3. PUBLIC PARTICIPATION

Public participation is vitally important in planning long term CSO controls. The City of Akron (City) feels strongly that citizen input should play a major role in helping to guide decision-making throughout the planning, design, and construction processes. Citizen input is critical since they enjoy water quality benefits associated with CSO LTCP improvements, but they also must pay the costs associated with controlling CSOs. This section describes public participation requirements set forth within the CSO Policy, as well as summarizes public participation activities conducted by the City throughout the history of LTCP planning.

3.1 USEPA Requirements

The US Environmental Protection Agency's 1994 CSO Policy and subsequent guidelines emphasize that the public should be informed about CSO control alternatives before the city selects the specific CSO controls in its long term control plan. These guidelines suggest the use of public meetings, advisory groups, public education, and other tools to educate and involve the public in water quality decisions. Section II.C.2 of the CSO Policy entitled "Public Participation" states that in developing its long term CSO control plan, the permittee will employ a public participation process that actively involves the affected public in the decision-making to select the long term CSO controls. The affected public includes rate payers, industrial users of the sewer system, persons who reside downstream from the CSOs, persons who use and enjoy these downstream waters, and any other interested persons.

In addition, EPA's Combined Sewer Overflows: Guidance for Long Term Control Plan states that "The extent to which each type of control measure is utilized with each alternative can be based on public input. The implementation schedule and method of financing can also be selected or modified based on public input." The guidance also recommends a number of public informational meetings leading up to at least one formal public hearing at which public comments, questions, and responses are recorded.

3.2 Long-Term Control Plan '98 Activities

As part of preparing the Long-Term Control Plan '98 (2002), the City formed a Technical Advisory Group (TAG), held public meetings, and posted information on their web site informing citizens about CSOs.

3.2.1 Technical Advisory Group

The TAG provided two key functions. First, the TAG provided independent technical advice and expertise as the city and its consulting engineers conducted studies and prepared models to support long term CSO control planning. Second, it provided a public forum in which city staff could report progress during the early stages of CSO control planning and obtain feedback on other wet-weather-related issues. Members of the TAG included representatives from the following organizations:

- A. Schulman, Inc
- BF Goodrich Company Chemical Group
- Cascade Locks Park Association
- City of Akron City Council
- City of Cuyahoga Falls
- City of Fairlawn
- City of Tallmadge
- Cuyahoga Valley Communities Council
- Cuyahoga Valley National Recreation Area
- Friends of the Crooked River
- GenCorp
- Goodyear
- Little Cuyahoga River Conservancy
- MetroParks Serving Summit County
- Ohio & Erie Canal Corridor Coalition
- Ohio Environmental Protection Agency
- Village of Lakemore

A total of nine TAG meetings were held, starting in February 1998. The last meeting was held in January of 2000. Topics covered at the meetings included:

- Project history
- Hydraulic and water quality modeling
- Collection system and WPCS alternatives
- Impacts of CSOs on existing water quality conditions
- Impacts of alternatives on water quality conditions
- Non-traditional stream restoration alternatives
- Floatables control technology
- Cost information on the ultimate integrated plans
- Evaluation of ultimate integrated plans
- Selection and rate impacts of the selected ultimate integrated plan

Table 3-1 presents a summary of each TAG meeting. A detailed summary of each TAG meeting can be found in Appendix 3-A.

Table 3-1 Technical Advisory Group Meeting Summary

TAG Meeting Number	Date	Agenda
1	February 19, 1998	Introduction Technical Advisory Group purpose Project history and background Current project scope Facilities planning area Sewer service area Combined sewer area Water quality Alternatives to be investigated Future meeting schedule

Table 3-1 Technical Advisory Group Meeting Summary (Continued)

TAG Meeting Number	Date	Agenda
2	April 2, 1998	Water quality • Stream designations • Chemistry Collection system alternatives • Complete separation • Express sewers • Ohio Canal Interceptor • Rack 40/parallel outfall sewer • North Side interceptor • Detention basins (end-of-pipe) • Infiltration-Inflow reduction • Floatable controls for selected CSOs Non-traditional alternatives Cost-benefit analysis
3	May 14, 1998	Existing water quality conditions Cost estimates Water quality impacts Non-traditional alternatives Cost-benefit analysis
4	June 25, 1998	Water quality impacts • Express sewers • Ohio Canal Interceptor Tunnel • Rack 40/parallel outfall • North Side interceptor CSO rack rankings by hydraulic measures
5	August 6, 1998	Water Pollution Control Station alternatives Alternative evaluation criteria
6	September 24, 1998	Non-traditional alternatives Floatables control technology Ultimate integrated plan alternatives
7	October 29, 1998	Ultimate integrated plan cost estimates Selection of final ultimate integrated plan
8	January 1, 1999	Review and update Non-traditional alternatives Selected integrated plan
9	January 26, 2000	Review of Integrated Plan 2 submittal to OEPA Future course of action Cuyahoga American Heritage River presentation

3.2.2 Public Meetings

The City held a public meeting on March 26, 1998 at 7:30 pm at the Oliver Ocasek State Office Tower in downtown Akron. This meeting presented information on the scope of the project, reasons the project is required, and the future schedule. Agenda items for the meeting included:

- Introductions
- Background of CSO issues
- Water quality issues
- Potential CSO control alternatives
- Schedule for completing CSO projects
- Public comments

Meeting attendees received a map showing the Regional Planning Area Districts, a listing of reference documents, description of previous CSO control work, and a CSO regulatory framework summary.

3.2.3 Public Information Dissemination

The City also utilized a less formal means of disseminating information to the public concerning the CSOs and Long Term Control Plan via their Internet web site. The City developed and posted a CSO section on the website so that citizens could learn about existing CSOs, including details of their operation and locations, as well as reviewing information about controlling CSOs.

3.3 Long Term Control Plan Update Report

Public participation involved the formation of a CSO Community Action Group (CSO CAG) and holding meetings per the Consent Decree Requirements as discussed in the following sections.

3.3.1 Consent Decree Requirements

As part of the Consent Decree between the City, the United States (on behalf of the Environmental Protection Agency (USEPA)) and the State of Ohio (on behalf of the OEPA), the City of Akron agreed to continue its public participation process (Attachment A, Appendix 4 of the Consent Decree). The Consent Decree states “a continuation of the previous program will allow for continued public input and comment throughout the development of the control levels, to the implementation of the projects and to the final post construction monitoring program that determines the final compliance with the performance criteria. Public participation will be achieved with the Community Action Group (CSO CAG). The CSO CAG membership will be open to the following groups and individuals in the service area:

- Akron City Council
- Local industry
- Tributary communities
- Local environmental groups (Friends of the Crooked River)
- Regulatory agencies (OEPA)
- Parks (National Park Service and MetroParks Serving Summit County)
- Councils (Cuyahoga Valley Community Council)
- Area-wide planning agencies (NEFCO)

The meetings will all be public meetings (open to the general public).

The objective of the CSO CAG will be to inform and receive input from the community on the interim and final submittals throughout the LTCP Update and its implementation."

3.3.2 CSO Community Action Group (CSO CAG)

The City of Akron reconvened their public participation program with formation of the CSO CAG. The CAG includes a cross-section of people in the CSO planning area including local industry, municipalities, environmental groups, regulatory agencies, parks, associations, and councils. Table 3-2 provides a list of members that make up the City's CAG.

Table 3-2 CSO CAG Membership Information

Name	Company	Job Title
Eric Akin	NEFCO (Alternate)	Environmental Planner
Jennifer Bennage	OEPA	Environmental Specialist
Rich Blasick	OEPA	Northeast District Office Surface Water Manager
Tony Demasi	City of Cuyahoga Falls	City Engineer

Table 3-2 CSO CAG Membership Information (Continued)

Name	Company	Job Title
Stephen Duirk	University of Akron	Assistant Professor
Patrick Gsellman	City of Akron, Engineering Bureau	Environmental Division Manager
Joe Hadley	NEFCO	Executive Director
Robert Hollis	Summit County Environmental Services	Deputy Director of Operations
Ken Jones	Akron City Council Ward 5	Public Utilities Chairman
Paul Joyce	JG Pads	
Michael Lyons	Cuyahoga Valley Regional Council	CVRCOG President
Roger Lyons	City of Tallmadge	City Engineer
Elaine Marsh	Friends of the Crooked River	Conservation Director
Paul Michalec	The Ruscoe Company	President
Chris Miller	University of Akron	Associate Professor
Meg Plona	Cuyahoga Valley National Park	Biologist
Joe Powell	Akron Steel Treating Company and IQ Technologies	President
Dan Rice	Ohio & Erie Canalway Coalition	President & Chief Officer
Stu Rickman	Goodyear Tire and Rubber	Director, Headquarters Facilities & Services
Keith Riley	OEPA	Assistant Chief
Kelvin Rogers	Cuyahoga River Remedial Action Plan	Steering Committee
Debby Rolland	Ohio & Erie Canalway Coalition (Alternate)	Vice President of Operations and Development
Dean Stoll	OEPA	DSW Supervisor
Thomas Studer	Bridgestone Americas, Inc	Sr. Corporate Auditor
Laura Thompson	Goodyear Tire and Rubber	Vice President of Business Development
John Valle	City of Akron	Deputy Director
David Whited	MetroParks Serving Summit County	Chief of Planning and Development
Paul Wilkerson	MetroParks Serving Summit County	Construction Supervisor/Civil Engineer
Lan Zhang	University of Akron	Assistant Professor

The City held a Kickoff Meeting on Wednesday, March 3, 2010. Agenda items covered during the kickoff meeting included:

INTRODUCTION

Introduction from Service Director, Rick Merolla

Introduction of CSO CAG Participants

Goals and Objectives of CSO CAG (rules)

EDUCATION/BACKGROUND

What is a Combined Sewer Overflow (CSO)

CSO Policy and Guidance

Akron's CSOs

Akron's CSO Long Term Control Plan

Proposed Akron/EPA/DOJ Consent Decree

CSO CAG ADMINISTRATION TASKS

Future Meeting Topics and Dates (including day of week, time and location)

Agenda, Minutes, and Contact Information

Communication Tools

NEXT MEETING AND TOPIC

Additional CAG meetings were held during April, May, June, and July. Table 3-3 provides information presented at these meetings.

Presentations made to the CAG can be found in Appendix 3-B.

Table 3-3 CSO CAG Meeting Overview - 2010

Meeting Date	Topics Covered
April 29th	Overview of hydraulic and water quality modeling efforts Overview of cost/benefit information for CSO controls at individual rack locations, the Ohio Canal Interceptor Tunnel, and the North Side Interceptor Tunnel
May 19th	Tour of CSO Rack 40 basin and the City's Water Pollution Control Station
June 23rd	Overview of financial capability and affordability
July 9th	Brainstorming session to gather CAG member input into: • CSO control alternatives, • level of control, • project sequencing, • financial capability, and • affordability
July 22nd	Overview of City's Capacity, Management, Operations, and Maintenance (CMOM) program to include their Emergency Response Plan; Presentation of additional rate information scenarios requested by CAG members at the June 23rd meeting
August 18th	Consent Decree update and overview of Proposed Long Term Control Plan (LTCP) Update Report submittal, recommended plan and Akron's alternative plan.
September 15th	Overview of CSO program semi-annual report submitted to EPA. Presentation of the Proposed LTCP's Post-Construction Monitoring Program (required by the NPDES permit). Update on LTCP discussions with EPA.

In addition to the full CAG meetings, the City convened a sub-group of CAG members to focus on coordinating public education opportunities among the many stakeholder groups. An initial meeting was held on May 25, 2010 with representatives of Friends of the Crooked River, Cuyahoga River Remedial Action Plan, MetroParks Serving Summit County, Cuyahoga Valley National Park, Keep Akron Beautiful, and the Ohio & Erie Canalway Coalition. The purpose of the meeting was to discuss the development of a Public Education Program related to the CSO Consent Decree items, Environmental Education, and Cuyahoga River. Meeting attendees discussed each organization's current public education programs, and developed proposed strategies, schedules, and methods for developing a CSO Public Education Program.

3.3.3 Public Meetings

The City held public meetings on December 17, 2009 and September 22, 2010, to discuss the Consent Decree, various CSO program elements and the Proposed Long Term Control Plan.

December 17, 2009 – Items discussed at the public meeting included:

- History of Akron Sewers
- What is a Combined Sewer?
- How are Sewer Rates Calculated?
- History of Clean Water Act
- Consent Decrees in US/Ohio Cities
- Elements of the Proposed Akron Consent Decree
- Required Rate Increases
- Other Rate Options/Funding Sources

Following presentations by City staff, Akron City Council members and the general public provided comments and asked questions regarding the upcoming CSO program.

September 22, 2010 – Information presented at the public meeting included:

- Overview and background information on CSOs and history of Akron sewers
- Overview of Proposed LTCP Update Report
- Proposed capital projects and operational improvements to wastewater collection system and Water Pollution Control Station
- Projected rate increases based on Consent Decree and Proposed LTCP requirements

Forty-one people attended the September 22nd public meeting at 6:15 pm at the Morley Health Center Auditorium, 177 South Broadway Street. A copy of the presentation and sign in sheet are included in Appendix 3-C. Questions raised, City responses, and public comments from the meeting are provided starting on the next page.

Question: Why does the City of Columbus have a longer wet weather implementation schedule than the City of Akron?

Response: The City of Columbus has an agreement with Ohio EPA on their current wet weather program implementation schedule, whereas the City of Akron has an agreement with the USEPA, US Department of Justice, and Ohio EPA. The City of Columbus's schedule could change to a shorter time span if the USEPA becomes involved.

Question: Will the $650 million dollars spent on the Long Term Control Plan result in lowering the estimated E. coli hours of exceedance per year by only 40 hours?

Response: Yes

Question: Will the City of Akron continue to make repairs and replacements for the current sewer system during the time span of the Long Term Control Plan?

Response: Yes, it is a part of the program to make sure the current sewer system will be maintained through existing system reinvestment projects.

Question: Is repaving streets that may be damaged due to repairing or replacing pipe included in the costs for maintaining the current sewer system?

Response: Yes, it is included in the cost.

Question: Will there be discounted sewer rates or budget programs available for people on a fixed income or low income residents?

Response: Budget programs typically work with gas or electric bills to help spread out the high cost during winter months when more gas is used. Since water use doesn't fluctuate as much, budget programs typically aren't used. Assistance similar to the HEAP program is available for low income residents. Andre Blaylock, from the City, has additional information for those who are interested.

Question: How does the City decide which sewers to fix first?

Response: The City knows where the problem areas are within the collection system due to historical data, customer complaints and inspecting pipes for defects. The CMOM program involves inspecting the sewer system every five (5) years to identify issues and/or defects. Areas of high concern will be top priority and fixed/replaced first.

Question: I am a resident that lives next to the Ohio Canal and have pipes close to my house. Will this LTCP affect my property?

Response: Based on your address, no.

Question: Will the Ohio Canal Interceptor Tunnel construction affect my property?

Response: Based on your address, no.

Question: Are there other stipulated penalties involved with not fixing problems associated with inspecting the sewer pipes as part of this overall program?

Response: Yes, there are penalties involved if we do not fix issues that are known through inspecting the sewer pipes.

Question: Can the Ohio EPA trump/override the USEPA?

Response: Because Ohio EPA is a delegated authority of USEPA, USEPA typically has final authority over environmental issues.

Question: Can a copy of the LTCP report be housed in the document repository at the library?

Response: That is a good idea, we will look into it. The LTCP is also available for public review in the Engineering Bureau conference room on the 6th Floor of the City building and on the City's website.

Question: Does the City fear that residents will leave Akron and relocate to other local communities due to the sewer rate increase?

Response: The City of Akron will be facing this burden, but so will surrounding communities who use the collection system. This is something that will affect the whole area as well as other cities with combined sewers.

Question: Resident questioned whether sewer rates have really increased for commercial businesses due to legislation passing. He expressed some concern about when and how the rates had been proposed and passed by City Council.

Response: The sewer rate increase was passed in accordance with proper procedures.

Comment: Resident was upset about the increase in sewer rates and suggested the City of Akron go to the federal government and work harder so they can pay less on sewer rates. She expressed concern that these are such bad economic times and people do not have the money to pay the high rates, and felt Akron was not fighting enough on their behalf to keep the rates affordable.

Comment: A laundromat owner was upset that their sewer bill has increased by 41% since January 2010. He suggested the City and communities that use the collection system get together and sue the EPA/government.

Comment: Resident expressed concern that increasing sewer rates for commercial users will result in people losing jobs in Akron due to businesses closing down, reducing staff or leaving the area.

Comment: Resident suggested having the small business bureau try to help smaller businesses in the Akron area that will be impacted by the higher rates.

Comment: Resident made a comment about the federal policy and thought the federal government only cared about biological standards. He did not understand why the City has to spend millions of dollars when they have good biological standards.

Comment: Resident and CSO CAG member Elaine Marsh commented "…it is important to note this is a good thing for the river, and a good thing for the community. And, it's a good thing for the value of this community. Right now if you would paddle the river, the [E. coli] standard that you noted was like 300, and it could be thousands of times that high. There's hepatitis C, there's polio, there's every infectious disease that gets flushed down toilets, that is in the river. I think it's important to know this is something that has to be done. I'm on the citizens advisory group, and I'm with Friends of the Crooked River. We've been advocating this for a long time and I think that the City of Akron is doing a very good job from an engineering perspective and in considering the needs of ratepayers. I think also we should focus on the benefits that we're going to get out of this. We'll be able to paddle the Cuyahoga River, children will be able to wade in the river. Right now, if you have a son or daughter or grandchild and they wade in that river when the sewers are overflowing, they could get very sick. So, this is an historic thing that none of us caused, but unfortunately it's our job to correct it.

And, the City of Akron is doing a very good job and they are very sensitive to impacting the cost of living, working and playing."

Comment: Resident and CSO CAG member Dan Rice stated that,"…as a member of the citizens action group and advisory group, I have great sympathy, and actually admiration, for the City. Sympathy because I can't think of a worse time to deliver this message. It's a very tough and challenging economic time. What I've actually learned from this process is a couple of things; one, there's been a significant investment by the City to date, almost over $70-75 million dollars. The second thing, is that there's a burden that has been placed on us, and it's just not right. But, unfortunately, that's just the way the rules are written right now. And the City, Mayor, Council, Rick, and everybody, I think they're doing the best they can under the rules as they are right now. If the rules change as has been suggested tonight, that would be great. As Rick indicated in the past, some twenty years ago when they had these regulations, the federal government came to the City and said we're going to help you solve these problems, which was great. I think we should recognize we are in a very tough situation, that we're doing the best we can, and they really are representing the best interest of the City, and I really give the Mayor and Rick and administration and Council all the credit. It takes a lot of courage to stand up. They're going to keep fighting for all of us, as residents and people who are going to pay these rates. And, in regard to water quality, I'm a non-profit organization, located on the Ohio Canal and towpath trail, and what amazes me is the Rack 40 that went in. There are now beaver down there and blue heron. Sometimes I wish that I could take the US EPA people down there and show them that things are improving. It's amazing what is being revitalized. I think if we can strike that healthy balance, which I truly believe the City and the Mayor and the team here has our best interest in doing that. I can't think of any stone that they have left uncovered to help do that. And I really want to thank you for doing that. We want you to keep fighting."

In addition to the public discussion at the meeting on September 22nd, the City accepted written comments from the public via email or U.S. mail. The seven written comments received and the City's responses are included starting on the next page.

EMAIL 1:

Subject: Akron Combined Sewer Overflow Plan

Have you considered distributed, green alternatives, like Lancaster, PA, has recently proposed, instead of a huge infrastructure plan?

Read more: http://articles.lancasteronline.com/local/4/293190#ixzz10SP3klZx

Instead of building expensive public works facilities at the edges of the city, the green plan calls for numerous small low-cost changes at the neighborhood level to capture the rainwater before it runs into the sewer system, instead of trying to capture and treat it downstream.

Examples would include using porous asphalt in city parking lots to let rainwater drain through instead of runoff. Green roofs on buildings would catch rain and nourish plants, and much of it would evaporate. Rainwater from residential downspouts could be directed into alleyways paved with porous asphalt. "Rain gardens" and additional trees planted along city streets also would catch rainwater.

These options would be cheaper, more efficient and effective, and beautify the city at the same time.

(Although not a resident of the city, I spend a lot of time doing business or attending events in Akron.)

EMAIL 2:

Subject: LTCP

The Ohio Canal for the most part is a Ditch of Record and its use is unregulated, therefore a continuous cleaning and oxygenation can take place inline before it discharges into River. The cost to put treatment zones in place by a few 'lock dividers' would be economical compared to 'tunnel' being proposed and by having resident water pre-oxygenated when a rain event happens, so dilutes any discharge until fully treated. Would estimate cost to be 1/5 capital and third operational. Locations can best be configured with existing cross sections that are per report all ready done.

I'm confused that testing at five overflows per month would only cost $1000 monthly ($100 a test plus special transportation because not scheduled depending on rain event time table). Where does estimate of $825,827 come from for new NPDES? These are useless tests without volume and original inflow values. Would suggest river elevations be gaged at each test and rivers and canal test on entering corporation to also have input comparisons. Then they have meaning (or prove they have no purpose)

I'm very confused in that Federal CSO only speaks to biological diversity water quality attainment of water body which the existing sewer and storrmwater management practices have attained. No matter how pure we discharge, if the beginning quality is bad entering City, we only dilute it and dilution is not a recognized practice nor is it our responsibility.

EMAIL 3:

Subject: AKRON SEWER RATE INCREASES

We are making comments we voiced last evening at the public hearing official in this email.

1. Increased rates of this degree are a tremendous burden on residents and businesses due to the economic downturn.
2. The rate of the increases do not justify the small amount of benefits the residents will realize (400 million gallons of overflows as opposed to the current 800 million overflows; 40 more hours of recreation on the River).
3. The rate increases will impact PEOPLE'S lives negatively in economic terms; more jobs will be lost and less discretionary spending will be possible. More residents will leave the city of Akron for places with less economic hardships. Yes, we care about beavers but our first concern should be about the PEOPLE who live and work in the City of Akron; those that make and spend their livelihood here.
4. Solutions to sewer upgrades should be kept local; they were being handled more appropriately by the Ohio EPA.
5. Federal mandates are unconstitutional. These organizations have no right to place this economic burden upon residents of this city. They are unelected and have no power to tell us what to do.

6. The city has disgracefully fallen down in its duty to represent its citizens. You and the mayor are accountable to the people and how YOU SPEND THEIR MONEY. You will be held to account in the next election

7. SOLUTIONS:

A. Stand up for the people, refuse to promise payments from the people to the Fed EPA, tie it up in court while you work on realistic changes. Sue them on grounds that what they propose violates the constitution. B. The leaders in the city should demand from our Attorney General to join other state attorney general's that are suing for 'State's Rights'- the enforcement of the 10th Amendment. This would get the Federal EPA out of our business, with the possibility of keeping the city financially alive while we solve the problem in a reasonable amount of time & expense.

<u>EMAIL 3 – RESPONSE:</u>

Subject: RE: AKRON SEWER RATE INCREASES

Thank you for your comments and input on the Akron CSO Long Term Control Plan. Your comments will be include in our submittal of the final plan to the US EPA and Ohio EPA and will be part of our upcoming discussions with the Department of Justice.

Akron feels it is essential that EPA consider the Akron sewer user rates as part of the financial capability and affordability determination.

<u>EMAIL 4:</u>

Subject: Combined Sewer Overflow Plan

Thanks so much for the opportunity of participating in your meeting.

I'm making a suggestion that may be difficult to implement, but worthy of trying:

As discussed at the meeting, there are many businesses who will be impacted due to the tremendous increases in upcoming sewer rates, especially laundromats or car washes. Businesses don't feel they can take on the added expense and may, in fact, be forced to either close or lay off employees to cut their costs. This only exacerbates our current problems with the economy where there are no jobs and businesses closing.

Therefore, my suggestion would be:

Petition the SBA (Small Business Administration) to make federal funds available to metropolitan areas and states to assist in infrastructure support, such as our sewer improvements. Also, I've noted the following information from the White House Web Site:

Ohio Will Receive $276.5 Million in Stimulus Funding for Sewer Lines, Wastewater Treatment and Drinking Water Facilities. "Meanwhile, communities hoping to get some of the estimated $276.5 million in stimulus money being allocated to Ohio for sewer lines, wastewater-treatment plants or drinking-water facilities have until 5 p.m. Friday to submit their projects to recovery.ohio.gov for consideration. The Ohio Environmental Protection Agency already has received project funding requests worth about $4 billion, the state said yesterday." [Columbus Dispatch, 3/4/09]

In checking the Recovery.gov, I find a listing that shows the following:

	▲sortAward #	sortOrder #	sortFunding Agency	sortAward Type	Award Amount	sortLocal Amount	sortRecipient Role
1	AKRON, CITY OF	2W-00E72301-0		Environmental Protection Agency	Grants		$87,500.00
2	AKRON, CITY OF	2W-00E72301-0		Environmental Protection Agency	Grants		$212,988.12
3	AKRON, CITY OF	2W-00E72301-0		Environmental Protection Agency	Grants		$420,989.00
4	AKRON, CITY OF	2W-00E72301-0		Environmental Protection Agency	Grants		$1,351,816.00
5	AKRON, CITY OF	2W-00E72301-0		Environmental Protection Agency	Grants		$100,000.00
5	AKRON, CITY OF	2W-00E72301-0		Environmental Protection Agency	Grants		$2,479,129.00

This listing shows that Columbus is in receipt of these dollars. Is that a mistake? Since Akron, Ohio is listed as the benefactor, could it be that we were supposed to get this money rather than Columbus? Or is it sent to Columbus to be dispersed to Akron? This is the website:
http://www.recovery.gov/Transparency/RecipientReportedData/pages/RecipientProjectSummary508.aspx?AwardIdSur=10652&AwardType=Grants

EMAIL 4 – RESPONSE:

Subject: RE: Combined Sewer Overflow Plan

Good evening. It was nice to see you at the meeting. We will pass your comments about trying to help small businesses affected by the Long Term Control Plan along as part of our public participation process.

Regarding the Recovery funding, we did receive ARRA funds for some of our routine sewer lining and reconstruction projects. the awards were half grants and half loans. so we had to borrow 50% of the funds listed on the chart. We did get the funds, but they are awarded through the state to us. That might be why Columbus is listed.

As a side note, we did apply for ARRA funding for some of the big projects we presented Wednesday night, and all requests were denied.

EMAIL 5:

Subject: Rates

Please tell me why the sewer rates are going up so much and what do we get out of it?

EMAIL 6:

Subject: SEWER RATES!!

1. Increased rates of this degree are a tremendous burden on residents and businesses due to the economic downturn.
2. The rate of the increases do not justify the small amount of benefits the residents will realize (400 million gallons of overflows as opposed to the current 800 million overflows; 40 more hours of recreation on the River).
3. The rate increases will impact PEOPLE'S lives negatively in economic terms; more jobs will be lost and less discretionary spending will be possible. More residents will leave the city of Akron for places with less economic hardships. Yes, we care about beavers but our first concern should be about the PEOPLE who live and work in the City of Akron; those that make and spend their livelihood here.
4. Solutions to sewer upgrades should be kept local; they were being handled more appropriately by the Ohio EPA.

5. Federal mandates are unconstitutional. These organizations have no right to place this economic burden upon residents of this city. They are unelected and have no power to tell us what to do.

6. The city has disgracefully fallen down in its duty to represent its citizens. You and the mayor are accountable to the people and how YOU SPEND THEIR MONEY. You will be held to account in the next election

7. SOLUTIONS: A. Stand up for the people, refuse to promise payments from the people to the Fed EPA, tie it up in court while you work on realistic changes. Sue them on grounds that what they propose violates the constitution. B. The leaders in the city should demand from our Attorney General to join other state attorney general's that are suing for 'State's Rights'- the enforcement of the 10th Amendment. This would get the Federal EPA out of our business, with the possibility of keeping the city financially alive while we solve the problem in a reasonable amount of time & expense.

<u>EMAIL 6 – RESPONSE:</u>

Subject: RE: SEWER RATES!!

Thank you for your comments and input on the Akron CSO Long Term Control Plan. Your comments will be include in our submittal of the final plan to the US EPA and Ohio EPA and will be part of our upcoming discussions with the Department of Justice.

Akron feels it is essential that EPA consider the Akron sewer user rates as part of the financial capability and affordability determination.

<u>EMAIL 7:</u>

Subject: SEWER RATES ARE DRASTICALLY GOING UP!

I am tired of working hard to make ends meet only for you(the government) to continuously raise rates. I would suggest that you and every other department needs to chop their budget and live within their means. What part of NO HIKES and LIVE WITHIN THE BUDGET does this administration not understand.

STOP RAISING MY RATES

3.4 Public Education Activities

In continuing their on-going public information process, the City of Akron posted CSO program information on their internet site, conducted ward meetings addressing the CSO program, and distributed CSO program brochures to local water and wastewater customers.

3.4.1 City Website

The City of Akron created a dedicated space on their Internet website to post relevant historical and current data regarding the CSO program. Figure 3-1 illustrates the information currently contained on the City's website.

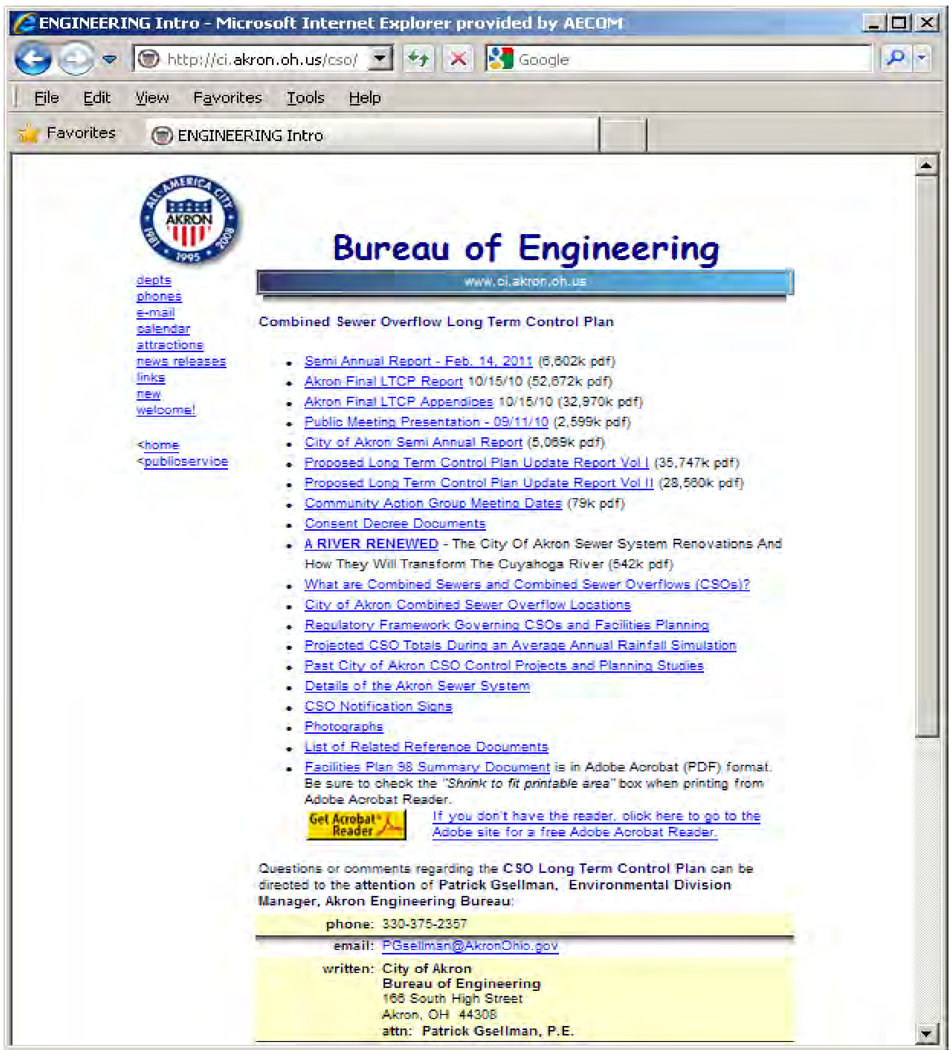


Figure 3-1 CSO Information on City of Akron Website

3.4.2 Ward Meetings

Local Akron residents have the opportunity to attend regular Ward meetings with their respective City Council members. These meetings typically occur on a monthly basis. Staff from the City Engineering Bureau and Public Utilities Bureau have attended numerous Ward meetings to provide information relating to the CSO program, answer questions from Akron residents, and solicit feedback on the City's long term control plan.

3.4.3 CSO Program Brochure

The City of Akron developed a CSO Program brochure entitled *"A River Renewed: The City of Akron Sewer System Renovations And How They Will Transform the Cuyahoga River"* and distributed it to local water and wastewater customers in July, 2010. This brochure (illustrated in Figure 3-2) provided an overview of the City's combined sewer system, a history of wastewater improvements, projected sewer rates for various customer types, and the benefits of the CSO program to the Cuyahoga River. A copy of the brochure is located in Appendix 3-D.

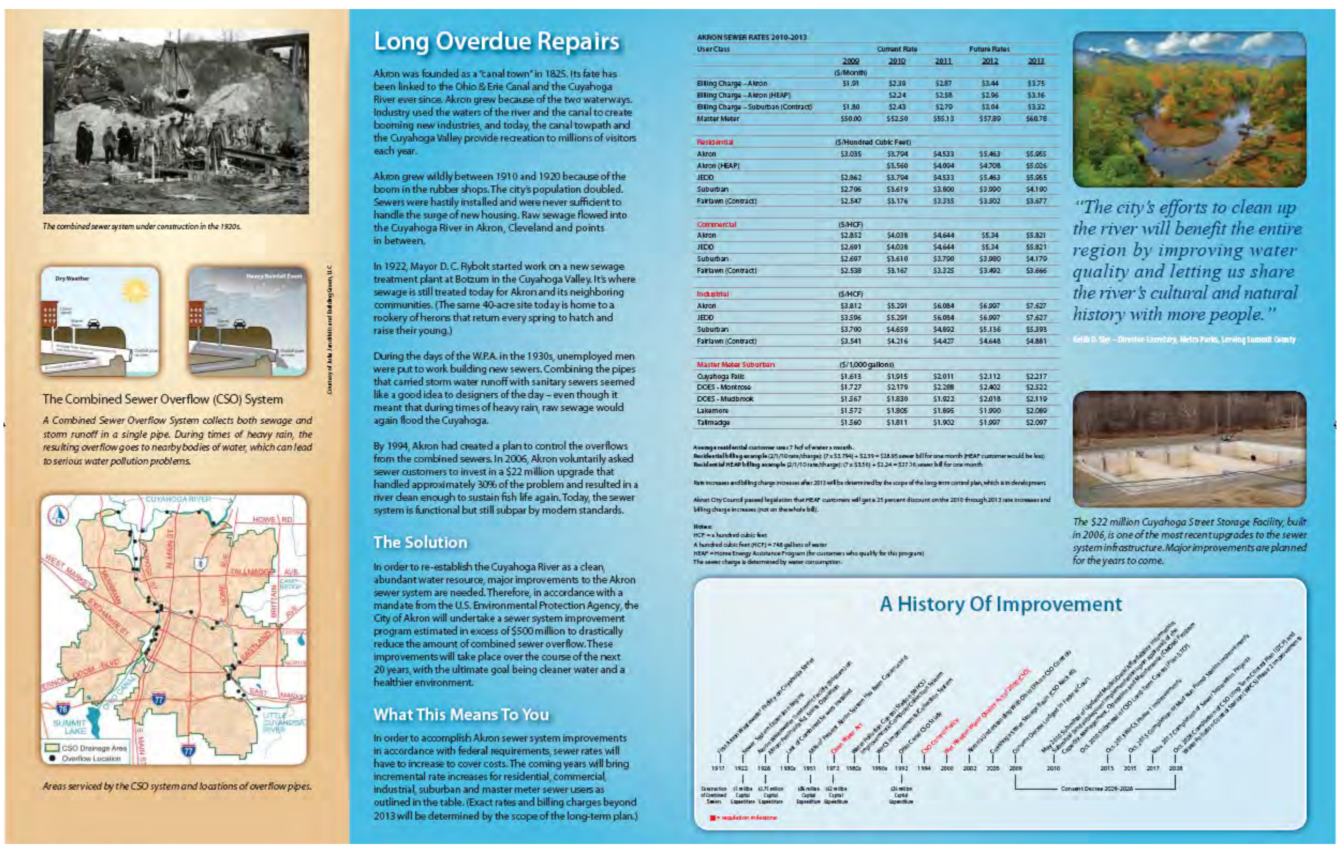


Figure 3-2 CSO Program Brochure

3.5 Future Public Participation Activities

As noted earlier, the City strongly believes in the value of public participation and is committed to continuing to seek public input during the planning, design, and construction of CSO control projects. Future public participation will continue to educate citizens about CSOs and water quality problems; seek input into specific project options; inform neighborhood residents before, during and after construction; and report on the City's progress in reducing combined sewer overflows and improving water quality.

3.5.1 LTCP Public Comment Period

The City solicited public comments on the Proposed Long Term Control Plan through various methods, including placing the draft plan on the City's website and attending local civic and stakeholder group meetings as requested. In addition, the City held a public meeting on the draft plan on September 22, 2010. Public comments, questions and responses from this meeting are summarized in 3.3.3 Public Meetings.

3.5.2 CSO Program Website

The City is also considering developing a CSO program specific website that will serve as a single point of information for all things related to the CSO program. This website could include overall program information; provide instructions for local vendors, contractors, and consultants on project opportunities; highlight upcoming and on-going construction projects; serve as a centralized repository for CSO program documents; and provide contact information for CSO program activities and projects.

3.5.3 Neighborhood Communication

During implementation of the LTCP, the City plans to continue to keep residents informed of construction progress and water quality improvements. During construction, the City will communicate with residents and business owners on the construction schedule and work being performed in each neighborhood to help minimize impacts on day-to-day activities. The City will also keep residents updated on overall progress of the CSO program through sewer bill inserts, newspaper articles, public meetings, and presentations to stakeholder groups as requested.

4. CONSIDERATION OF SENSITIVE AREAS

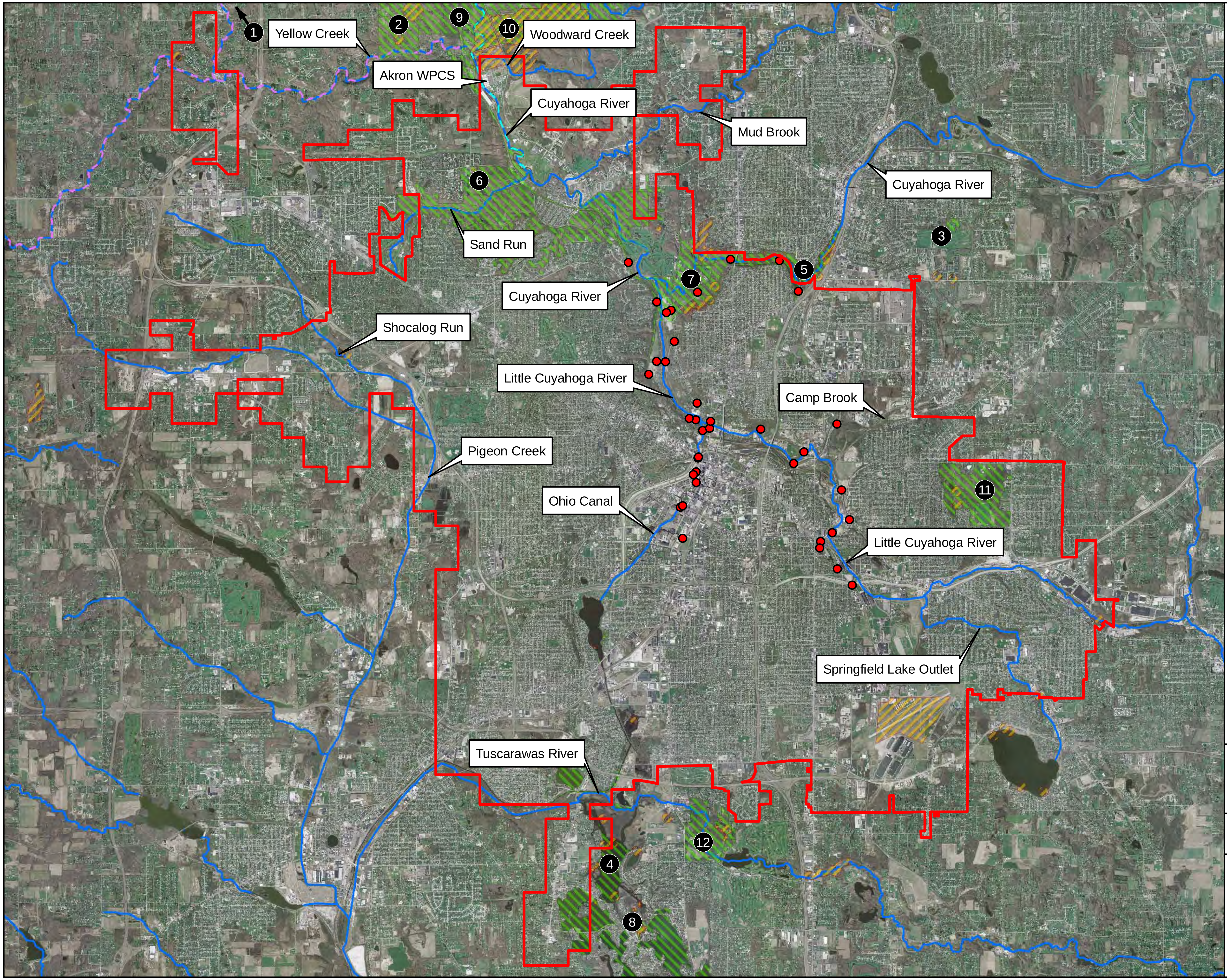
The USEPA Combined Sewer Overflow (CSO) Control Policy (1994) requires municipalities to give the highest priority to controlling overflows to receiving waters considered sensitive. Wherever physically possible and economically achievable, a municipality's CSO Long Term Control Plan (LTCP) shall eliminate or relocate existing overflows that discharge to sensitive areas. According to Section II.C.3 of the CSO Control Policy, sensitive areas include:

- Outstanding National Resource Waters and State Resource Waters
- National Marine Sanctuaries
- Waters with threatened or endangered species and their habitat
- Waters with primary contact recreation
- Public drinking water intakes or their designated protection areas
- Shellfish beds

This section summarizes the approach used to identify sensitive areas in the planning area (see Figure 4-1) and provides the findings, organized by the sensitive area types listed above. A brief discussion of potential impacts to the sensitive areas as a result of implementation of the recommended LTCP is also included. The Evaluation of Alternatives Section, located in Section 6 of this document, illustrates how the City considered CSO control as it relates to sensitive areas and found that total elimination or relocation of overflows is not physically possible or economically achievable.

4.1 Approach

Information was obtained, including a variety of GIS data, from several agencies to aid in the identification of sensitive areas (as defined by the CSO Control Policy) in the planning area. Agencies contacted include: City of Akron Bureau of Engineering and Public Utilities Bureau, Summit County Geographic Information Services, Ohio Environmental Protection Agency, Ohio Department of Natural Resources, and U.S. Fish and Wildlife Service. In addition, the State of Ohio Water Quality Standards (Chapter 3745-1 of the Ohio Administrative Code (OAC)) was reviewed.



Legend

Service Area Boundary

Sewer Racks (CSO Outfalls)

Rare and Endangered Species

Managed Areas

Superior High Quality Waters

Outstanding State Waters

Primary Contact Recreation Waters

N
W E
S

0 3,150 6,300 12,600

Feet

Cuyahoga River Renewed

CSO LONG TERM CONTROL PLAN UPDATE

Figure 4-1

CSO Control Policy Sensitive Areas

4.2 Identified Sensitive Areas

The following sections identify sensitive areas located within the planning area based on application of the approach described above.

4.2.1 Outstanding National Resource Waters and State Resource Waters

No Outstanding National Resource Waters are located in the planning area. However, the state has established designations for Superior High Quality Waters and Outstanding State Waters (see Rule 3745-05 of the OAC). Superior High Quality Waters are surface waters that possess exceptional ecological values, which are assessed based upon a combination of the presence of threatened or endangered species and a high level of biological integrity. The only Superior High Quality Water located within the planning area is Yellow Creek, which joins the Cuyahoga River downstream of the Akron Water Pollution Control Station (WPCS) and is not affected by any CSOs or flows from the WPCS in wet weather events (see Figure 4-1).

Outstanding State Waters are surface waters that have special significance for the state because of their exceptional ecological values or exceptional recreational values. As stated in Rule 3745-05 of the OAC, “To qualify on the basis of exceptional ecological values they must meet the qualifications for superior high quality waters and be further distinguished as being demonstratively among the best waters of the state from an ecological perspective. To qualify on the basis of exceptional recreational values they must provide outstanding or unique opportunities for recreational boating, fishing or other personal enjoyment.” The Cuyahoga River is designated an Outstanding State Water based on exceptional recreational values beginning in the planning area at Sand Run (river mile 39.12) (see Figure 4-1). CSOs are located on the Cuyahoga River upstream of this designated area, and the WPCS is located within this reach.

4.2.2 National Marine Sanctuaries

No National Marine Sanctuaries are located within the planning area.

4.2.3 Waters with Threatened or Endangered Species and their Habitat

Based on data supplied by the Ohio Department of Natural Resources (ODNR) Division of Natural Areas and Preserves, several rare and endangered species and/or suitable habitat are located within and near the planning area (see Figure 4-1). The only CSO receiving water in the planning area that was identified as having suitable habitat for rare and endangered species are portions of the Cuyahoga River.

The ODNR Division of Natural Areas and Preserves also documents “managed areas” that provide wildlife habitat (see Figure 4-1). These include state wildlife areas, nature preserves, parks and forests, and national wildlife refuges. Table 4-1 identifies the managed areas located within and near the planning area. Several CSOs are located in or adjacent to these managed areas.

Table 4-1 Managed Areas

Map ID	Name
1	Bath Nature Preserve
2	O'Neil Woods Metro Park
3	Galt Park
4	Portage Lakes State Park
5	Gorge Metro Park
6	Sand Run Metro Park
7	Cascade Valley Metro Park
8	Portage Lake Wetlands
9	Cuyahoga Valley National Park
10	Hampton Hills Metro Park
11	Goodyear Heights Metro Park
12	Firestone Metro Park

4.2.4 Waters with Primary Contact Recreation

The State of Ohio Water Quality Standards assigns recreational use designations to water bodies in the state. The following CSO receiving waters are designated as waters with primary contact recreation: Cuyahoga River, Little Cuyahoga River, and portions of the Ohio Canal. Table 4-2 summarizes the recreational use designations for the CSO receiving waters. Additional primary contact recreation waters are located within the planning area, including: Yellow Creek, Woodward Creek, Shocalog Run, Sand Run, Mud Brook, Springfield Lake Outlet, and Tuscarawas River. As defined in the Water Quality Standards, primary contact waters are those that, “during the recreation season [May 1st to October 31st], are suitable for one or more full-body contact recreation activities such as, but not limited to, wading, swimming, boating, water skiing, canoeing, kayaking, and scuba diving.” The Cuyahoga River is further classified as a Class A primary contact recreation water, which is a water body that supports or has the potential

Table 4-2 Recreational Use Designations for CSO Receiving Waters

Receiving Water	Recreational Use Designation
Cuyahoga River	Class A primary contact recreation (entire reach within planning area)
Little Cuyahoga River	Class B primary contact recreation (entire reach within planning area)
Camp Brook	Secondary contact recreation (entire reach within planning area)
Ohio Canal	Class B primary contact recreation from Summit Lake to Lock 1; secondary contact recreation from Lock 1 to end of enclosed segment); Class B primary contact recreation from end of enclosed segment to the mouth.

to support frequent contact recreation activities. The river is a popular paddling water body with public access points developed, maintained, and publicized by governmental entities. Figure 4-1 identifies the primary contact recreation waters within the planning area.

The remaining CSO receiving water, Camp Brook, is designated as a water with secondary contact recreation. Secondary contact waters are defined as waters that result in minimal exposure potential to water borne pathogens because the waters are rarely used for water-based recreation.

4.2.5 Public Drinking Water Intakes or their Designated Protection Areas

The City of Akron's water supply is the Upper Cuyahoga River, and the City's water intakes are located at Lake Rockwell, which is upstream of the planning area and not affected by CSOs. None of the water bodies in the planning area are used as a potable water source, and there are no water intake structures within these waterways. Furthermore, no designated public drinking water protection areas are located within the planning area.

4.2.6 Shellfish Beds

No shellfish beds are located within the planning area.

4.3 Consideration of Sensitive Areas

As stated previously in this section, Section II.C.3. of USEPA's CSO Control Policy provides that "EPA expects a permittee's long term CSO control plan to give the highest priority to controlling overflows to sensitive areas." However, all of the City's CSOs discharge to sensitive areas or discharge to waters that enter sensitive areas. Thus, all of the CSOs receive equal priority under the sensitive area analysis.

Section II.C.3. of USEPA's CSO Control Policy further requires that a long-term control plan "…should….eliminate or relocate overflows that discharge to sensitive areas wherever physically possible and economically achievable, except where elimination or relocation would provide less environmental protection than additional treatment…"

4.3.1 Elimination of Overflows to Sensitive Areas

Elimination of existing combined sewer overflows would require completely separating existing storm water and wastewater systems. This separation would be required throughout the entire combined sewer area to ensure that all CSOs were fully eliminated.

The City performed an analysis of total sewer separation as part of their Facilities Plan '98 (Complete Separation Alternatives Memorandum, February 19, 1998, Malcolm Pirnie). The estimated cost for full separation in 1998 was $1,302,002,390. Updating this number using a 1996 annual average ENR CCI of 5620 and the January 2010 ENR CCI of 8660, the cost in 2010 dollars becomes $2,006,288,380. This cost includes design and construction, as well as the cost for storm laterals. Thus the cost to eliminate the City's CSOs is economically unachievable. This determination is supported by the financial capability information presented in Section 8 and Appendix 1-B of this LTCP.

4.3.2 Relocation of Overflows to Sensitive Areas

In USEPA's comment letter regarding the City's proposed LTCP submittal (received by the City on September 21, 2010), USEPA states that "Moreover, as you are aware, in Attachment A, Section II of the Consent Decree, the parties acknowledged that "all Akron's CSOs discharge directly into sensitive areas, with the exception of the CSOs that discharge into the Ohio Canal, and that Akron's CSOs that discharge into the Ohio Canal enter sensitive areas." This statement demonstrates that relocation of existing combined sewer overflows is not physically possible since all local receiving waters are considered sensitive areas, or drain into a sensitive area.

4.3.3 Conclusion

Based on the information presented above, elimination of the CSOs discharging to sensitive waters is not economically achievable and relocation of the CSOs that discharge to sensitive waters is not physically possible. Under Section II.C.3. of U.S. EPA's CSO Control Policy, where this occurs the permittee would then "provide the level of treatment for remaining overflows deemed necessary to meet WQS for full protection of existing and designated uses. In any event, the level of control should not be less than those described in Evaluation of Alternatives below. . . ." Therefore, the City performed an additional alternatives analysis to develop the controls for the long term control plan. This analysis is further described in Section 6 of this LTCP report.

5. MAXIMIZATION OF TREATMENT AT WATER POLLUTION CONTROL STATION

The City of Akron's Consent Decree and the EPA's CSO Control Policy both include requirements to evaluate the use of the Akron Water Pollution Control Station (WPCS) in three capacities:

1. Maximize flow to the WPCS to ensure optimum use of the treatment facilities.
2. Evaluate expansion of secondary and primary capacity.
3. Evaluate CSO-related bypass of the secondary treatment portion of the WPCS.

Item 1 relates to the operation of the collection system and considers maximizing the delivery of flows during wet weather to the WPCS for treatment. Many treatment plants, including the Akron WPCS, have a primary treatment capacity greater than the secondary treatment capacity. Item 1 ensures that the treatment capacities at the plant are fully utilized by maximizing the volume of flow that is conveyed to the WPCS for a minimum of primary treatment, thereby minimizing or eliminating untreated overflows in the collection system. This evaluation is one of EPA's specific requirements of a Long Term Control Plan and builds on the City's Nine Minimum Controls (1995).

The Evaluation of Alternatives section of this report includes alternatives to maximize this delivery by using tunnels, sewer separation, and storage basins. The tunnels and storage basin alternatives allow the flow to be stored during wet weather events up to a certain control level. When the storm subsides, the flow discharges back into the collection system to be conveyed to the WPCS. The sewer separation alternatives separate the stormwater flow from the sewer collection system, thereby allowing more sanitary wastewater to be conveyed to the WPCS rather than overflowed to receiving waters.

Item 2 evaluates the operation of the WPCS and considers capital improvements to the primary and/or secondary facilities to increase treatment capacity as an alternative for decreasing or eliminating untreated overflows. The City has performed stress testing to determine the actual treatment capacities of the primary and secondary facilities. Based on the testing, an evaluation was performed to consider expanding the capacities to reduce the frequency of secondary bypass diversions. Key conclusions and recommendations from that analysis are summarized herein, and more detail can be found in the No Feasible Alternative (NFA). The NFA Report, dated December 29, 2006, was revised by Addendum No. 1 on June 8, 2009 and further revised by Addendum No. 1 Update with Supplement on November 25, 2009.

Item 3 evaluates the wet weather secondary bypass procedures at the plant. Intentionally bypassing secondary treatment is permitted by EPA under specified limited circumstances, including that there was no feasible alternative to the bypass. Feasible alternatives for treating the secondary bypass flow were evaluated and are summarized herein.

5.1 Akron Water Pollution Control Station

The Akron Water Pollution Control Station (WPCS) is located on Akron-Peninsula Road, along the Cuyahoga River in the City of Akron, Ohio. It began operation in 1928. The WPCS currently serves City of Akron, City of Cuyahoga Falls, City of Fairlawn, City of Munroe Falls, Village of Lakemore, Village of Mogadore, Village of Silver Lake, and parts of the City of Stow, City of Tallmadge, Bath Township, Copley Township, Coventry Township, and Springfield Township. Figure 5-1 presents a general site location map.

Figure 5-1 WPCS General Site Location Map

5.1.1 Historic Outline

The City of Akron's first sewage treatment plant was located on Cuyahoga Street where the Little Cuyahoga River joins the Cuyahoga River. The 15 MGD plant began partial operation in 1917 as the first step in ceasing pollution of the Cuyahoga River. A 1913 Ohio State Board of Health Order required the City of Akron to take these steps.

Before construction was completed on the Cuyahoga Street facility, it was abandoned in favor of an 834-acre site on Akron-Peninsula Road. The new site provided significantly more land for expansion and was located further downstream on the Cuyahoga River. By 1928, a new trickling filter plant with a capacity of 33 million gallons per day (MGD) was in operation. However, with the continued rapid growth of the City of Akron, this second treatment plant was overloaded by World War II.

During the period 1947 to 1957, a new activated sludge, secondary treatment plant was constructed to replace the trickling filters and humus tanks. The new treatment facilities included new bar screens, grit removal equipment, primary settling tanks, aeration tanks, final settling tanks and chlorination facilities. Six new anaerobic digesters and a sludge incineration facility were also constructed. All of these new processes were in service by early 1957.

During the period 1957 to 1967, a variety of minor improvements were completed to enhance the secondary treatment facility operation. These projects included elutriation tank enlargement, sludge thickener construction, City water supply, building electrical system improvements, and a new 69 kilovolt (KV) substation, natural gas distribution system, digester gas recirculation systems, river water sediment basin, administration building addition, and vacuum filter replacement.

During the period 1967 to 1977, further improvements were completed to enhance current process operations and increase the treatment capacity. The major improvements included:

- Six additional primary settling tanks (PST Nos. 7 through 12)
- Preaeration tanks and associated Chemical Handling and Blower Building and Fine Screen Building
- A new chlorination facility including chlorine contact tank and chlorination building

- A wet air oxidation (Zimpro) facility
- A second raw water conduit from the Administration Building to the bypass and control chamber
- Memorial Parkway storm retention tank
- A new, separate laboratory building
- Numerous repairs and enhancements to the Zimpro facility
- A sixth aeration tank and a new secondary treatment blower building (North Blower Building) with electric motor drives, and positive displacement blowers
- A 96-inch diameter secondary treatment bypass conduit to the chlorine contact tanks and an 84-inch diameter primary/secondary bypass conduit to the final settling tank effluent 96-inch diameter conduit

The year 1978 began another decade of major process improvements. By 1980, an addition to the North Blower Building was completed, which included four additional electric motor driven blowers. These centrifugal compressors could supply air to the original five aeration tanks through a new overhead steel air header and/or through the existing air header. A chlorination and plant water facility was constructed adjacent to the chlorine contact tanks to provide a chlorine supply to these existing tanks. The facility included a wet well and pumps with strainers to provide a pressurized, nonpotable water supply for use throughout the plant. Within this same 2-year period, sludge handling improvements were constructed including a waste activated sludge treatment system using a dissolved air floatation (DAF) process. A standby power facility including diesel driven generators was constructed adjacent to the Zimpro facility. To raise the hydraulic profile of the return activated sludge being returned from the final settling tanks, three screw pump stations were constructed.

The late 1970s also saw further improvements planned to the Zimpro facility, but not all were executed. By 1986, the Zimpro facility was abandoned. Chronic operational problems made this facility impractical to continue in operation.

In 1982, the Akron WPCS primary treatment capacity was enhanced by the construction of 12 additional primary settling tanks (PST) (Nos. 13 through 24). As part of this project, chemical feed systems, including alum, polymer, and caustic soda were installed in the Chemical Handling and Blower Building. A grease incineration system was removed to provide the space needed for the chemical feed systems. A third final settling tank was constructed for each of the six secondary treatment process trains under a second project. New hydraulic control chambers were also constructed to accommodate these six additional tanks.

From 1981 to 1984 significant improvements were made to the Akron WPCS sludge handling facilities. These improvements included gravity thickener and sludge equalization improvements to better process primary sludge and conversion of the six anaerobic digesters to mixing and holding tanks. The mixing and holding tanks would serve as blending tanks for the gravity thickened primary sludge and the waste activated sludge thickened in the DAF facility. A waste liquor treatment facility which uses lime to precipitate phosphorous and adjust the pH of sludge recycle flows was also constructed. Two other old anaerobic digesters were converted for use as recycle water equalization tanks.

In 1983 the existing sludge incinerators received modifications to the scrubbers to bring them into compliance with emission standards. Recognizing the limitations of this facility and the costs associated with its operation, the City of Akron began construction in 1983 of the Akron Compost Facility (ACF), a sludge composting plant. The ACF was initially constructed to reduce the load on the sludge incinerators and reduce sludge disposal costs. However, with ever more stringent emission regulations pending, and incinerator operational costs increasing, it was decided in 1993 to discontinue operation of the sludge incinerators. The ACF presently handles all sludge from the Akron WPCS.

The Akron WPCS began headworks improvements in 1988. The mechanical coarse bar screens were replaced with continuously cleaning, fine screens. A fourth screen channel and grit bypass channel were added along with modification to the raw bypass overflow weir and auxiliary (postscreen) plant bypass channel. This improvement allowed the demolition and removal of fine screens and comminutors located in a building next to the Preaeration Tanks. This building was further renovated in 1996 to serve as a central locker facility.

Downstream of the new fine screens, the Detritus tanks were also rehabilitated with new grit collectors and shaftless screw conveyors. New belt conveyors were installed to convey the grit into a new grit truck load out building. With all grit tanks and fine screens in operation, a sustained flow of approximately 280 MGD may be processed. The firm capacity of the renovated headworks is considered to be 210 MGD.

In 1988, a new plant discharge structure was constructed. This project included a new headwall, discharge conduits, and effluent gates to help reduce hydraulic restrictions during high plant flows in conjunction with high river water levels. The secondary bypass conduit (96-inch diameter conduit) was also modified to connect to the 96-inch diameter plant effluent conduit upstream of the chlorine contact tanks.

In 1993, a new Administration Building was constructed adjacent to the Laboratory Building. This allowed the original aging Administration Building to undergo major rehabilitation, including asbestos removal and abatement, and modification for use as a training facility. The completion of both facilities was critical to the support of the distributed control system (DCS) project undertaken in 1994. This project, originally envisioned in 1981, provided a complete computer monitoring and control system for the entire Akron WPCS. Several minor process improvements were constructed in conjunction with the DCS to enhance operation and control of process systems throughout the plant. A supervisory control center with data archiving and engineering workstations is located in the Administration Building. A fully functional DCS workstation provides hands on training for the DCS at the training facility.

Several other improvements were constructed between 1992 and 1994. These include 1) rehabilitation of the gravity thickeners, 2) rehabilitation of the Lime Stabilization Plant, 3) final settling tank covers, 4) remodeling of the old administration building to serve as a training facility, and 5) rehabilitation of the Recycle Water Equalization Tanks (original 1936 anaerobic digesters).

To comply with new chlorine residual limitations imposed by the OEPA, it was necessary in 1994 to begin feeding sodium bisulfite, a reducite. A new building was constructed east of the chlorine contact tank to house the sodium bisulfite storage tanks and feed pumps. This facility also houses a diesel standby generator, which provides standby power for all disinfection facilities. In 1995, the gas chlorination system was replaced with a liquid sodium hypochlorite feed system. This feed system is housed in the Chlorination and Plant Water Facility.

Renovation of the activated sludge treatment facilities was completed in 1996. The medium bubble diffusers and associated air supply piping in all six aeration basins were removed and replaced with fine bubble ceramic discs to provide higher oxygen transfer efficiency and reduce the volumetric air flow rate. Electrical costs associated with operating the activated sludge treatment facility have been significantly reduced.

The 1928 Imhoff Tanks had been used for a number of years as stormwater retention tanks. Renovation of these tanks was completed in 1996, which allows these tanks to provide increased storage volume. Solids handling pumps were installed to remove settled solids from the bottom of the tanks. A third influent screw pump was also added.

The sludge incinerators were abandoned in 1993 and later torn down in 2004. As a replacement process for disposal of primary settling tank scum and grease, a filter screen was installed in the Fine Screen Building. The screen dewaters the grease before disposal at a landfill. This project was completed in 1997.

Two projects were completed in 1999 - Primary Settling Tank (PST) improvements and Waste Activated Sludge Thickening. The PST Improvements project was a maintenance/replacement project where aging and deteriorated equipment was replaced. The Waste Activated Sludge Thickening project abandoned the dissolved air flotation system in favor of gravity belt thickeners for thickening of sludge from the secondary treatment process.

In 2003, a project to reroute the flow into the Storm Retention Tanks was completed to meet the 60 MGD design capacity of the system and to provide greater accuracy and control for flows to this off-line storage system. In addition, a screenings dewatering and compaction unit was completed to dewater the screenings prior to transporting to a landfill for disposal.

In 2006, the Cuyahoga Street Storage Facility was put into operation to control overflow from Racks 40, 31, and 30 during wet weather events. Flow is pumped into the existing collection system once the WPCS has the capacity to treat the flow. The location of the basin on Cuyahoga Street is near the original wastewater treatment plant. The facility is controlled via a buried fiber optic cable connection to the wastewater plant.

5.1.2 Existing Facilities

The Akron WPCS is a single stage nitrification, activated sludge treatment facility with an average design flow of 90 MGD. In 2009, the influent to the Akron WPCS averaged 69 MGD with a peak flow rate of 269 MGD. The existing facilities at the WPCS include preliminary, primary, and secondary treatment followed by disinfection and dechlorination. The preliminary treatment system has a firm treatment capacity of 210 MGD and includes influent screening, grit removal, and storm retention. The primary treatment system capacity is 150 MGD and includes settling tanks. The secondary treatment system capacity is 110 MGD and includes aeration basins, final settling tanks, return activated sludge (RAS) pumping station, blowers, and associated influent and effluent conduits. The disinfection system consists of chlorine contact tanks with a 14 minute detention time during the design peak flow rate of 210 MGD. The treated flow is then dechlorinated using sodium bisulfite. The treated effluent is discharged to the Cuyahoga River south of Bath Road, just upstream of the Cuyahoga Valley National Park. Figure 5-2 presents a site plan of the facilities at the WPCS. Figure 5-3 is an overall flow schematic, and Figure 5-4 presents a flow diagram which shows the locations of the reporting stations. Table 5-1 includes the unit processes through the plant with a summary of the number of units, dimensions, and volumes and rated capacities.

Wastewater flow from the tributary service area is discharged to the plant Influent Chamber by a 90- by 144-inch influent sewer. The Influent Chamber includes a bypass located ahead of all treatment facilities.

Influent to the plant passes through four 72- by 48-inch sluice gates ahead of four continuously cleaning fine screens in the Screening Building. Screenings are dewatered and hauled away to a sanitary landfill for disposal. Plant flow then passes into the grit removal complex consisting of four Detritus tanks. The four Detritus tanks are equipped with center drive circular collectors and peripheral grit removal. Grit is removed from each tank by a shaftless screw conveyor which discharges collected grit down a chute onto a belt conveyor. The belt conveyor, common to all four grit screws, transfers grit to the Grit Removal Building. A second belt conveyor discharges grit from the main conveyor to a roll-off container positioned in either of two locations within the building. The grit is hauled to a sanitary landfill for disposal.

Following grit removal, flow is routed beneath the training facility through four 48-inch diameter Venturi meters. The metered flow is split between two 60- by 99-inch channels (east and west channels) which convey flow to the Bypass Junction Chamber. Improvements to the Bypass Junction Chamber prevent wastewater from being bypassed from this location. Wastewater from both channels combines in the Bypass Junction Chamber and flows in a common channel to the Primary Settling Tanks.

The eastern channel is equipped with a discharge sluice gate to divert flows to the storm retention tanks (the original 1928 Imhoff Tanks). The Stormwater Retention Tanks provide an off-line storage volume of approximately 10 million gallons (MG). Sludge pumps are available to pump settled solids back to the grit influent channel. The stored wastewater is lifted by screw pumps into the Primary Tank influent channel, following cessation of wet weather flows.

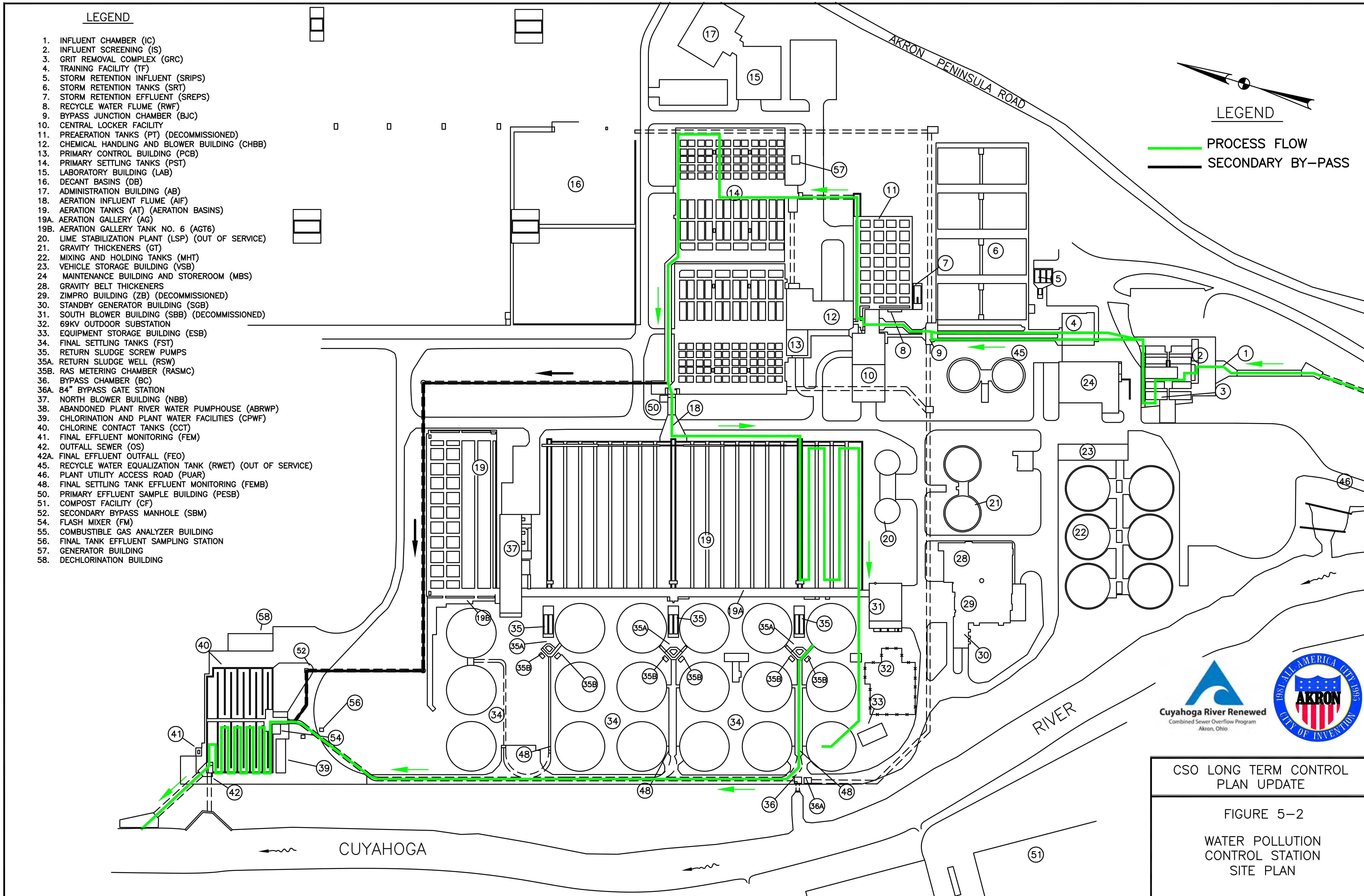
Sodium aluminate can be added to the plant flow just upstream of the Primary Settling Tanks. The storage and feed equipment is located in the Chemical Handling and Blower Building adjoined with the Primary Control (Sludge) Building.

The Primary Settling Tanks are fed via two influent channels. The west influent channel serves Primary Settling Tanks Nos. 1 through 6 (constructed in 1957) and Nos. 7 through 12 (constructed in 1969). The east influent channel serves Primary Settling Tank Nos. 13 through 24 (constructed in 1984).

The Primary Settling Tanks are rectangular tanks with two sets of chain and flight sludge collection mechanisms. A third chain and flight collection mechanism is provided in the end hopper of each tank as a cross collector.

A manually actuated grease skimming system is also provided in each tank. Collected grease and scum is pumped via a glass lined force main to the Influent Screening Building. A rotating drum fine screen dewaters the grease and scum for final disposal at the sanitary landfill.

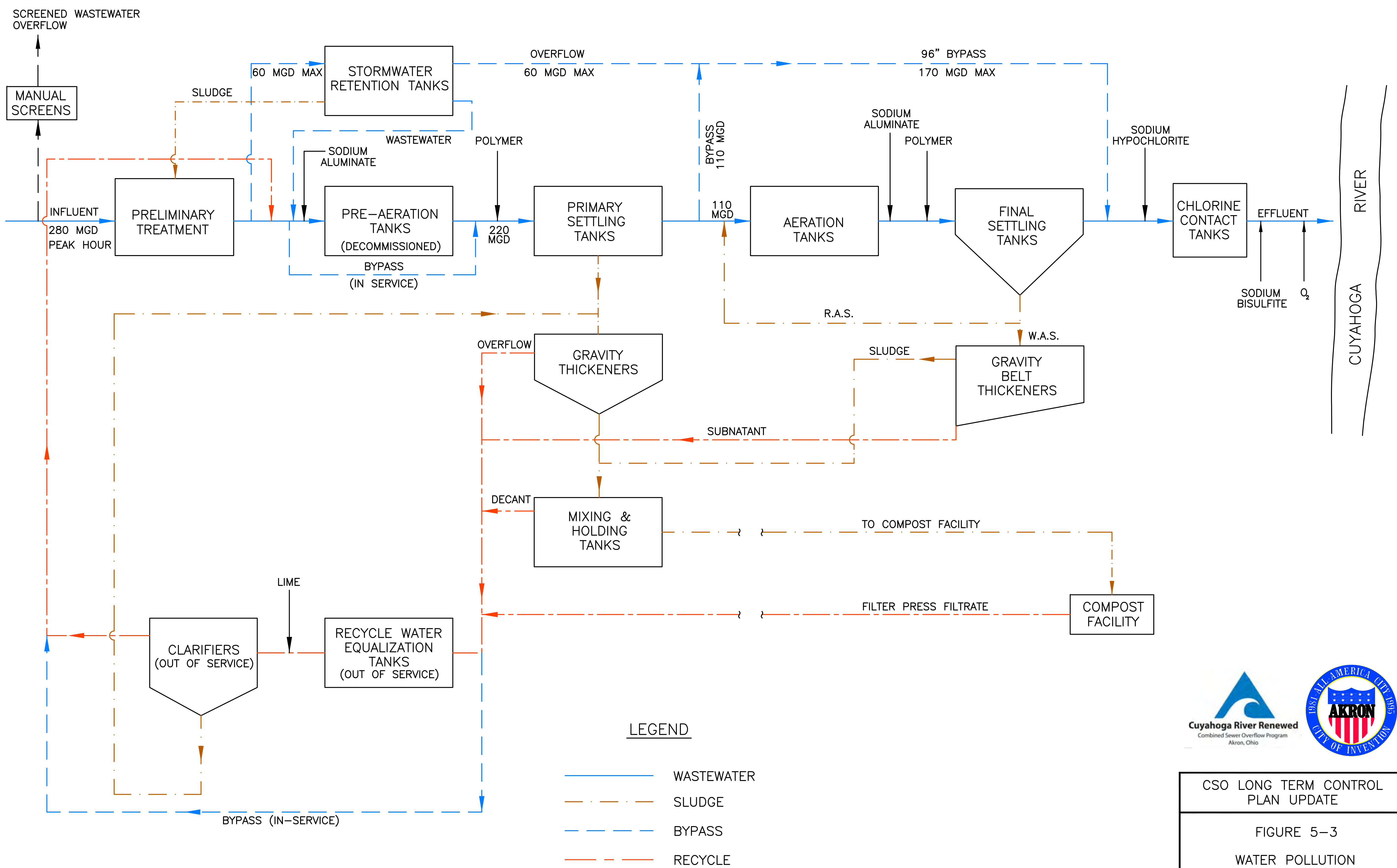
Sludge from the primary settling tanks is removed by sludge pumps located in the pipe gallery adjacent to each set of primary tanks. The primary sludge force mains are equipped with Doppler-style flow meters and a primary sludge sampler. Primary sludge is pumped to the gravity thickeners.



CSO LONG TERM CONTROL PLAN UPDATE

FIGURE 5-2

WATER POLLUTION CONTROL STATION SITE PLAN



NOTE: FLOW RATES SHOWN ARE MAXIMUM PROCESS AND/OR HYDRAULIC CAPACITIES

Cuyahoga River Renewed
Combined Sewer Overflow Program
Akron, Ohio

CSO LONG TERM CONTROL PLAN UPDATE

FIGURE 5–3

WATER POLLUTION CONTROL STATION FLOW SCHEMATIC

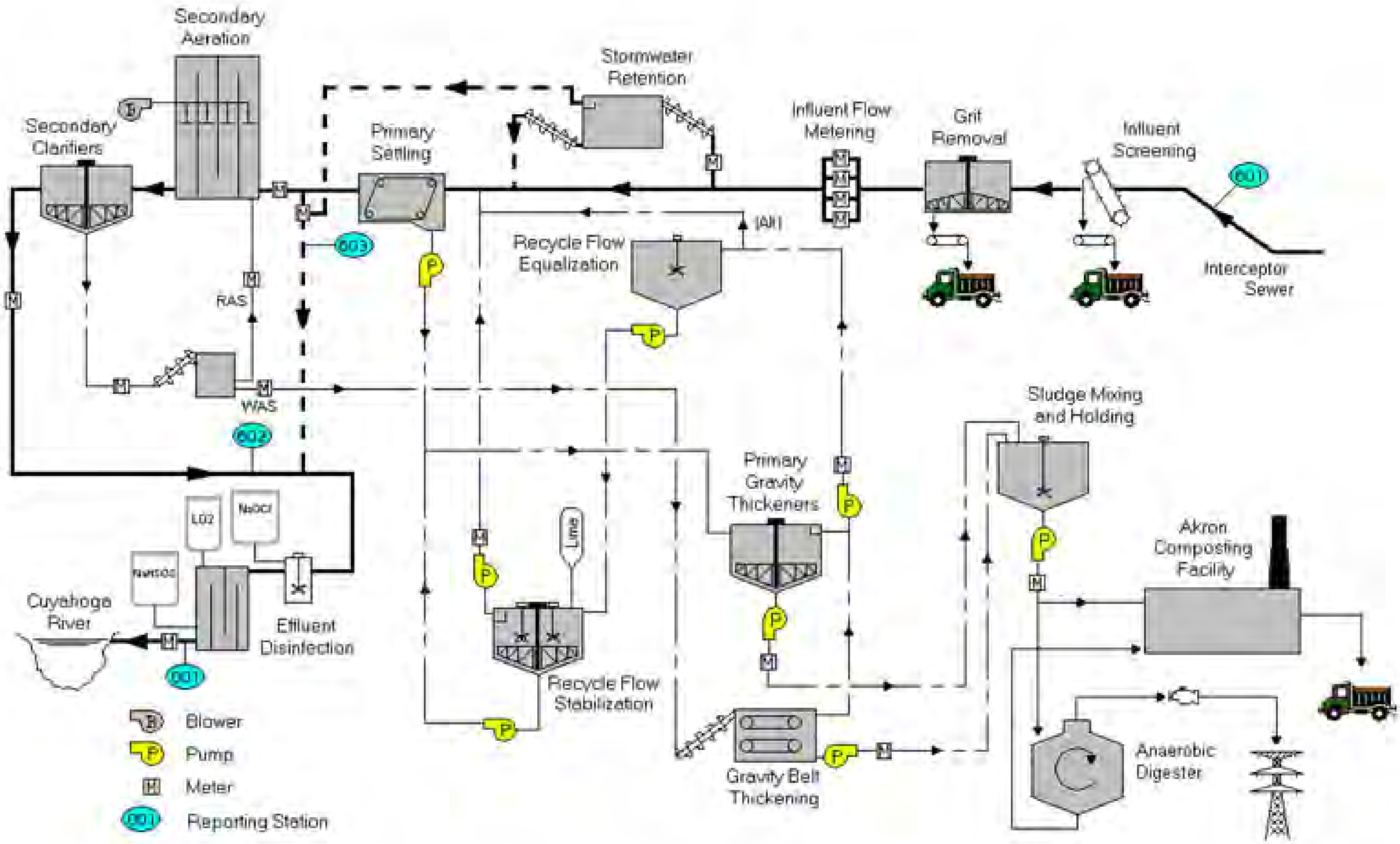


Figure 5-4 Water Pollution Control Station Flow Diagram

Table 5-1 Akron WPCS Existing Design Data Summary

Unit Processes		Loading Rates[1] 2009 Avg	Loading Rates[1] 2009 Peak	Loading Rates[1] Design Avg	Loading Rates[1] Design Peak	Units	Ten State Standards
Treatment Efficiency							
Flow		69	151	90	210	MGD	
Preliminary Treatment							
Fine Screens		69	151	90	210	MGD	
Number of Units	4						
Screen Width	8 ft.						
Screen Clearance	6 mm						
Capacity (each)	70 MGD	23	51	30	70	MGD	
Detritus Tanks		69	151	90	210	MGD	
Number of Units	4						
Length	40 ft.						
Width	40 ft.						
Depth	2.5 ft.						
Surface Overflow Rate		14,375	31,460	18,750	43,750	gpd/sf	
Grit Removal		4	9	5	11	cy/day	
No. of Mechanical Grit Collectors	4						
No. of Screw Conveyors	4						
No. of Belt Conveyors	1						
Storm Retention Basin							
Number of Units	1						
Depth (SWD)[3]	26 ft.						
Capacity (total)	9.5 MGD						
Influent pumps at 30 MGD	3						
Preaeration Tanks (decommissioned)							
Volume (total)	1.83 MG						
Primary Treatment							
Primary Settling Tanks		69	151	90	150	MGD	
Number of Units	6						
Length	110 ft.						
Width	33 ft.						
Depth (SWD)	10 ft.						10 ft.
Volume (each) gallons	271,520						

Table 5-1 Akron WPCS Existing Design Data Summary (Continued)

Unit Processes		Loading Rates[1] 2009 Avg	2009 Peak	Design Avg	Design Peak	Units	Ten State Standards
Primary Treatment (cont'd)							
Detention Time (each)		2.2	1.0	1.7	0.7	hour	Peak
Surface Overflow Rate (Area = 3,630 sf each)		813	1,777	1,058	2,471	gpd/sf	1,500-2,000
Weir Length (each)	240 ft.						
Weir Overflow Rate (each)		12,277	26,868	16,014	37,366	gpd/lf	30,000
Number of Units	18						
Length	120 ft.						
Width	33 ft.						
Depth (SWD)	9 ft.						
Volume (each) gallons	266,590						
Detention Time (each)		2.0	0.9	1.5	0.7	hour	Peak
Surface Overflow Rate (Area = 3,960 sf each)		807	1,334	970	2,265	gpd/sf	1,500-2,000
Weir Length (each)	260 lf						
Weir Overflow Rate (each)		12,227	26,868	16,014	37,366	gpd/lf	30,000
Secondary Treatment							
Aeration Basins		69	114	90	150	MGD	
Number of Units	6						
Length	1,200 ft.						
Width	32 ft.						
Depth (SWD)	15 ft.						
Number of Passes in Each Basin	4						
Volume	25.9 MG						
Detention time		9.0	4.1	6.9	3.0	hour	
Organic Loading		14.8	16.5	17.3	34.7	lb. BOD_5/ 1000 cf/day	40
No. of Centrifugal Blowers @ 17,900 cfm	4						
Positive Displacement Blowers @ 11,000 cfm	2						
Available Air Supply (firm) cfm	75,700	32,000	46,000	45,000	83,400	scfm	

Table 5-1 Akron WPCS Existing Design Data Summary (Continued)

Unit Processes		Loading Rates[1]				Units	Ten State Standards	
		2009		Design				
		Avg	Peak	Avg	Peak			
Secondary Treatment (con't)								
Return Activated Sludge								
No. of Streams	6						Min	Max
Flow Rate of Each Stream (typ)	15%	2.0	3.1	2.3	3.8	MGD	50%	150%
Final Settling Tanks		69	114	90	144	MGD		
No. of Units	10							
Inside Diameter	100 ft.							
Depth (SWD)	10.6 ft.						12 ft.	
No. of Units	8							
Inside Diameter	100 ft.							
Depth (SWD)	12 ft.						12 ft.	
Surface Area (each) (sf)	7,854							
Total Surface Area (sf)	141,400							
Total Volume (cf)	1,586,508							
Detention Time		4.1	1.9	3.2	1.4	hour	Peak	
Surface Overflow Rate		488	1,068	636	1,485	gpd/sf	1,500	
Weir Length	4,900 ft.							
Weir Overflow Rate		14,082	30,816	18,367	42,857	gpd/lf	30,000	
Chlorine Contact Tanks		69	151	90	210	MGD		
Number of Units	2							
Length	106 ft.							
Width	113 ft.							
Depth (SWD)	11.5 ft.							
Volume	2.06 MG							
Detention Time		43	20	33	14	mins	15 min @ Design Peak	
Dechlorination (in effluent channel)								
Effective Aeration with LOX								
Solids Handling								
Gravity Thickener Tanks								
No. of Units								
Diameter	2							
Sidewall Depth	70 ft.							
Solids Loading	9-16 ft.	5.6			11.0	lb./sf/day		
Surface Overflow Rate		39			46	gpd/sf		
Dry Tons		648			1,270	tons/mo.		
Gravity Belt Thickeners								
No. of Units	2							
Capacity (firm)	300 gpm							
Waste Activated Sludge Flow				170	220	gpm/unit		

Table 5-1 Akron WPCS Existing Design Data Summary (Continued)

Unit Processes		Loading Rates[1]				Units	Ten State Standards
		2009		Design			
		Avg	Peak	Avg	Peak		
Solids Handling (con't)							
Mixing and Holding Tanks							
Number of Units	6						
Diameter	95 ft.						
Sidewall Depth	18-26 ft.						
Dry Solids		32				tons/day	

[1] One unit out of service for preliminary treatment processes and two primary settling tanks out of service for primary treatment.

[2] Peak day flow is the average of the top 12 peak day flows for 2009.

Source: Adapted and updated from Table 3-3 in the *No Feasible Alternative*, dated December 29, 2006.

Effluent from the primary settling tanks is discharged into effluent channels tributary to the northwest corner of the primary tank complex for discharge to the aeration basins. A bypass chamber at this location allows treated primary effluent flows in excess of the secondary treatment system capacity (approximately 110 MGD) to be routed around the secondary treatment facility to the chlorine contact tank. Overflows from the storm retention tank flow through a bypass channel parallel to the primary settling tank effluent channel and into this secondary bypass channel. The channel is comprised of 96-inch diameter concrete pipe and three manholes. Primary settling tank effluent is routed to six aeration basins with a total volume of 25.9 MG. The basins are each divided into four passes with settled sewage and return activated sludge (RAS) fed at the head of the first pass. The basins are outfitted with ceramic disc, fine bubble diffusers. Compressed air is supplied to the diffuser system from four centrifugal compressors and three positive displacement blowers located in the North Blower Building. Typically, it is only necessary to operate two of the centrifugal compressors to satisfy secondary treatment air requirements.

Mixed liquor from the aeration basins is discharged to eighteen 100-foot diameter final settling tanks with a total surface area of 141,400 square feet (sf). Each aeration basin is served by three final settling tanks. The 18 settling tanks have center feed suction type collector mechanisms. All 18 tanks are equipped for scum containment and withdrawal. Two submersible pumping stations transfer collected scum to the Bypass Junction Chamber. RAS is returned to the aeration basins via three screw pumping stations. Each pumping station serves six final settling tanks. The RAS flow to each aeration basin is metered and can be controlled by a motor actuated plug valve. Waste activated sludge (WAS) is withdrawn from the discharge well of each RAS screw pumping station and transferred through a common header to the Gravity Belt Thickeners (GBT) facility. The WAS is metered and may be similarly controlled.

The effluent channels serving the final settling tank associated with Aeration Basin Nos. 1 through 5 are equipped with 6-foot rectangular weirs and ultrasonic level indicators for flow metering. The meter transmitters and final effluent samplers are located in three Final Settling Tank Effluent Monitoring Buildings. Final effluent from the final settling tanks serving Aeration Basin No. 6 is monitored by a doppler style flow meter attached to the buried effluent pipe.

The settling tank effluent is tributary to a 96-inch diameter effluent sewer. This sewer discharges to the chlorine contact tank. Just upstream of the chlorine contact tank, the 96-inch diameter secondary bypass sewer connects with the effluent sewer. At the entrance to the chlorine contact tank is a mixing chamber where sodium hypochlorite is introduced for disinfection. The sodium hypochlorite is stored in two 3,000-gallon liquid storage tanks in the Chlorination and Plant Water Facility. Chemical metering pumps are used to transfer the sodium hypochlorite.

Sodium bisulfite is introduced for dechlorination in the final channel of the chlorine contact tank immediately upstream of the effluent weir. Sodium bisulfite is stored in two 6,000-gallon tanks in the Dechlorination Building. Chemical metering pumps are used to transfer the liquid. The Dechlorination Building also houses a standby generator.

Primary sludge from the primary settling tanks is pumped to either of two 70-foot diameter gravity thickeners to be thickened. The WAS from the secondary treatment system is pumped to the GBT facility for thickening. The thickened primary and waste activated sludges are pumped from their respective thickening facilities to the Mixing and Holding Tanks where they are blended and then pumped across the Cuyahoga River to the City of Akron’s Composting Facility (ACF). ACF is located opposite the Akron WPCS on the west bank of the Cuyahoga River.

Recycle flows can be pumped from each respective sludge handling facility to the recycle water equalization tank (RWET) or directed to the Primary Settling Tanks influent channel. The RWET facility equalizes recycle flows to the Lime Stabilization Plant (LSP). These flows include compost belt filter press filtrate, gravity thickener overflow, GBT filtrate and mixing and holding tank decant. The LSP adjusts the pH of the recycle flows and reduces phosphate concentrations through application of lime in two solids contact clarifiers. The clarifier overflow is pumped to the primary auxiliary influent flume upstream of the Primary settling Tanks. Lime sludge is pumped into the primary sludge force main upstream of the gravity thickeners.

During wet weather events, flow through the plant is maximized before a secondary bypass occurs. Once the secondary treatment capacity of 110 MGD is met, additional flow beyond 110 MGD is treated by preliminary treatment and then directed to the 10 MG Stormwater Retention Tank (SRT) at a rate up to 60 MGD for retention. Once the influent flow exceeds 170 MGD, flow is bypassed at the secondary bypass conduit at Station 603 up to a flow rate of 110 MGD (during the 280 MGD total peak hour influent flow rate). The bypassed flow is blended with the effluent from the secondary clarifiers before disinfection and monitoring at Outfall 001. When the storage capacity of the SRT is exceeded, up to 60 MGD is overflowed from the SRT and blended with flow bypassed at Station 603. The SRT is shown in Figure 5-4 after grit removal and influent flow monitoring. Based on water quality sampling data conducted at the WPCS, the water quality of the SRT overflow is similar to the water quality of effluent from the primary treatment system. When the influent flow rate decreases after a wet weather event, the volume retained in the SRT tank is directed to the primary treatment facilities for primary and secondary treatment.

Raw wastewater influent characteristics tested at the Akron WPCS include 5-day biological oxygen demand (BOD_5), suspended solids, dissolved solids, oil and grease, ammonia nitrogen, phosphates, and bacteria. Table 5-2 summarizes the WPCS raw water characteristics from 1992-2009, and Table 5-3 summarizes WPCS performance through the raw, primary, and secondary treatment trains during 2001-2009.

Table 5-2 Akron WPCS Average Annual Raw Water Characteristics (1992-2009)

Item	Unit	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Flow (Average Day)	MGD	70.9	76.9	76.5	71.4	89.1	80.6	76.77	69.92	71.60	64.29	67.81	78.28	85.95	78.62	75.40	79.00	78.60	69.10
BOD_5[1]	mg/l	100	101	108	110	95	116	118.0	95.0	96.0	91.1	87.8	87.0	87.0	90.1	86.0	95.0	92.0	101
COD[2]	mg/l	275	282	281	309	275	292	302	272	292	292	305	286	250	292	280	306	328	332
Suspended Solids	mg/l	136	142	133	143	133	147	149	151	182	161	184	185	157	202	193	220	197	172
Total Phosphorus as P	mg/l	2.80	2.52	2.66	2.69	2.33	2.61	2.85	2.90	3.00	3.05	3.10	2.63	2.42	2.77	3.03	2.96	2.79	2.76
Ammonia (NH_3-N)	mg/l	9.0	8.9	9.7	11.1	9.2	9.7	11.22	10.96	11.11	11.83	11.59	10.07	10.15	11.10	10.38	9.04	11.16	10.94
pH (maximum)	-	8.5	7.5	9.1	9.8	8.2	9.5	8.4	8.9	9.9	8.6	7.4	10.4	11.9	8.4	8.7	11.5	9.2	8.5
pH (minimum)	-	5.4	6.5	5.7	5.7	5.4	5.6	5.2	5.0	5.6	5.6	6.7	6.2	6.3	5.4	6.0	5.2	5.6	5.9
Temperature	°C	15.5	15.4	15.9	16.4	15.6	15.6	16.9	16.6	16.5	16.5	17.2	16.1	15.5	16.3	17.3	16.3	15.3	15.1
Copper	µg/l	51	44	46	44	36	44	45.0	42.0	39.0	40.0	47.0	41.0	38.0	46.4	47.9	51.3	42.2	45.7
Zinc	µg/l	271	235	233	226	226	256	276	258	224	209	199	191	178	216	196	204	206	197
Cadmium	µg/l	1	1	0	0	0.2	0	0.40	0.50	0.50	0.45	0.60	0.50	0.48	0.66	0.55	0.60	0.44	0.40
Lead	µg/l	17	12	10	13	11	10	15.00	11.00	12.00	10.00	9.70	3.80	9.88	12.30	4.90	7.66	5.52	8.48
Chromium (total)	µg/l	11	12	8	6	6	6	6.00	5.00	5.00	5.00	5.00	5.80	4.93	5.20	5.30	4.64	5.40	4.95
Mercury	µg/l	0.12	0.12	0.14	0.07	0.12	0.09	0.13	0.16	0.16	0.20	0.20	0.20	0.20	0.22	0.20	0.20	0.20	0.23
Total Rainfall	inches	45.1	41.2	40.5	35.7	50.6	36.6	40.27	35.84	45.61	32.87	40.67	51.11	46.69	41.04	43.93	40.89	41.69	36.58

1. BOD_5 - Biochemical Oxygen Demand, 5 day
2. COD - Chemical Oxygen Demand

Source: City of Akron, Ohio Water Pollution Control Division 1992-2009 Annual Reports.

Table 5-3 2009 Performance of Akron Water Pollution Control Station (average)

Month	Raw Influent Flow (MGD)	Raw Sewage (mg/l)				Primary Flow Treated (MGD)	Primary Effluent (MGD)		Secondary Flow Treated (MGD)	Secondary Effluent (mg/l)			
		$CBOD_5$	TSS	NH_3-N	P		$CBOD_5$	TSS		$CBOD_5$	TSS	NH_3-N	P
January	63.3	103	164	12.7	2.85	64.2	63.0	50	64.0	4.1	8.7	0.46	0.70
February	92.2	89	151	9.5	2.22	89.9	59.3	50	83.9	6.0	12.6	<0.59	0.62
March	83.2	86	153	9.2	2.30	82.7	51.0	54	79.2	5.3	14.5	0.66	0.64
April	70.8	98	166	8.5	2.65	71.3	55.2	49	70.3	3.6	6.2	<0.23	0.65
May	66.1	105	193	10.9	2.84	66.9	64.7	52	66.2	3.0	5.7	0.27	0.61
June	69.9	96	186	10.3	2.94	70.0	61.4	51	69.6	2.1	5.3	0.17	0.45
July	64.9	110	202	11.1	3.19	64.4	57.3	55	64.5	3.1	6.6	0.16	0.74
August	67.7	96	172	11.9	2.74	68.1	55.3	47	67.4	0.8	4.1	0.09	0.66
September	57.1	107	185	10.4	2.98	57.9	64.2	61	57.5	1.9	7.5	0.16	0.82
October	62.4	107	171	11.6	3.02	62.9	61.8	55	61.7	2.8	7.1	0.12	0.77
November	60.4	108	163	11.9	2.85	61.6	60.4	67	61.0	1.9	4.3	0.12	0.68
December	71.9	105	155	12.9	2.59	72.5	56.2	48	71.2	2.7	5.4	0.06	0.64
Maximum Month	92.2	108	202	12.9	3.19	88.9	64.7	55	83.9	6.0	14.5	0.46	0.82
Minimum Month	57.1	86	151	8.5	2.22	61.6	51.0	47	57.5	0.8	4.1	0.06	0.45
2009 Average	69.2	101	172	10.9	2.76	69.3	58.7	53	68.0	3.1	8.0	0.26	0.67
2008 Average	78.6	92	197	11.2	2.79	---	53.5	56	75.8	2.9	9.0	0.32	0.59
2007 Average	79.0	95	220	9.0	2.96	---	43.2	49	76.7	<2.6	6.2	0.15	0.77
2006 Average	75.4	86	193	10.4	3.03	---	44.5	51	66.6	<2.1	6.1	0.22	0.74
2005 Average	78.6	90.1	202	11.1	2.77	75.7	51.0	58	75.7	<2.6	7.0	<0.16	0.68
2004 Average	86.0	87.0	157	10.2	2.42	72.8	43.1	45	72.8	<2.8	8.0	<0.19	0.64
2003 Average	78.3	87.0	185	10.1	2.63	69.6	50.3	49	69.6	<3.0	8.0	<0.30	0.74
2002 Average	67.8	88.0	184	11.6	3.10	64.5	54.2	60	64.5	<2.2	9.0	0.18	0.81
2001 Average	64.3	91.0	161	11.8	3.05	65.9	55.2	54	65.9	<2.4	7.0	0.24	0.79

Sources:

1. *2003, 2005 and 2009 Annual Reports of the Akron Water Pollution Control Station*, Department of Public Service, City of Akron, Ohio.
2. City of Akron, Akron Water Pollution Control Station, No Feasible Alternative (NFA), December 29, 2006.

5.2 Determination of Actual Capacities of Treatment Units

To determine the actual capacities of each treatment unit, the City of Akron has conducted a series of stress tests which are documented in a series of reports listed in Section 1 of this report and are summarized in the NFA (2006) report provided in the appendix.

As previously stated, the preliminary treatment and primary treatment capacities exceed the capacity of the secondary treatment. Based on past operational experience and past studies including the Primary Settling Tank Flow Study (1996), the primary settling tanks provide optimal treatment up to approximately 150 MGD, whereas the rated treatment capacity of the secondary treatment system is 110 MGD. The limiting process through the plant is the secondary treatment system.

The NFA evaluated the results of the stress tests and found the Akron WPCS secondary treatment system currently meets its permit requirements at flows up to 110 MGD. The 2006 Stress Test found that the secondary treatment system may be able to treat up to 120 MGD for conditions comparable to the test conditions. However, additional stress testing is required to confirm that the effluent permit parameters can be met with the additional 10 MGD during actual wet weather conditions and during all seasonal variations in air and water temperature. Therefore, the NFA evaluated alternatives to increase the current, baseline treatment capacity of 110 MGD. Operation beyond a simulated 120 MGD results in DO sags and diminished nitrification, even with actively managed air supply and distribution. Additional stress testing should be considered to further study process and equipment limitations that may be modified or improved to support flows above 120 MGD.

As a result of the 2006 Stress Tests, the maximum capacity limit of the secondary treatment system was further evaluated during the 2007/2008 Stress Tests and is documented in 2007/2008 Stress Test and Process Model Report (2008). These tests found that the WPCS can continue to meet the 1994 NPDES permit limitations while operating existing secondary treatment process at a peak wet weather flow of 130 MGD during a 24-hour event. However, the following plant improvements on the next page are required to support this 130 MGD operational flow rate.

- Raise aeration basin wall elevation to provide freeboard
- Remove final settling tank domes and replace effluent weirs/launders to provide improved flow distribution and access to clean launders
- Reconstruct the aeration influent flume to provide metering and improved hydraulics and flow splitting
- Provide additional diffused air to basin passes 1 and 2 during wet weather events

At secondary flows above 130 MGD and total mixed liquor flows of approximately 150 MGD (~ 20 MGD RAS flow), the final settling tanks begin to fail as evidenced by loss of sludge blankets over the weirs. Also, the flow channels and conduits associated with the secondary facility appear to have a hydraulic limitation of approximately 150 MGD, which is consistent with the Facilities Plan '98 (1999) hydraulic analysis; the aeration basins have "zero‟ freeboard at this flow rate.

5.3 No Feasible Alternative (NFA)

The City has an existing National Pollutant Discharge Elimination System (NPDES) permit for the Water Pollution Control Station (WPCS) that allows intentional diversions of waste streams around the secondary treatment units during wet-weather flows. Title 40 of the Code of Federal Regulations (CFR) section 122.41(m) and Part III of the NPDES permit prohibits a bypass, and EPA may take enforcement action against a permittee for a bypass, unless:

A) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage.

B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime.

C) The permittee submitted required notices.

An anticipated bypass may be approved by the Director, if the Director determines that the bypass will meet the criteria listed in subsection (m)(4)(i).

The City of Akron has complied with this requirement through development of a No Feasible Alternative (NFA) report in accordance with Section II.C.7 of the USEPA's CSO Control Policy, 40 CFR Section 122.41(m) and the requirements of the Consent Decree. The NFA was an amendment to the City of Akron's LTCP '98 (2000, revised 2002). It was developed to incorporate the City of Akron's prior NFAs into one report and to review and update the NFA with additional evaluation of the capacity of the WPCS and the various alternatives to the secondary bypass.

Based on the benefit analysis for the WPCS alternatives, the proposed alternative to maximize treatment at the Akron WPCS is to modify the existing secondary treatment system in two phases to operate in Step Feed mode during wet weather periods at a peak day flow of 130 MGD after the first phase construction and, if successful, operate at a targeted peak day flow of 170 MGD following a second phase of improvements. Achieving zero-bypass of secondary treatment is not technically or financially feasible.

Depending on the actual performance of the Step Feed improvements, other facility improvements may be necessary. Upon completion and verification of the increased secondary treatment capacity, an additional technical and financial evaluation of applicable technologies to treat the reduced bypass flows will be completed. The evaluation will consider feasible technologies including additional Step Feed, storage and enhanced high rate clarification (EHRC) systems. For more details of the evaluation and recommendations from the NFA, refer to Section 6, Evaluation of Alternatives.

6. EVALUATION OF ALTERNATIVES

The following section summarizes the evaluation process performed by the City to arrive at the agreed upon controls that are identified in the Consent Decree. A range of CSO improvement alternatives for both the collection system and the Akron Water Pollution Control Station (WPCS) were screened and evaluated for the development of an updated recommended plan. Alternatives evaluated included storage, treatment, collection system controls, source controls, non-traditional, and WPCS alternatives. The objective of each alternative was to reduce or eliminate combined sewer overflows and to improve water quality of the Ohio Canal, Little Cuyahoga and Cuyahoga Rivers, and Camp Brook by reducing bacteria levels, solids, volume, $CBOD_5$, and floatables in discharges from the combined sewer system. The matrix of collection system and WPCS improvement alternatives screened is contained in Table 6-1. Advantages and disadvantages of each alternative were considered as part of the screening process. During the evaluation process, the effectiveness of the alternatives was evaluated through water quality modeling and by assessing CSO impacts.

6.1 Storage and Treatment Basins

Off-line or satellite storage and treatment facilities can be used to capture wet-weather flows and attenuate peak flows during storm events. CSO is stored until the WPCS can treat the excess flows. Satellite storage and treatment facilities have been widely used and their effectiveness at pollutant removal has been well documented. Satellite storage and treatment facilities were considered for Akron's system as a way of maximizing use of the existing dry weather treatment facilities. Off-line storage requires detention facilities (such as basins or tunnels) and may require facilities for pumping CSOs to the storage facility or pumping the CSO back to the sewer system.

6.1.1 Storage Basins

Storage basins were evaluated in detail as part of Akron's LTCP. A basin can be an effective method of storing overflows from one or more racks. Storage basins are reservoirs constructed for the capture and storage of CSOs. Storage basins provide storage up to the capacity of a selected design storm. During a storm event, CSO currently directed to a receiving stream from a rack would flow to a basin where solids settling can occur. Overflow would be stored in the basin during a rain event, with the

Table 6-1 Alternatives for Sewer System Improvements

Alternative	Objective	Effectiveness
Storage Alternatives		
- In-line Storage	- Retain wet weather flow in system	- Effective in large flat sewers
- Deep Tunnels	- Store CSO off-line	- Effective for large volume
- Near Surface Concrete Tanks	- Store CSO off-line and treat pass- through	- Effective for smaller volumes and treatment of overflow
- Box Sewers	- Store CSO off-line without pumping back	- Effective
Treatment Alternatives		
- High Rate Physical/Chemical	- Treat wet weather peaks to reduce TSS	- Effective to enhance primary capacity at Akron WPCS
- Swirl Concentrator	- End of pipe treatment for solids	- Effective within design flow range
- Outfall Screens/Netting	- End of pipe treatment for floatables	- Effective
- High Rate Primary Treatment	- Increase flow through Akron WPCS Primaries	-Good up to limits of Primary tanks
- Disinfection	- Pathogen reduction at CSO	- Effective as a separate facility
Collection System Controls		
- Pump Station Modifications	- Increase wet weather pumping	- Limited by interceptor and Akron WPCS capacity
- Regulator Modifications	- Increase flow retained in system	- Limited by upstream flooding
- Sewer Separation	- Exclude storm water from sewer	- Effective but negative storm water impact
- Express Sewers from Separately Sewered Areas	- Give treatment priority to separate sanitary flow	- Effective
- Flow diversion to adjacent area	- Utilize treatment and system storage capacity where it exists	- Effective when available
Source Controls		
- Public Education	- Reduce litter and waste dumping	- Unpredictable
- Pretreatment Program	- Control site runoff	- Limited
- I/I Abatement Program	- Control extraneous flow	- Effective
- Community Discharge Permits	- Control excess flow	- Limited
- Water Conservation Program	- Control flow	- Limited

Adapted from: Facilities Plan '98 Alternatives (1999) basin dewatering to the existing collection system within 24 to 48 hours from the end of the event. Pumping may be required to return stored flows to the sewer system when capacity is available. CSO volumes that exceed the basin volume would overflow into the receiving stream. A section view of a typical storage basin is shown on Figure 6-1.

6.1.2 Treatment Basins

Treatment basins are similar to storage basins in that they are both designed for storage, screening, and settling up to the capacity of a selected design storm. The basins also dewater into the interceptors within a relatively short time frame. However, treatment basins require less capacity than storage basins because they are designed as a flow-through system to provide a minimum residence time and settling capacity at design flow rate. Treatment basins may also include disinfection systems to treat flows upon entering the basin.

A control building would be designed to house all equipment associated with treatment at the basin. Space would be provided for chemical storage, mechanically cleaned bar screens, dewatering, odor control facilities (fans and carbon adsorption beds) if there is a concern for odors, and the electrical and instrumentation control panels. Plan and section views of a proposed treatment basin are shown on Figure 6-2.

6.1.3 Selection of Basin Type – Initial Evaluation

This section describes the cost-effective evaluation that was performed to determine the recommended type of basin (storage or treatment). A knee-of-the-curve performance evaluation was performed to determine the most effective control level based on design parameters for a storage basin and a treatment basin. Then, costs for the two basins were compared to determine the most cost-effective alternative. A further evaluation of the selection of basins is set forth in Section 6.8.2.

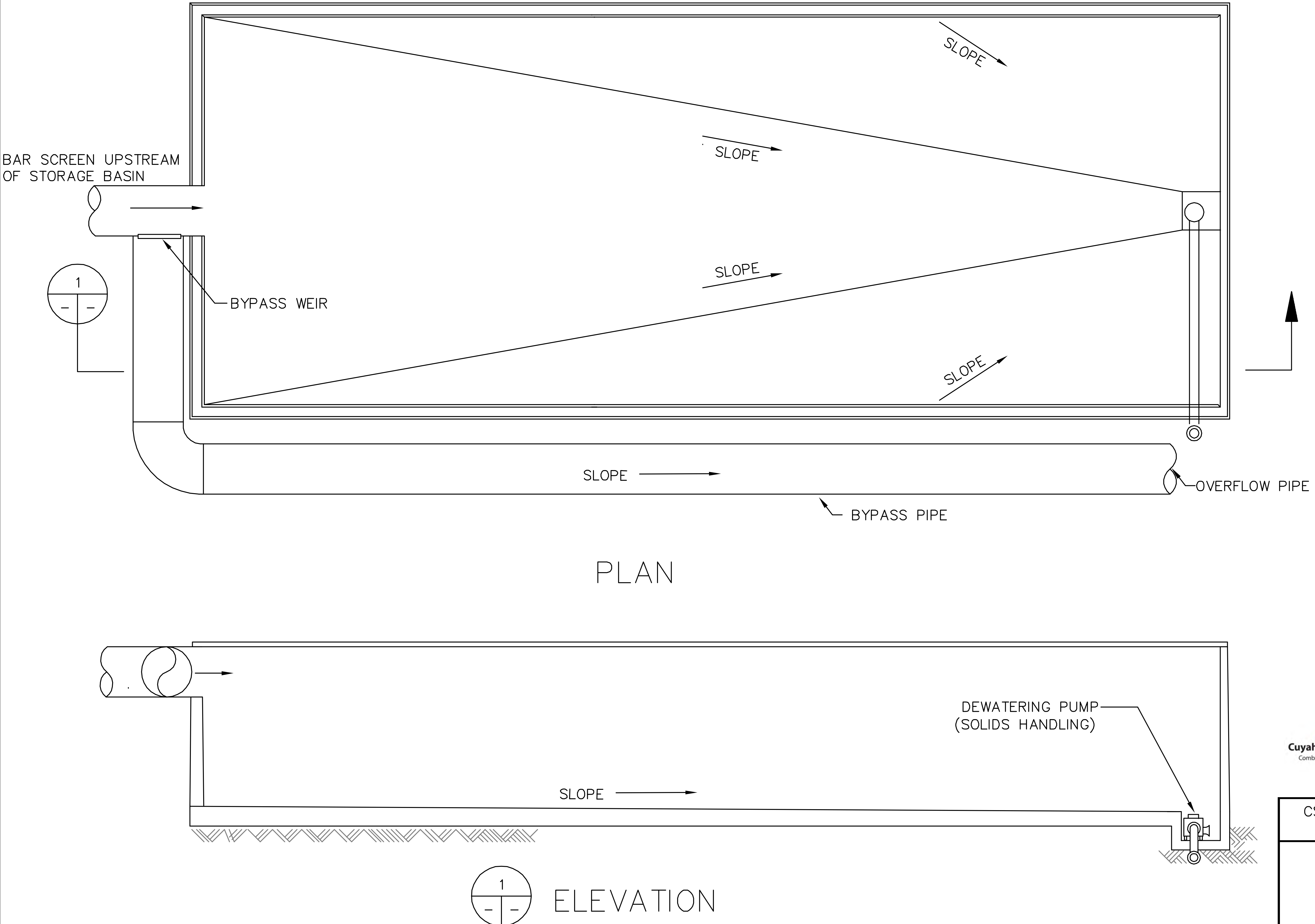


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FIGURE 6–1

TYPICAL STORAGE
BASIN

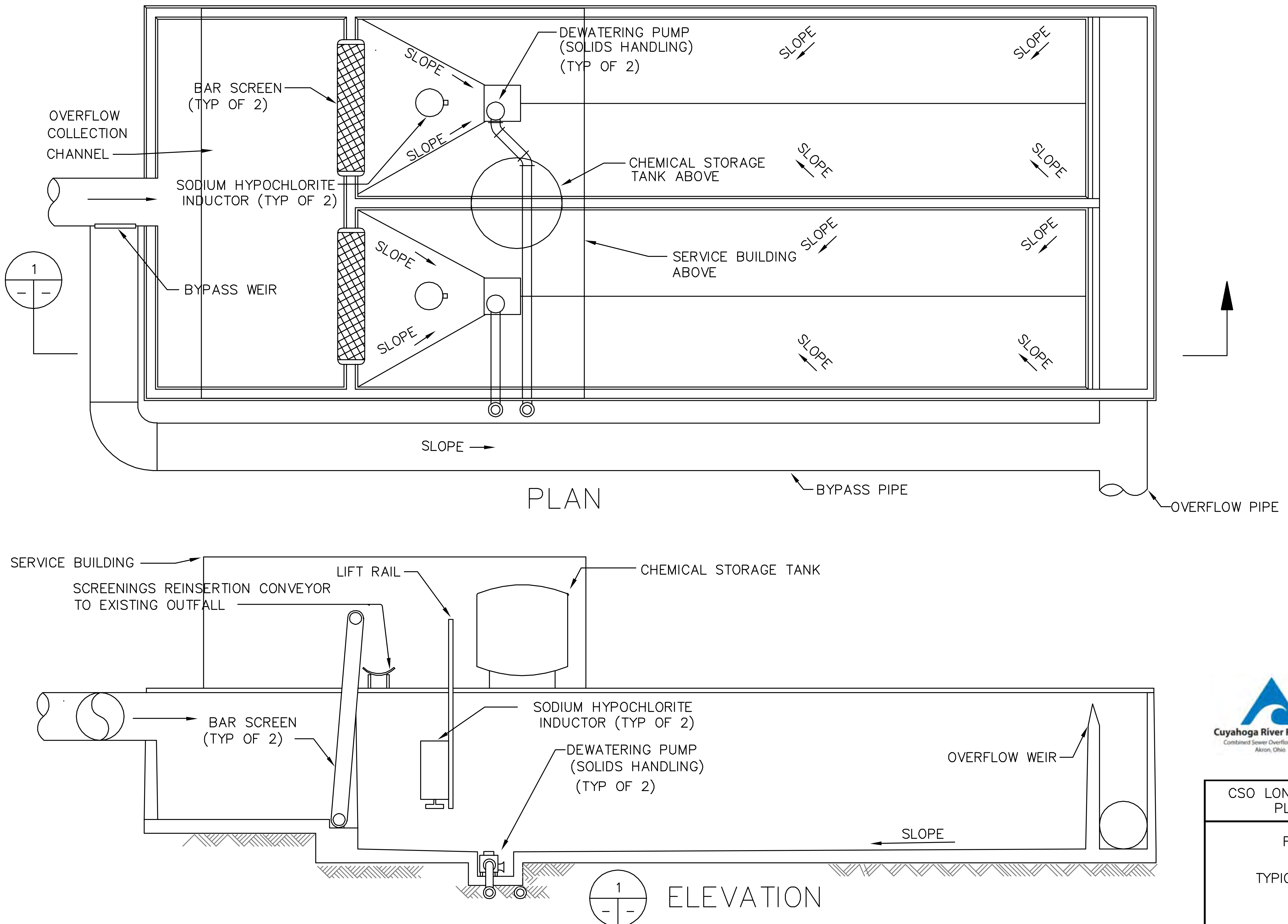

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FIGURE 6–2

TYPICAL TREATMENT BASIN

Performance Evaluation

Design parameters used in evaluating basin storage vs. treatment were as follows:

- CBOD load (pounds)
- Number of overflow events
- Number of overflow hours

At each rack, for each design storm level from 0 to 12 overflows per year, the overflow volume was used to size a storage basin and the overflow rate was used to size a treatment basin. The 1994 typical year rainfall was simulated for a range of collection system configurations, each one incorporating a specific design storm control level at all relevant racks using either a storage or treatment basin. From the average annual simulations, the CBOD load, number of overflow events, and number of hours of overflow, all dependent upon basin type and control level, were calculated. Performance curves were then developed for the annual CBOD load and the number of overflow events.

A knee-of-the-curve analysis was performed for the three design parameters. This analysis resulted in selection of a basin at each rack that maximizes the benefit in terms of increasing level of control, *i.e.,* finds the most benefit-effective basin. An example of the benefit-effective level of control curves is shown on Figures 6-3 and 6-4 for Rack 12. See Appendix 6-A for the level of control curves for all racks.

For Rack 12, the treatment basin curve falls above the storage basin curve because for each treatment basin control level, more CBOD reaches the receiving stream than with a storage basin at the same control level. For the CBOD parameter, this difference occurs because for the same control level, treatment basins are less effective than storage basins in removing CBOD. In contrast, in terms of number of untreated overflow events and number of untreated overflow hours, the most effective basin type (treatment vs. storage) for a given control level varies.

At each rack, the minimum performance standard was identified for each design parameter; CBOD, number of events, and number of hours. The knee-of- the-curve for the performance curves for each technology was estimated. Beyond this knee-of-the-

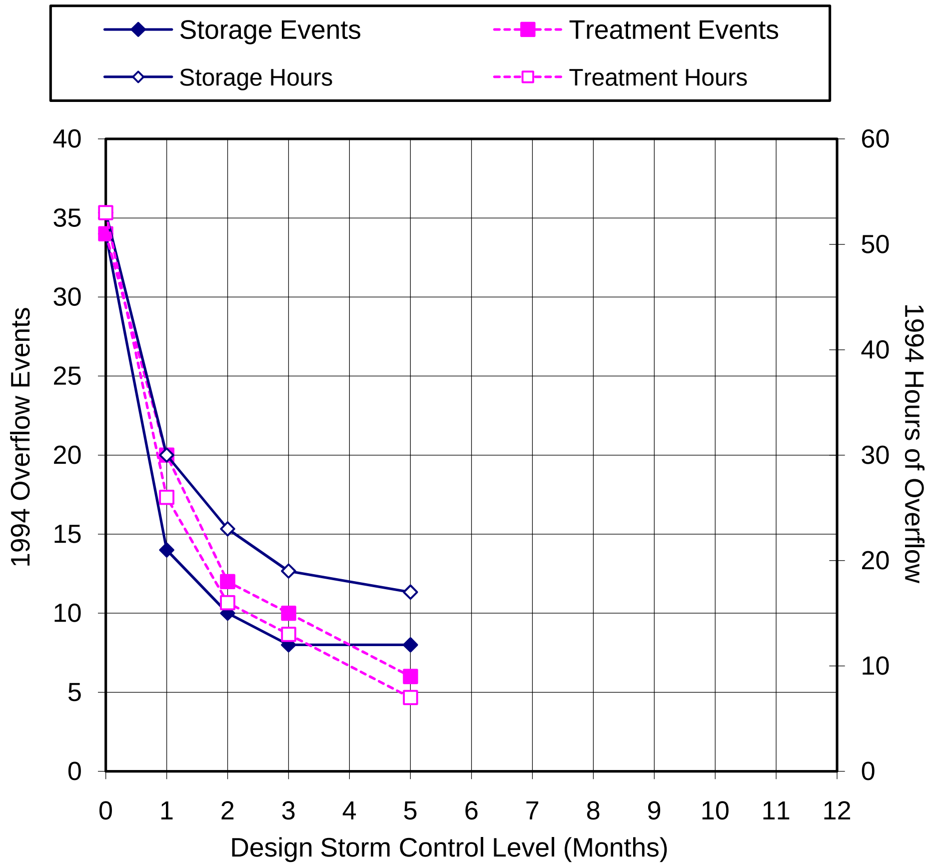

Figure 6-3 Rack 12 Level of Control Curves: Event and Number of Hours

curve, the increment of benefit relative to increment of additional control decreases. Given the two available technologies (storage and treatment), the knee with the greatest reduction impact on the design parameter was defined as the minimum performance standard.

A decision making criterion was that the selected control level would meet all three minimum performance standards, so the highest-peak storm of the three design parameters for both the storage and treatment basin scenarios was selected as the design storm.

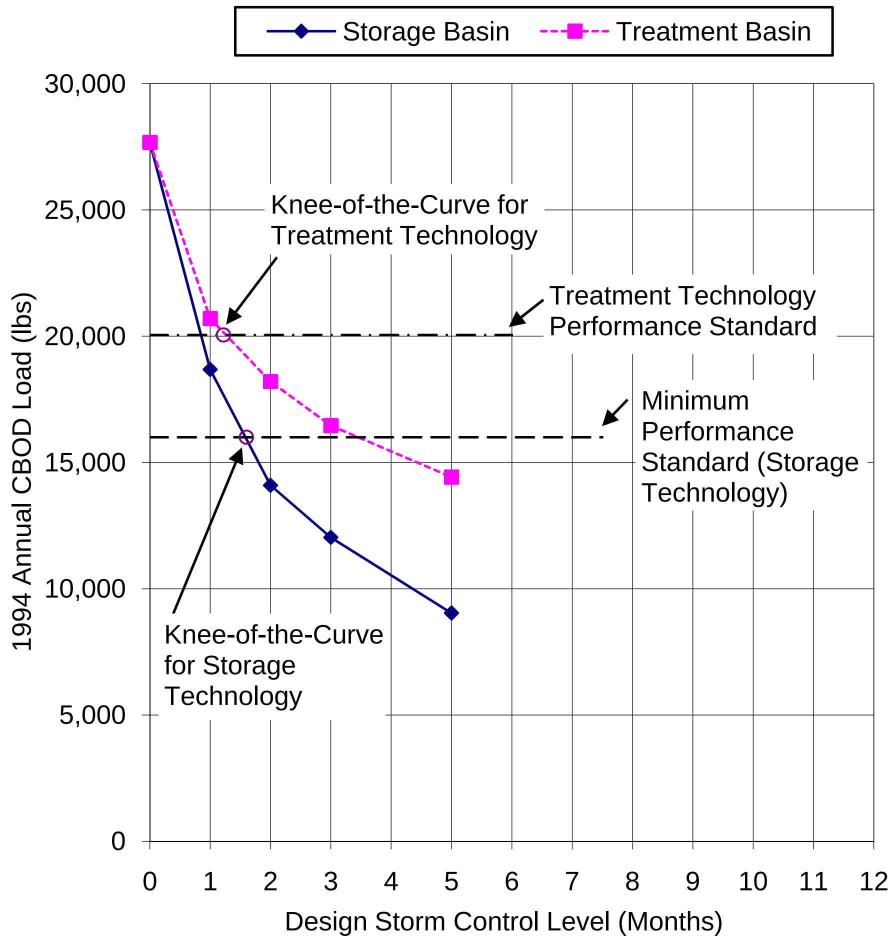

Figure 6-4 Rack 12 Level of Control Curves: Annual CBOD Load

Cost Evaluation

Present worth costs of the selected storage and treatment basins were compared to select the cost-effective technology. Details on the basis of the cost development are included in Appendices 6-B through 6-F. All costs are reported in 1998 dollars.

For Rack 12, the two options were a storage basin sized to the 5.2-month storm with a present worth cost of $5,207,000 compared to a treatment basin sized to the 3.4 month storm with a present worth cost of $5,075,000. For this rack, a treatment basin was selected as the most cost-effective basin that meets the CBOD, events, and hours performance standards. Present worth cost tables presenting results of this decision process for all racks are contained in Appendix 6-G.

Table 6-2 is a summary of the results of this initial screening indicating the parameter which fixed the minimum level of control. Basin design investigations were not performed for Racks 39, 30, 25, 21,13, 9, and 8 because sewer separation was deemed the most appropriate control method for these racks. Similarly, the upstream areas of Racks 37 and 23 would be separated or controlled in a tunnel alternative, so no basin design investigations were performed. Also, racks 2N/2S already have a basin in the existing system and, along with Rack 6, would have the Nine Minimum Controls applied in their areas.

6.1.4 Tunnels

Storage and conveyance tunnels are another means of implementing satellite treatment and control technologies. This type of satellite facility can provide capture and storage of CSOs from a number of racks in close relative proximity to the tunnel. Most of these systems are designed for gravity fill and drainage, although pumping to the existing sewer system may be required depending on grade. In addition to the storage of wet-weather overflows, tunnels can also serve as dry weather conveyance, providing a back-up system for maintenance of existing infrastructure, or the replacement of failing infrastructure. Tunnels capture and control overflow from several racks in areas where large volumes of overflow cause odors, floatables, and water quality problems, and/or in areas where failing infrastructure is a concern.

Tunnels were evaluated as a method of providing dry weather conveyance and wet weather storage for flows now transported by the Ohio Canal Interceptor (OCI) and Northside Interceptor (NSI). The initial concept of these tunnels is to convey the dry weather flow through a small inner pipe which would be designed to lie at the invert of the larger wet weather storage tunnel. The dry weather pipe would express the dry weather flow to the existing collection system, while the wet weather flow would be stored in the tunnel. However, the cost associated with conveying the dry weather and wet weather flow separately will be evaluated during preliminary design. In both tunnels, dry weather flow and wet weather tunnel dewatering from racks tributary to each interceptor would be conveyed through outlet control structures to the Little Cuyahoga Interceptor (LCI), at or near the outlet points currently in use by the OCI and NSI. Portions of the existing OCI and NSI could be abandoned and replaced by the proposed tunnels to alleviate possible failure or excessive maintenance.

Table 6-2 Storage vs. Treatment Basin Technology Selection

Rack Location	Selected Basin Technology	Basin Size (Design Storm Control Level)	Controlling Parameter (CBOD, Events or Hours)
3	Treatment	3-month	Events
4	Treatment	2.6-month	CBOD
5 & 7	Storage	2.4-month	Events/Hours
10 & 11	Treatment	3.7-month	Events
12	Treatment	3.4-month	CBOD
14	Storage	3.4-month	Hours
15	Storage	3-month	Hours
16 & 17	Treatment	8-month	CBOD
18 & 19	Treatment	8.3-month	CBOD
20	Storage	3-month	Hours
22	Storage	3-month	Hours
24	Storage	5-month	Hours
26 & 28	Treatment	9.6-month	CBOD
27 & 29	Treatment	1.5-month	Hours
32	Storage	5-month	Hours
33	Storage	>5-month	Hours
34	Storage	5 month	Hours
35	Storage	1.6-month	Events
36	Storage	2-month	CBOD
40 & 31	Storage	1.4-month	Events

Detention basins were also investigated for racks tributary to the OCI; however, the lack of large parcels of available land to construct basins near downtown made the tunnel option more viable.

The original basis of cost for the tunnels reported in 1998 dollars is included in Appendix 6-H.

6.2 Floatables Control

Floatables control is a means of preventing gross pollutants such as street litter from entering waterways. Floatables cause aesthetic and odor problems in populated areas, and contribute to the CBOD load of affected waterways. Several methods of controlling floatables were screened as part of the development of the LTCP, including increased street sweeping (existing program, somewhat effective), catch basin netting (high maintenance) and litter prevention programs (public participation required). Two technologies which were considered viable means of controlling floatables in Akron's system:

- *In-line vortex separator technologies* separate and trap floatables and debris for removal after storm events
- *In-line or end-of-pipe netting systems* trap floatables in mesh bags, which can be disposed of and replaced after storm events

Vortex separators utilize continuous deflective separation technology to separate and trap floatables and debris in a screened basket for removal after storm events. The concrete units (pre-fabricated for small capacity racks) can be placed in-line with existing infrastructure, and are completely below ground. Access for floatables removal would be through a manhole at grade. Floatables can be removed from the collection sump either by suction or by lifting the sump basket out mechanically, or by routing sump contents directly to the interceptor (pumping may be necessary in some cases, along with additional piping). The design of vortex separators is limited by design flow (300 cubic feet per second maximum).

The netting systems evaluated for use in Akron's system can be installed in-line, on the overflow just downstream of a rack, or at the outfall for an end-of-pipe installation. These pre-fabricated modular concrete chambers contain basket support frames to hold disposable mesh bags which are removed following CSO events. Access to change bags in an in-line system would be through aluminum or galvanized “Bilco”-type doors equipped with spring- or hydraulic-assist for ease of opening. Bags removed with boom trucks can be transported directly to the landfill. Installation of end-of-pipe systems may not be feasible or desirable due to access difficulties at many of Akron’s present outfall sites. Therefore, these systems were not priced for evaluation. The design of netting trash traps is limited by flow velocity (5 feet per second maximum). Netting was piloted in the late 1990’s with little success. Additionally, due to the outfall locations, the systems would be extremely difficult to access and maintain.

Floatables control should be provided at each rack which is shown by the model to overflow, according to the Nine Minimum Controls objective of the CSO Control Policy. For the City of Akron’s racks, any storage or treatment facility, *i.e.*, detention basins or tunnels, will incorporate its own floatables control based on the adjusted 1994 typical year. The type of floatables control will be evaluated during preliminary design.

6.3 Sewer Separation

Sewer separation was evaluated to determine whether this control technology would be an effective method of improving stream water quality. In much of Akron’s existing system, storm and sanitary flows are combined into a single transport pipe which conveys flow to the Akron WPCS. During significant rain events, pipe capacity is exceeded and the system overflows. Sewer separation is one method of removing storm water flows from the sanitary sewer system, reducing CSO volume, and increasing equipment life and capacity at the Akron WPCS.

Sewer separation would involve the installation of an additional conduit, typically to convey storm water, alongside the existing combined sewer system. The existing lines would be left in place to convey sanitary sewage to the treatment plant, since sanitary laterals are already attached and the existing pipe goes directly to the plant.

Separation technology was evaluated on a system-wide basis; and partial separation, in the form of storm water inflow removal, was also screened.

System-wide separation would involve the separation of the combined sewer area tributary to any overflow point, or rack by installing new storm sewers in all combined areas and uncoupling of any storm water connections to the present combined system. The removal of storm water leaves the existing system with enough capacity to carry sanitary flow and reduces overflowing of the sanitary system. It would also increase the available capacity at the Akron WPCS by reducing the average daily flow to the plant. Only areas which have both sanitary and storm flows in a single pipe were considered for the installation of an additional conduit. However, the performance of sewer separation is dependent on the extent of building roof surface for which roof drains cannot be separated. For example, it is generally considered infeasible to separate roof drains for flat-roofed buildings where the roof drains run inside and often co-mingle with sanitary building drains. Figure 6-5 shows the combined sewer areas within the City of Akron which would be considered for system-wide sewer separation.

To evaluate system-wide separation, all combined sewer areas in the city were compared according to attributes such as size, population density or land use, percent permeable, and receiving interceptor/water body. Three land use/density categories were developed (high, medium, and low), and each area was assigned to one of these categories. One CSO area from each category (Areas 7, 28 and 35) was evaluated in detail to determine the cost of separating existing combined sewers in that area. Cost estimates for the CSO areas examined were reduced to a cost per acre factor based on land use/density categories. System-wide costs were then extrapolated.

Cost estimates performed for system-wide separation found that this improvement may be prohibitively expensive. Implementation of this improvement would cause lengthy disruptions to traffic and other utilities, along with increased noise and construction traffic in every combined sewer area of the city. In addition, the recreational water quality benefit in terms of attainment of water quality standards from system-wide sewer separation was found by the receiving water quality model to be insignificant, and the overall biological water quality benefit is not predictable. Therefore, system-wide separation was screened out as being not feasible.

However, inflow removal (defined as partial separation) remained in the alternative matrix as a cost-effective means to eliminate or reduce the wet-weather volume reaching selected racks. The combined sewer areas tributary to the following nine Racks were evaluated in more detail using cost estimations for separation: 7, 8, 9, 13, 20, 21, 25, 30, and 35. The lengths and diameters of any required new sewers were measured and

CSO LONG TERM CONTROL PLAN UPDATE

FIGURE 6-5

COMBINED SEWER AREAS CONSIDERED FOR SEPARATION entered into a design spreadsheet which calculated the velocity (minimum 2.0 fps) and maximum capacity based on the downstream invert elevation selected. Each pipe diameter, downstream invert elevation, length and price per lineal foot was entered into a cost spreadsheet to calculate costs of installation. This spreadsheet calculated the trench width and depth, volume excavated, backfill and select fill required, and pavement demolition and repair, along with associated installation costs. The basis of the unit costs developed for these estimates are included in Appendix 6-I. The spreadsheets used to calculate piping costs and the basis of the unit costs used for separating CSO areas tributary to Racks 7, 8, 9, 13, 20, 21, 25, 30, and 35 are contained in Appendix 6-J. Cost summary sheets for separation of the CSO areas are contained in Appendix 6-K, and present worth calculation sheets are included in Appendix 6-L. All costs are reported in 1998 dollars.

Based on this analysis, seven rack basins were identified as being feasible to separate. These areas are Racks 8, 9, 13, 21, 25, 30 and 39.

6.4 Express Sewers

Express sewers would separate a large sanitary component from upstream of the combined sewer system, and provide an independent transport pipe to convey this sanitary flow directly to the Akron WPCS. The use of express sewers can reduce the risk of overflow to the tributary rack and would decrease capacity constraints of the main interceptors by reducing flows. This relief of the interceptor can also have the effect of reducing overflows at other racks. Express sewers were evaluated to collect and convey sanitary flow from areas located upstream of the racks that are known to be large contributors of CSO in the system.

Preliminary model results were used to establish which racks in Akron’s system were prone to large volumes of overflow during rain events. CSO basins selected for an express sewer alternative were evaluated based on annual volume of CSO and ease of separate sanitary flow interception upstream of the rack. For these reasons, separate sanitary flows upstream of Racks 12 and 18 were selected for express sewer evaluation. Detailed investigations found that sanitary flow from a portion of CSO Area 11 could be easily routed and captured by the collection system in CSO Area 12. One proposed express sanitary sewer was routed from each of the CSO contributing areas to a common point near the intersection of the OCI and LCI. Here the two express sewer lines would join to form a single express sanitary interceptor to convey flows directly to the headworks of the Akron WPCS. Other combined sewer areas were not considered good candidates for express sewers due to a lack of significant upstream tributary sanitary sewer areas.

Once upstream sanitary components were identified in each of the CSO areas evaluated, required pipe sizes and lengths for the express sewers were determined and proposed routes selected. Routes were selected based on reasonably direct, convenient routing and evaluation of topographic maps of the area. A grade was established which would maintain a minimum velocity of at least 2 fps in all three segments of the express sewer.

The evaluation of express sewers revealed that this control technology would be cost-prohibitive for the City of Akron. The present worth value in 1998 dollars of this proposed alternative was estimated to be $64,000,000 and would serve portions of only three CSO contributing areas. The evaluation also revealed many practical limitations to the installation and operation of the proposed express sewers. These limitations include construction difficulties, a route through an area of historic and archaeological significance, and the fact that a substantially above-grade alignment would be the only configuration which would allow gravity flow from upstream sanitary express lines. In addition, water quality model simulations revealed little if any benefit to receiving water conditions with express sewers.

6.5 Regulator Modifications

Regulator modifications involve altering the rack configurations, such as raising the overflow weir height or moving the location of the rack. This would increase the flow retained in the collection system, but implementation is limited due to risks of causing upstream flooding. In most cases, the rack overflow elevations were established to protect the upstream sewer system from surcharging and flood. Therefore there are limited opportunities where adverse collections impacts would not result.

6.6 Source Control

Most of the source control alternatives screened have limited or unpredictable effectiveness. Infiltration and Inflow (I/I) abatement is being evaluated further and sewer flushing is an effective part of regular Operations and Maintenance (O&M) that should be continued. The source control alternatives screened were considered unpredictable or limited in their effectiveness and were not evaluated further.

6.7 No Feasible Alternative (NFA): Secondary Bypass Evaluation

In limited situations, the waste stream at the WPCS is bypassed around the secondary treatment facilities (the "Secondary Bypass"). The City's LTCP includes a demonstration, in accordance with the CSO Policy, that the City will maximize flows to the WPCS for treatment, and that there is no feasible alternative to the limited use of the Secondary Bypass. The City developed a No Feasible Analysis and then updated it with an additional analysis of the capacity of the WPCS and a range of alternatives to the secondary bypass. The results of this additional analysis are documented in the NFA Report, dated December 29, 2006, revised by Addendum No. 1 on June 8, 2009 and further revised by Addendum No. 1 Update with Supplement on November 25, 2009. The results of the key points of the evaluation, addendum and update are summarized below.

A planning level evaluation of alternatives for reducing secondary bypass diversions was conducted as part of the NFA. The evaluation considered several secondary treatment upgrade alternatives, up to a total capacity 280 MGD. The evaluation was based on the following assumptions:

- Adjusted 1994 typical year data
- Baseline secondary treatment capacity of 130 MGD, based on obtaining 20 MGD additional capacity by conducting hydraulic-related improvements
- WPCS storage and enhanced high-rate clarification (EHRC) alternatives based on the annual SWMM transport model
- The recommended plan for collection system improvements is Integrated Alternative #2 from the Long Term Control Plan (2002). The WPCS evaluation assumes these recommended improvements are completed.
- Cost basis is from the Facilities Plan '98 Alternatives (1999) and the LTCP (2002). Costs were updated to May 2009 based on cost indices.

One of the primary goals of the NFA was to evaluate alternatives to reduce the frequency and volume of secondary bypass overflow events, and $CBOD_5$ load from overflows to the rivers that are tributary to the Cuyahoga River. The secondary bypass events at the WPCS under existing conditions (not including the Recommended Plan or the completed Rack 40 and separation projects) were established using the 1994 baseline precipitation data in the Facilities Plan ’98 Alternatives (1999) and the Long-Term Control Plan (2002). These bypass volumes were updated as part of the NFA Addendum No. 1 using the adjusted 1994 typical year and are listed here in Table 6-3.

Table 6-3 WPCS Secondary Bypass Characteristics in Existing Conditions for the Adjusted 1994 Typical Year

Item	Units	Value
No. of Events	Ea	26
Total Duration of Overflow Events	Hours	489
Volume	MG	1,211
$CBOD_5$	Lbs	302,992

The NFA evaluated capital improvements to increase the peak hourly capacity of the secondary treatment units, which would decrease the occurrence of secondary bypass events. The alternatives evaluated consisted of the following:

- Increase Secondary Treatment Capacity
- Single Stage Nitrification Processes
- Conventional and Attached Growth Processes
- Increase Solids Separation Capacity
- Additional Final Settling Tanks
- Final Settling Tank (FST) Effluent Treatment with High Rate Treatment Process
- Membrane Filtration
- Membrane Bioreactor (MBR) Facility
- Step Feed (with and without EHRC)

A prescreening of the above alternatives found that the feasible alternatives consist of increasing secondary treatment capacity, adding final settling tanks, adding an MBR Facility, and operating the secondary treatment units using the step feed process. The recommended alternative selected in the NFA is Alternative 6 Step Feed, and this is summarized below.

The Step Feed alternative considers operating the existing aeration basins using the Step Feed process during wet weather events only. During dry weather flow, the secondary treatment system would operate in its current plug flow mode. Using these two operational modes allows the plant to meet the NPDES permit effluent limits during wet and dry weather.

The existing secondary treatment facility feeds the effluent from the primary settling tank directly to Aeration Basin Pass No. 1. The modified Step Feed facility mode would alternatively feed additional primary settling tank effluent directly to Aeration Basin Pass Nos. 2, 3, and 4. This operation would result in a reduction in the mixed-liquor suspended solids (MLSS) concentration in the final basin pass, thus reducing the solids loading rate to the secondary settling tanks. This allows the plant to operate the existing aeration basins at higher capacities while maintaining its effluent quality, requiring minimal modification to the existing system, including modifying the existing facilities to reduce hydraulic limitations and to provide controls for this alternative operating process.

Table 6-4 compares the existing conditions of operating the secondary treatment system at 110 MGD maximum capacity with the recommended Step Feed alternative. The number of bypass events for the adjusted 1994 typical year decreased from 26 to 6 events. This decreased the bypassed volume by 77.5%, from 1,211 MG to 272 MG.

The NFA (2006) recommends implementing this alternative using a phased approach. First, the existing process would be modified using step feed to expand the conventional secondary treatment system up to 130 MGD. Full-scale testing should be performed to test the Step Feed process under actual operating conditions to evaluate its effectiveness and to determine the actual maximum capacity of the process.

Once the Step Feed project is in operation and the new secondary treatment capacity is defined, the secondary bypass will continue to be used for peak wet weather flows. The bypass will not be used until the capacity of the upgraded step feed secondary treatment and the volume of the Storm Retention Tank (SRT) are exceeded. After the improvements are completed, the reduced flow rate that bypasses secondary treatment will be known, and the need for further WPCS control measures will be evaluated to further decrease secondary bypass events. Potential additional WPCS control measures could consist of implementing storage, enhanced high rate clarification (EHRC), or additional step feed for the remaining five secondary treatment trains.

6.8 Integrated Plan Development

The above alternatives were evaluated to develop an integrated plan for the entire combined sewer area of the City of Akron system. Initially, five alternatives were evaluated to select a recommended integrated plan. This recommended plan was adjusted after an evaluation of implementing treatment versus storage basins, which then became the foundation of the baseline integrated plan. Consistent with the requirements of the Consent Decree, the projects from the Integrated Plan Alternatives evaluation (and subsequent treatment versus storage basin evaluation) were subject to an additional cost/performance evaluation in Section 7, Cost Performance Consideration.

6.8.1 Integrated Plan Alternatives

Five integrated alternatives were developed as part of the City's Long Term Control Plan (LTCP) which integrates the viable CSO control technologies for Akron's collection system and receiving waters. The technologies include sewer separation, storage/conveyance tunnels, and detention basins (both storage and treatment). Each integrated alternative summarized below and in Tables 6-5 and 6-6 was made up of some combination of these technologies.

The approach to basin and tunnel sizing resulted in the same approximate levels of control whether rack overflows were controlled by treatment basins, storage basins, or tunnels. Therefore, different combinations of these control technologies used in the different alternatives would also result in the same approximate levels of control. The parameters for assessing benefits of each alternative were number of untreated overflow events, number of untreated overflow hours, and total CBOD load (in pounds) for the average 1994 precipitation year. From a water quality perspective, Integrated Alternatives #2 through #5 achieve the same relative water quality impacts.

Table 6-4 Step Feed Alternative Performance Summary

Secondary Treatment Alternative	Secondary Capacity (MGD)	Existing Storage Volume (MG³)	Secondary Treatment & Storage Capacity (MG(D))	Total Treatment & Storage Capacity (MG(D))	Annual Treated Bypass				Total Secondary Bypass $CBOD_5$ Reduction (lbs)	Secondary Treatment % $CBOD_5$ Removal
					Bypass # of Events	Bypass # of Hours	Bypass Volume (MG³)	Bypass $CBOD_5$ (lbs)		
"No Change" Alternative: Operate Secondary Treatment at 110 MGD	110	10	120	120	25	489	1,211	302,992	N/A	90
Alt. 6 - 170 MGD Step Feed	170	10	180	180	6	184	272	68,054	234,938	90

Notes:

1. The 10 MG SRT volume is included in the analysis.
2. All scenarios assume implementation of LTCP Integrated Plan No. 2 in the collection system.
3. “Existing Conditions” assumes a bypass loading of 30 mg/L $CBOD_5$ concentration.
4. 170 MGD – estimated secondary treatment capacity with step feed implemented in all aeration basins
5. Source: NFA Addendum No. 1 Update with Supplement (November 2009)

Table 6-5 Summary of Integrated Plan Alternatives

#1:	Sewer Separation (34 racks) Rack 40/31 Storage Basin	#2:	Sewer Separation (7 racks) 5 Storage Basins (6 racks) 5 Treatment Basins (8 racks) Rack 40/31 Storage Basin Ohio Canal Interceptor Tunnel (9 racks) Northside Interceptor Tunnel (4 racks)
#3:	Sewer Separation (7 racks) 9 Storage Basins (10 racks) 5 Treatment Basins (8 racks) Rack 40/31 Storage Basin Ohio Canal Interceptor Tunnel (9 racks)	#4:	Sewer Separation (9 racks) 7 Storage Basins (8 racks) 8 Treatment Basins (13 racks) Rack 40/31 Storage Basin Northside Interceptor Tunnel (4 racks)
#5:	Sewer Separation (9 racks) 11 Storage Basins (12 racks) 8 Treatment Basins (13 racks) Rack 40/31 Storage Basin		

Evaluation Methodology

The Ultimate Integrated Plan Alternatives were evaluated using decision making computer software (Criterium Decision Plus) against the following values:

- Storm Water Impacts
- Water Quality Improvements
- Operation and Maintenance
- Costs
- Public Acceptance
- Community Improvements
- Construction Issues

Table 6-6 Detailed Comparison of Integrated Plan Alternatives

Rack No. / Location	Integrated Alt #1	Integrated Alt #2	Integrated Alt #3	Integrated Alt #4	Integrated Alt #5
2-S & 2-N	N/A. No overflow in adjusted 1994 precipitation year.				
3	Separation	Treatment Basin	Treatment Basin	Treatment Basin	Treatment Basin
4	Separation	OCI Tunnel	OCI Tunnel	Treatment Basin	Treatment Basin
5	Separation	Storage Basin, w/ R7	Storage Basin, w/ R7	Storage Basin, w/ R7	Storage Basin, w/ R7
6	N/A. No overflow in adjusted 1994 precipitation year.				
7	Separation	Storage Basin, w/ R5	Storage Basin, w/ R5	Storage Basin, w/ R5	Storage Basin, w/ R5
8	Separation	Separation	Separation	Separation	Separation
9	Separation	Separation	Separation	Separation	Separation
10	Separation	Treatment Basin, w/ R11	Treatment Basin, w/ R11	Treatment Basin, w/ R11	Treatment Basin, w/ R11
11	Separation	Treatment Basin, w/ R10	Treatment Basin, w/ R10	Treatment Basin, w/ R10	Treatment Basin, w/ R10
12	Separation	Treatment Basin	Treatment Basin	Treatment Basin	Treatment Basin
13	Separation	Separation	Separation	Separation	Separation
14	Separation	Storage Basin	Storage Basin	Storage Basin	Storage Basin
15	Separation	Storage Basin	Storage Basin	Storage Basin	Storage Basin
16	Separation	OCI Tunnel	OCI Tunnel	Treatment Basin, w/ R17	Treatment Basin, w/ R17
17	Separation	OCI Tunnel	OCI Tunnel	Treatment Basin, w/ R16	Treatment Basin, w/ R16
18	Separation	OCI Tunnel	OCI Tunnel	Treatment Basin, w/ R19	Treatment Basin, w/ R19
19	Separation	OCI Tunnel	OCI Tunnel	Treatment Basin, w/ R18	Treatment Basin, w/ R18
20	Separation	OCI Tunnel	OCI Tunnel	Storage Basin	Storage Basin
21	Separation	Separation	Separation	Separation	Separation
22	Separation	Storage Basin	Storage Basin	Storage Basin	Storage Basin
23	Separation	OCI Tunnel	OCI Tunnel	Separation	Separation
24	Separation	OCI Tunnel	OCI Tunnel	Storage Basin	Storage Basin
25	Separation	Separation	Separation	Separation	Separation
26	Separation	Treatment Basin, w/ R28	Treatment Basin, w/ R28	Treatment Basin, w/ R28	Treatment Basin, w/ R28
27	Separation	Treatment Basin, w/ R29	Treatment Basin, w/ R29	Treatment Basin, w/ R29	Treatment Basin, w/ R29
28	Separation	Treatment Basin, w/ R26	Treatment Basin, w/ R26	Treatment Basin, w/ R26	Treatment Basin, w/ R26
29	Separation	Treatment Basin, w/ R27	Treatment Basin, w/ R27	Treatment Basin, w/ R27	Treatment Basin, w/ R27
30	Separation	Separation	Separation	Separation	Separation
32	Separation	NSI Tunnel	Storage Basin	NSI Tunnel	Storage Basin
33	Separation	NSI Tunnel	Storage Basin	NSI Tunnel	Storage Basin
34	Separation	NSI Tunnel	Storage Basin	NSI Tunnel	Storage Basin
35	Separation	NSI Tunnel	Storage Basin	NSI Tunnel	Storage Basin
36	Separation	Storage Basin	Storage Basin	Storage Basin	Storage Basin
37	Separation	OCI Tunnel	OCI Tunnel	Separation	Separation
39	Separation	Separation	Separation	Separation	Separation
40/31	Storage Basin	Storage Basin	Storage Basin	Storage Basin	Storage Basin

The results of the evaluation, which are shown on Figure 6-6, were as follows:

- Alternative No.1 - 34.5% acceptable
- Alternative No.2 - 67.9% acceptable
- Alternative No.3 - 61.4% acceptable
- Alternative No.4 - 56.0% acceptable
- Alternative No.5 - 48.9% acceptable

Therefore, Integrated Plan Alternative No.2, the highest ranking alternative plan, was selected as the recommended plan.

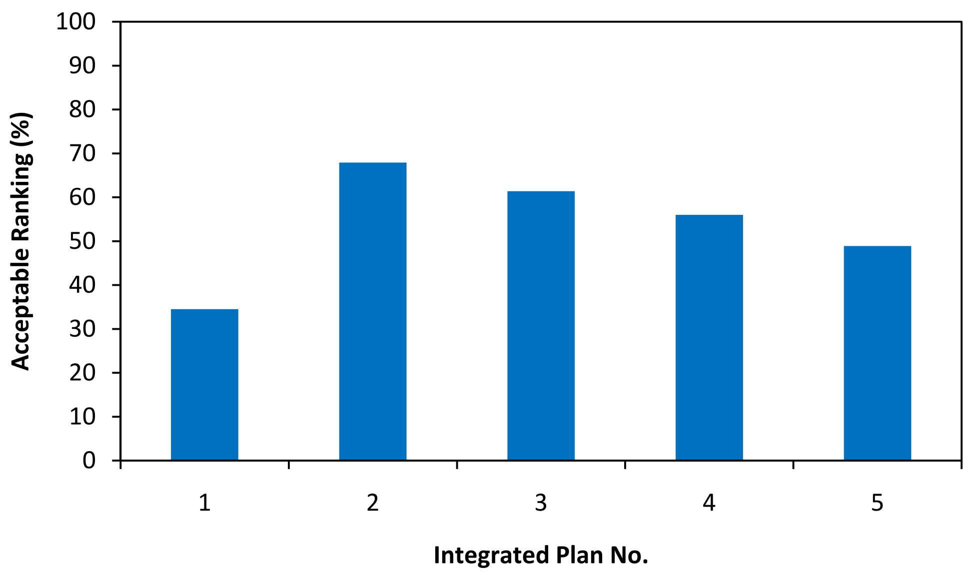

Figure 6-6 Ranking of Integrated Plan Alternatives

6.8.2 Treatment versus Storage Basin Comparison

As mentioned previously, the selection of treatment versus storage basins was based on results of system modeling. This selection was re-evaluated by updating the cost basis, using an updated version of the model, using revised rainfall data, and evaluating the level of control. As a result of the analysis OEPA, all treatment basins alternatives were converted to storage basins in the recommended plan. A cost analysis found that while the capital cost for storage basins was marginally greater than the capital cost for treatment basins, the capital cost savings for treatment basins would be more than offset by additional operations and maintenance costs associated with treatment basins. In addition, changing the basin type to storage, results in a larger volume of captured flow receiving secondary treatment at the WPCS.

6.9 Baseline Integrated Plan

A recommended plan for controlling combined sewer overflow, herein referred to as the baseline integrated plan, was developed based on evaluations of these alternatives that are documented in the Facilities Plan '98 Alternatives (1999) and the Long Term Control Plan (2002) and subsequent evaluations that occurred since the LTCP (2002) as described above. The use of this plan as input to the final recommended plan will be considered in the cost/performance and financial feasibility analyses.

The baseline integrated plan is summarized in Table 6-7, which includes a summary of the recommended treatment alternatives for all of the 34 permitted combined sewer overflows, improvements at the WPCS, and other improvements required by the Consent Decree. The locations of these projects are shown in Figure 6-7. For controlling the CSOs, the plan includes the Ohio Canal Interceptor (OCI) Tunnel, the Northside Interceptor (NSI) Tunnel, five sewer separation projects, and 10 storage basins in addition to the Cuyahoga Street Storage Facility (CSSF) and previously implemented sewer separation projects. Note that Racks 9 and 39 are not included in the table because sewer separation projects have been completed to eliminate these overflows. Recommended improvements at the WPCS include increasing secondary capacity. One additional project, to control overflows at the Mud Run Pump Station, is required by the consent decree, and therefore, has been added to the Baseline Integrated Plan.

Table 6-7 Summary of the Baseline Integrated Plan

Rack No. / Location	Description
2-S & 2-N	N/A. No overflow in adjusted 1994 precipitation year.
3	Storage Basin
4	OCI Tunnel
5	Storage Basin, combined w/ R7
6	N/A. No overflow in adjusted 1994 precipitation year.
7	Storage Basin, combined w/ R5
8	Sewer Separation; Rack 8 Separation Project
10	Storage Basin, combined w/ R11
11	Storage Basin, combined w/ R10
12	Storage Basin
13	Sewer Separation; Rack 13 Separation Project
14	Storage Basin
15	Storage Basin
16	OCI Tunnel
17, Div. Ch.	OCI Tunnel
18	OCI Tunnel
19	OCI Tunnel
20	OCI Tunnel
21	Sewer Separation
22	Storage Basin
23	OCI Tunnel
24	OCI Tunnel
25	Sewer Separation; Rack 25 Separation Project
26	Storage Basin, combined w/ R28
27	Storage Basin, combined w/ R29
28	Storage Basin, combined w/ R26
29	Storage Basin, combined w/ R27
32	NSI Tunnel
33	NSI Tunnel
34	NSI Tunnel
35	NSI Tunnel
36	Storage Basin
37	OCI Tunnel
40/31/30	Completed. Racks 40 & Rack 31 were combined with a Storage Basin. Rack 30 Separation Project.
WPCS	Upgrade WPCS to 130 MGD
WPCS	Revised WPCS Control Measures
Other	Mud Run Pump Station

Key

(orange)	OCI Tunnel
(blue)	Separation
(purple)	NSI Tunnel
(green)	Storage Basin

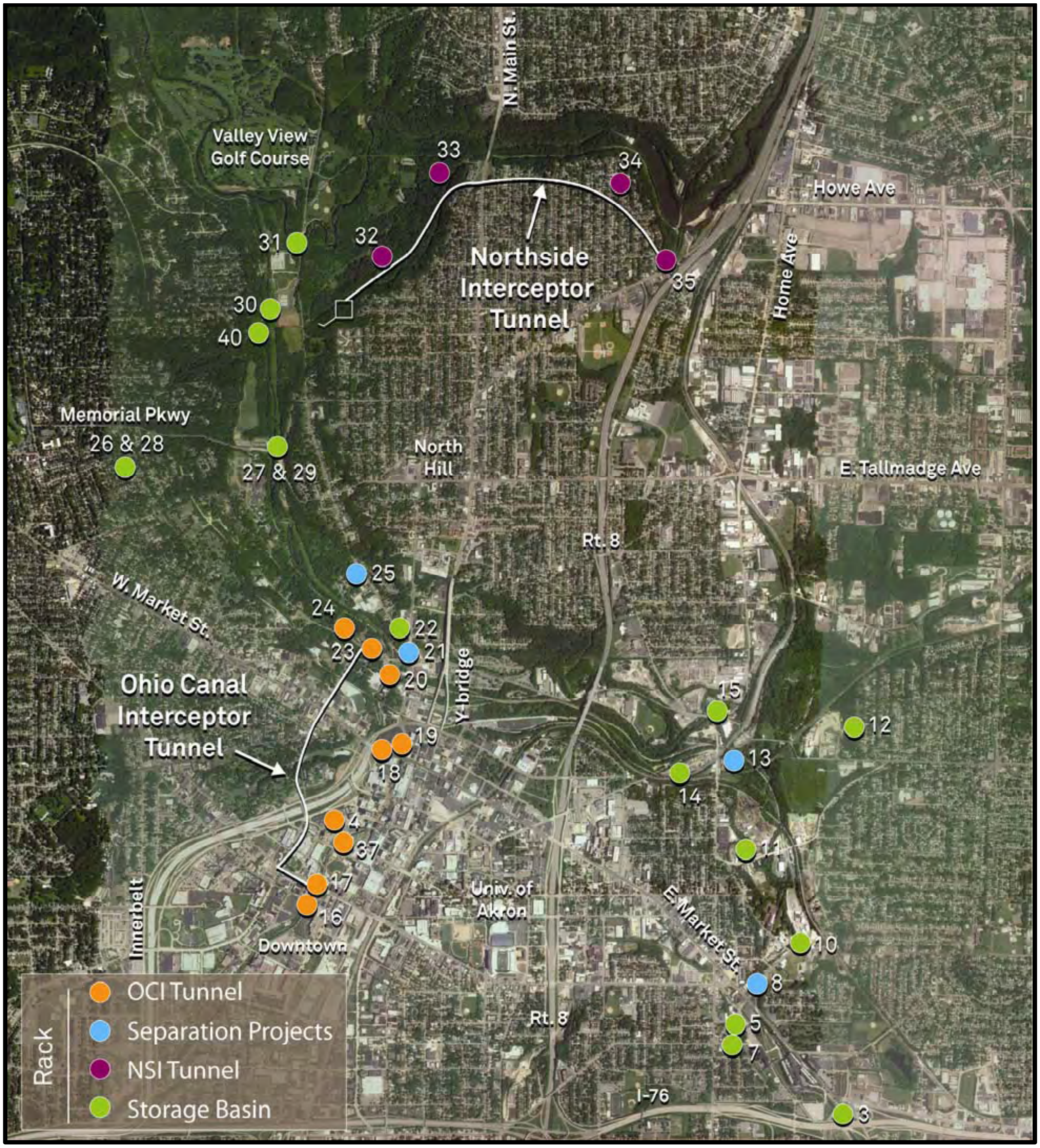

Figure 6-7 Baseline Integrated Plan

6.9.1 Tunnels

As discussed above, the OCI and NSI Tunnels would provide storage for wet weather flow and conveyance for dry weather flow for the racks tributary to the tunnels, up to the capacity of a selected control level. During a storm event, overflow that is currently directed to the receiving surface water body would instead be redirected to the storage tunnel. If the storage capacity of the tunnel is exceeded, the tunnel would overflow at one location to the receiving water body. The tunnels were evaluated both with and without EHRT. Figures 6-8 to 6-10 show the conceptual plan and profiles for the OCI Tunnel, and Figure 6-11 to 6-13 show the conceptual plan and profiles for the NSI Tunnels. These figures are included at the end of this section.

OCI Tunnel

The OCI Tunnel is proposed to control combined sewer overflow from nine CSO racks adjacent to the Ohio Canal in downtown Akron. These racks include Racks 4, 16, 17 / Diversion Chamber, 18, 19, 20, 23, 24, and 37. The Ohio Canal CSO Alternatives Advanced Planning Study (2006) identifies the following three primary goals for the OCI Tunnel:

1. Capture and store for treatment 5.3 to 74.1 million gallons of CSO, depending on the level of control.
2. Eliminate CSO discharges to the Ohio Canal.
3. Provide conveyance to a consolidated overflow location to the Cuyahoga River.

The OCI Tunnel would achieve these goals because the large-diameter storage/conveyance tunnel would intercept all flow during the 1994 adjusted typical year from Racks 16, 17, 18, 19, 20, 23, and 27 and convey the flow north to a consolidated overflow location. If EHRT is selected to treat the overflow, a storage basin near the overflow location would give flexibility to include clarification, advanced primary treatment, high-rate treatment, and/or disinfection before discharge downstream of the confluence of the Ohio Canal and the Little Cuyahoga River. By redirecting this flow to the tunnel, the existing Ohio Canal Interceptor has capacity to convey all flow during the 1994 adjusted typical year from Racks 4 and 37. This flow is routed to and controlled at the existing Cuyahoga Street Storage Facility, which also controls Racks 30, 31, and 40. In effect, Racks 4, 16, 17 / Diversion Chamber, 18, 19, 20, 23, 24, and 37 would be controlled to zero overflows per year at the existing overflow locations, while the control level of the consolidated overflow location on the outlet of the tunnel will be determined based on the cost/performance evaluation contained in Section 7.

The tunnel alignment was evaluated during the Ohio Canal CSO Alternatives Advanced Planning Study (Akron 2006) and has been further evaluated as part of this LTCP Update. The route proposed for the OCI Tunnel alternative was based on reasonably direct routing, apparent right of way, and the preference to avoid downtown congestion while maintaining a relatively close proximity to the OCI to facilitate connecting existing racks to the tunnel. A profile was chosen which would provide the depth required to maintain a gravity outlet to the LCI while allowing connections from racks to cross underneath the canal. The tunnel is proposed to convey dry weather flow and wet weather flow from Racks 16 and 17 to the beginning of the OCI tunnel at the intersection of E. Exchange Street and Locust Street. The tunnel alignment continues south along Locust Street, crossing underneath SR 59 and continues down N. Maple Street. Racks 4 and 37 are proposed to be eliminated, and the flow would be conveyed by the existing Ohio Canal Interceptor to Racks 18 and 19 where the dry weather and wet weather flow would be conveyed to the OCI Tunnel. Racks 23 and 24 would be controlled by intercepting the flow upstream of the existing rack locations and conveying the flow to a proposed 66-inch diameter tunnel which connects to the OCI Tunnel. The outlet of the OCI Tunnel is proposed to be discharged by gravity into a new storage tank that would be constructed near the Little Cuyahoga River, north of Hickory Street.

The OCI Tunnel provides several additional benefits as follows:

- Addresses several of the largest annual CSO volumes
- Removes visible debris (floatables, etc.) and odor problems from downtown (Lock 2 Park/Canal Park) Ohio Canal area
- Promotes economic development/public relations
- Replaces failing infrastructure which may need rehabilitation/replacement within 10 years
- Reduces O&M by eliminating the Ohio Canal Interceptor north of the Innerbelt (from the Racks 18 and 19 to North Street)

- Improves control and reduces monitoring of overflows by combining nine existing rack overflows into one overflow location

- Reduces the potential for North Street flooding

The OCI Tunnel was evaluated both with and without treatment. The treatment option includes treating the tunnel overflow using Enhanced High Rate Treatment (EHRT). The EHRT unit has been sized for the peak overflow flow rate during the adjusted 1994 typical year. A diversion chamber diverts the flow either to the existing LCI sewer, the EHRT and chlorination/dechlorination tank, or the Little Cuyahoga River.

NSI Tunnel

The Northside Interceptor (NSI) Tunnel is proposed to control overflows that discharge into the Cuyahoga River at Racks 32, 33, 34, and 35. These overflows are activated due to the limited capacity in the existing interceptor sewer. Therefore, the NSI Tunnel is proposed to capture and convey this overflow up to the selected control level, as well as capture discharges from the Cuyahoga Street Storage Facility at the former Rack 30, 31, and 40, which discharges to the Little Cuyahoga River. The preliminary plan and profile are shown in Figures 6-11 and 6-12. The proposed alignment would be constructed generally south of and parallel to the existing NSI. This alignment was developed to maintain a relatively close proximity to the NSI to facilitate connecting existing racks to the tunnel. A profile was chosen which would provide gravity outlet to the LCI and avoid mixed-face tunneling (both hard rock and soft ground boring surface) to the greatest extent possible. It would begin at Rack 35 in the Gorge Boulevard District near the Front Street Bridge, and it would generally follow the path of the existing Northside Interceptor along the Cuyahoga River alignment, crossing under the Little Cuyahoga River, and joining with the existing Little Cuyahoga Interceptor. A section of the existing Northside Interceptor is proposed to be abandoned.

The NSI Tunnel provides several benefits as follows:

- Eliminates the existing Northside Interceptor O&M problems

- Eliminates failing infrastructure

- Removes visible debris (floatables, etc.) and odor problems from the Cascade Valley Park area

- Removes overflows from a State Resource Water (Cuyahoga River in the Gorge Metropolitan Park)

- Improves control and reduces monitoring of overflows by combining four existing rack overflows into one overflow location

- Gains support from environmental groups

- The NSI Tunnel was evaluated both with and without treatment. The treatment option includes treating the tunnel overflow using Enhanced High Rate Treatment (EHRT). The EHRT unit has been sized for the peak overflow flow rate during the adjusted 1994 typical year. The EHRT unit is proposed to be sited near the existing Cuyahoga Street Storage Facility (CSO Rack 31/40 Storage Basin), as shown in Figure 6-13. To decrease overflows at the Storage Facility, when the storage facility is full, a pump station would convey the flow to the NSI Tunnel. When the tunnel is full, the EHRT would treat the overflow before discharging to the Little Cuyahoga River