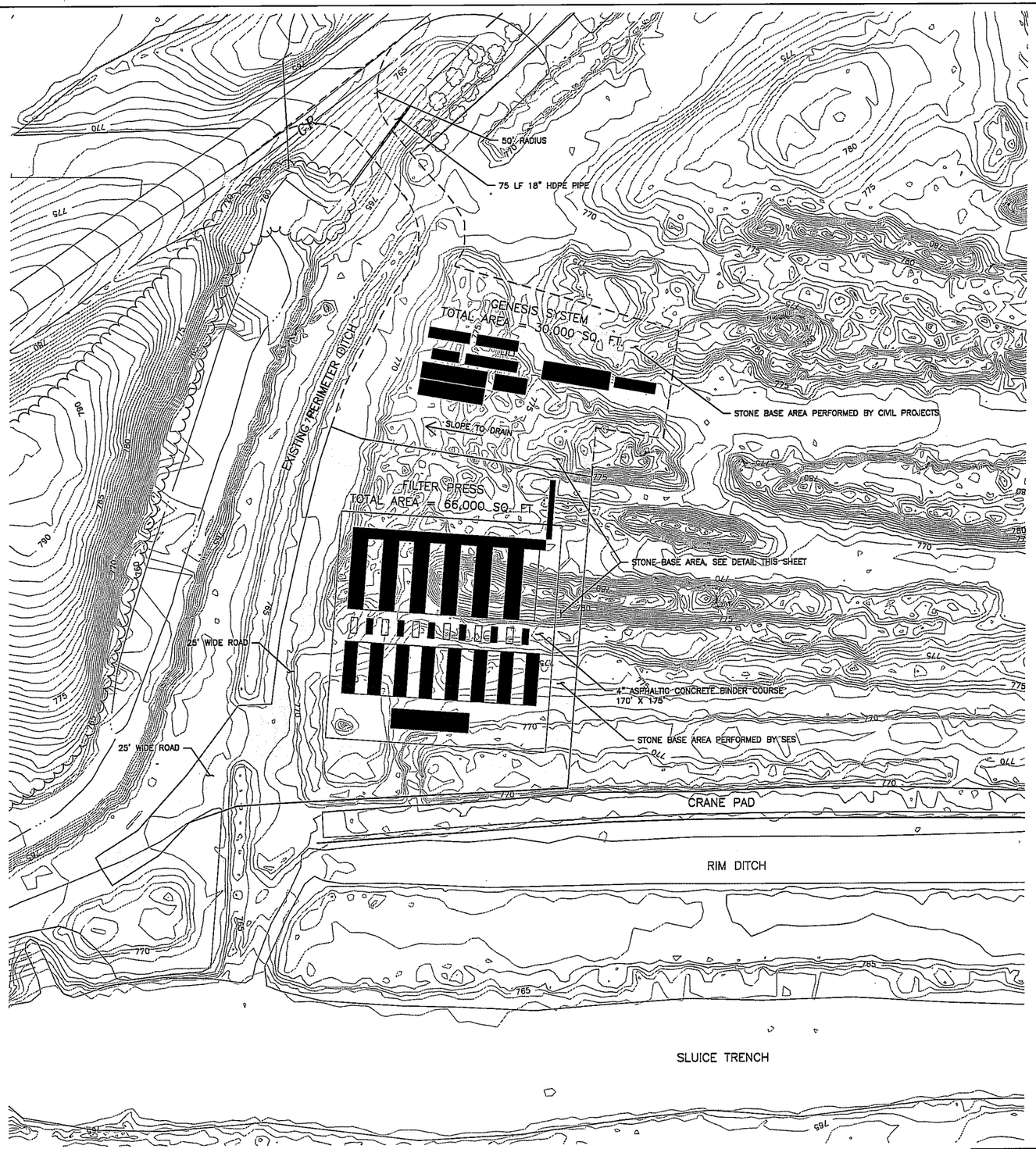
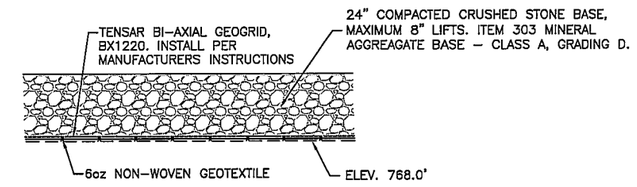
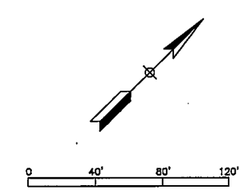


PLAN
SCALE: 1"=40'



STONE BASE SECTION
NOT TO SCALE



REVISION NO.	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
A	12/09/09	ISSUED FOR CONSTRUCTION		

SEAL

JACOBS

KINGSTON FOSSIL PLANT
TENNESSE VALLEY AUTHORITY

GENESIS AND FILTER PRESS
LOCATION PLAN

SCALE	DRAWING NO.	REV.
SHOWN	INF-SK-041	A