From:	Figgures, Sharon Mclin
To:	Vojin Janjic
Cc:	Water Permits; Angela Adams; Rob Burnette; James Clark; Pat Flood; Caleb Nelson; Judy Low; Christopher Vail; Robert S. Wilkinson; Lees, Britta; Pearman, Paul Jonathan
Subject:	[EXTERNAL] TVA - KIF Pore Water Extraction Pilot
Date:	Monday, July 24, 2023 12:23:18 PM
Attachments:	image001.png image002.png image003.png image004.png image005.png image006.png image007.png image008.png

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Please find attached your copy of the subject.

Thanks

Sharon

Sharon Figgures
Business Support Representative
Regulatory Environmental Programs

TENNESSEE VALLEY AUTHORITY

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1101 Market Street, Chattanooga, TN 37402

TENNESSEE VALLEY AUTHORITY

1101 Market Street, BR 2C, Chattanooga, Tennessee 37402

Sent Via Electronic Transmittal

July 24, 2023

Mr. Vojin Janjić (Vojin.Janjic@tn.gov)
Division of Water Resources (water.permits@tn.gov)
Tennessee Department of Environment
and Conservation (TDEC)
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243

Dear Mr. Janjić:

TENNESSEE VALLEY AUTHORITY (TVA) – KINGSTON FOSSIL PLANT (KIF) – NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NO. TN0005452 – PORE WATER EXTRACTION PILOT PROJECT

TVA proposes a short duration, pore water extraction pilot project at KIF's Sluice Trench and Area East of Sluice Trench to determine efficacy of the extraction method and evaluate opportunities for further use in support of the TDEC Commissioner's Order OGC 15-0177 (TDEC Order). The TDEC Order sets forth a "process for the investigation, assessment, and remediation of unacceptable risks" at TVA's coal ash disposal sites in Tennessee. The Corrective Action/Risk Assessment (CARA) Plan will be prepared pursuant to the TDEC Oder to evaluate whether unacceptable risks related to management of coal combustion residual (CCR) material exist at the KIF Plant and specify the actions TVA plans to take at the CCR management unit and the basis of those actions. The proposed pilot project would better inform the evaluation of methods proposed for use in KIF's CARA Plan for this and potentially other CCR units. The pore water extraction pilot test results would be discussed in the CARA Plan.

The proposed pilot consists of one observation well and one vertical extraction well installed in the Sluice Trench and Area East of Sluice Trench, operating short term for no more than 45 days, and pumping water at low flow rates between 15 and 23 gallons per minute (not continuous). Extracted pore water would be pumped via a 3-phase/240-volt submersible pump to baffled frac tanks for sampling, then released to the Water Quality Channel. The Water Quality Channel flows to the Polishing Pond, which discharges to Outfall 001.

Outfall 001 is currently authorized for discharge of combustion residual leachate (CRL), which is defined as leachate from landfills containing CCR (40 CFR Part 123.11(r)). Pore water is the liquid contained in the interstices between CCR particles. Current best available technology (BAT) for treatment of CRL consists of physical treatment via settling in a wastewater pond. Therefore, the same treatment is proposed for the extracted pore water as is accepted and authorized for discharge of CRL in KIF's NPDES permit (TN0005452). The extracted pore water would comingle with other plant waste streams in the water quality channel, adjusted for

pH as needed, and flow to the polishing pond for settling prior to discharge to Outfall 001, in compliance with KIF's NPDES permit.

A reasonable potential evaluation (RPE) of constituent loading based on concentrations found in temporary wells for sampled pore water in the Sluice Trench and Area East of Sluice Trench indicates no discernible impacts to Outfall 001 discharge. In addition, the RPE demonstrates parameter concentrations are well below water quality criteria (WQC) when applying TDEC's most stringent stream allocation criterion.

The pore water extraction location map, conceptual extraction well design, and RPE are enclosed for your review. Based on the proposed short term and low flows for the pilot and compliance with current ELGs, BAT, and WQC, TVA believes discharge of extracted pore water to Outfall 001 complies with KIF's current NPDES permit coverage. Please respond with your concurrence or provide further guidance to ensure this pilot project meets the required NPDES compliance regulations for the KIF facility.

If you have questions or need additional information, please contact Britta Lees at (865) 771-0051 or by email at bplees@tva.gov.

Sincerely,

Paul Pearman

Paul Pearman
Senior Manager
Water Permits, Compliance, and Monitoring

Enclosure

cc (Electronic Distribution w/ Enclosure):

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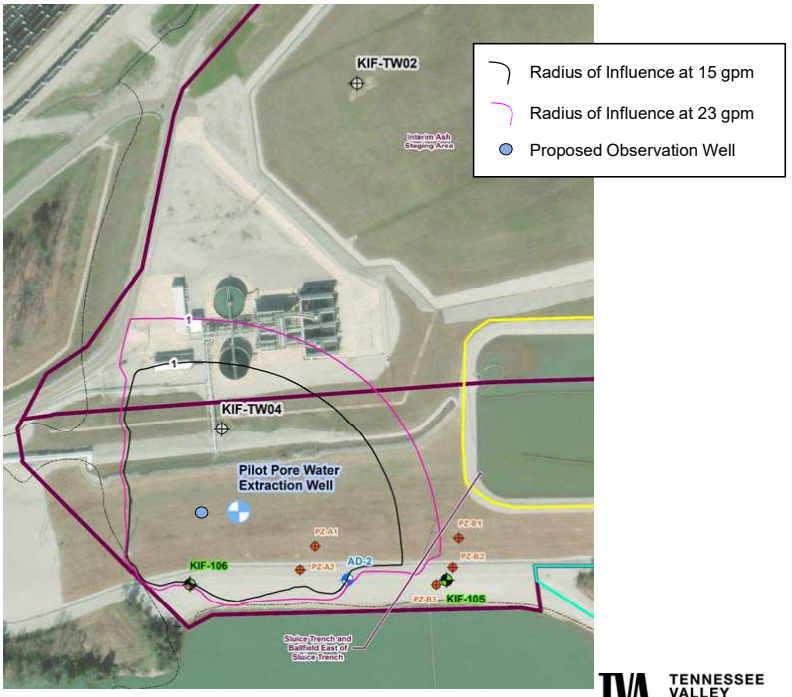
DELIBERATIVE AND PRE-DECISIONAL

Collector/Extraction Well Pilot Study Design - Summary

- 3-Phase/240-volt submersible pump (e.g., Grundfos Redi-flo4 SPE 25E3)
- Install **one extraction well**/one observation well
- LSI/RSI values suggest low CaCO3 encrustation potential in pilot area
- Step test prior to start
- **Extraction at 15 to 23 gpm for 45 days**
- Data logging transducers in EX-01, OW-01, TW04, TW02, PZ-A1, PZ-A2, KIF-106, KIF-105 and background gw monitoring well (TBD)
- Pore water elevation monitoring through duration of test and 45 days following or PW levels recover to pre-pilot study pore water levels which ever occurs first



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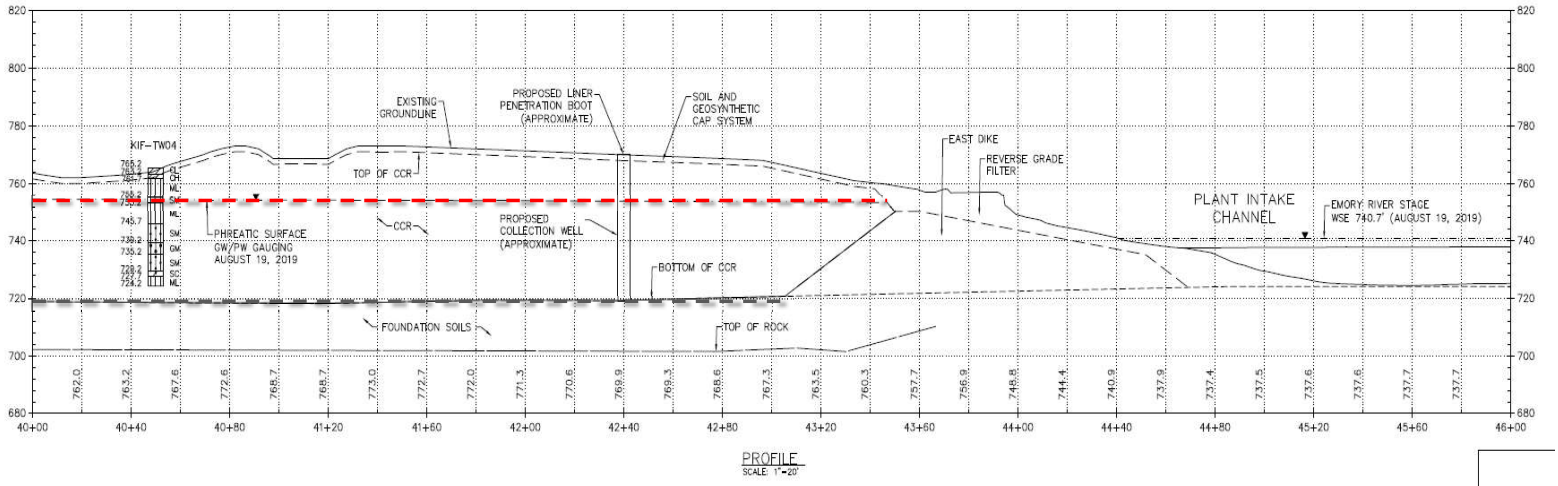
KIF Porewater Extraction Pilot Test – Conceptual Design Elevation



PROFILE
SCALE: 1"=20'

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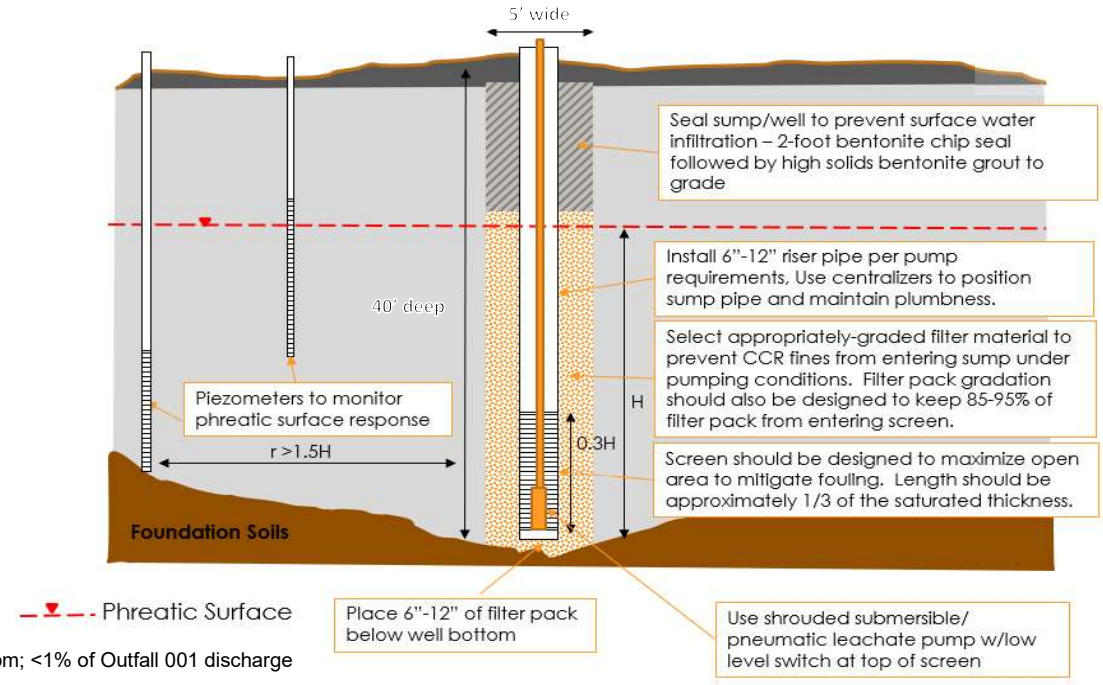
KIF Porewater Extraction Pilot Test – Conceptual Design



15 gpm; <1% of Outfall 001 discharge

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KIF Reasonable Potential Evaluation – to 001

Parameter	Units		Outfall 001		Outfall 001 + TW-04 Porewater	Allowable Discharge Criteria[1]	Allowable Discharge Criteria[2]
Aluminum	ppb		271		272	NA	NA
Antimony	ppb	<	2.2	<	2.2	156	86.5
Arsenic	ppb	<	1.52	<	1.66	344	191
Barium	ppb		73.1		73.4	84177	46765
Beryllium	ppb	<	1.13	<	1.12	129	72
Boron	ppb	<	200	<	206	NA	NA
Cadmium	ppb	<	1.14	<	1.14	152	84.5
Calcium*	ppb		-		-	NA	NA
Chromium	ppb	<	6.2	<, <	6.19	4254	2364
Cobalt	ppb	<	2	<	2	NA	NA
Copper	ppb	<	5.92	<, <	5.91	2186	1215
Iron	ppb		440		441	NA	NA
Lead	ppb	<	1.17	<	1.17	205	114
Magnesium	ppb		5960		5994	NA	NA
Manganese****	ppb		42.8		43.2	1154	641
Mercury	ppb		0.0103	<	0.0106	2.0	1.1
Molybdenum	ppb	<	5	<	5.65	NA	NA
Nickel	ppb	<	3.63	<, <	3.62	4192	2329
Selenium	ppb	<	12.9	<	12.8	771.4	429
Silver	ppb	<	1.03	<	1.02	198	110
Sodium*	ppb		-		-	NA	NA
Thallium	ppb	<	1.98	<, <	1.98	43.7	24.3
Tin**	ppb	<	4		-	NA	NA
Titanium**	ppb	<	10		-	NA	NA
Vanadium*	ppb		-		-	NA	NA
Yttrium***	ppb		-		-	NA	NA
Zinc	ppb	<	36.5	<, <	36.4	48065	26702
Cyanide**	ppb	<	5		-	13.1	7.3

Conclusions:

1. **No discernible impact to discharge quality from addition of porewater based on the TDEC loading spreadsheet**
2. **Similar type of discharge already permitted**

Notes:

*No data available for Outfall 001; 001 flows dominate

** No data available for TW-04 porewater

*** No data available for Outfall 001 or TW-04 porewater

****No promulgated instream standard for manganese. Closest public drinking water intake appears to be Kingston.

[1] 90% Stream Allocation – most stringent criterion (90% included in the NPDES permit)

[2] 50% Stream Allocation – most stringent criterion

Qualifier Color Code:

All J, UJ, U* or <

All <

One or more results reported <

One or more results reported with J, JJ, or U* qualifier <

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