



U.S. Department of Energy
Office of River Protection

0059275

P.O. Box 450
Richland, Washington 99352

03-TPD-045

APR 30 2003

Mr. Michael A. Wilson, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
1315 W. Fourth Avenue
Kennewick, Washington 99336

RECEIVED
MAY 08 2003

EDMC

Dear Mr. Wilson:

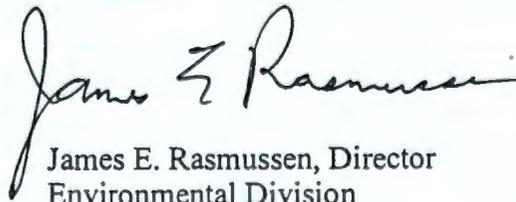
TRANSMITTAL OF DELIVERABLE FOR MILESTONE M-45-05J-T01 COMPLETE TANK
241-C-106 DESIGN

The U.S. Department of Energy, Office of River Protection (ORP) would like to inform Washington State Department of Ecology (Ecology) that the final design for Tank 241-C-106 has been completed and the design has been approved for fabrication and construction. The requirements of Milestone M-45-05J-T01 have been met.

In order to facilitate meeting the requirements of the milestone, ORP and CH2M HILL Hanford Group, Inc. have provided Ecology with a design consultation on April 23, 2003. The design consultation provided information on the retrieval approach, including oxalic addition to mobilize the solid waste, and the approach taken for Leak Detection Monitoring and Mitigation. The information that was provided in the meeting is in (Attachment 1). Additionally, a table of the released design drawings and one set of the Piping and Instrumentation Diagrams are contained in (Attachment 2).

If you have any questions, please contact me, or your staff may contact Jim Thompson, Tank Farms Programs and Projects Division, (509) 373-9757.

Sincerely,


James E. Rasmussen, Director
Environmental Division

TPD:JFT

Attachments

cc: See page 2

Mr. Michael A. Wilson
03-TPD-045

-2-

APR 30 2003

cc w/attachs:

K. E. Carpenter, CHG
S. B. Fowler, CHG
M. N. Jarayssi, CHG
T. L. Hissong, CHG
TPA Administrative Record

cc w/o attachs:

J. J. Lyons, Ecology

C-106 Waste Retrieval and Closure Demonstration Project Design Briefing

In support of TPA Milestone M-45-05J-T01

April 23, 2003



Overview

- Project Status
- Design Media
- Process Control (Leak Detection, Monitoring and Mitigation)
- Project Challenges
- Summary



Project Status - Objective

- Provide systems, structures, and components necessary to retrieve waste and transfer to the DST system (remaining residual waste \leq 360 cubic feet)
- Minimize waste generation during retrieval and transfer
- Accelerate near-term risk reduction by removing liquids and mobilizing solids
- Perform final waste retrieval by November 1, 2003, or sooner, in accordance with TPA target milestone (M-45-05L-T01)
- Interim close tank by April 30, 2004, or sooner, in accordance with TPA milestone (M-45-05H)
- Final closure in accordance with approved Closure Plans and EIS-ROD

Project Status-Accomplishments

- Removed Thermocouple from riser 14 and Heel Jet Pump from Riser 13
- Designed, installed, tested and operated a liquid removal system for accelerated risk reduction
- Designed, installed and currently testing a solid mobilization system
- Designed balance of system for acid dissolution and approved over 90% of design for construction and/or fabrication
- Completed Process Control Plan (PCP) for sludge mobilization, drafted PCP for acid-dissolution, trained for mass-balance and ex-tank activities

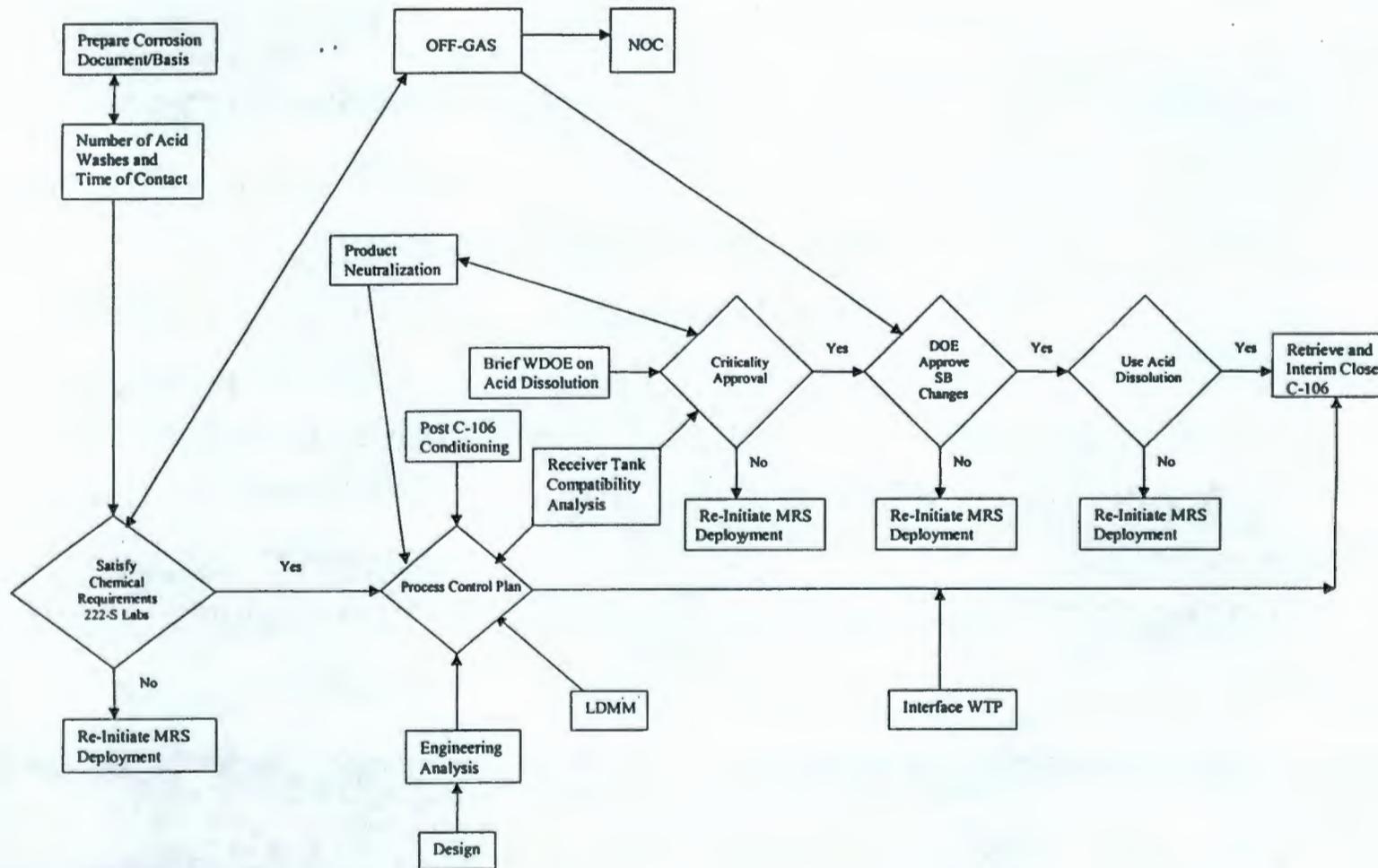
Project Status – Retrieval Approach

- Improve “past practice” sluicing using lower liquid volumes and more effective sluice operations, pump design, and pump placement
- Remove liquids and mobilize solids from C-106 and transfer to AY-102 using existing 4” line
- Utilize acid-dissolution, pumping system, and sluicer to mobilize remaining waste for removal and transfer via hose-in-hose transfer line (HIHTL) to AN-106

Project Status – Current Waste Properties

Waste Volume and Physical Properties	Value
Sludge Volume	9K gal
Supernatant	2K gal water/waste
Liquid density	1.10 g/ml (estimated)
Sludge density	1.55 g/ml
Viscosity	<3 (Supernatant, no data for sludge or solids)
Temperature	60 - 86°F
Median particle size	0.75 – 6.4 micron

Project Status – Acid Dissolution



Project Status – Acid Dissolution

- Initial testing demonstrated up to 70% of sludge dissolved in laboratory conditions
- Additional testing 50% complete with focus on additional dissolution tests, gas generation rates, re-neutralization and residue analyses
- Criticality Safety Evaluation Report drafted
- Hazards and Operability study complete
- Process Plans drafted
- Corrosion evaluation initiated

Design Media

- Functions and Requirements
- Table of Approved ECNs, Calcs, etc.
- Equipment installation Design Media
 - P&ID
 - PFD
 - Electrical One-line diagram

Project Design Media – Functions & Requirements

Function	Requirement	Basis	Key Elements
Control 241-C-106 structure and waste temperature	Maintain tank structure and waste temperature within limits defined in SST operating specification.	OSD-T-151-00013	Maximum 137 °C (280 °F) for waste and Maximum 120 °C (250 °F) for dome
Control 241-C-106 waste level	Prevent waste overflow and limit hydrostatic head-induced stresses in the tank. The 241-C-106 WRS shall be operated to ensure interstitial liquid level remains below its starting level.	HNF-4712 Good engineering practice	Minimize liquid level to the extent practical.
Control 241-C-106 vapor space pressure	Maintain vapor space pressure within limits defined in SST operating specification.	OSD-T-151-00013	Maintain a minimum vacuum of 0.3 in. w.g. to confine air emissions.

Project Design Media – Functions & Requirements (cont.)

Control 241-C-106 gaseous discharges	The ventilation system exhaust shall be filtered to restrict radioactive emissions to the environment.	WAC-173-400 WAC 173-460 HNF-IP-0842 Volume 6, Section 1.7	Maintain minimum vacuum of 0.3 in w.g. and filter exhaust stream prior to discharge.
Remove waste from 241-C-106	The WRS shall be capable of removing as much waste as technically feasible. As a goal, the 241-C-106 WRS shall be capable of retrieving waste down to a volume of less than 360 cubic feet.	HFFACO Milestone M-45-00	The WRS shall provide the ability to retrieve waste to less than 10.2 m ³ (360 ft ³)
Control and monitor 241-C-106 waste removal process	Control and monitor the process for retrieving waste from 241-C-106. This includes controlling and monitoring of waste removal process parameters (e.g., waste transfer line pressures, flow rates, waste densities), environmental safety parameters, and pertinent equipment parameters.	Good engineering practice	Provide for safe and effective operation of the waste retrieval system.

Project Design Media – Functions & Requirements (cont.)

Detect leaks during 241-C-106 waste removal	The WRS shall be capable of detecting liquid waste releases during waste removal operations. System shall be designed to detect leakage from tank using best available technology during retrieval to low as reasonably achievable.	40 CFR 265	Utilize best available leak detection and monitoring technologies coupled with mitigation strategies to minimize the potential for retrieval leakage.
Monitor leaks from 241-C-106 during waste removal	The WRS shall quantify liquid release volumes from tank 241-C-106 if a release is detected during waste retrieval operations.	Good engineering practice	Utilize best available leak detection and monitoring technologies coupled with mitigation strategies to minimize the potential for retrieval leakage.
Measure and estimate residual waste in 241-C-106	The WRS design shall allow for measuring and calculating the residual waste in 241-C-106 following retrieval operations.	HFFACO Milestone M-45-00	Design feature.
Minimize waste generation	The WRS shall minimize waste generation to the greatest extent practical, including water introduced into the tank.	Good engineering practice	No numerical requirement.

Project Design Media – Functions & Requirements (cont.)

<p>Mitigate leaks during 241-C-106 waste retrieval</p>	<p>The integrated retrieval and LDM system shall be designed and operated to mitigate leaks as the primary means of minimizing environmental impacts from leaks during retrieval if they occur. The primary means of mitigation shall be through removal of free liquid as rapidly as possible. The operating approach shall minimize the free liquid in the tank and ensure that the interstitial liquid level remains below its starting level.</p>	<p>HNF-SD-WM-AP-005 Good engineering practice</p>	<p>Leak mitigation strategy described in Process Control Plan and summarized herein.</p>
<p>Nuclear safety</p>	<p>The WRS shall be designed and operated to protect workers, public, environment, and equipment from exposure to radioactive tank waste and emissions during the retrieval campaign.</p>	<p>HNF-5183 WAC 246-247 10 CFR 835</p>	<p>Ensure protection of workers and the public from routine and potential accident conditions.</p>

Project Design Media – Functions & Requirements (cont.)

Maintain design and operating limits for DST used as a receiver tank	The WRS shall not adversely affect the function of the DST system or exceed the DST design and operational limits.	HNF-SD-WM-TSR-006, LCO 3.3.2 HNF-SD-WM-TRD-007	Ensure safe and effective receipt and storage of C-106 waste in DST receiver tank.
Occupational safety and health	The WRS shall incorporate design features that comply with the requirements of 29 CFR 1910, Subparts D, E, G, H, J, L, M, O, and S.	29 CFR 1910	OSHA Standards
SST and DST dome loading	The WRS shall not exceed the maximum dome loading on existing SSTs and DSTs specified in HNF-IP-1266.	HNF-IP-1266 HNF-SD-WM-SAR-067	Concentrated loads limited to 200,000 lbs. Deviations evaluated on a case-by-case basis.
WRS secondary containment and leak detection	For ex-tank equipment and piping, WRS shall incorporate secondary containment and leak-detection design features in accordance with 40 CFR 265.193, WAC 173-303-640(4), and DOE O 435.1.	40 CFR 265 WAC 173-303 DOE O 435.1	Provide for safe and compliant transfer of waste to the DST receiver tank.
<p>DST = double-shell tank. HFFACO = <i>Hanford Federal Facility Agreement and Consent Order</i>. LCO = Limiting Condition for Operation. LDM = leak detection and monitoring. SST = single-shell tank. WRS = waste retrieval system.</p>			

Process Control - Process Control Plan

- Process Control Plan for sludge redistribution in final review and approval
- Process Control Plan for acid dissolution is being developed and will be publicly released prior to initiation of waste removal operations
- Coordinates technical operating controls for waste retrieval and provides guidance for transfer system operations
- Technical operating controls include Final Safety Analysis Report, Technical Safety Requirements, Operating Specification Document, environmental controls, and good operating practices
- Describes tank conditions, waste conditions, major equipment, operating strategy, and response to off-normal conditions
- Provides controls to manage flammable gas, waste temperatures, ammonia releases, and solids precipitation
- Establishes monitoring requirements

LDMM Logic/Thresholds – General

- C-106 not currently leaking and has no history of past leaks
- Initial focus on removing liquids to quickly minimize leak potential
- Followed by solids retrieval with minimal liquid additions
- Ex-tank leak detection with gamma-ray logging and neutron moisture probe logging in dry wells surrounding tank
- Hand-held moisture monitoring on more frequent basis, if practical
- Totalized volume material balance during retrieval supplemented by static liquid level measurements
- Receiver tank and transfer lines also monitored for leakage

LDMM Logic/Thresholds – Leak Mitigation

- Control liquid to minimum level necessary and minimize fluid head
- Minimize contact of sluice stream with tank walls until final cleanout
- Pump down to minimum liquid heel during retrieval downtimes
- Time at risk relatively short
- If leak occurs, operations will cease and tank will be pumped down to minimum liquid level

LDMM Logic/Thresholds – Leak Detection and Monitoring (cont.)

Dry Well Monitoring

- Eight dry wells located around periphery of C-106
- Monitoring with gamma-ray and neutron moisture probe logging
- Baseline established prior to retrieval operations
- Monitor for deviations

LDMM Logic/Thresholds – Leak Detection and Monitoring (cont.)

Material Balance

- Compare total liquid volume transferred out versus amount of liquid added for sluicing/acid addition and flushing operations
- Liquid volume removed and transferred to DST receiver tank measured with process flow instrumentation
- Compare liquid pumped out versus amount entering receiver tank
- Complete mass balance documentation via process control plan requirements and transfer procedure

Project Challenges

- Criticality Safety Evaluation Report review and approvals
- Safety basis modifications and approvals
- Remaining equipment installations
- Validation of operating and maintenance procedures
- Closure recognition

Summary

- Approximately 60% of waste removed from C-106 on 04/01/03
- Design is over 90% complete and has been approved for fabrication and/or construction
- Criticality Safety Evaluation, Safety Basis approval, and equipment installations drive critical path for retrieval system operation
- Parallel activities required to minimize schedule impacts and support project completion in accordance with Tri-Party Agreement milestones and commitments
- C-106 first tank to be retrieved and closed
- Demonstration provides opportunity to work through regulatory process to ensure cost-effective completion of work in a manner protective of human health and the environment

Document #	RPP/Drwg #	Title	Date Released
EDT's Releasing RPP's			
EDT-600947	RPP-13898	Phase 1 Electrical Study	3/7/03
EDT-621028	RPP-14429	Heel Pit Retrieval Plates for 241-C-03B & 241-C06B	2/21/03
EDT-623255	RPP-14846	Acceptance Test Report for 1000 CFM POR-008	3/25/03
EDT-626360	RPP-15082	Analysis of Flygt Pump Failure	3/3/03
EDT-626371	RPP-15180	Heel Jet Removal Tool Evaluations Tank 241-C-106	3/26/03
EDT-626373	RPP-15211	C-106 Retrieval System Instrument List	3/25/03
EDT-627975	RPP-14458	Acceptance Test Report for ATP-RPP-14219	3/10/03
EDT-628483	RPP-13993	Analysis of Pump Pit 241-C-06A Temp Work Platform	2/12/03
EDT-629728	RPP-13613	Remove Thermocouple Tree From Riser 14	12/3/02
EDT-629739	RPP-14940	Temp Work Platform and Penetration Cover for Sluice Pit	3/12/03
EDT-631260	RPP-13662	241-C-106 WRP PEP	1/7/03
EDT-633291	RPP-13381	Sluicer Specification	12/26/02
EDT-633849	RPP-11526	Passive Ventilation Breather Installation at C-106	7/10/02
EDT-633867	RPP-13883	Slurry Pump Specification	12/26/02
EDT-633869	RPP-14048	Raw Water Skids Specification	1/10/03
EDT-633870	RPP-14157	Sluicer Booster Pump Sizing Calcs	1/10/03
EDT-633986	RPP-13502	Calc of Effect of C-106 Retrieval on Chemistry of AN-106	12/12/02
EDT-635108	RPP-11017	Passive Ventilation Breather Installation at C-106	11/14/02
EDT-635109	RPP-13775	Hydraulic Cylinder Analysis	12/31/02
EDT-635110	RPP-13984	Tank C106 Heel Pit Wall Evaluation	1/13/03
EDT-635111	RPP-14065	Max Allowable Hydraulic Force for Heel Jet Removal	1/13/03
EDT-635491	RPP-13628	Alara Review of C-106 Retrieval Operations	1/10/03
EDT-635500	RPP-11567	Level 2 Spec for WRS for Single Shell Tank 241-C-106	11/12/02
EDT-635676	RPP-14008	CCTV Specification (Camera Inspection System)	1/28/03
EDT-635682	RPP-13152	Liquid Retrieval System Preliminary SEL	3/3/03
EDT-635694	RPP-13864	Eval of Riser 13 for Heel Jet Removal	12/17/02

Document #	RPP/Drwg #	Title	Date Released
EDT-635704	RPP-15296	241-C-106 Retrieval System Pump Acceptance Test Report	3/24/03
EDT-635742	RPP-13956	Preliminary LRS Description	1/10/03
EDT-635745	RPP-14352	Force Imparted by Sluicing Nozzles onto Heel Jet Pump	3/13/03
EDT-635746	RPP-15342	Phase 1 Modification Design and Stress Analysis	3/19/03
EDT-635748	RPP-14927	C-106 WRS Transfer Route Losses-Phase I	3/13/03
EDT-635749	RPP-15173	Comparative Calc for C-106 Electrical Power Rack Assembly	3/12/03
EDT-635753	RPP-14455	Raw Water Inlet Flow Rate and Control Valve Sizing Calc	3/3/03
EDT-635786	RPP-14848	Vibrating Lifting Device	2/12/03
EDT-635788	RPP-14445	Struct. Analysis of Supernate Removal Pump Assy (LRS)	2/24/03
EDT-635924	RPP-12711	Temporary Waste Transfer Line Management Plan	12/10/02
EDT-635926	RPP-13554	HIHTL Specification	12/19/02
EDT-635941	RPP-13222	Eval of Temporary Ventilation System to Support WRS	11/14/02
EDT-635943	RPP-14677	Pressure Boundary Insp/Test Plan for Ventilation System	2/25/03
EDT-635996	RPP-14218	Acceptance Test Procedure for HIHTL	1/16/03
EDT-635997	RPP-14456	Acceptance Test Report for Vendor Testing	3/13/03
EDT-635998	RPP-14382	SD for Environmental Compliance Hose Transfer Lines	3/7/03
EDT-635999	RPP-13631	HIHTL Calc for 241-C-106 Retrieval Program	2/11/03
EDT-636130	RPP-12754	Waste Compatibility Assessment C-106 with AN-106	12/31/02
EDT-636278	RPP-14129	Engineering Documentation Bibliography	1/10/03
EDT-636279	RPP-14379	Spec for Hazardous Location Power Control Skid	1/30/03
EDT-636281	RPP-14304	Struct. Analysis Waste Retrieval Ventilation Equipment	2/25/2003
EDT-636482	RPP-14791	Functional Requirements/Design Criteria for Ventilation System	3/27/03

Document #	RPP/Drwg #	Title	Date Released
EDT's Releasing Drawings			
EDT-632693	H-14-105675	Structural Pump Pit Retrieval Platform	2/7/03
EDT-632947	H-14-105661	C Farm Raw Water Delivery Options	3/3/03
EDT-633387	H-14-105637, Sh. 1-5	Pit A, B, C Shield Box Assembly, Details	1/30/03
EDT-633388	H-14-105638, Sh. 1-5	Sluice, Pump, Heel Pit Hose Support Assembly, Details	1/29/03
EDT-633390	H-14-105636, Sh. 1-2	C-106-C103 HIHTL Shielding Layout and Details	2/5/2003
EDT-633391	H-14-105639, Sh. 1-2	Swaged Hose Transfer Line Assembly, End Fittings	1/30/03
EDT-633392	H-14/105641	Retrieval 241-C-106 Waste Transfer Installation	2/11/03
EDT-633866	H-14-105652 H-14-105653	Drawings for Removal of Equipment in Sluice Pit	12/10/02
EDT-633868	H-14-105667, Sh. 1-2	C-106 Instrumentation Cabinet Assembly	2/6/03
EDT-632692	H-14-105673 H-14-105674	Pit 06B Coverplate Pit 03B Coverplate	1/16/03
EDT-634023	H-14-104773, Sh. 1-4	C-106 Retrieval Supernate Pump Assembly & Detail	1/16/03
EDT-634049	H-14-104775	Flygt Pump Shims	2/26/03
EDT-635077	H-14-105640	Hose in Hose Electrical Plan	1/10/03
EDT-635684	H-14-105879	Addition Water Hose Assembly at 241-AY-02E Sluice Pit	2/26/03
EDT-635695	H-14-105662 H-14-105663	Struct. Pump Pit Temporary Work Platform Piping Pump Pit Pump and Winch Removal Spray Ring	1/10/03
EDT-635699	H-14-105666	Waste Retrieval P & ID	2/26/03
EDT-635700	H-14-105660, 105668 H-14-105669 H-14-105670, 105671	C-106 Instrument Interconnect, Loop Diag, Term Box Assy	2/6/03
EDT-635789	H-14-105651	Heel Jet Hyd Cylinder	12/31/02
EDT-635942	H-14-105646	Air Intake Filter Fab Details	12/26/02
EDT-815302	H-2-830814	Electrical Drawings for C106 Power Rack Assembly	11/27/02

Document #	RPP/Drwg #	Title	Date Released
Engineering Change Notices			
ECN-670057	H-2-818468, H-2-818470	Atmospheric Breather Filter Install	9/17/02
ECN-670061	H-2-90718	Atmospheric Breather Filter Assemblies	11/6/02
ECN-671074	H-2-818676, 80, 81	Additional Power for C-106 for Pumping Activities	1/22/03
ECN-673633	H-14-010613, 020613	Remove Thermocouple Tree from Riser 14, C-106	10/16/02
ECN-673634	H-14-010613	Remove Heel Jet from Riser 13	10/16/02
ECN-674173	RPP-13381	Sluicer Specification Modification	1/29/03
ECN-674184	H-2-83746, H-2-83747	Secondary Catch Mechanism Drawing Mods	12/17/02
ECN-674185	H-2-820734, H-2-820737	Design Mods for Temp Work Platform and Spray Ring	1/13/02
ECN-674224	H-2-93797, H-2-818470	C-106 Atmospheric Breather Filter Installation	12/12/02
ECN-674228	H-2-95267, H-2-95268	Atmospheric Breather Filter Install	12/13/02
ECN-674235	H-2-818468	Breather Filter Installation Design Changes	1/6/03
ECN-674271	H-2-73975	C-103 Saltwell Cover Plate Mod for C-106 HIHTL	10/23/02
ECN-674302		Remove Sluicer from Pit 06C/Install Shield Plug	11/15/02
ECN-674317	H-2-830814	C-106 Electrical Racks	1/7/03
ECN-674321		Remove Slurry Pump from Pit 06A/Install Shield Plug	11/2/02
ECN-674328	H-2-81868-H-2-81870	WRS Portable Ventilation System Installation	12/26/02
ECN-674434		Phase 1, HIHTL from C-06A to C-06B	2/19/03
ECN-674435		Remove HIHTL from C-103 to AN-106	3/26/03
ECN-674439	RPP-13222	Eval of Temporary Ventilation System to Support WRS	1/23/03
ECN-720007	Rev 0	Phase 2, HIHTL from C-06B to C-03B and C-06A to C-06C	2/24/03
ECN-720007	Rev 1	Phase 2, HIHTL from C-06B to C-03B and C-06A to C-06C	2/27/03
ECN-720007	Rev 2	Phase 2, HIHTL from C-06B to C-03B and C-06A to C-06C	2/24/03
ECN-720007	Rev 3	Add C-103 Jumper to Field Drawing	3/22/03
ECN-720019	RPP-13381	Sluicer Specification Modification	3/17/03
ECN-720023	RPP-13554, 13369	Test Pressure for 4" HIHTL	1/2/03
ECN-720026		Sluicer Reactivation	2/10/03

Document #	RPP/Drwg #	Title	Date Released
ECN-720048	RPP-11567	Level 2 Spec Revision for LRS	2/20/03
ECN-720059	H-2-818674, 75, 76	Electrical Installation Power Racks/Flex Jumper Heat Trace	2/10/03
ECN-720059	Rev 1	SO Cord Conduit Replacement	3/10/03
ECN-720059	Rev 2	Relocate Power Rack	3/25/03
ECN-720059	Rev 3	Correct Drawings to Match Field Labels and Wire Runs	3/31/03
ECN-720070		WRS Portable Ventilation System Installation	2/27/03
ECN-720071		As-Built Portable Air Inlet Assembly, 1000 CFM	2/27/03
ECN-720085	H-14-105662, Sh 1-1	Equip Removal Work Platform Mods, Pit 06A	3/7/03
ECN-720089		Connect heat trace for HIHTL between C-06A to C-06B	2/25/03
ECN-720089	Rev 1		3/25/03
ECN-720092	H-14-102610	1000 CFM Portable Exhauster P & ID	2/27/03
ECN-720117		Leak Detection Installation and Connection Details	2/18/03
ECN-720122	RPP-14129, Rev 1	Engineering Documentation Bibliography	2/20/03
ECN-720122	Rev 1	Engineering Documentation Bibliography	3/7/03
ECN-720123		Supernate Removal Pump Installation	2/21/03
ECN-720123	Rev 1	Supernate Removal Pump and Water Skid Installation	3/19/03
ECN-720124		Remove Equipment from 06A, Connect SL-100 Line	2/24/03
ECN-720124	Rev 1	Booster Pump Mod & Jumper Abandon in Pit	3/25/03
ECN-720128		POR-08 Exhauster Redline Incorporation	2/28/03
ECN-720147	RPP-13956 Rev 1	Phase 1 LRS	3/18/03
ECN-720148		P & ID Mods	2/26/03
ECN-720151		06C Equip Removal Spray Ring Mods	2/26/03
ECN-720156		Capping of Nitrogen Purge Line at AY-02E	2/25/03
ECN-720193	H-14-105638, 105639	C-106 Retrieval HIHTL/HIHTL Supports	2/27/03
ECN-720216		06B Cover Plate Fabrication Changes	3/7/03
ECN-720217	H-14-105663	Modify 06A Spray Ring Design	3/10/03
ECN-720230	RPP-12711	Temporary Waste Transfer Line Management Plan Mods	3/10/03

Document #	RPP/Drwg #	Title	Date Released
ECN-720238		241-C-106 Essential Drawings	3/11/03
ECN-720252		I & C Wiring and Terminal Box Mods	3/13/03
ECN-720252	Rev 1	I & C Wiring and Terminal Box Mods	3/19/03
ECN-720252	Rev 2	I & C Wiring and Terminal Box Mods	3/28/03
ECN-720254	H-14-104140	Flygt Pump Design Modifications	3/10/03
ECN-720276		Raw Water Interface Assembly and Delivery Design Mods	3/14/03
ECN-720277		06C Equip Removal Spray Ring Mods	3/19/03
ECN-720280		P & ID Mods	3/18/03
ECN-720280	Rev 1	P & ID Mods	3/24/03
ECN-720280	Rev 2	P & ID Mods	3/25/03
ECN-720290		Supernate Removal Pump Assembly Mods	3/17/03
ECN-720290	Rev 1	Supernate Removal Pump Assembly Mods	3/19/03
ECN-720291	Rev 1	Update Drawing and Label References	3/22/03
ECN-720293		I & C Redline Incorp	3/20/03
ECN-720293	Rev 1	I & C Redline Incorp	3/24/03
ECN-720298		AY-02A Pump Pit LD Jumper Removal	3/19/03
ECN-720298	Rev 1	AY-02A Pump Pit LD Jumper Removal	3/22/03
ECN-720300		Liquid Removal Pump Shims	3/18/03
ECN-720307		Electrical Rack Fabrication Redline Incorporation	3/22/03
ECN-720327		06B Sump Pump Modification	3/21/03
ECN-720344		Compartment 1FF Nameplate Replacement	3/25/03
ECN-720363		I & C and Electrical	3/31/03

ENGINEERING CHANGE NOTICE

Page 1 of 15

- DM
- FM
- TM

1a. ECN 720391 R 0

1b. Proj. W-
ECN

2. Request Information Record Information on the ECN-1 Form		3a. Design Inputs -Record Information on the ECN-2 Form		3b. Design References - Record Information on the ECN-3 Form		3c. Engineering Evaluation / Estimate / Approval to Proceed w/ the Design - Record Information on the ECN-4 Form	
4. Originator's Name, Organization, MSIN, & Phone No. M.A. White, ARES, 946-3300				5. USQ Number No. TF-03-0772D <input type="checkbox"/> N/A <i>REV. 1</i> Init <i>ASB</i> Date <i>4/30/03</i>		6. Date 04/04/03	
7. Title Modify C-106 Waste Retrieval P&ID			8. Bldg. / Facility No. 241-C, 241-AN		9. Equipment / Component ID 241-C-103, 241-C-106, 241-AN-106		10. Approval Designator ESQ
11. Document Numbers Changed by this ECN (For FM or TM Changes Record Information on the ECN-5 Form) Sheet and Rev. See ECN-5 Form			12. Design Basis Documents? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		13. Safety Designation <input type="checkbox"/> SC <input checked="" type="checkbox"/> SS <input type="checkbox"/> GS <input type="checkbox"/> N/A		14. Expedited / Off-Shift ECN? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
15a. Work Package Number <i>N/A</i> <i>108P</i> <i>4/30/03</i>		15b. Modification Work Completed <i>N/A</i> <i>108P</i> <i>4/30/03</i> <small>Responsible Engineer / Date</small>		15c. Restored to Original Status (TM) N/A <small>Responsible Engineer / Date</small>		16. Fabrication Support ECN? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
17. Description of the Change (Use ECN Continuation pages, as needed) See page 3.							
18. Justification of the Change (Use ECN Continuation pages, as needed) See page 3. This modification will not result in a change to exposure > 1 person-rem (whole body) or > 10 person-rem (extremities) for the installation, maintenance, and operation of the modification.						19. ECN Category <input type="checkbox"/> Direct Revision <input checked="" type="checkbox"/> Supplemental <small>ECN Revision Type</small> <input type="checkbox"/> Void/Cancel <input type="checkbox"/> Closure <input type="checkbox"/> Revision	
20. Distribution (Name and MSIN)						Release Stamp	
J.R. Bellomy R3-83 G.P. Janicek S7-24 J.F. Bores R2-87 J.G. Propson S7-65 S.D. Burton R3-83 R.E. Butler S7-86 S.D. Doss S7-03 K.R. Ellingson S7-24 P.J. Fuller R3-83 D. Gerken R3-83						DATE: APR 30 2003 STA: 3 HANFORD RELEASE 18	

ENGINEERING CHANGE NOTICE

Page 2 of 15

- DM
- FM
- TM

1a. ECN 720391 R 0

1b. Proj. ECN W-

21. Design Check
Record Information on the ECN-6 Form

22. Design Verification Required?
 Yes No
If Yes, as a minimum attach the one page checklist from TFC-ENG-DESIGN-P-17.

23. Closeout / Cancel / Void
 Yes No
If Yes, Record Information on the ECN-7 Form and attach form(s).

24. Revisions Planned (Include a brief description of the contents of each revision)
N/A

Note: All Revisions shall have the approvals of the affected organizations as identified in block 9 "Approval Designator," on page 1 of this ECN.

25a. Commercial Grade Item Dedication Numbers (associated with this design change)
N/A

25b. Engineering Data Transmittal Numbers (associated with this design change, e.g., new drawings, new documents)
N/A

26a. Design Cost Estimate
\$ 32K

26b. Materials / Procurement Costs
N/A

26c. Estimated Labor Hours
16 hrs

27. Field Change Notice(s) Used? (Used for ECN Revisions only)
 Yes No
If Yes, Record Information on the ECN-8 Form attach form(s) and identify permanent changes.

NOTE: ECN Revisions are required to record and approve all FCN's issued during the field modification work process. If the FCN's have not changed the original design media then they are just incorporated into the ECN file via an ECN revision. If the FCN did change the original design media then the ECN Revision will include the necessary engineering changes to the original design media changes.

28. Approvals

Signature	Date	
Design Authority <u>George Janicek</u> <i>[Signature]</i>	<u>4/30/03</u>	
Team Lead/Lead Engr. <u>John Propson</u> <i>[Signature]</i>	<u>4/30/03</u>	
Resp. Engineer <u>CH Cize</u> <i>[Signature]</i>	<u>4/30/03</u>	
Resp. Manager <u>Warren Thompson</u> <i>[Signature]</i>	<u>4/30/03</u>	
Quality Assurance <u>John Bores</u> <i>[Signature]</i>	<u>04/30/03</u>	
IS&H Engineer <u>Ralph Butler</u> <i>[Signature]</i>	<u>4/30/03</u>	
NS&L Engineer _____		
Environ. Engineer <u>Shelly Doss</u> <i>[Signature]</i>	<u>4-30-03</u>	
Project Engineer _____		
Design Checker _____		
Design Verifier <u>Pat Fuller</u> <i>[Signature]</i>	<u>4/30/03</u>	
Operations _____		
Radcon _____		
Other <u>Jim Bellomy</u> <i>[Signature]</i>	<u>4/30/03</u>	
Other <u>DAVE CARLSON</u> <i>[Signature]</i>	<u>4/30/03</u>	

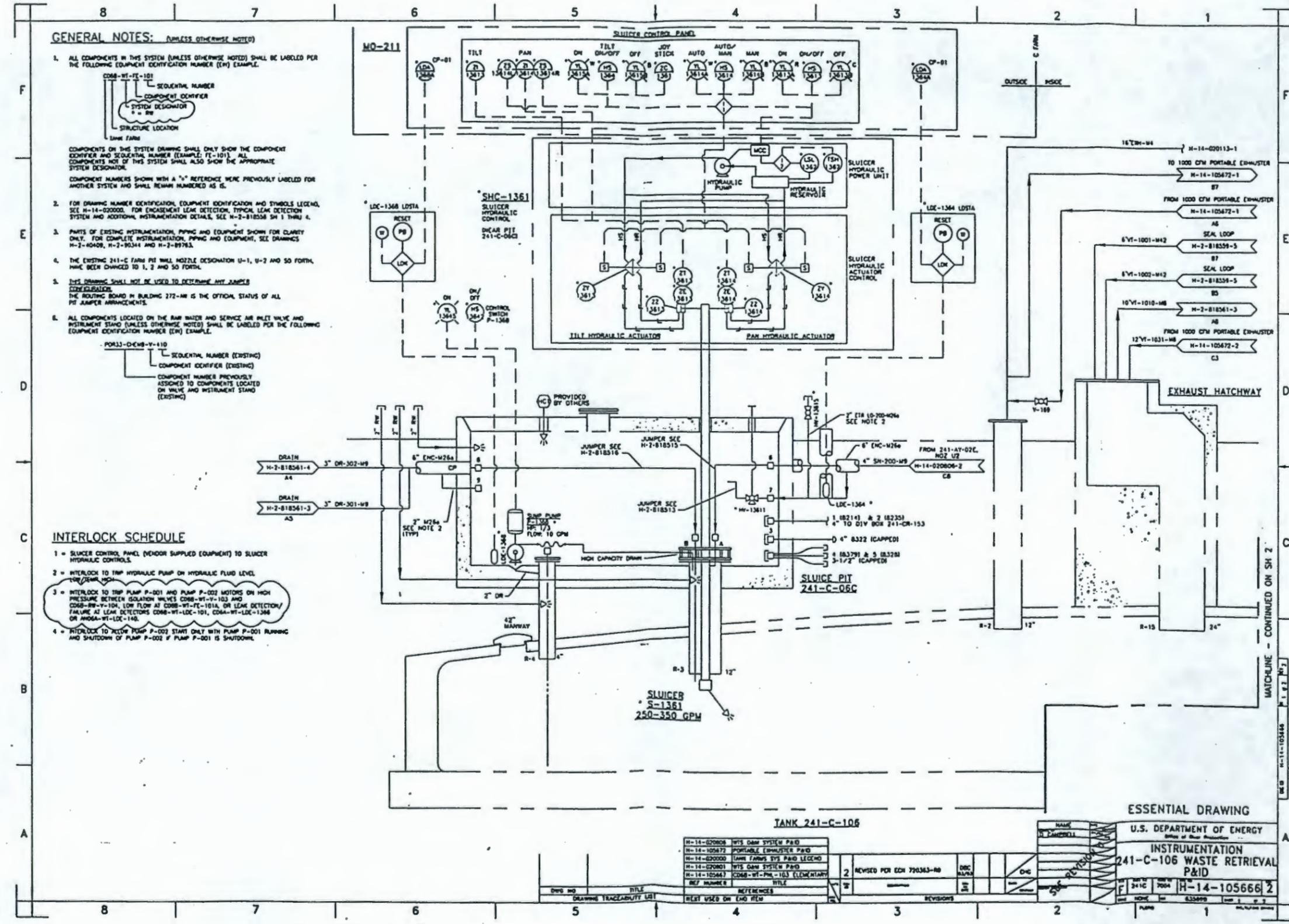
Signature	Date	
Originator/Design Agent <u>Mike White, ARES</u> <i>[Signature]</i>	<u>4/25/03</u>	
Professional Engineer _____		
Project Engineer _____		
Quality Assurance _____		
Safety _____		
Designer _____		
Environ. Engineer _____		
Other _____		
Other _____		

DEPARTMENT OF ENERGY / OFFICE OF RIVER PROTECTION

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL SIGNATURES

Document/Drawing No. H-14-105666 Sheet 1 Revision 2
(Note: A separate ECN Continuation page shall be used for each document/drawing to be modified.)



- GENERAL NOTES: (UNLESS OTHERWISE NOTED)**
- ALL COMPONENTS IN THIS SYSTEM (UNLESS OTHERWISE NOTED) SHALL BE LABELED PER THE FOLLOWING EQUIPMENT IDENTIFICATION NUMBER (EIN) EXAMPLE:
 COMB-WT-FE-101
 SYSTEM DESIGNATOR
 SEQUENTIAL NUMBER
 COMPONENT IDENTIFIER
 STRUCTURE LOCATION
 TANK NAME
 COMPONENTS ON THIS SYSTEM DRAWING SHALL ONLY SHOW THE COMPONENT IDENTIFIER AND SEQUENTIAL NUMBER (EXAMPLE: FE-101). ALL COMPONENTS NOT OF THIS SYSTEM SHALL ALSO SHOW THE APPROPRIATE SYSTEM DESIGNATOR.
 - FOR DRAWING NUMBER IDENTIFICATION, EQUIPMENT IDENTIFICATION AND SYMBOLS LEGEND, SEE H-14-020000. FOR ENCASMENT LEAK DETECTION, TYPICAL LEAK DETECTION SYSTEM AND ADDITIONAL INSTRUMENTATION DETAILS, SEE H-2-818558 SH 1 THRU 4.
 - PARTS OF EXISTING INSTRUMENTATION, PIPING AND EQUIPMENT SHOWN FOR CLARITY ONLY. FOR COMPLETE INSTRUMENTATION, PIPING AND EQUIPMENT, SEE DRAWINGS H-2-80408, H-2-90344 AND H-2-89783.
 - THE EXISTING 241-C FARM PIT WALL NOZZLE DESIGNATION U-1, U-2 AND SO FORTH, HAVE BEEN CHANGED TO 1, 2 AND SO FORTH.
 - THIS DRAWING SHALL NOT BE USED TO DETERMINE ANY JUMPER CONFIGURATION. THE ROUTING BOARD IN BUILDING 272-AM IS THE OFFICIAL STATUS OF ALL PIT JUMPER ARRANGEMENTS.
 - ALL COMPONENTS LOCATED ON THE BARRIAGE AND SERVICE AIR INLET VALVE AND INSTRUMENT STAND (UNLESS OTHERWISE NOTED) SHALL BE LABELED PER THE FOLLOWING EQUIPMENT IDENTIFICATION NUMBER (EIN) EXAMPLE:
 P-013-D-EMB-Y-410
 SEQUENTIAL NUMBER (EXISTING)
 COMPONENT IDENTIFIER (EXISTING)
 COMPONENT NUMBER PREVIOUSLY ASSIGNED TO COMPONENTS LOCATED ON VALVE AND INSTRUMENT STAND (EXISTING)

- INTERLOCK SCHEDULE**
- SLUICE CONTROL PANEL (NEEDOR SUPPLIED EQUIPMENT) TO SLUICE HYDRAULIC CONTROLS.
 - INTERLOCK TO TRIP HYDRAULIC PUMP ON HYDRAULIC FLUID LEVEL LOW/DEAD END.
 - INTERLOCK TO TRIP PUMP P-001 AND PUMP P-002 MOTORS ON HIGH PRESSURE BETWEEN ISOLATION VALVES COMB-WT-Y-103 AND COMB-WT-Y-104, LOW FLOW AT COMB-WT-FE-101A, OR LEAK DETECTION/FAILURE AT LEAK DETECTORS COMB-WT-LDC-101, COMB-WT-LDC-1368 OR ANOXA-WT-LDC-140.
 - INTERLOCK TO ALLOW PUMP P-002 START ONLY WITH PUMP P-001 RUNNING AND SHUTDOWN OF PUMP P-002 IF PUMP P-001 IS SHUTDOWN.

ESSENTIAL DRAWING

U.S. DEPARTMENT OF ENERGY
Office of Energy Research and Development

INSTRUMENTATION
241-C-106 WASTE RETRIEVAL P&ID

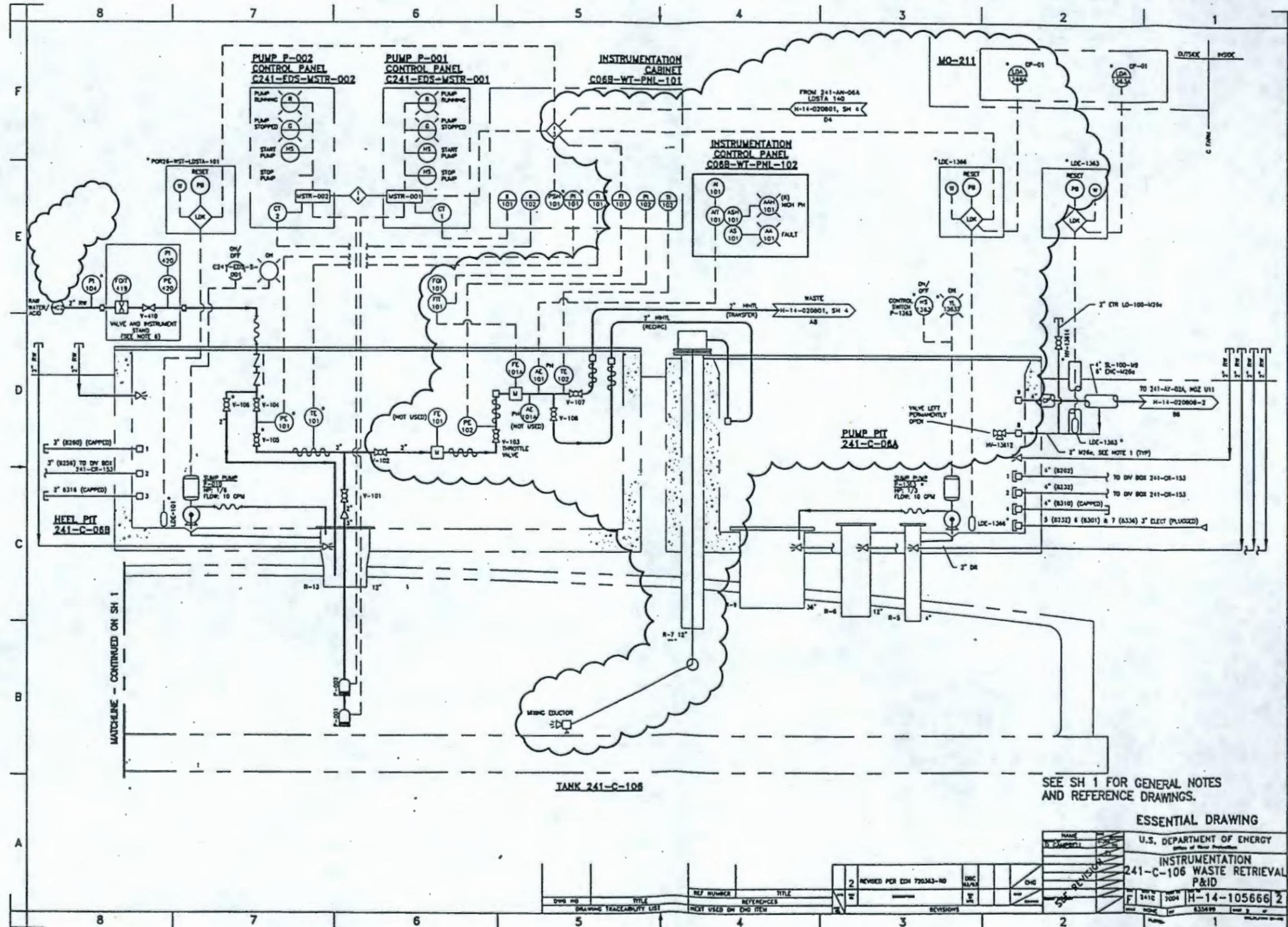
H-14-105666 2

NO.	DATE	DESCRIPTION	BY	CHKD
1		REVISED FOR ECN 720391-R0	DM	DM
2		REVISED FOR ECN 720391-R0	DM	DM

- DM
- FM
- TM

1a. ECN 720391 R 0
 1b. Proj. W-
 ECN

Document/Drawing No. H-14-105666 Sheet 2 Revision 2
 (Note: A separate ECN Continuation page shall be used for each document/drawing to be modified.)



SEE SH 1 FOR GENERAL NOTES AND REFERENCE DRAWINGS.

ESSENTIAL DRAWING

U.S. DEPARTMENT OF ENERGY	
INSTRUMENTATION	
241-C-106 WASTE RETRIEVAL P&ID	
DATE	REV
0412	0004
NO. 033499	REV 2

REV	NO.	DATE	DESCRIPTION
2			REVISED PER ECN 720343-10
1			ISSUED FOR CONSTRUCTION

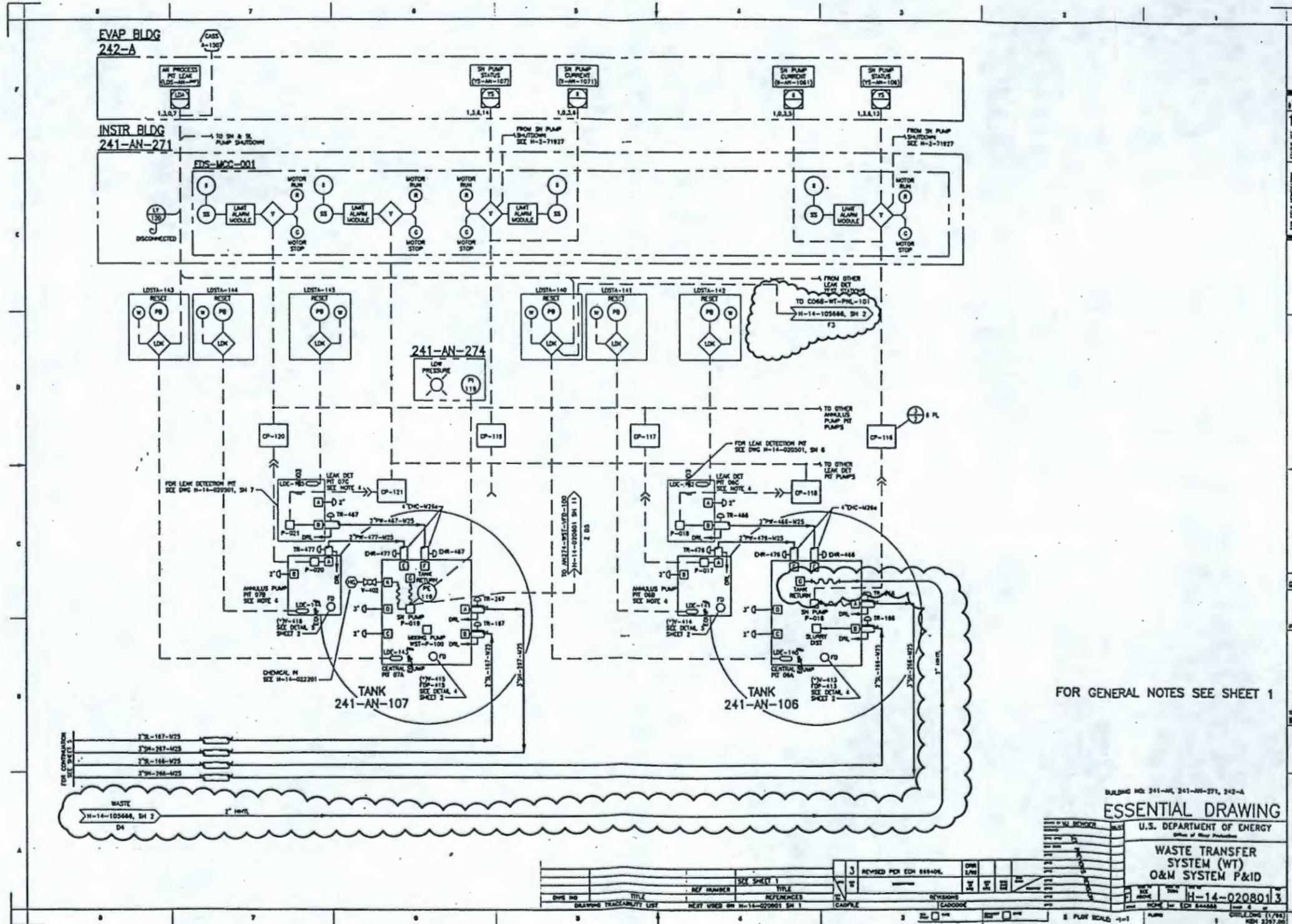
ENGINEERING CHANGE NOTICE CONTINUATION SHEET

- DM
- FM
- TM

1a. ECN 720391 R 0
 1b. Proj. W-
 ECN

Page 6 of 15

Document/Drawing No. H-14-020801 Sheet 4 Revision 34 12
 (Note: A separate ECN Continuation page shall be used for each document/drawing to be modified.) 4/30/03



FOR GENERAL NOTES SEE SHEET 1

BUILDING NO: 241-AN, 241-AN-271, 242-A

ESSENTIAL DRAWING

U.S. DEPARTMENT OF ENERGY

WASTE TRANSFER SYSTEM (WT) O&M SYSTEM P&ID

H-14-020801 3

REV	NO	DATE	DESCRIPTION	BY	CHKD
3			REVISED PER ECH 88840L		
2					
1					