

LESSONS LEARNED FROM THE DECOMMISSIONING OF JOHN SEVIER YARD

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NORFOLK SOUTHERN
ENVIRONMENTAL OPERATIONS



JOHN SEVIER YARD

Knoxville, Tennessee

Built in 1925 by Southern Railway

America's First Fully Automated Hump Classification Yard – 1951

35 trains per day





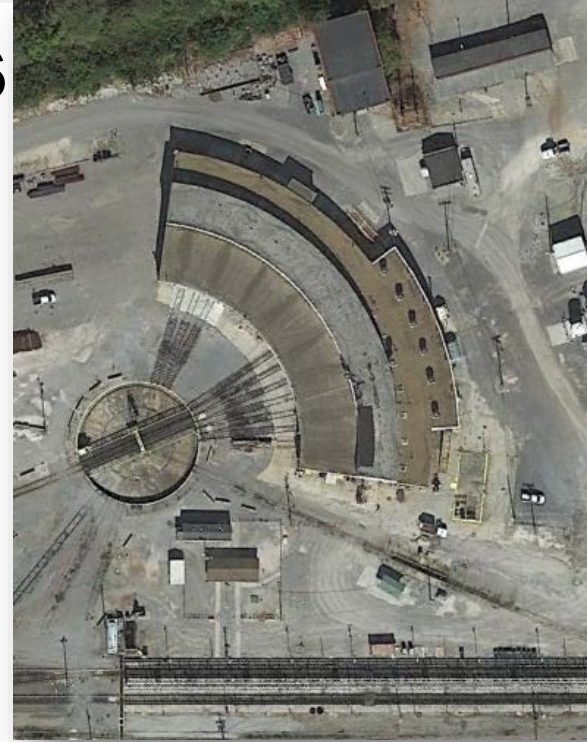


- Corridor Track
- Hump Count
- Hump Cost
- Facility Limitations

2016 NS HUMP YARDS

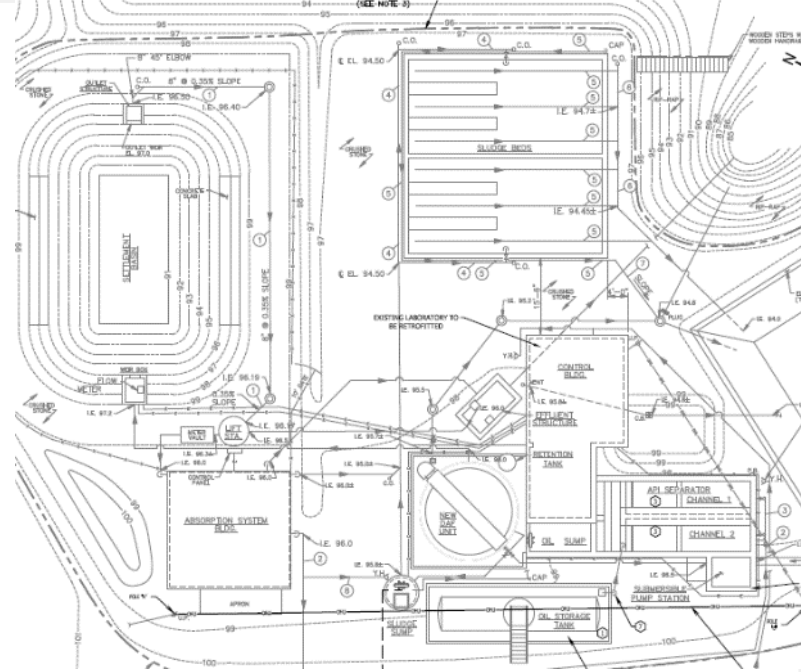
JOHN SEVIER YARD IDLED MAY 1, 2016

- All Terminal operations ceased
- No originating/terminating trains, locals, or yard crews
- All Mechanical operations ceased
- T&E crew change location only (mainline traffic)
- Equipment Storage
- Train meets
- [Environmental Commitments](#)



ENVIRONMENTAL COMMITMENTS

- Tennessee Individual NPDES Permit
- Tennessee Underground Injection Permit
- Knox County Air Board Permit
- SWPPP, SPCC, & FRP
- Compliance Tasks and WWTP's



“Shut it all down”

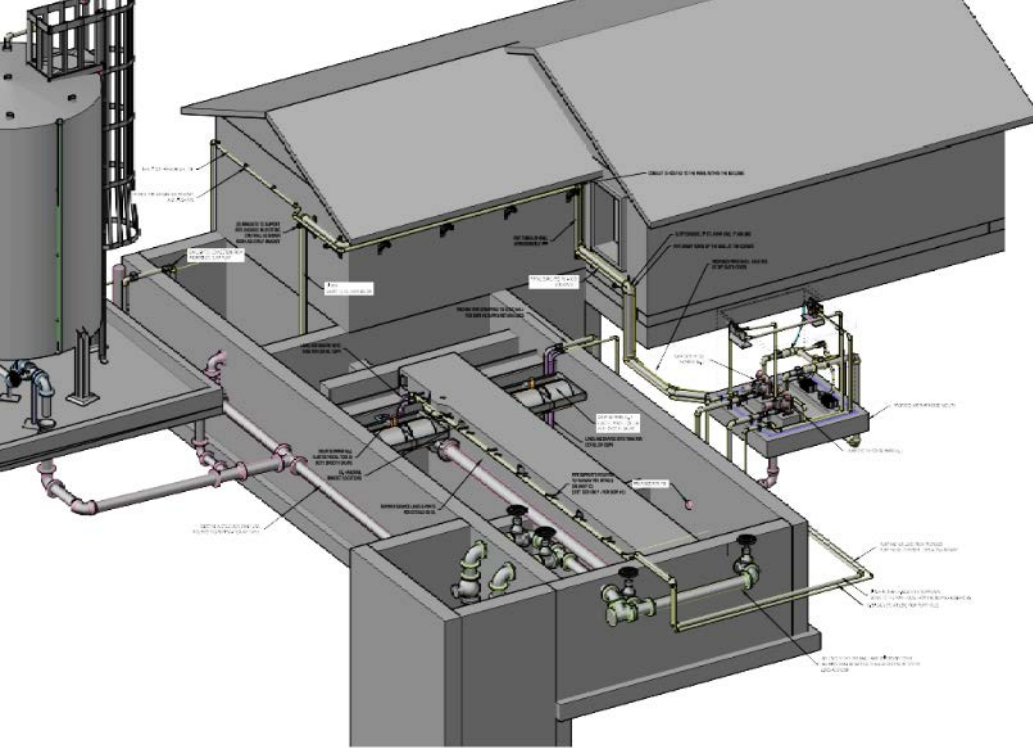
Item	Container #	Capacity (gallons)	Contents	Activity	Sludge Waste Generation %	Price	Unit Price	Price	Justification/Notes
1			Wastewater, oil, and Sludge	Pump out on two frac tanks for two months		\$2,000	LS	\$5,000	waste management
2	1	500	Used Oil	Purge, clean, and disconnect tank	3%	\$23	LS	\$500	Requirement of 40 CFR 112.2 Permanently Closed
3	3	398,630	Diesel	Purge, clean, and disconnect tank	0.3%	\$4,434	LS	\$3,000	Requirement of 40 CFR 112.2 Permanently Closed
4	4	10,018	Lube Oil	Purge, clean, and disconnect tank	3%	\$451	LS	\$2,000	Requirement of 40 CFR 112.2 Permanently Closed
5	5	5,000	Used Oil	Purge, clean, and disconnect tank	3%	\$0	LS	\$0	Staying in Service
6	10	4,000	Used Oil	Purge, clean, and disconnect tank	3%	\$180	LS	\$2,000	Requirement of 40 CFR 112.2 Permanently Closed
7	13	2,000	Oily Water	Remain in Service to Dewater Jack Pit	0%	\$0	LS	\$0	Staying in Service
8	16	500	Suspension Bearing Oil	Purge, clean, and disconnect tank	3%	\$23	LS	\$500	Requirement of 40 CFR 112.2 Permanently Closed
9	17	300	Gasoline	Purge, clean, and disconnect tank	3%	\$14	LS	\$500	Requirement of 40 CFR 112.2 Permanently Closed
10	18	300	Diesel	Purge, clean, and disconnect tank	3%	\$0	LS	\$0	Staying in Service
11	19	500	Winter Fuel Additive	Purge, clean, and disconnect tank	3%	\$23	LS	\$1,000	Requirement of 40 CFR 112.2 Permanently Closed
12	20	1,200	Diesel	Purge, clean, and disconnect tank	3%	\$0	LS	\$0	Staying in Service
13	21	2,500	Used Oil	Purge, clean, and disconnect tank	3%	\$113	LS	\$2,000	Requirement of 40 CFR 112.2 Permanently Closed
14	22 (generator)	415	Diesel	Purge, clean, and disconnect tank	3%	\$0	LS	\$0	Staying in Service
15	24	300	Switch Plate Lubricant	Purge, clean, and disconnect tank	3%	\$0	LS	\$0	Returned to Vendor
16	25	2,000	Used Oil	Purge, clean, and disconnect tank	3%	\$30	LS	\$2,000	Requirement of 40 CFR 112.2 Permanently Closed
17			Used Oil	Drain and Purge Used Oil Heater System (8 Units)			LS	\$0	Staying in Service
18	Car Jack Reservoir	65	Hydraulic Oil	Purge, clean, and disconnect tank	100%	\$38	LS	\$500	Requirement of 40 CFR 112.2 Permanently Closed
19	DSA 1	55	Flammable Waste Liquid	characterize, profile, and dispose of Non-Haz Waste	100%	\$0	LS	\$0	Staying in Service
20	DSA 2	550 (10x55)	Used oil, hydraulic oil	characterize, profile, and dispose of non-Haz Waste	100%	\$0	Load & Trans	\$0	Transferred to other facilities
21	DSA 3	385 (7x55)	ATF, used oil, mineral spirits	characterize, profile, and dispose of non-Haz Waste	100%	\$0	Load & Trans	\$0	Transferred to other facilities
22	DSA 4	435 (9x55)	Bearing oil, used oil	characterize, profile, and dispose of non-Haz Waste	100%	\$0	Load & Trans	\$0	Transferred to other facilities
23	DSA 5	220 (4x55)	Compressor oil, used oil	characterize, profile, and dispose of non-Haz Waste	100%	\$0	Load & Trans	\$0	Transferred to other facilities
24	DSA 6	220 (4x55)	Journal, hydraulic, engine oil	characterize, profile, and dispose of non-Haz Waste	100%	\$0	Load & Trans	\$0	Transferred to other facilities
25	DSA 7	110 (2x55)	Bearing and hydraulic oil	characterize, profile, and dispose of non-Haz Waste	100%	\$0	Load & Trans	\$0	Transferred to other facilities
26	Other Drums	275 (5x55)	Various Oils	characterize, profile, and dispose of non-Haz Waste	100%	\$0	Load & Trans	\$0	Transferred to other facilities
27	Totes	4,620 (14x3)	Various	characterize, profile, and dispose of non-Haz Waste	100%	\$0	Load & Trans	\$0	Transferred to other facilities
28	Parts Washer	60 (2x30)	Solvent	Disposal through service provider	100%	\$420	Load & Trans	\$150	RCRA waste determination requirements
29			Diesel	Drain and Purge Fuel Lines from Tank to Pump Station			LS	\$16,000	Required to shut down W/WTP and bypass water
30			Diesel, Lube Oil, and Water	Drain and Purge All Fluids from Fuel Rack Equipment			LS	\$12,000	Required to shut down W/WTP and bypass water
31			Diesel	Drain and Purge Fuel Transfer Pump Station			LS	\$4,000	Required to shut down W/WTP and bypass water
32			Sand and Petroleum	Clean Fuel Rack Containment and Equipment			LS	\$20,000	Required to shut down W/WTP and bypass water
33			Oil, Water, and grit	Clean Fuel Rack DWS and jet upstream I/W/W piping			LS	\$4,000	Required to shut down W/WTP and bypass water
34			Oil, Water, and grit	Clean Roundhouse Tracks and Pits			LS	\$6,000	Required to shut down W/WTP and bypass water
35			Oil, Water, and grit	Jet and Clean I/W/W lines from Roundhouse to EQ Basin			LS	\$4,000	Required to shut down W/WTP and bypass water
36			Oil, Water, and grit	Jet and Clean I/W/W lines from outdoor inspection pit to EQ Basin			LS	\$1,000	Required to shut down W/WTP and bypass water
37			Oil, Water, and grit	Jet and clean I/W/W line from Fuel rack to EQ Basin			LS	\$4,000	Required to shut down W/WTP and bypass water
38			Oil, Water, and grit	Clean EQ Basin			LS	\$3,000	Required to shut down W/WTP and bypass water
39			Oil, Water, and grit	Clean first lift station and both API Channels			LS	\$5,000	Required to shut down W/WTP and bypass water
40			Oil, Water, and grit	Drain and Purge W/WTP piping			LS	\$4,000	Required to shut down W/WTP and bypass water
41			Oil, Water, and grit	Drain and Clean DAF, sludge pit, and sludge piping			LS	\$3,000	Required to shut down W/WTP and bypass water
42			Settled Solids	Drain and Clean Polishing Pond			LS	\$3,000	Required to shut down W/WTP and bypass water
43			Petroleum Solid Waste	Clean and Empty Drying Beds		\$2,000	LS	\$4,000	Required to shut down W/WTP and bypass water
44	Frac tanks (2)	44,000	Oily Water	disposal of oily after W/WTP is cleaned	60%	\$5,280			Required to shut down W/WTP and bypass water
45	Frac tanks (2)	44,000	Sludge	Disposal of sludge after W/WTP is cleaned	10%	\$1,380			Required to shut down W/WTP and bypass water
46				Transportation of Oily Water and sludge for disposal			LS	\$2,300	Required to shut down W/WTP and bypass water
47				Misc debris cleanup and disposal		\$1,000	LS	\$5,000	Solid waste management BMP
48				Demolish Riverside dam and diversion structures			LS	\$20,000	Required to shut down W/WTP and bypass water
49				Excavate impacted sediments at Riverside dam			LS	\$3,500	Required to shut down W/WTP and bypass water
50				drain and clean Riverside W/WTP				\$5,000	Required to shut down W/WTP and bypass water
51				Install baffle pipe in EQ Basin				\$106,000	
52				Clean Concrete Pit next to Ramp				\$4,000	
53				Pipe Trench cleaning				\$3,000	
54									
55				puncture concrete floor and fill dirt/gravel in Riverside W/WTP				\$10,000	W/WTP retirement

INITIAL ESTIMATE:

\$296,736

- Assumptions
- Items Not Addressed
- Disclaimers
- Budget

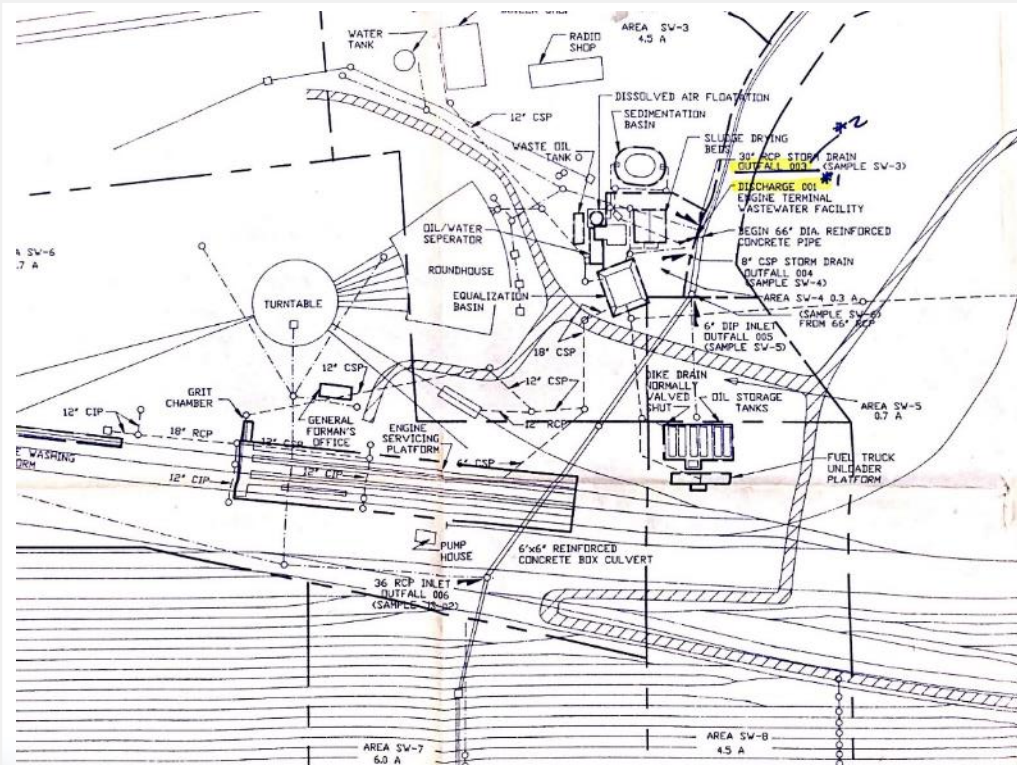
COST BENEFIT ANALYSIS



- Waste Water Treatment Plants
- Defer Complete Shutdown
- Reduce Operation
- Complete Shutdown

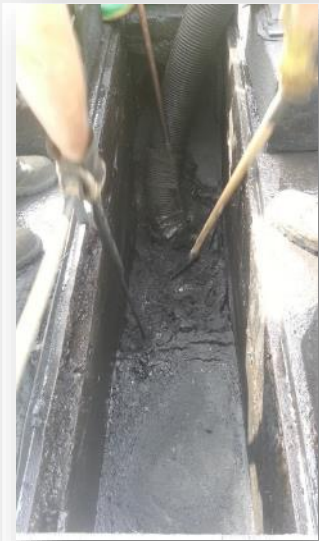
CONVEYANCE SYSTEM

- Generations of Alterations
- Impacted Sediment
- Pipe Cleaning Challenges
- Budget Affects



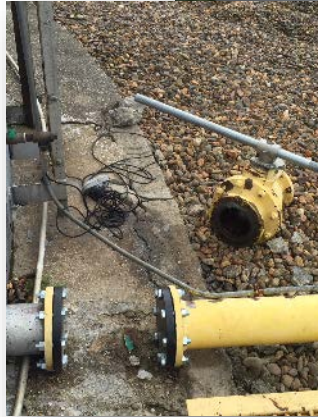
LOCOMOTIVE SERVICE TRACKS

- Cleaning Containment
- Fueling and Lubricating Equipment
- Managing Sludge



STORAGE TANK AND PIPING RETIREMENT

- Permanently Close Storage Tanks
- Managing Residue Materials
- Sequencing Work
- Regulatory Submittals
- Plan Updates

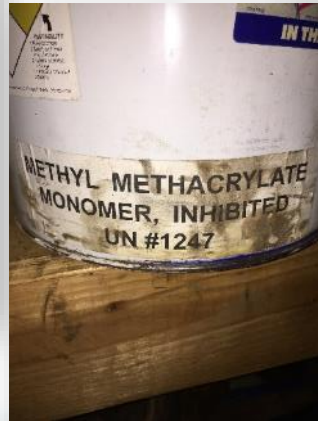


BENEFICIAL REUSE AND ASSET TRANSFER



- Useable parts and components
- Consumable products
- Equipment

EVERYTHING ELSE



- Off spec materials
- Residue containers
- Outdated & non-compliant parts and equipment
- Universal waste
- Hazardous Waste

THE UNKNOWN



KEY LESSONS LEARNED AND TAKEAWAYS



- Budget as soon as possible and seek special funding
- Seek input from those with detailed facility knowledge
- Gather information from as many sources as possible
- Abandon what you can

KEY LESSONS LEARNED AND TAKEAWAYS



- Proactive manage Environmental Compliance Team
- Utilize internal departments to manage material
- Build in plenty of contingency time, money, and quantities