

Fluor Fernald, Inc.  
P.O. Box 538704  
Cincinnati, OH 45253-8704

(513) 648-3000



June 3, 2004

Fernald Closure Project  
Letter No. C:SP:2004-0036

Mr. Thomas A. Winston, District Chief  
Ohio Environmental Protection Agency  
Southwest District Office  
401 East Fifth Street  
Dayton, Ohio 45402-2911

Dear Mr. Winston:

**DISCHARGE CHANGES – NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
PERMIT NUMBER 11000004\*GD FERNALD CLOSURE PROJECT**

- References:
- 1) Letter C:OOTP:2002-0047, Dennis Carr to Thomas Winston, District Chief, OEPA Southwest District Office, NPDES Renewal Application – Fernald Environmental Management Project, dated April 30, 2002
  - 2) Letter C:EXPD:2003-0042, Dennis Carr to Mike McCullough, OEPA Division of Surface Water, Amended NPDES Permit Renewal Application, dated April 22, 2003
  - 3) Letter DOE-0247-04, William J. Taylor, Director USDOE Fernald Closure Project, to Mr. James Saric USEPA and Mr. Tom Schneider, OEPA, Path Forward for the "Conversion" of the Advanced Wastewater Treatment Facility at the Fernald Closure Project, dated May 5, 2004
  - 4) Letter, James Saric USEPA, to Johnny Reising USDOE, AWWT Conversion, dated May 17, 2004

As the operating contractor of the United States Department of Energy (USDOE) owned Fernald Closure Project (FCP), Fluor Fernald, Inc. (Fluor Fernald) is working to complete remediation of the site being conducted under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) in accordance with a schedule baseline date of June 2006. While acceleration or delay is possible, in June 2006, Fluor Fernald is planning that the remediation of the four source operable units will be complete and the only activities conducted on site thereafter will be related to the continued operation of the groundwater pump and treat remedial action, long-term care of the On-Site Disposal Facility (OSDF), and other long-term stewardship activities required to provide security of the site and the monitoring of the clean-up remedies.

5475

Mr. Thomas A. Winston, District Chief  
Letter No. C:SP:2004-0036

The wastewater currently generated and managed at the FCP is being discharged under NPDES Permit 11000004\*GD (effective July 1, 2003) which was issued based upon the April 2002 NPDES Renewal Application and the April 2003 Amendment to the NPDES Renewal Application (References 1 and 2). The intent at the time of application was that the issued permit would remain in effect through completion of all remedial activities.

However, there are issues that need to be brought to the attention of the Ohio Environmental Protection Agency (OEPA) Division of Surface Water because they differ from the description of activities reflected in the renewal application and associated amendment. Two of these issues involve the finalization of the design of the remediation process for Silos 1&2 under Operable Unit 4 and the changes to the site treatment facilities as the site evolves to a groundwater only treatment facility.

In addition to these two specific issues, this letter serves to provide a status of the sources of remediation wastewater and treatment systems. As discrete remediation objectives are completed sources of wastewater will be eliminated. As the planning for the last remedial activities progresses, ancillary features of the FCP treatment systems will be impacted and flow paths of remaining wastewater streams will have to be adjusted. One such waste stream is the leachate from the OSDF, which will be redirected to the Storm Water Retention Basin due to the need to remove the Bio-Surge Lagoon from service. The management strategy of the Storm Water Retention Basin is being changed to ensure that there will be no overflow of this basin to Paddys Run (Outfall 4002). This will ensure the leachate will receive the required treatment while allowing Fluor Fernald to proceed with the overall remediation objectives.

This letter is being submitted under the Discharge Changes clause of the existing FCP NPDES permit because of the changes to the FCP treatment systems described herein and in the attached information. After reviewing applicable OEPA policy and evaluating these changes with respect to compliance with existing NPDES effluent limits, it is the opinion of Fluor Fernald that a formal NPDES Permit modification will not be required.

This letter describes the basis for Fluor Fernald's position that a formal permit modification will not be required.

Silos Remediation Wastewater Management

The NPDES renewal application and amendment (renewal application) identified and provided estimates for three sources of silos wastewater: Radon Control System (RCS) condensate, Silo 3 Wastewater, and Accelerated Waste Retrieval (AWR) wastewater. A specific waste stream was not identified for Silos 1&2 remediation processing. At the time of application, the design of the Silos 1&2 remediation facility had not been finalized and the assumption at the time was that the remediation facility would likely be a net water user (no wastewater discharges).

Processing of the K-65 wastes at the Fernald Site is scheduled to begin in August of 2004 with the sluicing of Silos 1&2 material from the existing silos into four new 750,000 gallon tanks. This step is referred to as the AWR. Processing of the material continues by pumping/sluicing the material from these four tanks into the Silos 1&2 remediation facility.

Mr. Thomas A. Winston, District Chief  
Letter No. C:SP:2004-0036

These operations differ only in the percent solids. Both of these operations will likely require make-up water or the reuse of generated supernatant. In the Silos 1&2 remediation facility, the material is stabilized with the addition of fly ash, Portland cement, and water to form a concrete monolith inside a sealed steel shipping container. Any excess wastewater requiring disposition from any of these individual processes will not differ in character from that identified in the original application. The amount of water generated will be based on actual operations but again, should not differ significantly from that identified in the original application. After operations, the decontamination and decommissioning (D&D) water will be managed similar to all other site D&D activities.

Based on the estimates provided for the silos wastewater in the renewal application an effluent limit was established for lead. (Radium is the other contaminant of concern but there is no state or federal water quality standard established for radium, therefore, no estimates were provided in the renewal application. Radium discharges will be controlled in accordance with DOE Order 5400.5, "Radiation Protection of the Public and the Environment" which establish the concentration for radium-226 and radium-228 each at 100 pico-curies/liter (pCi/L.) Fluor Fernald is considering the need for a modification to the existing Advanced Wastewater Treatment (AWWT) Slurry Dewatering Facility to serve as a pre-treatment system or, potentially a new pre-treatment system to ensure the lead limit is attained, but in any case there is no need to modify the lead limit in the permit.

Conversion of the FCP Wastewater Treatment Facilities to Groundwater Treatment

Over the past several months, discussions have been held with public stakeholders, the regulatory agencies, and other key decision makers regarding the decision for what the most cost effective water treatment facility would be for use over the long term for accomplishing groundwater restoration at the FCP.

The existing AWWT Facility is comprised of three distinct phases. AWWT Phase I is dedicated to the treatment of contaminated storm water, AWWT Phase II is dedicated to the treatment of remediation wastewater and contaminated storm water from the waste pits area, and the AWWT Phase III Expansion system is dedicated to only groundwater treatment. The centerpiece of each of these phases is ion exchange technology for the removal of uranium. In addition to ion exchange, AWWT Phase I implements clarification/sedimentation, AWWT Phase II implements clarification/sedimentation and activated carbon, and AWWT Phase III implements aeration. Each of the phases is equipped with multi-media filtration. The combined treatment capacity of these three phases is a nominal 2,600 gpm.

The culmination of the above negotiations and consultations led to the USDOE proposal that the existing AWWT would be reduced down from the 2,600 gpm three phase facility to a modified 1,800 gpm facility (two distinct treatment trains; one 600 gpm and one 1,200 gpm) by eliminating AWWT Phases I and II and modifying the AWWT Phase III Expansion system including the addition of activated carbon to the 600 gpm treatment train (reference 3). This proposal has been accepted by all key stakeholders and USDOE's proposal has been approved by USEPA (reference 4). Comments from the Office of Federal Facilities Oversight of OEPA have been incorporated into this proposal as well. This modified facility (Converted Advanced Wastewater Treatment system or CAWWT) will

Mr. Thomas A. Winston, District Chief  
Letter No. C:SP:2004-0036

contain the same unit operations as the existing facility with the exception of clarification/sedimentation. However, by implementing multi-media filtration solids removal will be acceptable.

As identified above, the CAWWT will be operated in two distinct treatment trains until all treatment obligations for contaminated storm water and remediation wastewater are completed in June 2006. Of the 1,800 gpm CAWWT, a 600-gpm treatment train containing the activated carbon will be used for treatment of all necessary contaminated storm water and remediation wastewater while a 1,200-gpm train will be dedicated to the treatment of groundwater. A process flow diagram of the new CAWWT and an overview of the timeline for implementation are included as attachments.

Once the remediation of all source operable units is complete, the CAWWT would then continue to be operated to provide the necessary groundwater treatment post June 2006 to ensure the required uranium discharge limits stipulated in the Operable Unit 5 Record of Decision (ROD) are maintained.

The existing AWWT Phase III Expansion system is scheduled to be shut down for modifications beginning October 2004. As the existing Phase III Expansion system is dedicated to groundwater treatment only (the effluent from which is either discharged directly to the Great Miami River (GMR) or reinjected into the Great Miami Aquifer (GMA)), the shut down of this system does not impact the management and treatment of other storm water and remediation wastewater streams. AWWT Phase I, Phase II, Interim-AWWT (IAWWT), and South Plume Interim Treatment (SPIT) systems will remain in service during the conversion process and until the CAWWT is fully functional (anticipated in February 2005).

The groundwater management strategy implemented since 1998 with the initiation of operations of AWWT Phase III Expansion system, involves the extraction of groundwater from the GMA and directing the most contaminated portions of extracted groundwater to treatment while bypassing the less contaminated groundwater directly to the GMR. A portion of the treated groundwater is re-injected to the GMA. This philosophy, which has been embraced by both USEPA and OEPA, is used to ensure compliance with uranium discharge limits (30 parts per billion - monthly average; 600 pounds per year) specified in the Operable Unit 5 CERCLA Record of Decision. During the time that the AWWT Phase III Expansion system is taken off-line for modifications the amount of groundwater extracted will be reduced and re-injection into the GMA will be eliminated. The amount of groundwater bypassed directly to the GMR will remain approximately the same as that reflected in the permit renewal application.

After successful start-up of the modified CAWWT, Fluor Fernald will immediately begin to decommission and dismantle (D&D) the AWWT Phase I and Phase II systems. In addition, during the summer of 2005, Fluor Fernald will begin to remove from service the SPIT and IAWWT systems as their service will no longer be required and they must be removed to accomplish the overall D&D objectives under CERCLA. Table 1 provides a comparison of the estimated flow rates expected during and after these modifications are made to the flow rates used as the permitting basis.

Mr. Thomas A. Winston, District Chief  
Letter No. C:SP:2004-0036

### Wastewater Sources and Treatment System Adjustments

The closure contract with the USDOE, under which Fluor Fernald is performing the remediation required by the five ROD's under CERCLA, requires that all site infrastructure be removed and dispositioned with the exception of that required for groundwater remediation, the OSDF, and administrative type facilities to support long-term stewardship. To accomplish these objectives, certain facilities associated with the existing wastewater treatment system infrastructure will be removed from service and adjustments to the flow paths of lingering wastewater streams will be needed. However, the required treatment will continue to be provided for these wastewater streams. Table 3 provides a description of the status of all remediation wastewater sources and treatment system infrastructure.

### NPDES Permit Modification Evaluation

Fluor Fernald's obligation under the NPDES Permit is to inform OEPA of any significant change in the character of the discharge that will occur or any proposed facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants. Once informed, OEPA evaluates whether the permit requires modification to reflect any changes in permit conditions including any effluent limits for any pollutant not currently limited. However, Fluor Fernald believes that a modification to the existing permit will not be required for the following reasons:

1. There will be no introduction of new pollutants into the FCP effluent discharge to the GMR, nor will there be increases in the mass loading of pollutants identified in the permit renewal application.
2. The quality of the FCP effluent will be consistent with the character of effluent reflected in the NPDES Permit Renewal Application and associated amendment.
3. None of the proposed changes will result in a violation of existing permit limits.
4. None of the changes proposed will result in effluent concentrations exceeding the most restrictive effluent limit to maintain water quality standards (WQS) determined by OEPA during the permit renewal process. The effluent limits to maintain WQS were established by OEPA during the permit renewal cycle.

These effluent limits are summarized in Table 2 which includes a listing of the pollutants OEPA evaluated, the effluent limit needed to maintain the most restrictive water quality standard, the estimate provided by Fluor Fernald in the renewal application, and the actual average concentration for those parameters monitored and reported since the current permit became effective.

Fluor Fernald believes this to be a valid assumption because Fluor Fernald and USDOE will continue to be required to meet the Operable Unit 5 imposed uranium discharge limit of 30 ug/L. Uranium is the primary site contaminant and has served well as an indicator parameter for other contaminants related to past site operations.

5. A further antidegradation evaluation would not be required as there is an actual reduction in flow discharged from that currently permitted and no new pollutants or different levels of pollutants are being requested to be discharged or increased from that estimated in the antidegradation addendum from the original

Mr. Thomas A. Winston, District Chief  
Letter No. C:SP:2004-0036

application. Further, sources of wastewater will begin to be removed as discrete portions of remediation are completed resulting in decreases in wastewater volumes and contaminant concentrations.

Fluor Fernald acknowledges OEPA discretion in determining whether a permit modification is required. Because the changes and issues identified within this letter are being conducted under our CERCLA obligations, we are requesting your earliest possible review and concurrence with our position or notification that formal modification will be required.

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If you have any questions related to this correspondence, please contact Mr. Frank Johnston at 513-648-5294.

Sincerely,



Dennis J. Carr  
Senior Project Director  
Silos Project

DJC:FLJ:ced

Attachments (5)

Table 1 - Volumetric Comparison

Table 2 - Contaminant Comparison

Table 3 - Status of Remediation Wastewater Sources and Treatment & Control Systems

CAWWT Process flow diagram

CAWWT Timeline

Mr. Thomas A. Winston, District Chief  
Letter No. C:SP:2004-0036

c: Joe Bartoszek, OEPA-SWDO  
Steve Beckman, MS20  
Steve Bozich, MS52-5  
J.D. Chiou, MS64  
Ev Henry, MS52-5  
Bill Hertel, MS52-5  
Frank Johnston, MS52-5  
Rob Kneip, MS52-5  
Dave Lojek, DOE-FCP, MS45  
Graham Mitchell, OEPA-SWDO  
Johnny Reising, DOE-FCP, MS45  
Jim Saric, USEPA  
Tom Schneider, OEPA-SWDO  
Jim Simpson, OEPA-SWDO  
Ed Skintik, DOE-FCP, MS45  
File Record Subject: NPDES Permit  
Project Number: 52700; 40000/1.4  
SP Letter Log, MS19  
Administrative Record, MS78

**Table 1-** Volumetric comparison to the original permitting basis of changes between groundwater extracted, treated, and bypassed as well as total flow discharged. Information is provided for five distinct time periods (volumes expressed in gallons/day – average basis).

	<b>Groundwater Extracted</b>	<b>Groundwater Treated</b>	<b>Groundwater Bypassed</b>	<b>Total Discharge*</b>
Permitting Basis (gpd) (gpm)	7,990,514 (5,549)	3,231,586 (2,244)	4,758,929 (3,305)	8,600,996
CAWWT Modification (9/04 – 1/05)	4,320,000 (3,000)	951,802 (661)	3,368,198 (2,339)	5,005,787
CAWWT Operational (2/05 – 7/05). AWWT Phase I and II removed from service. SPIT and IAWWT remain in service	6,912,000 (4,800)	2,016,000 (1,400)	4,896,000 (3,400)	8,237,286
CAWWT Operational (8/05 – 6/06). SPIT and IAWWT removed from service	5,904,000 (4,100)	1,728,000 (1,200)	4,176,000 (2,900)	6,768,000
Post June 2006	7,200,000 (5,000)	2,592,000 (1,800)	4,608,000 (3,200)	7,200,000

\* Total discharge includes other wastewater discharges in addition to groundwater

**Table 2 - Contaminant comparison (concentrations expressed in ug/L unless otherwise noted)**

Contaminant	Effluent Limit to Meet Most Restrictive WQS <sup>A</sup>	Estimate of Effluent Quality Provided in Renewal Application <sup>B</sup>	Permit Limit (Monthly Average)	Actual Average Concentration <sup>C</sup> (7/03 - 4/04)
Antimony	1,800	4	M	ND
Arsenic	466	15	M	1.0
Barium	489	81	M	50.0
Beryllium	1,200	0.1	M	1.0
Bis(2-ethylhexyl)phthalate	44	1	M	ND
Boron	12,080	35	M	48.2
Cadmium	18	1	M	1.0
Total Residual Chlorine	21	-	21	ND
Chloroform	2,600	8	M	ND
Chromium	442	17	M	1.3
Cobalt	440	6	M	ND
Copper	46	4	M	2.4
Cyanide, free	31	-	M	ND
Fluoride	43,660	207	M	290
Lead	73	328	73	1.1
Mercury	.048	-	M	0.0012
Manganese	NE	182	M	134
Molybdenum	358	21	M	7.6
Nickel	387	18	M	1.4
Nitrate + Nitrite	6,626 mg/L	3560 mg/L	M	5.7 mg/L
Selenium	14	3	M	3.8
Silver	3.4	0.4	M	ND
Total Dissolved Solids	3,058,000 mg/L	-	M	508.4 mg/L
Zinc	640	7	M	5.7
Total Suspended Solids	NE	20 mg/L	20 mg/L	2.6 mg/L
Oil & Grease	NE	10 mg/L	10 mg/L	2.2 mg/L
CBOD	NE	20 mg/L	20 mg/L	2 mg/L
Ammonia Nitrogen	NE	5 mg/L	3 mg/L	0.89 mg/L
Trichloroethene	NE	5	M	ND
1,1-Dichloroethane	NE	8	M	ND

A - NPDES Fact Sheet, Public Notice 03-04-019, pg. 39, Table 7 "Summary of Effluent Limits to Maintain Applicable Water Quality Standards"

B - Amended NPDES Permit Renewal Application, April 2003, Ant degradation Addendum, Estimate of Future Effluent Quality at Average Conditions

C - Arithmetic average of data reported in monthly Discharge Monitoring Reports. Detection limit is used in calculating the average when result reported is less than detection.

M - Monitoring requirement only, no effluent limit imposed

ND - Not detected

NE - Not evaluated during NPDES Permit Renewal Process

Table 3 - Status of Wastewater Sources and Treatment Systems

Status of Remediation Wastewater Sources	
Source	Status
WPRAP Dryer Operations	Dryer Operations ongoing; scheduled to end August 2004
WPRAP Excavation/Loading Activities	Waste Pit Material/soil excavations ongoing; scheduled to end April 2005
Former Production Area Excavations	Excavation dewatering ongoing; scheduled to end March 2005
Former Production Area Storm Water Runoff	Runoff treated, as necessary, until soil clean-up levels attained and certified by USEPA and OEPA; scheduled to be complete April 2006
Silo 3 Remediation	Operations begin June 2004; scheduled to be complete September 2004
Radon Control System Condensate	Operations ongoing through August 2005; removed from service for D&D coinciding with the completion of Silos 1&2, remediation facility operations
Accelerated Waste Retrieval	Silos 1&2 sluicing operations begin August 2004; complete February 2005. Operations supporting Silos 1&2 remediation facility scheduled to be complete August 2005
Silos 1 & 2 Remediation	Initiation of operations scheduled to begin September 2004. Operations scheduled to be complete August 2005
Decommissioning/Decontamination (D&D) of Facilities and Structures	D&D activities on all legacy structures and constructed remediation facilities scheduled to be complete March 2006
Groundwater Remediation	Ongoing through June 2006; ongoing post closure
On-Site Disposal Facility Leachate	Ongoing through June 2006; ongoing post closure. Last cell capped March 2006 resulting in leachate generation being reduced to between 1 and 10 gpm. Beginning November 2004, leachate will be redirected from the BSL to the SWRB. Leachate will be treated through AWWT Phase I and AWWT Phase II during the CAWWT conversion process. Leachate will be discharged directly to CAWWT when the SWRB is removed from service in October 2005.
Wastewater Treatment and Control Systems	
System	Status
AWWT Phase 1	Operational through February 2005; removed from service for D&D beginning March 2005

Table 3 - Status of Wastewater Sources and Treatment Systems

AWWT Phase 2	Operational through February 2005; removed from service for D&D beginning March 2005
AWWT Expansion (Phase 3)	Operational through September 2004, removed from service and modified to CAWWT beginning October 2004
CAWWT	Operational February 2005; treating all remaining storm water and remediation wastewater through June 2006; groundwater treatment (and perhaps OSDF leachate) only beginning July 2006 and continuing thereafter until determined unnecessary by USDOE in consultation with USEPA and OEPA
Interim AWWT	Operational through June 2005; removed from service for D&D July 2005
South Plume Interim Treatment System	Operational through June 2005; removed from service for D&D July 2005
AWWT Slurry Dewatering Facility	Operational through October 2005; removed from service for D&D November 2005.
Storm Water Retention Basin	Operational through October 2005. Beginning November 2004, the SWRB will be operated to prevent any overflow to Paddys Run or bypassing to the GMR due to the significant reduction in flows coming to the SWRB by gravity. Removed from service for D&D November 2005
Bio-Surge Lagoon	Operational through October 2004; removed from service for D&D November 2004. All remaining flows formerly coming to the BSL will be routed to the SWRB after the BSL is removed from service.
Final Aeration Tank	Operational through July 2004; removed from service for D&D August 2004
Shaw Environmental Waste Pits Wastewater Treatment System (WWTS)	Operational through September 2004; removed from service coinciding with the completion of waste pit dryer operations September 2004
Waste Pits Storm Water Management Pond	Operational through July 2005; removed from service for D&D August 2005 coinciding with the completion of soil excavation activities in the waste pit area. From July 2004 through September 2004, will be modified to serve as the collection point for wastewaters requiring treatment through the Shaw WWTS replacing the Clearwell. From October 2004 through April 2005 discharge rerouted to SWRB.

**Table 3 - Status of Wastewater Sources and Treatment Systems**

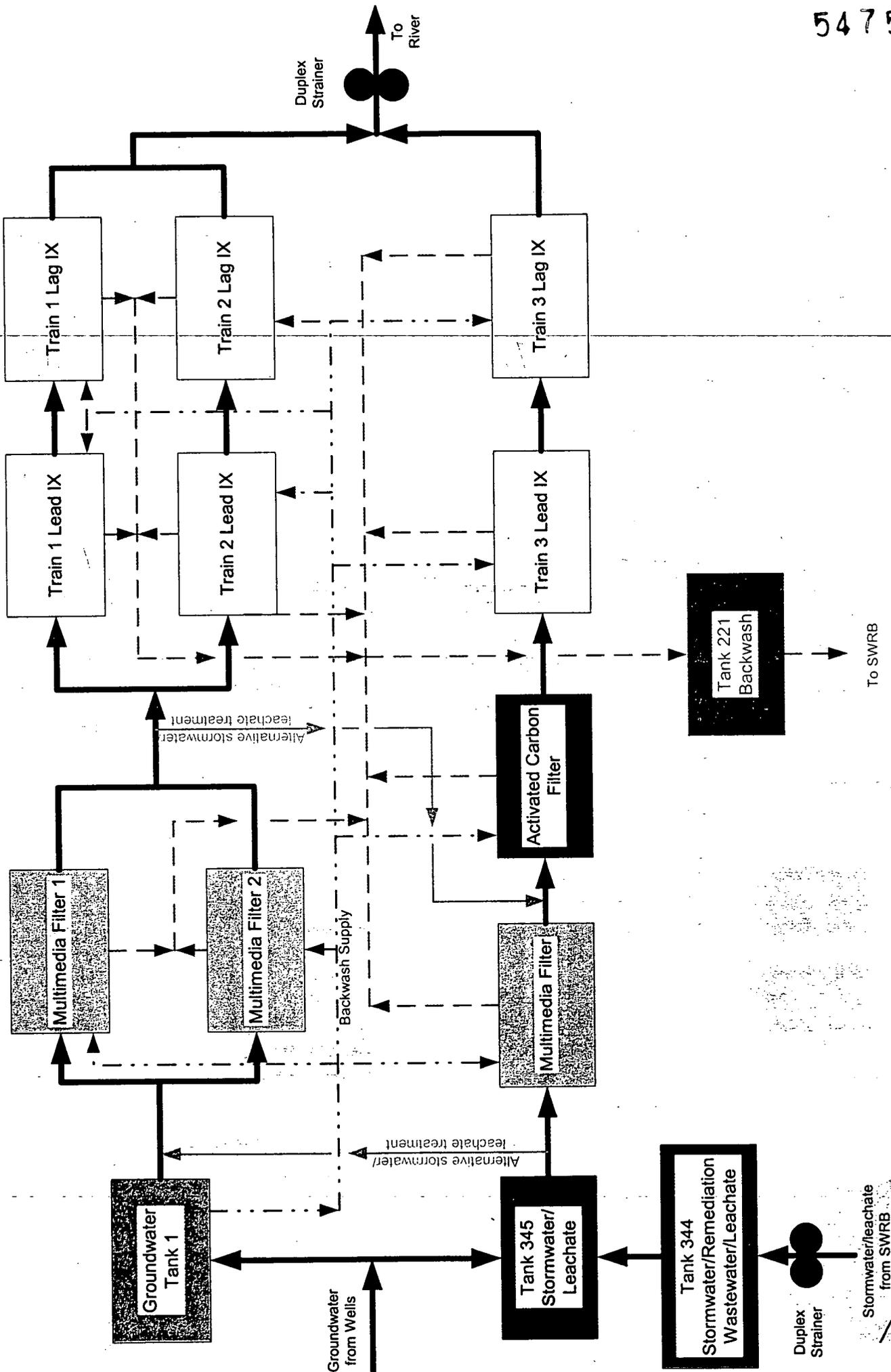
Waste Pit Area Runoff Control Sump	Operational through April 2005; removed from service for D&D/excavation May 2005 coinciding with the excavation activities in the silos/waste pits area (beginning September 2004 through end of operations discharge rerouted to SWRB/CAWWT)
Sewage Treatment Plant	Operational through June 2005, removed from service for D&D July 2005. Remaining site personnel to use portable chemical toilets or holding tanks

Note: This table is provided for information only and the dates herein are subject to change.

# CAWWT Process Flow Diagram

5475

5/26/04 09:40 CAWWT Stage 1.vsd



Stormwater/leachate from SWRB

13

