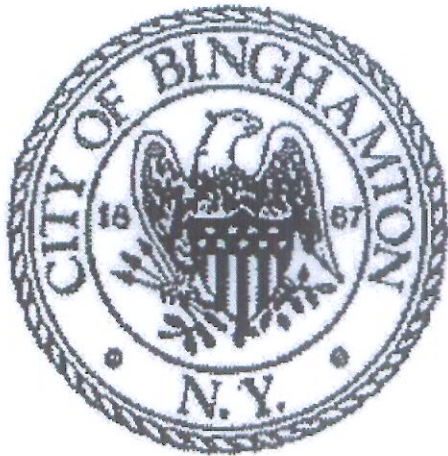


**Binghamton-Johnson City Joint Sewage  
Treatment Plant Restoration and  
Rehabilitation Project**

**2016 Quarter 4 Report**

*City of Binghamton  
Village of Johnson City  
Joint Sewage Board*



**January 2017**

## **2016 QUARTER 4 REPORT**

### **BINGHAMTON-JOHNSON CITY JOINT SEWAGE TREATMENT PLANT RESTORATION AND REHABILITATION PROJECT CASE NO: R7-20110628-59**

In accordance with Paragraph A-1c. of the Second Modification Consent Order (Case No. 87-20110628-59) between the City of Binghamton, Village of Johnson City, the Joint Sewage Board, and the State of New York, the City submits this 2016 Quarter 3 Report. The report summarizes the status and progress of the projects and programs required by the Consent Order from July 2016 to September 2016.

#### **SECTION 1— FACILITY OPERATIONS**

We continue to operate in CEPT mode. Settling Tanks 7, 8, 9 and 10 have been taken off line in preparation for work to be completed. Flow has been reduced to receive a minimum of 35 MGD. The Binghamton grit system is off-line. CEPT continues to be operational.

See Attachment A for the plant performance during this Quarter.

#### **Background**

The Binghamton - Johnson City Joint Sewage Treatment Plant (BJCJSTP) processes 18 million gallons per day with the capability of processing up to 60 million gallons per day (MGD) of wet weather flow. This plant is jointly owned by the City of Binghamton and the Village of Johnson City and managed by the Binghamton-Johnson City Joint Sewage Board (BJCJSB).

The BJCJSTP has suffered several catastrophic events since 2006. In 2006, the BJCJSTP was flooded by a 500 year flood that affected many of the processes in operation. In May of 2011, a concrete structure suffered structural failure, and in September 2011, the BJCJSTP suffered another 500 year flood that critically damaged equipment and rendered the secondary treatment fundamentally inoperable. The secondary process system is still largely inoperable today. A Consent Order was negotiated between the City of Binghamton, the Village of Johnson City, the BJCJSB and the NYSDEC to develop a plan to restore treatment operations at the BJCJSTP. The Consent Order requires the BJCJSTP to restore secondary treatment functionality and be able to fully treat 35 MGD of wet weather flow by August 1, 2018. To achieve this level of treatment, the reconstruction and testing of the Secondary Treatment Process must be completed as necessary to achieve treatment of 35 MGD. To comply with the Consent Order, the Sewage Treatment Plant must then be fully operable by May, 1, 2019, including the remainder of the secondary treatment process. There are also several interim milestones included in the Consent Order.

The project is being constructed in accordance with Wicks Law, which requires the project be bid as multiple prime contracts. More specifically, Wicks Law requires that the bulk of the construction work, consisting of the secondary treatment biological filtration filters (BAF), be

divided into a General Civil Construction Contract, an Electrical Contract, an HVAC Contract and a Plumbing Contract. The following projects are either nearing completion, in construction, or in the planning stage.

Contract No.	Description	Status
Contract No. 1	Compost Facility Demolition	Nearing final completion
Contract No. 2	FEMA Mechanical	Substantial Completion Date July 2016 Anticipated Completion Date October 2016
Contract No. 3	BAF Facility Demolition	Nearing final completion
Contract No. 4	MCC HH Emergency Replacement	Substantial completion in September 2016
Contract No. 5	BAF Restoration and Rehabilitation Civil Contract	Notice to Proceed (NTP) Issued May 27, 2016
Contract No. 6	BAF Electrical	NTP Issued May 27, 2016
Contract No. 7	BAF HVAC	NTP Issued May, 27, 2016
Contract No. 8	BAF Plumbing	NTP Issued May 27, 2016
Contract No. 9	Secant Pile Contract	Completion anticipated in November 2016
Contract No. 10 thru 13	Solids Handling Renovation	Currently in design. Anticipated completion of design is the end of 2016.
Floodwall	Floodwall and New Diversion Structure	Currently in construction. Anticipated Completion Date July of 2017

### **Contract Descriptions**

#### **Contract No. 1 - Compost Facility Demolition**

Demolition of the upper portion of the compost facility was performed to accommodate the construction of the new Administration Building to house the plant staff as well as provide the new control room to operate the new facilities. Demolition of the lower portion of the Compost Building clears the way for the construction of a new maintenance facility.

**Contract Status: 100% Complete**

#### **Contract No. 2 - FEMA Mechanical**

The FEMA Mechanical Project replaces valves, equipment and other miscellaneous items damaged in the 2011 flood. It includes equipment in both the East and West Primary Sludge Pumping Stations, valves and equipment located in the Head House, and equipment associated with Sludge Thickener Pumping Station Nos. 1 and 2. Work associated with this contract is being reimbursed by FEMA due to the flood of 2011.

**Status:** During this quarter, Blue Heron has installed two of the three grinders and has requested outages to install the valves in the east sludge pump station the first week of January

2017. We are negotiating with Blue Heron to delete some of the valve replacements and also equipment installations that GHD has determined should no longer be performed under this contract.

**Contract Status: 80% Complete**

### **Contract No. 3 - BAF Facility Demolition**

The BAF Demolition Contract removed existing structures and utilities that conflict with the new construction work included in the BAF Restoration Project. Demolition efforts include selective demolition in the existing process tanks (C-Filters, N-Filters, and DN-Filters) and buildings and mechanical equipment and piping to ready the site for new construction.

**Status:** During this quarter, LeChase completed the demolition on the BAF Facility. They have completed the repair of the overcuts in the CN and DN cells. During the work associated with the repairs of the overcuts, additional rebar was discovered to have been cut during the original construction. An analysis was performed by Atlantic Testing Lab to determine the extent of the damage in the DN cells, and GHD prepared a recommendation for the repairs to the exposed damaged rebar in the walls of the DN cells. The additional repair work was performed by LeChase to repair these additional damaged bars in December 2016.

The scope of work for the contract was increased with five Change Orders. Change Order One modified the contract to demolish and remove the existing Blower Building to improve construction on Contracts 5-8 at the C-N cells 1-8. Change Order Two demolished the known concrete in the C cell area inside the secant pile area below the elevation 825 (the original limit of demolition indicated on the contract documents). Change Order Three removed the additional concrete pile caps and steel H piles not originally included in the contract documents and also backfilled from elevation 825 to 831. The Fourth Change Order compensated the contractor for demolition of approximately 3600 CY of additional concrete within the secant pile area not known to exist. The removal of the additional concrete eliminated a delay in excess of four months on the overall project, and reduced the cost to avoid having a future contractor remove the concrete. The Fifth and final Change Order compensated LeChase for repairing defective rebar from the original construction while LeChase was repairing the rebar that they overcut at their own expense.

**Contract Status: 100% Complete**

### **Contract No. 4 - MCC - HH Emergency Replacement**

Contract 4 replaces the original existing Motor Control Center (MCC) in the Head House. The MCC is 50 years old, and is identified as MCC-HH. The contract was bid as an emergency contract because the electrical system in the Head House is both critical to keeping the BJCJSTP in service, and because the original MCC is extremely unreliable due to the age and condition of the gear. MCC HH Emergency Replacement also replaces the existing raw sewage pump drives of the existing 50 year old equipment including new electrical feeders from the HH to the Johnson City

Grit House No. 1, a new feeder from the HH to the Thickened Sludge Pump Station No. 1, and various other panel boards. The emergency work also includes replacement of the existing raw sewage variable frequency drives that were located in the existing MCC HH. The new drives will be more reliable, more efficient, and will provide better performance of the existing raw sewage pumps.

**Status:** The new VFD's and MCC HH have been installed in the Head House. All work on the MCC HH project has been completed including the removal of the existing MCC, and project closeout items. The only remaining item of work to complete is change order work to provide training to STP staff on the operation and maintenance of the new electrical equipment.

**Contract Status: 100% Complete**

### **Contract No. 5 - BAF Restoration and Rehabilitation Civil Contract**

When combined with the other BAF contracts (Nos. 6, 7 & 8), Contract No. 5, the General Civil contract, is intended to provide a functioning automated plant using a BIOSTYR system that can be modified to fit current plant configurations. It is also intended to provide functioning automated headworks and primary clarification processes upstream of the BIOSTYR system and solid handling processes downstream of the BIOSTYR system.

Major components of the work under Contract No. 5 include new coarse screens and ancillary equipment, new piping and valves for the influent pumps, new metering equipment, new fine screens and grit removal with ancillary equipment, a new primary distribution box, new mechanical equipment for primary clarifiers 1-10, new chemical equipment for primary treatment, modification of the primary clarifier structural components to replace the aged and deteriorated mechanical equipment, new secondary influent pumps for the new BAF system, a new BAF backwash tank, new CN-BAF and DN-BAF facilities, a new methanol system that will feed the DN-BAF cells, new Ultra Violet Light disinfection system to replace the existing chlorine disinfection system, new sludge thickening equipment and systems, a new administration building, new odor control equipment, two new 2MW electric generators, and a new plant outfall to the river.

**Status:** The NTP for Contract No. 5 was issued on May 27, 2016, which complied with milestone requirements in the revised Consent Order. During this quarter, the west tower crane was made operational. Work continued on demolition of the primary clarifiers 7-10, and has begun in the CN Cells 1-8. Structural work continued on the Administration Building, with the installation of concrete for the elevator on the north side of the building and the stairwell area on the south side of the building. The temporary bypass pumping piping was installed and is operational to divert the flow from Binghamton directly to primary clarifiers 2-5. CEPT has been relocated and is operational. The temporary electrical work at primary clarifiers 1-6 and the East Sludge Pump Station is now complete. The Binghamton grit house has been decommissioned, and the Johnson City grit house will be decommissioned as soon as the 30" Johnson City force main is diverted directly to primary clarifiers 1 & 6. As soon as all flow is diverted from Johnson City, mass demolition and excavation will begin for the Headworks Building. PC Construction is able to begin demolition of the Binghamton Grit House.

The rock anchors for the foundation of the backwash tank began this quarter, and will be complete by the middle of January 2017. The concrete slab is scheduled to begin before the end of January 2017. Concrete work in the PST 7-10 is scheduled to begin in January 2017, as is the demolition in the C-N Cells 1-8 and the D-N Cells 1-4. Work is scheduled to begin in the Thickener #1 during January 2017, and concrete work is scheduled to continue at the new Administration Building. The architectural shell of the Administration Building is scheduled to begin in February 2017.

The Master Schedule was updated to show the status of the work through the month of November. The latest draft shows that the Phase I Milestone is scheduled to complete on June 18, 2018 and the Phase 2 Milestone is scheduled to complete 44 days ahead of the required date. However, the draft schedule for the December CPM schedule shows Phase 1 completing on June 25, 2018, and Phase 2 Milestone finishing about 20 days earlier than required. The Kruger submittal continues to be revised to comply with the contract requirements. The equipment and materials associated with the Kruger package is valued at almost 20% of the project and is in detailed final review.

The excavation for the chemical storage building is complete and the foundation work is underway. Fabrication of the nozzle deck at the precast plant for the BAF system has started.

**3 Month Look Ahead:** PC Construction will continue work on primary clarifiers 1-7. A second tower crane near the existing distribution box will be installed. The Johnson City bypass for the primary clarifiers 1 & 6 will be completed. Demolition of the Grit Chambers and Headworks will be started as well as the excavation for the new facilities. Work will progress on the Chemical Storage Building. The concrete base slab in the backwash tank will be placed. The concrete base slab for CN cells 9-14 will begin. Demolition and concrete work in CN cells 1-8 and DN cells 1-4 will continue. Construction of the masonry walls for the Administration Building will be started. The existing methanol tanks and piping systems will be completely removed. Fabrication of the nozzle decks at the precast plant will continue. The sheeting for the flood protection system around the UV tanks, DN & CN cells will continue and the construction on the south floodwall will begin. Work will begin on the East Scrubber Building.

The contractor has acknowledged that they can meet the Phase I and Phase II milestones. The owners have requested revisions to three of the intermediate milestones to better reflect the construction sequencing.

**Contract Status: 9.5 % Complete**

### **Contract No. 6- BAF Electrical**

The BAF Electrical contract supports the BAF General Civil Contract and includes all electrical and instrumentation associated with the BAF contracts. The components include installation of the new UV disinfection system, installation of the new generators, installation of the electrical feed throughout the plant, as well as installation of the instrumentation and SCADA System throughout the plant.

**Status:** Contract No. 6 was bid and awarded in compliance with the May 27, 2016 milestone for issuing the NTP in the Consent Order.

This quarter, the contractor completed the work at the East Sludge Pump Station required to divert the flow from the Binghamton and Johnson City grit houses. They mobilized and began installing the underground electrical manholes within the site. They will begin installing the concrete duct banks during the month of January, 2017. NYSEG has identified their requirements for the cable, equipment, and duct banks to be installed within their substation east of the WTP site. MATCO is providing input for the Project CPM baseline schedule. Equipment and material shop drawings are being submitted for review and approval.

**3 Month Look Ahead:** MATCO will continue to install manholes and duct work for the various buildings and structures as they are constructed, for example, The Chemical Feed Building, Generator Building, Headworks and Administration Buildings, and the East Scrubber Building. They have received a considerable amount of materials and equipment which is being stored and is available to be installed when the project is ready for this work.

**Contract Status: 5% Complete**

#### **Contract No. 7-BAF HVAC**

The BAF HVAC contract supports the BAF General Civil Contract and includes installation of all HVAC Systems in all STP Facilities as well as revisions to the odor control systems throughout the plant. The odor control improvements are intended to alleviate the odors that have been prevalent in the past in and around the plant.

**Status:** Contract No. 7 was awarded on May 27, 2016 in compliance with the DEC milestones in the Consent Order. The contractor continued submitting material submittals for the HVAC Equipment for the project this quarter. They continue to provide supporting information for the development of the CPM schedule, and have acknowledged they can meet the required milestones of the Consent Order. They continued installing the HVAC Unit for the electrical room in the Head House, and will begin removing the permanent duct work in the East Scrubber Building in January, 2017.

**3 Month Look Ahead:** J & K Plumbing will continue with the installation of the HVAC systems as the structure and new facilities are built. They have received a considerable amount of material and equipment and these are in storage and ready to be installed.

**Contract Status: 10% Complete**

#### **Contract No. 8- BAF Plumbing**

The BAF Plumbing contract supports the BAF General Civil Contract and includes installation of plumbing systems for the new and existing facilities included in Contract No. 5.

**Status:** Contract No. 8 Notice to Proceed was issued in compliance with the May 27, 2016 milestone for issuing the NTP in the Consent Order. The contractor has continued providing the supporting information for the overall CPM schedule this quarter, and they have confirmed that they can meet the required milestones of the Consent Order.

This quarter, they continued installing the plumbing in the new Maintenance Building and the East Scrubber Building. They also intend to install the new potable water backflow preventer that will allow the potable water to be used as a back-up of the existing non-potable plant water system.

**3 Month Look Ahead:** JW Danforth will continue with the installation of the plumbing system as the structures and facilities are built. They also continue to work on the plant water supply system.

**Contract Status: 14% Complete**

### **Contract No. 9 - Secant Pile Contract**

The Secant Pile contract includes installation of the secant piles that support the excavation for the new BAF Backwash tank as well as supporting the new CN Cells 9-14. Construction also includes excavation to the final grade for the BAF Backwash tank. This project was bid separately from Contracts 5-8. In doing so, a minimum of four months on the critical path schedule was saved.

**Status:** This quarter, the installation of the secant pile wall was completed. The contractor completed the wales and struts and they have completed the excavation to the required elevation for work to be under Contract 5. A settlement agreement is being negotiated to extend the required substantial completion date to November 30, 2016. It is agreed by all parties that this will not have any impact on the overall project schedule. A list of work that needed to be completed before the Owner would consider the project to be substantially complete was provided in December, and with the exception of the repair of the leaks between the secants, the list of items were completed on December 30, 2016. A punch list for items to repair has been prepared for the Contractor.

**Contract Status: 97% Complete**

### **Contract No. 10 - 13 -Solids Handling Renovation**

Contracts No. 10-13 are intended to renovate and improve the solids handling systems including the existing digester control building, existing digesters, solids dewatering systems, and all ancillary equipment.

This quarter, the constructability review began on 100% design document. The design of the project and preparation of the plans and specifications is 90% complete.

**3 Month Look Ahead:** The design will be completed. Project will be advertised in mid-January. Bids will be opened in early March. Notice to Proceed is anticipated in early May.

### **Floodwall**

The new floodwall being constructed at the STP is intended to protect the plant to an elevation 1.5 feet above the 2011 flood level. The floodwall includes concrete walls on the east and north side of the STP. The project also includes two new pump stations to pump rainwater out of the



plant during the storm events that might overwhelm the existing storm drain system. The new flood wall system works in conjunction with new flood wall features included in Contract No .5 BAF General Civil Construction. The flood wall systems are being funded by a FEMA recovery grant.

**Status:** This quarter, the construction proceeded with the concrete walls for the floodwall around the sludge thickeners. The work is progressing both east and west from the thickeners, and the contract is nearing completion of the concrete work for Pump Stations 1 and 2.

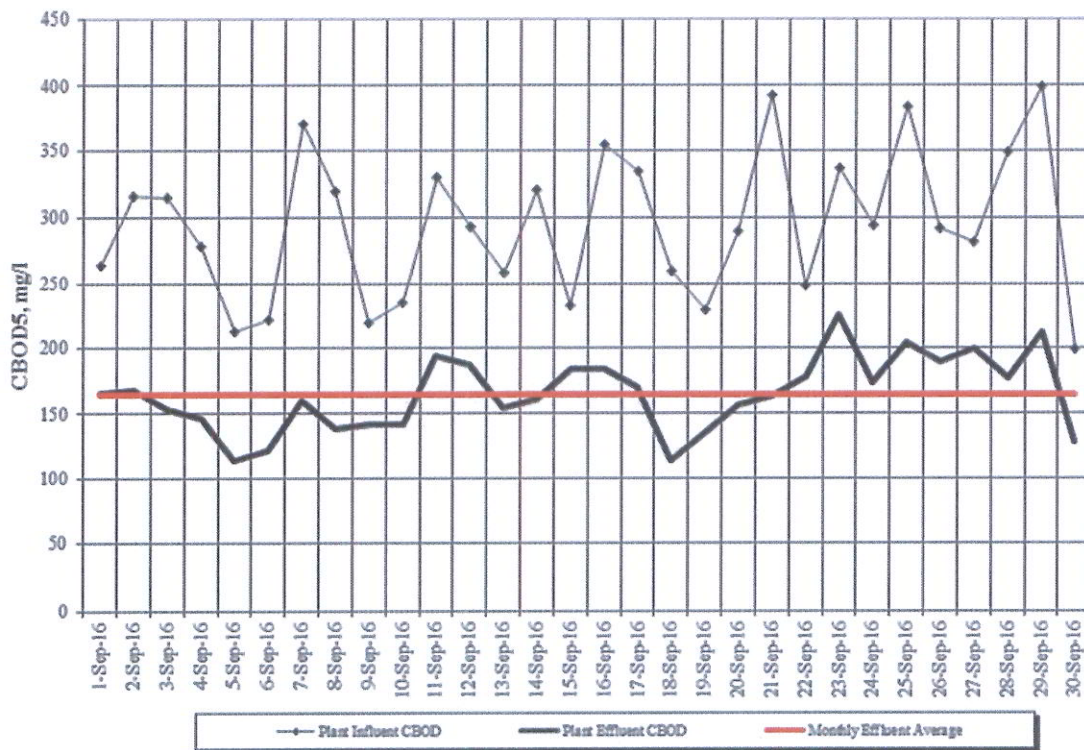
**3 Month Look Ahead:** Streeter will continue construction of the floodwall. The storm pump stations should be nearing completion. Relocation of the 10" sanitary sewer line from Vestal should be complete. Construction will begin on the diversion manhole for the 54" plant bypass as well as the 54" bypass line to the river. Work on the rehabilitation of digesters 1, 2, and 3 in advance of the Solids Handling Project will begin in late February early March depending on the weather.

**Contract Status: 42% Complete**

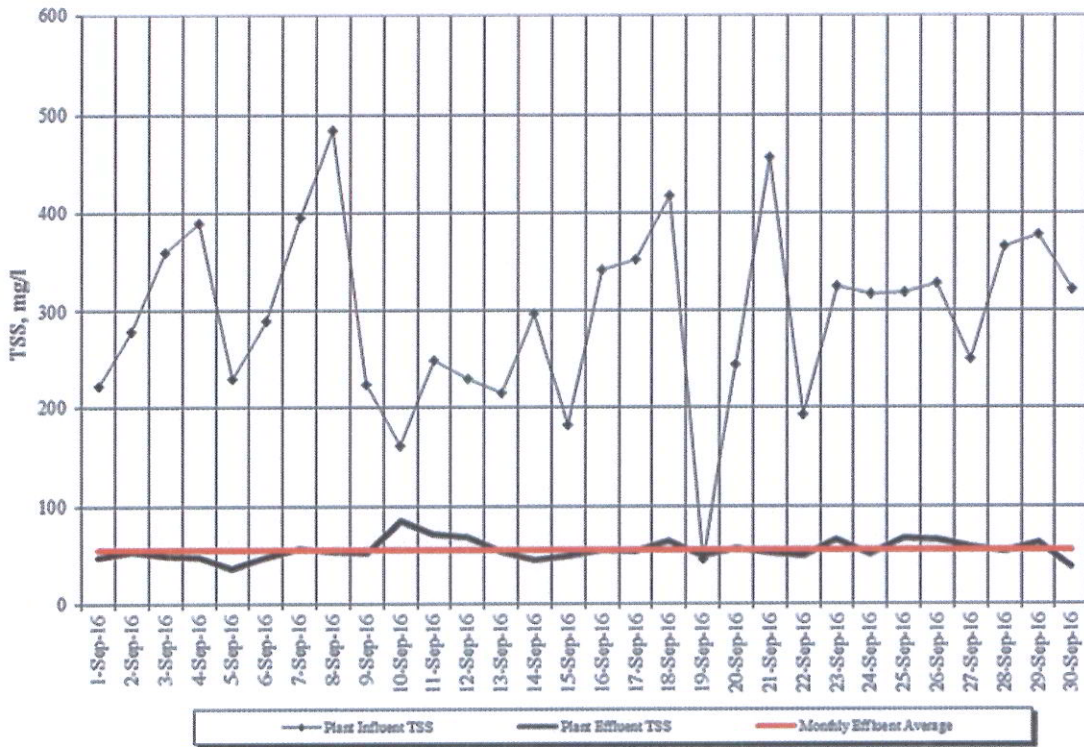
# Attachment A

## Facility Operations

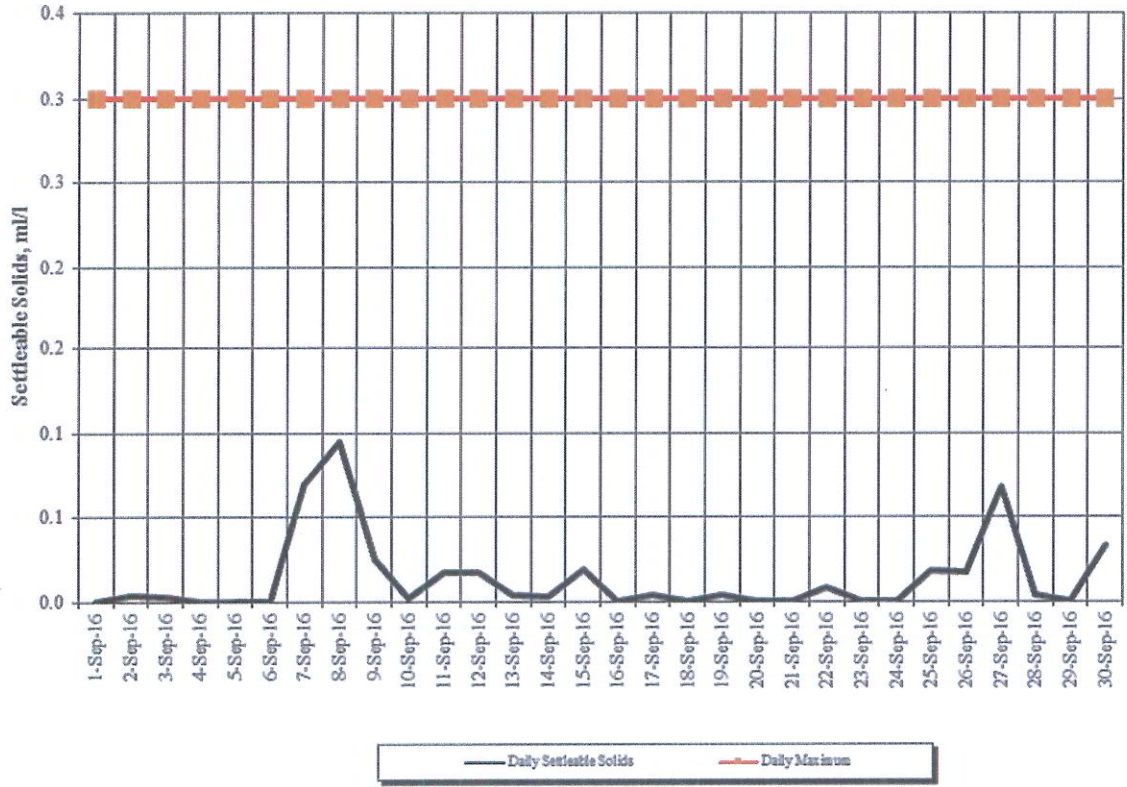
**CBOD5 Concentrations**  
 Binghamton - Johnson City JSTP



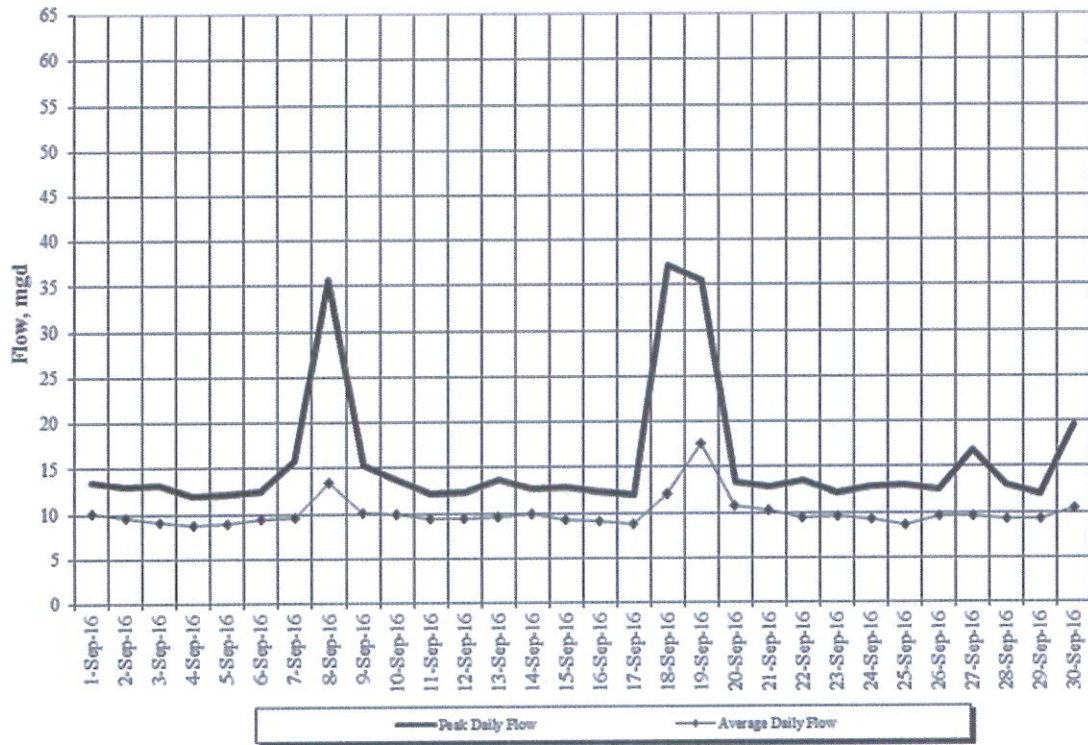
### TSS Concentrations Binghamton - Johnson City JSTP



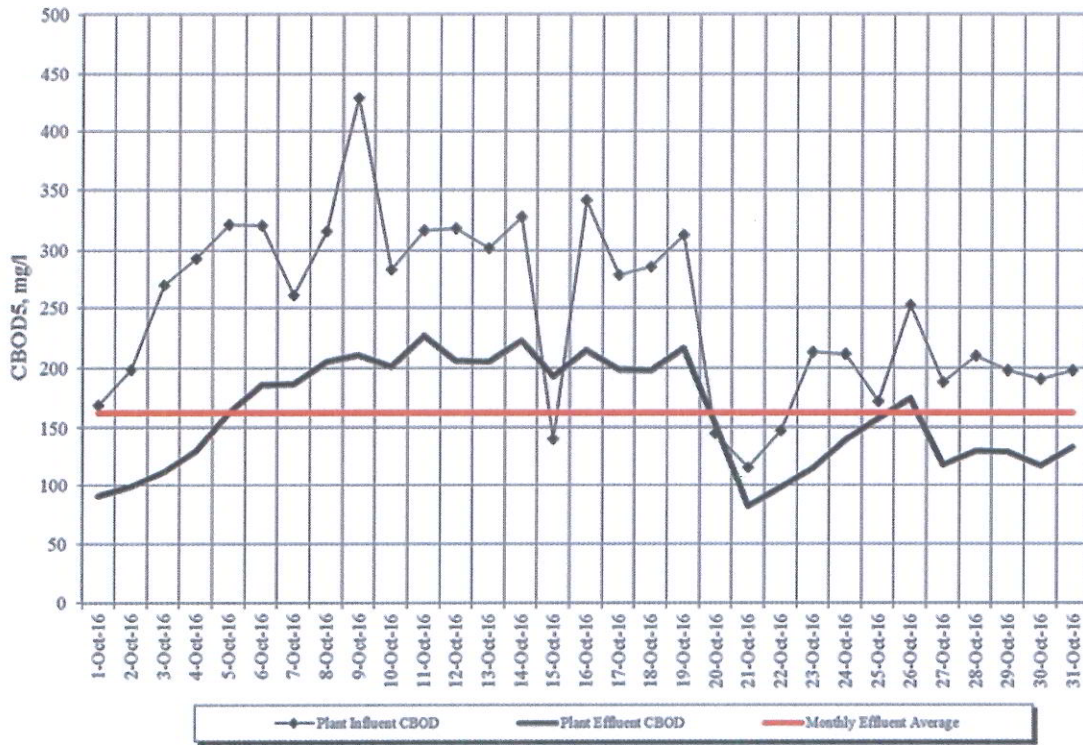
Settleable Solids  
Binghamton - Johnson City JSTP



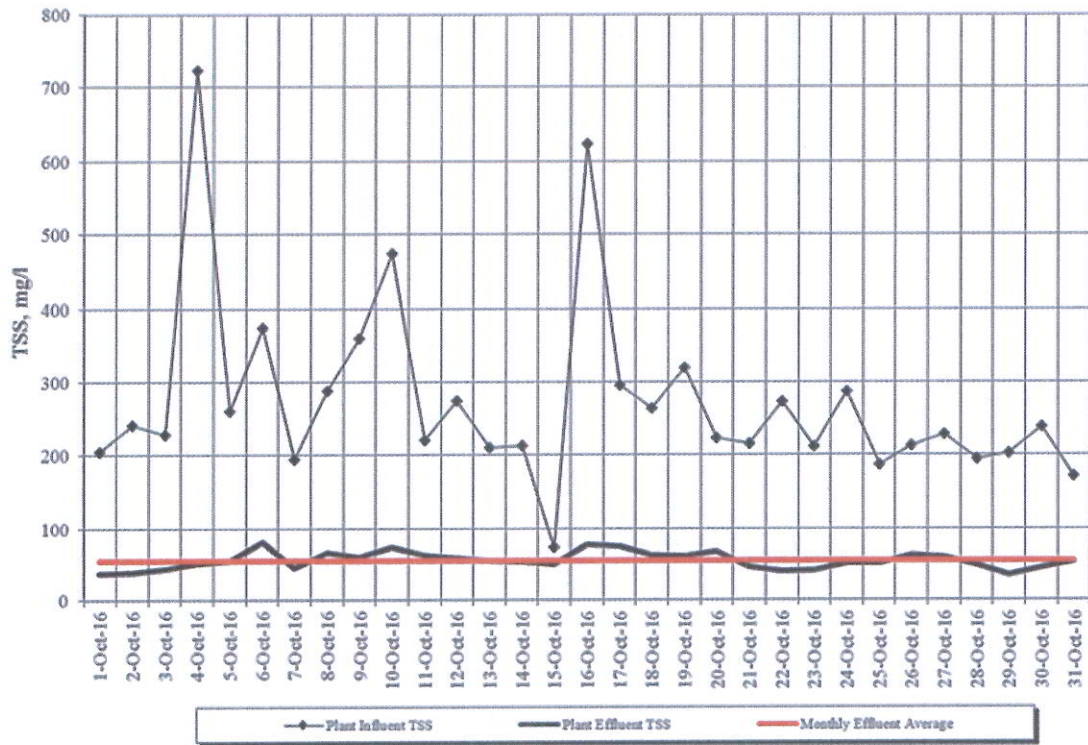
### Daily Flows Binghamton - Johnson City JSTP



### CBOD5 Concentrations Binghamton - Johnson City JSTP

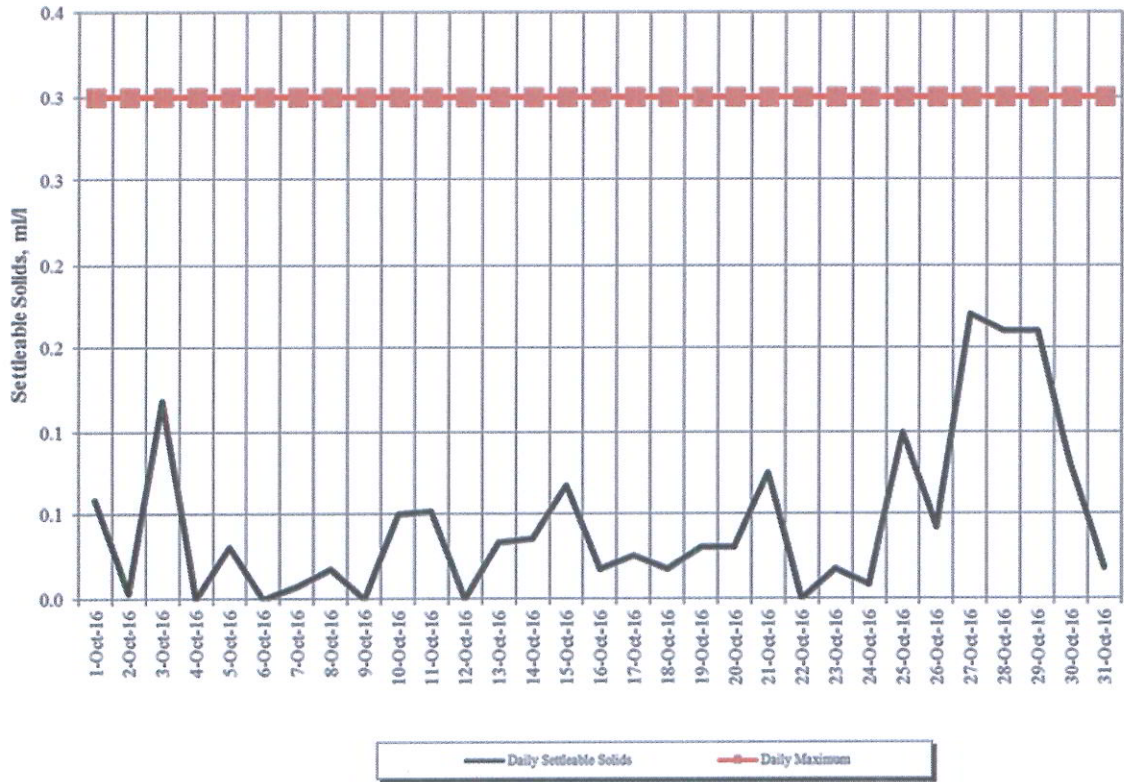


### TSS Concentrations Binghamton - Johnson City JSTP

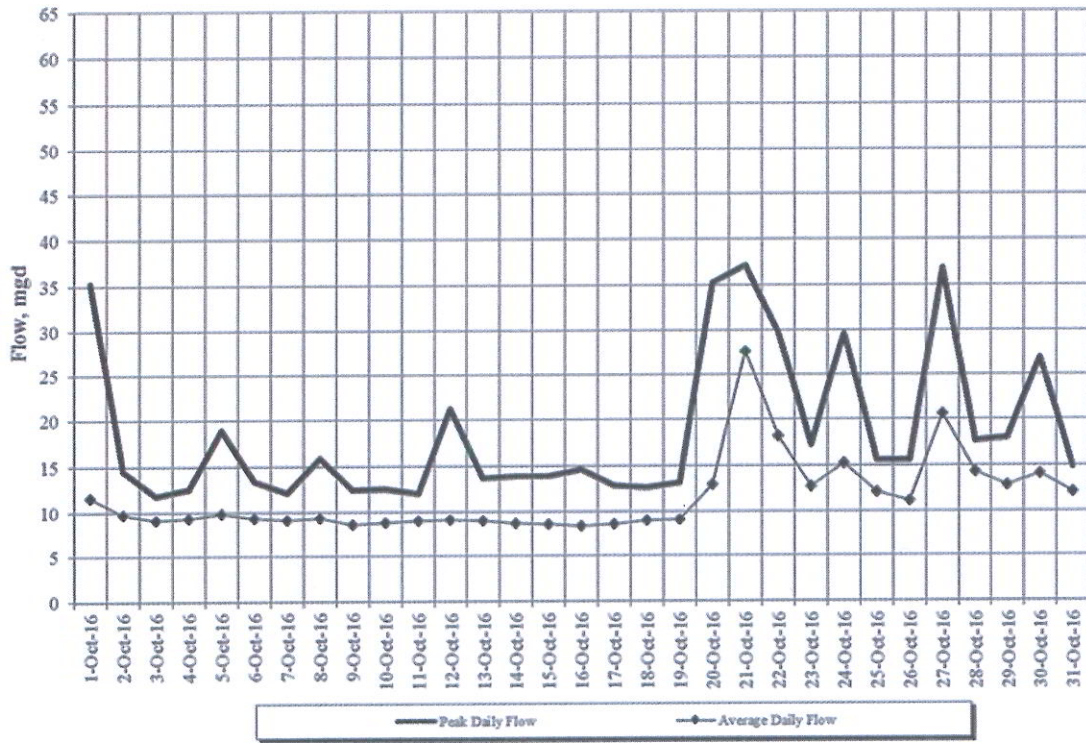




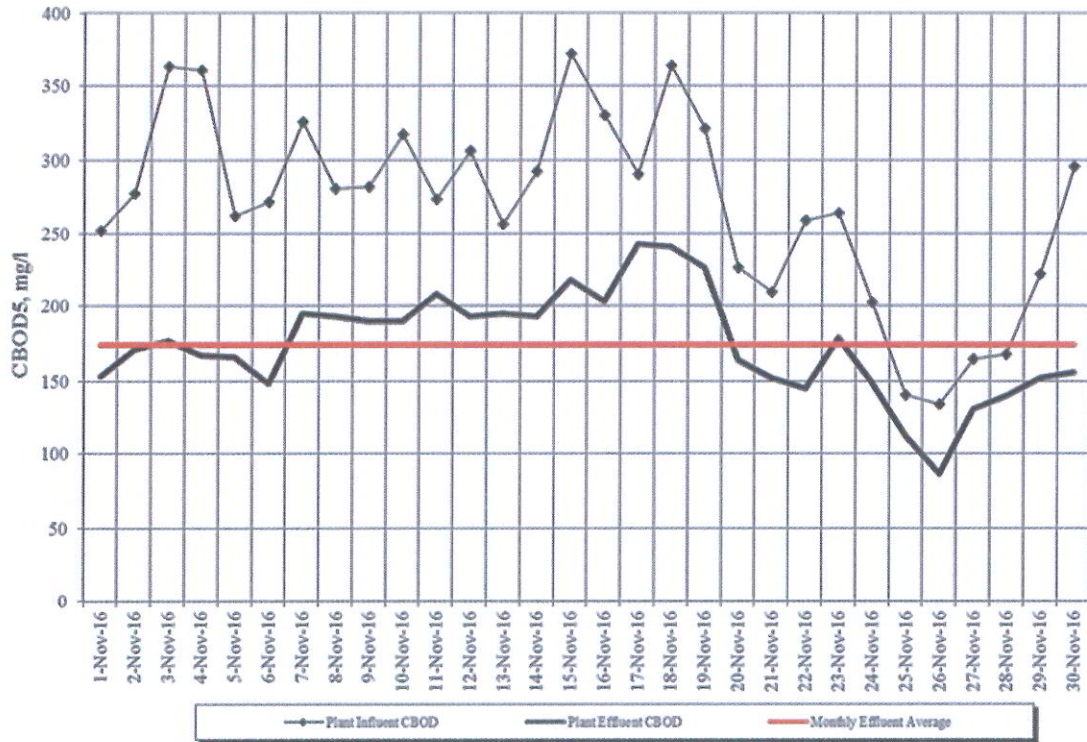
**Settleable Solids**  
Binghamton - Johnson City JSTP



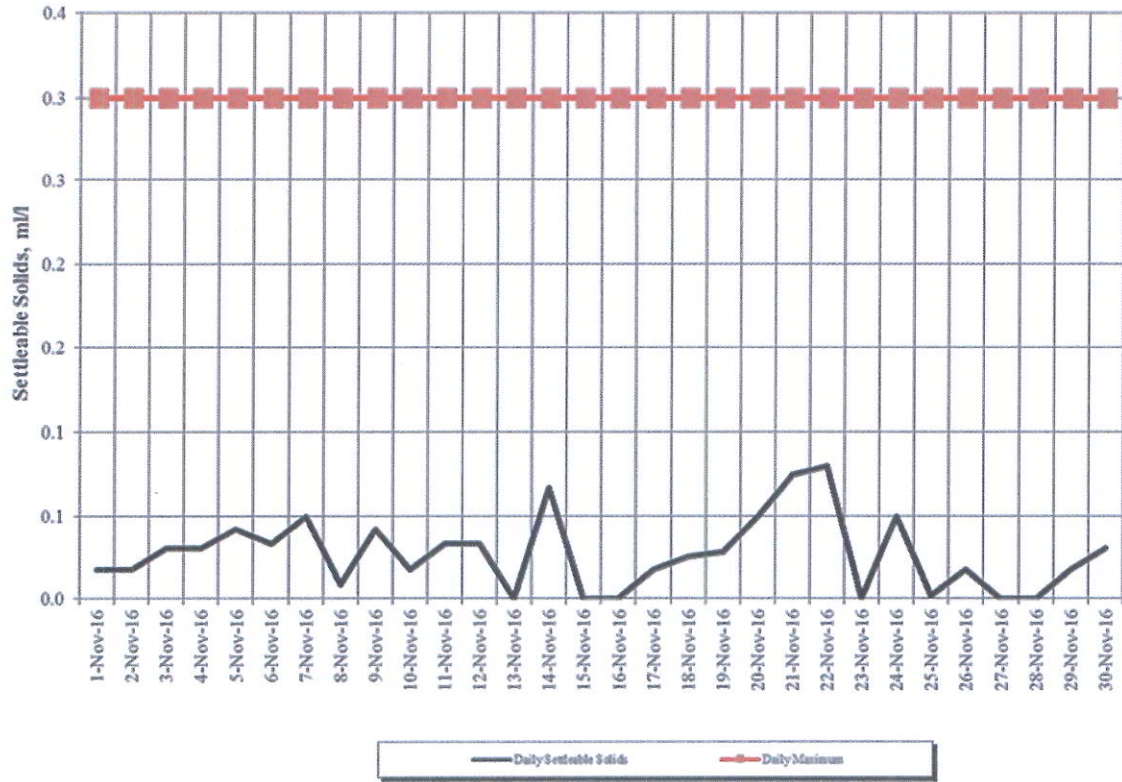
### Daily Flows Binghamton - Johnson City JSTP



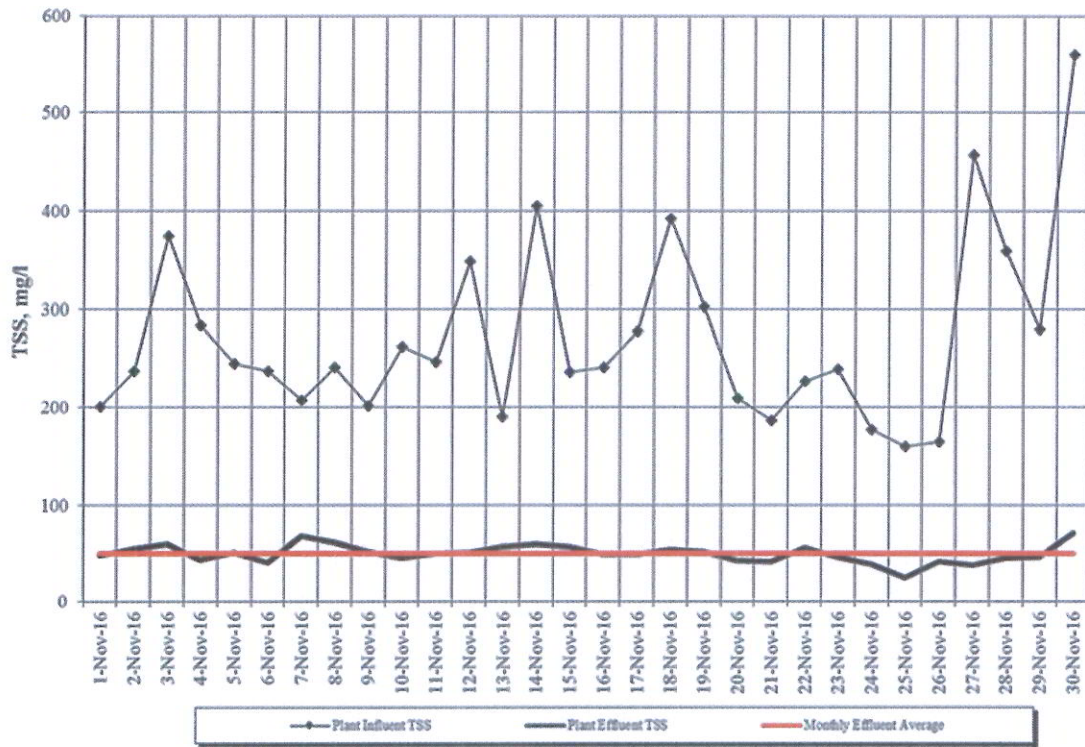
### CBOD5 Concentrations Binghamton - Johnson City JSTP



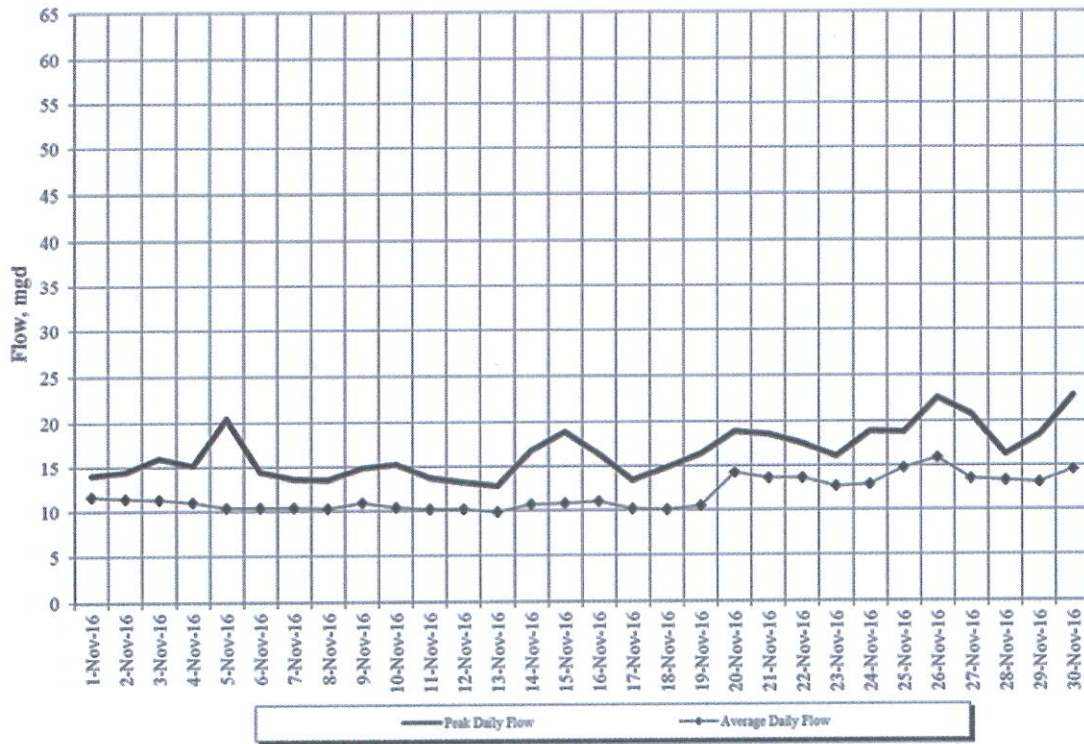
### Settleable Solids Binghamton - Johnson City JSTP



### TSS Concentrations Binghamton - Johnson City JSTP



### Daily Flows Binghamton - Johnson City JSTP

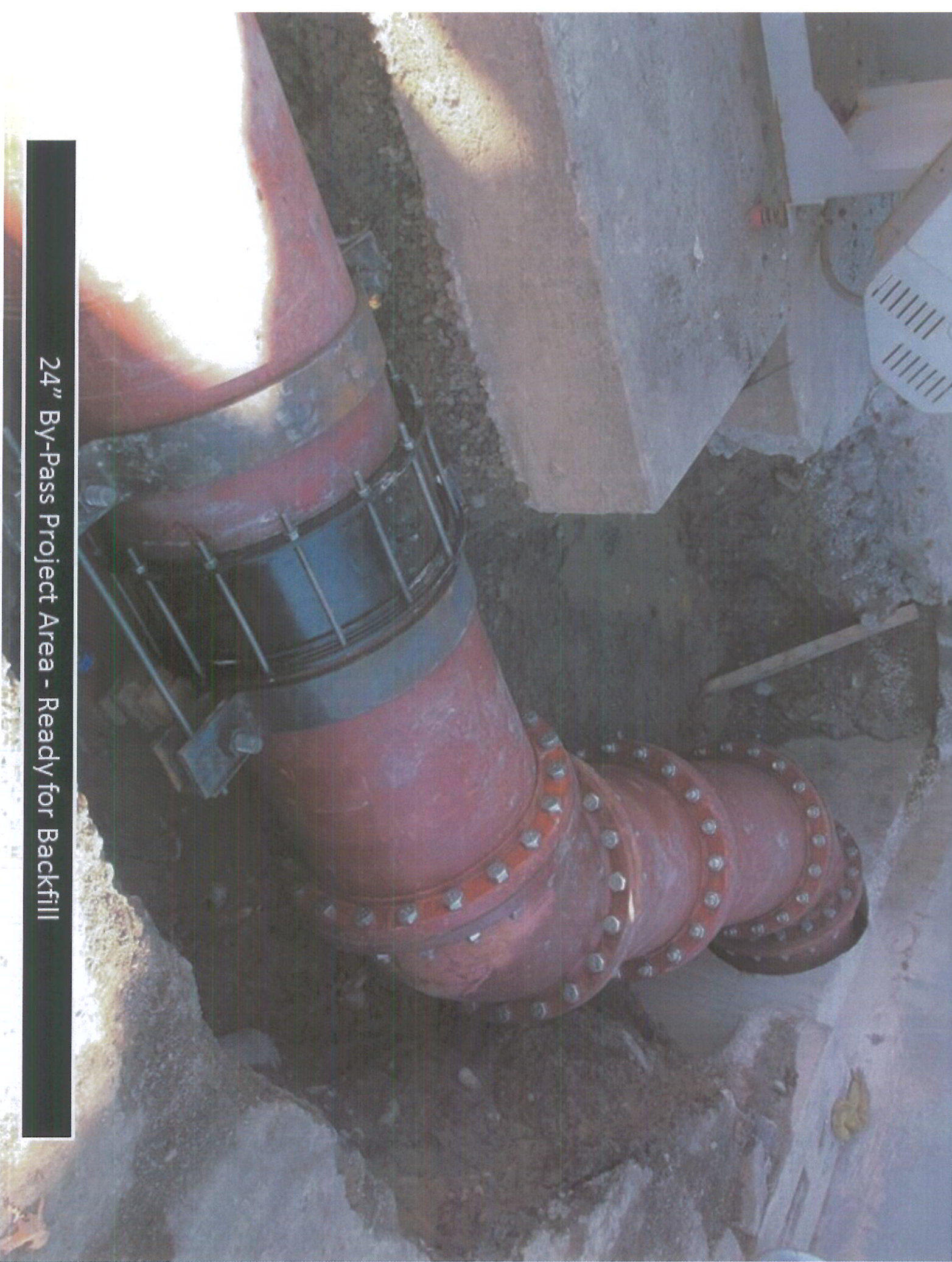


DATE	Final Eff	FW	Final Eff	FW	CL 2	Fecal	FW	Eff. Total	Daily	Iron (Fe)
	Amm. Avg	Amm. Avg	TKN	TKN	AVG	Coli mg/l	Phos. Avg	Iron	Total Q	lbs/day
1-Sep-16			26.5	34.0	1.08	43		3.42	10.12	289
2-Sep-16			27	37.7	1.11	55				
3-Sep-16			21.5	33.2	1.11	13				
4-Sep-16			22.6	35.8	1.12	2				
5-Sep-16			23	29.6	1.28	17				
6-Sep-16	24.2	24.7	22.9	25.7	1.04	175	4.7	3.49	9.46	275
7-Sep-16			22.4	21.1	1.18	106				
8-Sep-16			19.1	30.6	0.99	225		3.17	13.45	356
9-Sep-16			22.1	25.1	0.97	8				
10-Sep-16			19.7	25.1	1.2	2				
11-Sep-16			27.3	28.7	0.79	347				
12-Sep-16			23	37.3	1.16	42				
13-Sep-16	20.8	23.9	26.2	36.7	1.23	977	5.6	3.42	9.70	277
14-Sep-16			25.8	43.3	1.02	87				
15-Sep-16			29.1	38.4	0.99	27		3.55	9.45	280
16-Sep-16			25.9	45.6	1.05	8				
17-Sep-16			27	36.0	1.1	2				
18-Sep-16			19.2	32.5	1.17	23				
19-Sep-16			17.4	22.7	1.17	2				
20-Sep-16	18.7	21.1	20.6	28.7	1.24	23	4.0	3.82	10.79	344
21-Sep-16			25.5	27.4	1.17	162				
22-Sep-16			22.4	32.0	0.89	34		3.34	9.56	266
23-Sep-16			22.5	31.4	0.92	251				
24-Sep-16			21.1	25.3	1.01	2				
25-Sep-16			26.4	41.4	1.13	35				
26-Sep-16			26.9	34.4	1.07	884				
27-Sep-16	23.6	25.1	25.3	35.9	1.08	165	5.0	4.62	9.75	376
28-Sep-16			27.1	36.5	1.22	21				
29-Sep-16			28.4	24.5	0.93	260		4.2	9.34	327
30-Sep-16			21.3	29.0	1.22	35				
	21.83	23.7	23.84	32.2	1.28	#REF!	4.84	3.67	10.18	312
	Final Eff.	FW	Final Eff	FW	CL 2	30 Day	FW	Eff. Total	Daily	Mthly Avg
	Avg as N mg/l	Avg as N mg/l	TKN	TKN	Max	MEAN	PHOS.	Iron	Total Q	Iron lbs/day





DATE	Final Eff	FW	Final Eff	FW	CL 2	Fecal	Eff.	FW	Eff. Total	Daily	Iron (Fe)
	Amm. Avg	Amm. Avg	TKN	TKN	AVG	Coli mg/l	Phos.	Phos. Avg	Iron	Total Q	lbs/day
1-Nov-16	4.6	5.1	11.7	16.32	1.21	214	2.6	4.7	4.65	11.62	451
2-Nov-16			23.8	29.55	1.03	67					
3-Nov-16			22.7	29.35	1.21	300			5.13	11.29	483
4-Nov-16			22.8	33.53	1.06	78					
5-Nov-16			25.2	29.34	0.87	2					
6-Nov-16			22.3	28.87	1.26	2					
7-Nov-16			24.8	29.77	0.94	377					
8-Nov-16	21.7	21.6	27.6	31.17	1.11	25	3.5	5.5	4.99	10.27	427
9-Nov-16			22.9	17.98	1.03	53					
10-Nov-16			27.2	31.11	1.04	129			4.36	10.36	377
11-Nov-16			30.1	31.23	0.92	10					
12-Nov-16			24.7	28.93	1.18	2					
13-Nov-16			27.9	30.48	0.98	67					
14-Nov-16			26	33.16	1.11	2					
15-Nov-16	21	23.8	26.7	36.90	0.94	56	3.7	6.1	0.627	10.75	56
16-Nov-16			27.3	31.47	0.95	30					
17-Nov-16			27.4	33.48	1.02	25			0.433	10.15	37
18-Nov-16			26.7	36.14	1.15	35					
19-Nov-16			23.2	32.13	0.96	2					
20-Nov-16			18.7	21.94	1.03	2					
21-Nov-16			18.7	23.57	1.23	33					
22-Nov-16	16.4	17.5	19.8	25.07	1.22	75	2.8	3.8	0.429	13.57	49
23-Nov-16			20	28.46	1.3	147					
24-Nov-16			16.7	22.26	1.24	20			0.31	12.83	33
25-Nov-16			15.8	18.43	1.13	34					
26-Nov-16			13.8	17.07	1.28	260					
27-Nov-16			17.6	22.98	0.98	7					
28-Nov-16			21.5	25.73	1.29	235					
29-Nov-16	19.3	20.1	21	23.50	1.05	55	2.7	3.2	0.349	13.04	38
30-Nov-16			23	35.06	1.17	175					
	16.60	17.6	22.51	27.8	1.30	#REF!	3.06	4.65	2.36	11.54	228
	Final Eff.	FW	Final Eff	FW	CL 2	30 Day	EFF.	FW	Eff. Total	Daily	Mthly Avg
	Avg as N mg/l	Avg as N mg/l	TKN	TKN	Max	MEAN	PHOS.	PHOS.	Iron	Total Q	Iron lbs/day



24" By-Pass Project Area - Ready for Backfill

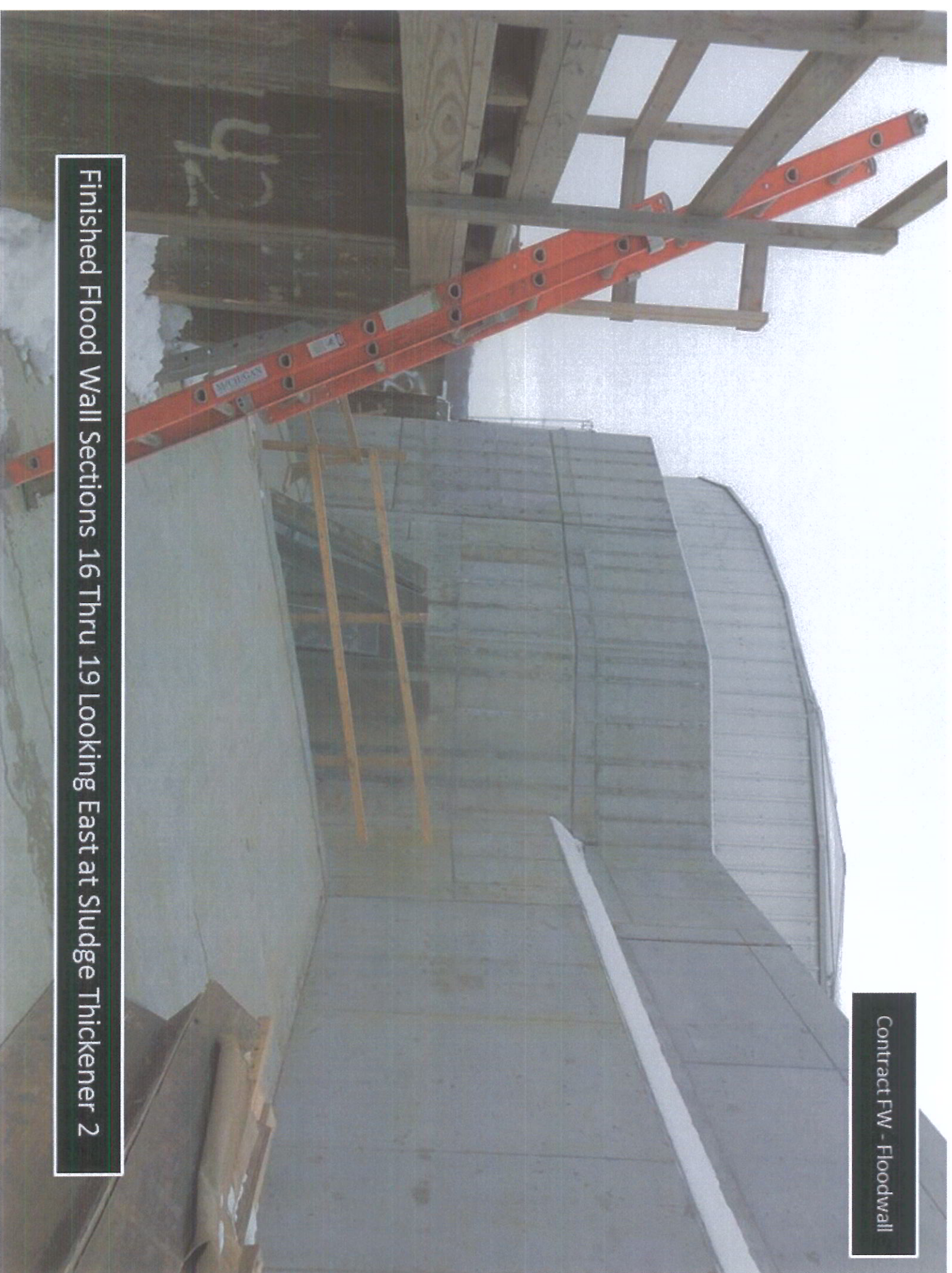


Demolition in Existing Primary Settling Tanks

2016 11 17 12:20

Contract FW - Floodwall

Finished Flood Wall Sections 16 Thru 19 Looking East at Sludge Thickener 2

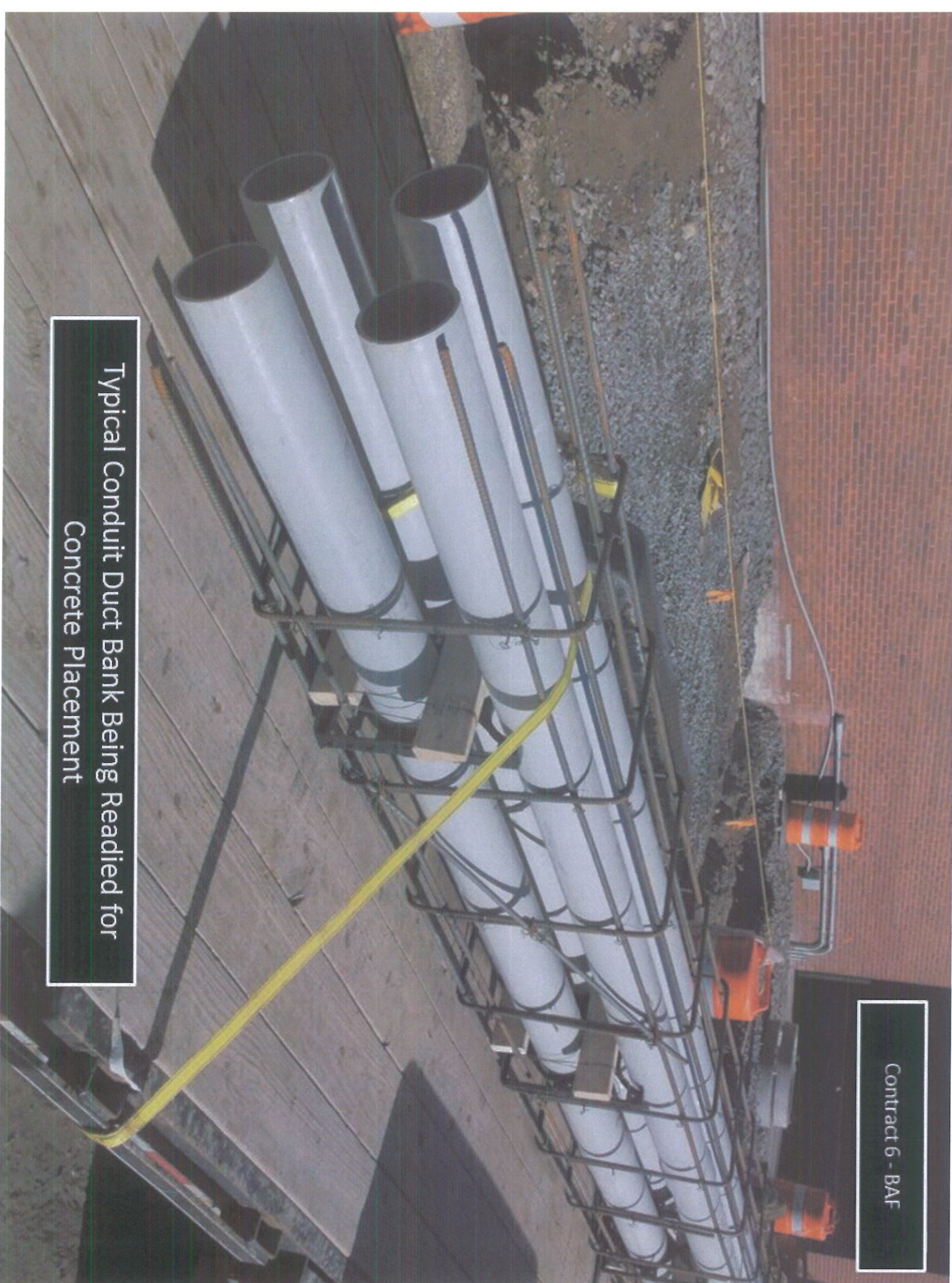


Aerial View of Completed Sections of the Floodwall, Indicated by Arrow



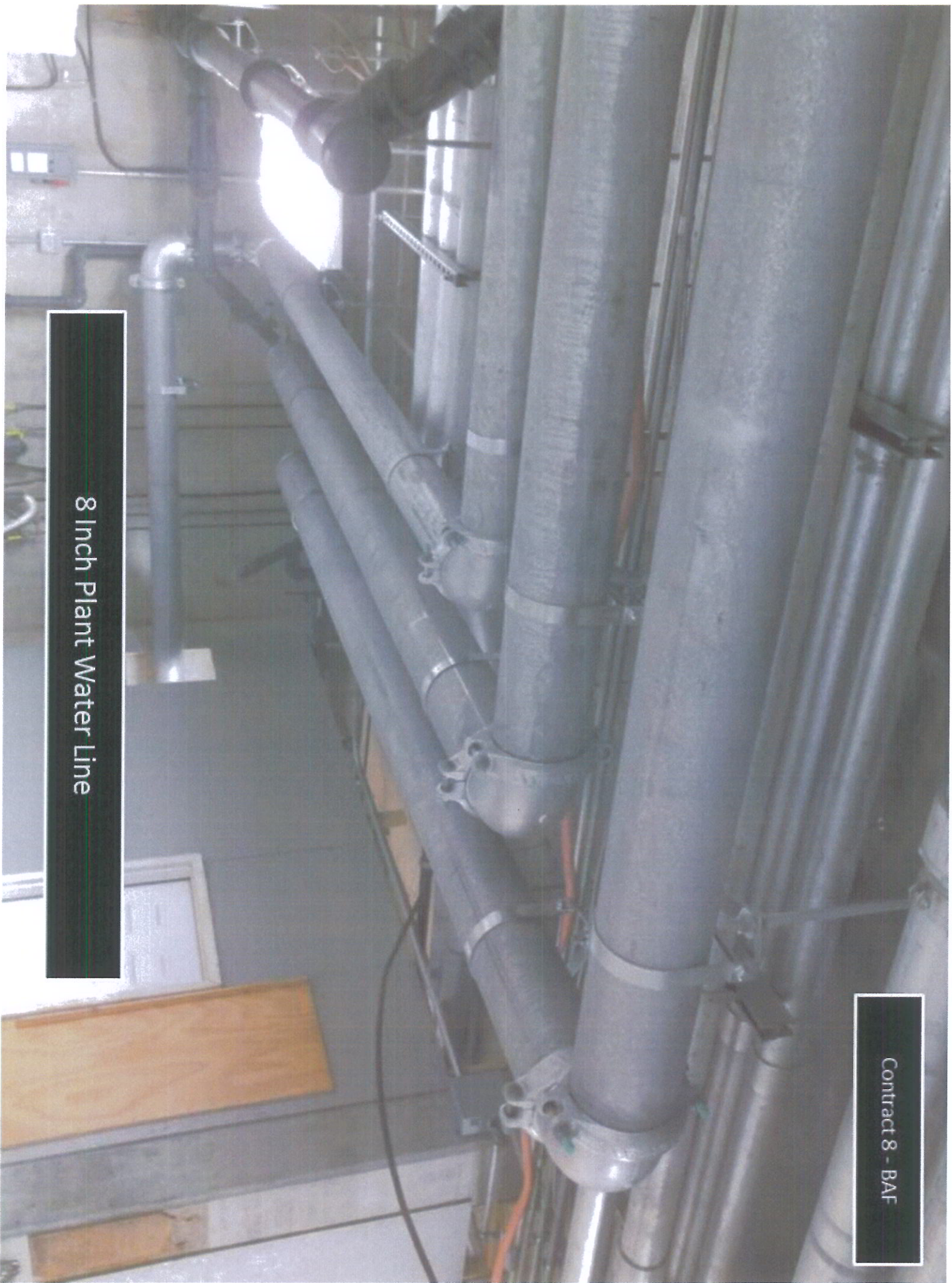
Aerial View of Completed Sections of the Floodwall, Indicated by Arrow





Typical Conduit Duct Bank Being Readied for  
Concrete Placement

Contract 6 - BAF



8 Inch Plant Water Line

Contract 8 - BAF







New Administration Building Stair & Ramp Foundation

2016 11 04 13 11