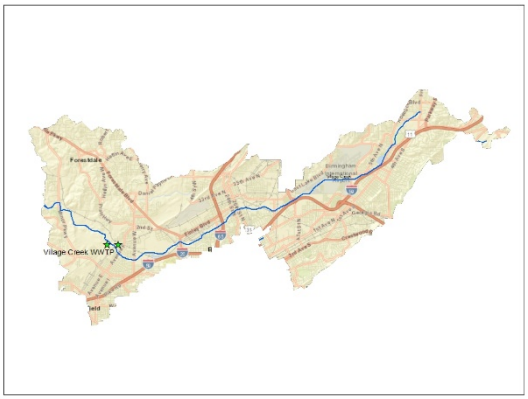
JEFFERSON COUNTY ENVIRONMENTAL SERVICES

VILLAGE CREEK
WATER RECLAMATION FACILITY

CONSTRUCTED: 20xx | PERMITTED AVERAGE CAPACITY: 60.0 MGD each | PEAK FLOW CAPACITY: 200 MGD (Combined 0011 & 0021 Facilities)



1440 Pleasant Hill Road Birmingham, AL. 35224

Village Creek WRF consists of two partially independent treatment facilities with separate outfalls permitted as 0011 and 0021, and are commonly referred to as plant 001 and plant 002 respectively. Each facility is rate to treat 60MGD. Both facilities have preliminary treatment. The 001 facility has primary clarification unlike the 002 facility. Construction is under way that will soon allow 001 primary effluent to be routed proportionally to the 002 facility's headworks. Each facility uses a conventional activated sludge process followed by secondary clarification then disinfection. Plant 001 uses chlorine disinfection whereas the 002 facility has deep bed sand filters followed by ultraviolet disinfection. All waste sludge is sent to anaerobic digesters ahead of centrifuges for biosolids thickening.

Village Creek is the second largest Water Reclamation Facility in Alabama.

- Grade IV facility
- Permitted flow 001 – 60MGD
  Permitted flow 002 – 60MGD
- Plant is staffed 24 hours per day, 365 days per year
- Personnel: 31 (7 Grade IV, 0 Grade III, 2 Grade II, 1 clerk, 6 maintenance crew, 11 operator I, 3 skilled laborers and 1 laborer III)

Village Creek Wastewater Treatment Plant Energy and Process Optimization Improvements (ongoing) – Expected Completion 2/2019

- Installing automated septic receiving station
- Installing magmeters on influent of 001 plant
- Automating primary sludge pumping
- Adding primary effluent splitter box to send part of primary effluent to the 002 plant
- Converting to single stage activated sludge aeration on the 001 plant with automated D.O. control
- Optimizing anaerobic digester mixing, heating and gas system
- Incorporating FOG receiving and emulsion system ahead of anaerobic digesters
- Installing new dual fuel boilers to heat anaerobic digesters and FOG system
- Replacing 002 influent pump station pumps
- Installing new SCADA system

Budget: (Estimated at $36, 650,000)

- ADEM is mandating phosphorus compliance which is currently estimated to cost taxpayers @ $42 million just for capital improvements. Chemicals will be required to maintain phosphorus removal and will further add to our fiscal years' operational budgets
- Aging work force
    - Average age of employees 49 years old
- Aging equipment
    - Majority of equipment between at least 18 years old
- Understaffing
    - Grade IV Certified Operators 89% understaffed
    - Shift Supervisors 71% understaffed
    - Maintenance team 22% understaffed
    - Laborer position 50% understaffed
- More maintenance employees
    - While we're not too bad understaffed based on our current budget, our equipment age is to the point where we're spending 90% or more of our time repairing failed equipment. We don't have enough maintenance employees to maintain equipment in order to keep it from breaking down

Project in Planning Stage

Phosphorus removal modifications and construction to meet new ADEM phosphorus removal requirements.

Budget: (Estimated at $42,000,000)

Capital Improvement Project #1

Description and photo (if applicable)

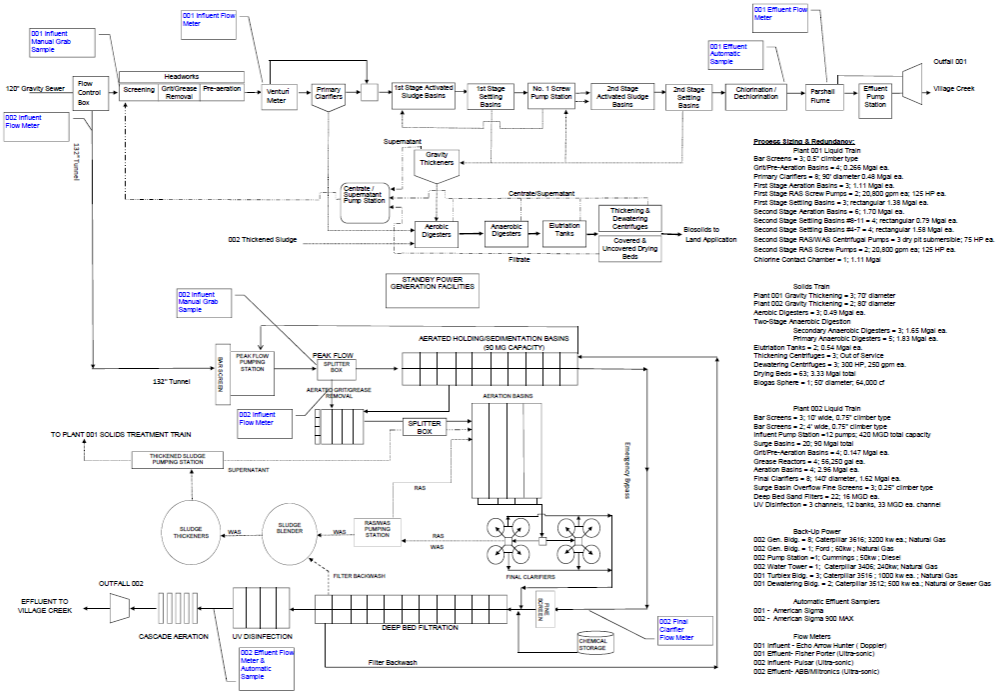
Budget: (Actual or estimated)

Director: David Denard | Deputy Director: Margaret Tanner | Plant Manager: Robby Bennett

JEFFERSON COUNTY ENVIRONMENTAL SERVICES DEPARTMENT

VILLAGE CREEK WASTEWATER TREATMENT PLANT AL0023647

FLOW SCHEMATIC - FIGURE 188-B



Process Sizing & Redundancy:

Plant 001 Liquid Train
Bar Screens = 3; 0.5" climber type
Grit/Pre-Aeration Basins = 4; 0.266 Mgal ea.
Primary Clarifiers = 8; 90' diameter 0.48 Mgal ea.
First Stage Aeration Basins = 3; 1.11 Mgal ea.
First Stage RAS Screw Pumps = 2; 20,800 gpm ea; 125 HP ea.
First Stage Settling Basins = 3; rectangular 1.38 Mgal ea.
Second Stage Aeration Basins = 6; 1.70 Mgal ea.
Second Stage Settling Basins #6-11 = 4; rectangular 0.79 Mgal ea.
Second Stage Settling Basins #4-7 = 4; rectangular 1.58 Mgal ea.
Second Stage RAS/WAS Centrifugal Pumps = 3 dry pit submersible; 75 HP ea.
Second Stage RAS Screw Pumps = 2; 20,800 gpm ea; 125 HP ea.
Chlorine Contact Chamber = 1; 1.11 Mgal

Solids Train
Plant 001 Gravity Thickening = 3; 70' diameter
Plant 002 Gravity Thickening = 2; 80' diameter
Aerobic Digesters = 3; 0.49 Mgal ea.
Two-Stage Anaerobic Digestion
Secondary Anaerobic Digesters = 3; 1.65 Mgal ea.
Primary Anaerobic Digesters = 5; 1.83 Mgal ea.
Elutriation Tanks = 2; 0.54 Mgal ea.
Thickening Centrifuges = 3; Out of Service
Dewatering Centrifuges = 3; 300 HP, 250 gpm ea.
Drying Beds = 63; 3.33 Mgal total
Biogas Sphere = 1; 50' diameter; 64,000 cf

Plant 002 Liquid Train
Bar Screens = 3; 10' wide, 0.75" climber type
Bar Screens = 2; 4' wide, 0.75" climber type
Influent Pump Station = 12 pumps; 420 MGD total capacity
Surge Basins = 20; 90 Mgal total
Grit/Pre-Aeration Basins = 4; 0.147 Mgal ea.
Grease Reactors = 4; 66,250 gal ea.
Aeration Basins = 4; 2.96 Mgal ea.
Final Clarifiers = 8; 140' diameter, 1.62 Mgal ea.
Surge Basin Overflow Fine Screens = 3; 0.25" climber type
Deep Bed Sand Filters = 22; 16 MGD ea.
UV Disinfection = 3 channels, 12 banks, 33 MGD ea. channel

Back-Up Power
002 Gen. Bldg. = 8; Caterpillar 3616; 3200 kw ea.; Natural Gas
002 Gen. Bldg. = 1; Ford ; 60kw ; Natural Gas
002 Pump Station = 1; Cummings ; 50kw ; Diese
002 Water Tower = 1; Caterpillar 3406; 240kw; Natural Gas
001 Turbex Bldg. = 3; Caterpillar 3516 ; 1000 kw ea. ; Natural Gas
001 Dewatering Bldg. = 2; Caterpillar 3512; 500 kw ea.; Natural or Sewer Gas

Automatic Effluent Samplers
001 - American Sigma
002 - American Sigma 900 MAX

Flow Meters
001 Influent - Echo Arrow Hunter (Doppler)
001 Effluent- Fisher Porter (Ultra-sonic)
002 Influent- Pulsar (Ultra-sonic)
002 Effluent- ABB/Mitronics (Ultra-sonic)

Other information