Standard Batch Treatment Design

WASTE TANKS	
Volume	1,000 - 2,500 Gallons
Construction	Flat bottom HDLPE
Level Sensing	Ultrasonic
Transfer Control	Automatic Volumetric
Tank Fittings	Sch. 80 PVC
SKID MOUNTED COMPONENTS	
Waste Transfer Pump(s)	Centrifugal drive
Tank Mixer	Gear reduced mechanical
Chemical Feed Pumps	1/4" AOD w/ analog control
Supernate Discharge	Gravity Flow
Sludge Transfer Pump	1" non-metallic AOD
REACTION TANK	
Volume	1,000 - 2,500 Gallons
Construction	Cone-bottom HDLPE
Level Sensing	Ultrasonic & Buoyancy
Process Control	pH & ORP Sensors
Tank Fittings	Sch. 80 PVC
SLUDGE TANK	
Volume	500 - 1,600 Gallons
Construction	Cone-bottom HDLPE
Level Sensing	Buoyancy
Tank Fittings	Sch. 80 PVC
FILTER PRESS	
Size	2 to 8 Cubic Foot
Design	Gasketed Plate & Frame
Hydraulic Closure	Semi-Automatic
Sludge Feed Pump	1 to 1 1/2" AOD
Operator Protection	Closure pressure switch
Sludge Collection	Cubic Yard "Supersacks"
Effluent Verification	Sludge tank recirculation

CONTROLLER	
Controller	CompactLogix PAC
Touchscreen	10" PanelvView 7+
Enclosure	Polycarbonate NEMA 4X
Status Notification	Red/Green Lights & Horn
Local Access	Password Protected
Remote Access	Ethernet based
Operator Communications	Smart-phone E-Mail
OPERATING SPECIFICATIONS	
Feed Water Quality	
Temperature	55°F-105°F
pH Range	2-12 SU
Maximum Metals	<5,000 mg/L
Residual metals	<1 mg/L
Ending pH	8-10 SU
Reaction Tank Fill Rate	45 gpm
Reaction Tank Empty Rate	45 gpm
Batch Cycle Time	5 Hours
UTILITIES	
Electrical Voltage	208-230/460
Full Load Amps	60/30
Compressed Air	50-scfm
PHYSICAL DATA	
Waste Tank Diameter	64" to 95"
Reaction Tank Diameter	73" to 96"
Sludge Tank Diameter	49" to 89"
Mixers/Pumps Skid	72" L x 48" W
Filter Press	Variable
Shipping/Operating Wt.	Variable
Frame/Coating	304SS/Polyurethane
Piping	Schedule 80 PVC
Electrical Conduit	Schedule 40 PVC

Operating Profile – For precipitation of dissolved heavy metals and contaminants including oil & grease (O&G) and organic contributors to biological oxygen demand (BOD) from waste water. Employs sulfuric-acid and sodium hydroxide for pH adjustment and proprietary liquid treatment chemistries for metals precipitation. Highly-automated including accumulated waste transfer, treatment cycle, solid/liquid separation, supernate discharge, and sludge dewatering. Produces treated water to meet applicable discharge limits relying on WI's technical expertise with both equipment, process chemistries, and treatment chemistries.

Waste Tanks – Typically one (1) each for acidic & a*lkaline Waste,* minimum 1,000-gallons (larger tanks used depending upon waste volume per day) flat-bottom, dome-top, and constructed of HDLPE. For concentrated or metal-bearing process wastes and/or ion exchange regeneration & backwash waste. Utilizes an ultrasonic sensor for liquid level monitoring and control of waste transfer by 1" AOD pumps to the Reaction Tank at operator-adjustable volumes

Reaction Tank – 1,000 to 2,500-gallon cone-bottom dome-top HDLPE with polyethylene stand; buoyancy floats for incoming waste, process control, and supernate transfer & sludge feed; pH & ORP sensors for process control; 1 1/2-HP gear-drive mixer with 1.25" SS shaft & dual 12" impellors mounted to adjacent stand for solution agitation; with supernate discharge through two manual flow-control valves with clear pipe for visual inspection and sample tap to a centrifugal-drive pump for discharge to sewer; and manual 2" diaphragm valve on the cone outlet for control of sludge transfer

Process Control – pH, ORP, and level sensors are employed to monitor the treatment process and regulate its automation with real-time display of sensor readings through the controller HMI. pH is utilized to control operation of acid and caustic feed pumps, ORP for precipitant addition, and level for control of incoming and outgoing solution flows and for activation of the treatment cycle

Pumps Skid/Mixer Stand - Integrating ¼" non-metallic AOD pumps for acid, NaOH, coagulant, precipitant, & flocculent addition with proportional dosing control; AOD pumps for incoming waste transfer; centrifugal-drive pump for supernate transfer; AOD pumps for sludge transfer and Filter Press feed; Reaction Tank gear-drive mixer; and direct-drive mixer for flocculent day tank

Sludge Tank – Minimum 500-gallon cone-bottom dome-top HDLPE with polyethylene stand; buoyancy floats for incoming waste and supernate transfer & sludge feed; with supernate discharge through two manual flow-control valves with clear pipe for visual inspection and sample tap to a centrifugal-drive pump for discharge to sewer; and manual 2" diaphragm valve on the cone outlet for control of sludge feed to the Filter Press Pump

Filter Press – Gasketed-cloth plates, plate & frame structure utilizing a semi-automatic hydraulic closure. Elevated legs permit placement of a cubic yard box on pallet for ease of sludge accumulation. Integrates operator-safety cables and air supply switch preventing operation if not fully closed. 1.5" non-metallic air operated diaphragm pump is regulated by our proprietary Auto-Pump Controller (APC) automatically increasing air volume & pressure as the press plates load and the pump stroke rate slows

System Controls – Operation, monitoring, and control of the integrated system utilizes an Allen-Bradley CompactLogix programmable automation controller (PAC) with Human-machine interface (HMI) through a Panelview Plus color touch screen. System operation while highly automated also employs manual control with an intuitive operator-friendly interface. System operating set points and alarms are set at the touch screen which is password protected to limit access to the operator, supervisor, maintenance, or engineer based on necessity