Proposed Water Treatment Residuals Management Process

Alternatives Analysis Submitted in Fulfillment of the Federal Facilities Compliance Agreement

Washington Aqueduct
Baltimore District, U.S. Army Corps of Engineers

Washington, D.C.

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Abbreviations and Acronyms

AWWTP	Advanced Wastewater Treatment Plant
C&O	Chesapeake & Ohio
CSO	Combined Sewer Overflow
DC WASA	District of Columbia Water and Sewer Authority
DEIS	Draft Environmental Impact Statement
DOPAA	Description of Proposed Actions and Alternatives
EIS	Environmental Impact Statement
EFS	Engineering Feasibility Study
EPA	Environmental Protection Agency
FCWA	Fairfax County Water Authority
FFCA	Federal Facilities Compliance Agreement
mgd	million gallons per day
MHW	mean high water
MLW	mean low water
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
TSS	total suspended solids
WSSC	Washington Suburban Sanitary Commission
WTP	Water Treatment Plant

Executive Summary

Paragraph 21 of the Federal Facilities Compliance Agreement between EPA Region 3 and the Washington Aqueduct, Docket No. CWA-03-2003-0136DN requires that Washington Aqueduct submit to EPA an analysis of the range of engineering and/or best management practices of the alternatives evaluation submitted in accordance with paragraph 20 of the FFCA. These alternatives are to cause the discharge from the Washington Aqueduct to achieve compliance with the numeric discharge limitations set forth in NPDES Permit DC0000019.

Each of the alternatives under evaluation (with the exception of the no-action alternative) necessitates developing infrastructure in an urban setting characterized by important natural and man-made resources. All alternatives under evaluation to meet this federally mandated action will carry some degree of impact. Of particular concern is the ability of an alternative to meet the project's purpose and need while minimizing impacts to the communities surrounding the Dalecarlia Water Treatment Plant and Georgetown Reservoir facilities.

Section 2 of this report describes the process used to identify the five alternatives that will be evaluated in detail in the Draft Environmental Impact Statement (DEIS). Further information on the complete set of 26 alternatives initially developed is contained within the Engineering Feasibility Study (EFS) published by the Washington Aqueduct in May 2004. A Supplement to the EFS is currently being prepared. This document will evaluate the feasibility of the new alternatives and options provided by the public from mid-September through November 15, 2004.

At the time of this writing, three alternatives, including the no-action alternative, are unsuitable to be recommended as the proposed action. The rationale leading to these conclusions is summarized in this report in section 3.

The on-going analysis is considering recently received alternatives contributed by the public during a 65-day extension of the opportunity to present alternatives. That additional period went through November 15, 2004. The complete analysis of 102 new alternatives and options relating to previously identified alternatives will be reported in the DEIS that is expected to be released to the public in late January 2005.

Two alternatives are still under analysis at this time from the original set. From those two and any other alternative submitted from the public that is not screened out, one will be identified as the proposed action in the DEIS.

SECTION 1

Introduction

1.1 Background and Project History

The U.S. Army Corps of Engineers, Baltimore District, Washington Aqueduct operates the Dalecarlia and McMillan Water Treatment Plants (WTPs) in Washington, D.C., serving over 1 million persons in the D.C. and Northern Virginia area with potable water. The treatment process removes solid particles (e.g., river silt) from the Potomac River supply water, treats and disinfects the water, and distributes the finished water to the metropolitan service area. The solids removed during the treatment process have historically been returned to the Potomac River, but a recently reissued version of the Washington Aqueduct National Pollutant Discharge Elimination System (NPDES) permit (Permit No. DC 0000019) effectively precludes the discharge of water treatment solids, or residuals, to the river.

Consequently, Washington Aqueduct is in the process of evaluating water treatment residuals management options that minimize or eliminate the discharge of residuals to the river. The residuals management option that is ultimately selected has a potential to affect the human environment, and thus development of the residuals management plan must comply with the National Environmental Policy Act (NEPA). NEPA requires federal agencies to integrate environmental considerations into their decision-making processes by evaluating the environmental impacts of their proposed actions and reasonable alternatives to those actions.

The current water treatment system consists of a series of reservoirs and treatment facilities (Figure 1-1). Raw water diverted from the Potomac River is collected in the Dalecarlia Reservoir. Natural sedimentation of river silt typically occurs in the Forebay of the Dalecarlia Reservoir (Figure 1-2). This silt (Forebay residuals) is periodically dredged, temporarily land applied on Washington Aqueduct property for drying, and then trucked offsite or utilized onsite. The part of this process that involves trucking of dried Forebay solids occurs approximately every seven years.

While some natural sedimentation continues as the river water flows through the Dalecarlia Reservoir, Washington Aqueduct water treatment operations then achieve an additional level of sediment removal by adding aluminum sulfate (alum) as a coagulant. Alum is added after the water has passed through the Dalecarlia Reservoir, but prior to reaching the four sedimentation basins at the Dalecarlia WTP (Figure 1-2) and the two sedimentation basins at Georgetown Reservoir (Figure 1-3) where the coagulated sediment (i.e., water treatment residuals) is removed. The settled residuals are periodically flushed from the basins to the Potomac River. This process had been previously permitted through the U.S. Environmental Protection Agency's (EPA's) NPDES permitting process.

The reissued NPDES permit, which became effective on April 15, 2003, significantly reduced the allowable concentration of residuals that may be discharged by the Washington Aqueduct to the Potomac River. The NPDES permit covers discharges from the Dalecarlia Sedimentation Basins 1, 2, 3, and 4 through Outfall 002 and discharges from the Georgetown

Sedimentation Basins 1 and 2 through Outfalls 003 and 004. The permit describes numeric limits for parameters such as total suspended solids, total aluminum, and dissolved iron that essentially eliminates residuals discharges from these outfall locations.

Washington Aqueduct and EPA Region III entered into a Federal Facilities Compliance Agreement (FFCA), on June 12, 2003, to allow the continued production of drinking water during the development of a new residuals management process to meet the requirements of the new permit. The FFCA includes a strict schedule for delivering documentation and achieving compliance with the NPDES permit, including completion of an alternatives evaluation and a disposal study, analysis of engineering options, and interim and final compliance with the numerical discharge limitations.

1.2 Purpose and Need for Action

The purpose and need for the project were defined in the Notice of Intent, published in the *Federal Register* on January 12, 2004, as restated below:

> The objectives of the proposed residuals management process are as follows, not necessarily in order of precedence (measurement indicators in parentheses):
>
> - To allow Washington Aqueduct to achieve complete compliance with NPDES Permit DC0000019 and all other federal and local regulations.
> - To design a process that will not impact current or future production of safe drinking water reliably for the Washington Aqueduct customers. (Peak design flow of drinking water)
> - To reduce, if possible, the quantities of solids generated by the water treatment process through optimized coagulation or other means. (Mass or volume of solids generated)
> - To minimize, if possible, impacts on various local and regional stakeholders and minimize impacts on the environment. (Traffic, noise, pollutants, etc.)
> - To design a process that is cost-effective in design, implementation, and operation. (Capital, operations, and maintenance costs)

Washington Aqueduct developed these objectives with the intention of ensuring compliance with all permit and other legal mandates, and preserving or improving upon the safety, reliability, and efficiency of the current water treatment process. In addition, Washington Aqueduct incorporated into the objectives a concern for minimizing impacts to the human and natural environment.

The comments generated from the scoping process have been incorporated into the list of alternatives presented in this document or will be included in the evaluations of the affected environment or environmental consequences in the DEIS. None of the submitted comments resulted in a modification of the original objectives as published in the Notice of Intent.

Alternatives screening criteria, linked to the purpose and need statement as listed above, were developed subsequent to the issuance of the Notice of Intent. These screening criteria have been used to identify a reasonable range of alternatives for detailed analysis in the DEIS.

Washington Aqueduct is committed, as indicated in the project objectives, to minimize (if possible) potential impacts on stakeholders and the environment. All of the alternatives under consideration have potential impacts. However, it is anticipated that mitigative measures may be planned and documented in order to minimize these potential impacts.

Washington Aqueduct will select an alternative among those presented in Section 2 for implementation. The final alternative selected may be contingent on authorization, approvals, or issuance of permits or easements by various public agencies or private entities including, but not limited to, the relevant State Historic Preservation Office, the National Capital Planning Commission, the Environmental Protection Agency, the National Park Service, and the Washington Aqueduct Wholesale Customers (i.e., the District of Columbia Water and Sewer Authority, Arlington County, Virginia, and the City of Falls Church, Virginia).

FIGURE 1-1
Washington Aqueduct Supply and Treatment System

CH2MHILL

Legend

- Approximate Location of New/Modified Facilities
- County Boundary
- Existing Buildings
- Roads

The geographic information shown on this map is based on data from the District of Columbia Geographic Information System (DC GIS). The District Government makes no warranty, express or implied, and disclaims all implied warranties of suitability of the DC GIS product for a particular purpose.

0 375 750 1,500 Feet

Figure 1-2
Dalecarlia Reservoir and Forebay

CH2MHILL

Legend

- County Boundary
- Existing Buildings
- Roads

The geographic information shown on this map is based on data from the District of Columbia Geographic Information System (DC GIS). The District Government makes no warranty, express or implied, and disclaims all implied warranties of suitability of the DC GIS product for a particular purpose.

0 375 750 1,500 Feet

Figure 1-3
Georgetown Reservoir

SECTION 2

Description of Proposed Action and Alternatives

2.1 Proposed Action

The proposed action is to develop, design, and construct a permanent new residuals management process that will cost-effectively collect, treat, and dispose of the residuals in conformance with the purpose and need stated in Section 1. The selected action must meet the FFCA compliance deadlines. It must also address the management of projected residuals quantities for a period of at least 20 years, a typical design period for a project of this type. Table 2-1 lists the volume of water treatment and Forebay residuals generated daily as developed for the Engineering Feasibility Study (EFS). The table also lists the number of truck trips associated with the residuals quantities based on a 5-day week. Not all alternatives evaluated use trucking for the disposal of dewatered residuals. The larger residuals values listed in the design year column reflect the larger quantity of water anticipated to require treatment approximately 20 years in the future.

TABLE 2-1
Washington Aqueduct Basis for Residuals Quantities

	Daily Generated Volume (Cubic Yards)[a]		Truck Trips/Day [b]			
			22 Cubic Yards/ Truck		11 Cubic Yards/ Truck	
Residuals	Current Average	Design Year Average	Current Average	Design Year Average	Current Average	Design Year Average
Water Treatment	94	120	7	8	13	16
Forebay	22	28	2	2	3	4

[a] Based on 7 days per week production.
[b] Based on hauling 5 days per week.

2.2 Development of Alternatives

Washington Aqueduct has periodically evaluated residuals management approaches for a number of years. During that time, many options have been identified. However, there have also been shifts in emphasis for the residuals management goals and objectives. Thus, not all approaches considered within the history of Washington Aqueduct efforts achieve the current objectives equally well.

The first step in the NEPA alternative identification process was to review the history of Washington Aqueduct's efforts to develop a residuals management plan and compile a full range of possible alternatives that have the potential to meet the stated purpose and need. The following documents were reviewed to develop the historical list:

- Department of the Army, Baltimore District, Corps of Engineers, Washington Aqueduct. "Dalecarlia Water Treatment Plant and Georgetown Reservoir Residuals Collection and Treatment Engineering Estimate (35percent Design)." Whitman, Requardt, and Associates. November 1996
- Department of the Army, Baltimore District, Corps of Engineers, Washington Aqueduct. "Dalecarlia Water Treatment Plant and Georgetown Reservoir Residuals Disposal Facilities Residuals Disposal Study." Whitman, Requardt, and Associates in association with Malcolm Pirnie, Inc. September 1995
- Department of the Army, Baltimore District, Corps of Engineers, Washington Aqueduct. "Draft NPDES Permit Review Memorandum on Residual Solids Evaluations." AH Environmental Consultants, Inc., and Greeley and Hansen LLC. May 30, 2003

To this list were added new alternatives and approaches with the potential to improve the historical alternatives. Suggestions made by the public during the scoping process, such as plasma heat treatment of residuals were also considered. This effort culminated in a list of 26 alternatives, which were screened following the Scoping Meeting and discussed in more detail in the Description of Proposed Action, and Alternatives (DOPAA) issued in May 2004.

Subsequent to the issuance of the DOPAA, the public was given another opportunity to suggest additional residuals alternatives for consideration. The second alternative suggestion period closed on November 15, 2004. A total of 102 additional residuals alternatives and options were received from the public during the additional alternative suggestion period. This section discusses the characteristics of both sets of residuals alternatives and options and presents the results of the associated screening analysis.

2.3 Alternatives Screening Process and Criteria

Screening of alternatives is an approach commonly used as part of the NEPA process to identify the feasible alternatives and ensure a reasonable range of alternatives for detailed evaluation in the DEIS. In this report, each previously or newly identified alternative (or individual component of a residuals management approach) was screened against the established criteria. The draft predetermined screening criteria were circulated for public review and comment during the Scoping Process before they were applied to the alternatives.

The screening criteria used to judge attainment of purpose and need are:

- Is able to comply with the requirements of the FFCA, including schedule
- Preserves the quality, reliability, and redundancy of the existing water treatment and distribution system
- Uses proven methods (i.e., proven design water treatment processes, construction equipment and techniques, and operating principles)

- Complies with NPDES permit to reduce or eliminate discharge to the Potomac River
- Does not produce an undue economic hardship on Washington Aqueduct customers by adding new facilities that are not needed for other feasible alternatives that cost more than 30 percent of the baseline budget of $50 million.
- Complies with zoning and land use regulations, institutional constraints, and other Federal and local regulations including, but not limited to, the Endangered Species Act, wetland protection requirements, and cultural resource protection requirements
- Reduces residual quantities, if possible

2.4 May 2004 Alternatives Description and Screening Results

2.4.1 May 2004 Alternatives Description

The following 26 alternatives were initially evaluated for this project. Since many of the alternatives are similar, they have been grouped in categories based on similarity of critical components, such as the method of dewatering residuals, transport, or the location of processing facilities.

Alternative 1 is a "No-Action" alternative that provides no changes to the current practice of discharging residuals to the Potomac River as allowed by the previous NPDES permit. Although this alternative clearly does not meet the purpose and need for the project because it does not comply with the current NPDES permit, it must be examined under NEPA for comparison to other alternatives.

Alternatives 2 through 8 do not require continuous trucking of residuals from the Dalecarlia WTP. They consist of the following alternatives:

- Alternative 2: Process water treatment residuals at Dalecarlia WTP and dispose of them in the Dalecarlia monofill. Process Forebay residuals by current methods and periodically haul offsite.
- Alternative 3: Coprocess water treatment and Forebay residuals at Dalecarlia WTP and codispose in Dalecarlia monofill.
- Alternative 4: Pump unthickened water treatment residuals via Potomac Interceptor to the District of Columbia Water and Sewer Authority (DC WASA) Blue Plains Advanced Wastewater Treatment Plant. Process Forebay residuals by current methods and periodically haul.
- Alternative 5: Thicken water treatment residuals at Dalecarlia WTP, then pump via a new pipeline to the District of Columbia Water and Sewer Authority (DC WASA) Blue Plains Advanced Wastewater Treatment Plant. Process Forebay residuals by current methods and periodically haul.
- Alternative 6: Thicken water treatment residuals at Dalecarlia WTP, then transport by barge to the Blue Plains Advanced Wastewater Treatment Plant. Process Forebay residuals by current methods and periodically haul.

- Alternative 7: Thicken water treatment residuals at Dalecarlia WTP, then pump via pipeline to neighboring water utility. Process Forebay residuals by current methods and periodically haul.
- Alternative 8: Thicken water treatment residuals at Dalecarlia WTP, then pump via pipeline to a new dewatering location. Process Forebay residuals by current methods and periodically haul.

Alternatives 9 through 11 anticipate discharging some portion of the residuals, or related process stream, back to the Potomac River. They consist of the following alternatives:

- Alternative 9: Process most water treatment residuals at the Dalecarlia WTP and haul offsite, but dilute some residuals for discharge back to the Potomac River. Process Forebay residuals by current methods and periodically haul.
- Alternative 10: Renegotiate NPDES permit to allow discharge of all residuals to the Potomac River.
- Alternative 11: Process water treatment residuals at Dalecarlia WTP and haul offsite. Process Forebay residuals by current methods and periodically haul. Dilute side streams and discharge to the Potomac River.

Alternatives 12 through 15 involve constructing residuals facilities in the Dalecarlia Reservoir. They consist of the following alternatives:

- Alternative 12: Store all residuals in the Dalecarlia Reservoir prior to processing at the Dalecarlia WTP. Coprocess Forebay and water treatment residuals. Dispose of in Dalecarlia and McMillan monofills.
- Alternative 13: Store all residuals in the Dalecarlia Reservoir prior to processing at the Dalecarlia WTP. Coprocess Forebay and water treatment residuals and haul to offsite disposal.
- Alternative 14: Construct new sedimentation basins at the Dalecarlia Reservoir and process all residuals at the Dalecarlia WTP. Coprocess Forebay and water treatment residuals and haul to offsite disposal.
- Alternate 15: Coagulate all flow in the Dalecarlia Reservoir and process all residuals at the Dalecarlia WTP. Coprocess Forebay and water treatment residuals and haul to offsite disposal.

Alternatives 16 through 23 anticipate constructing residuals facilities at the McMillan WTP. They consist of the following alternatives:

- Alternative 16: Thicken water treatment residuals at the McMillan WTP and dewater at an existing wholesale customer’s treatment facility. Contract haul dewatered residuals. Process Forebay residuals by current methods and periodically haul.
- Alternative 17: Coprocess Forebay and water treatment residuals at the McMillan WTP. Dispose of residuals via contract hauling from the McMillan WTP.

- Alternative 18: Process water treatment residuals at the McMillan WTP and haul offsite. Process Forebay residuals by current methods and periodically haul.
- Alternative 19: Thicken water treatment residuals at the McMillan WTP and dewater at an existing wholesale customer's dewatering facility. Dispose of residuals via contract hauling from the existing facility. Discharge Forebay residuals to the Potomac River.
- Alternative 20: Thicken water treatment residuals at the Dalecarlia WTP and Georgetown Reservoir and dewater at the McMillan WTP. Dispose of water treatment residuals via contract hauling from the McMillan WTP. Process Forebay residuals via current methods and periodically haul.
- Alternative 21: Store residuals at lagoons at Forebay, Dalecarlia WTP, and McMillan WTP. Thicken and dewater residuals with portable equipment and dispose via contract hauling from all locations.
- Alternative 22: Store water treatment residuals in Dalecarlia and Georgetown Reservoirs prior to thickening and dewatering at Dalecarlia and McMillan WTPs. Dispose of water treatment residuals via contract hauling from the Dalecarlia and McMillan WTPs. Process Forebay residuals via current methods and periodically haul.
- Alternative 23: Store water treatment residuals in the McMillan Reservoir prior to dewatering at the McMillan WTP. Dispose of water treatment residuals via contract hauling from McMillan WTP. Process Forebay residuals via current methods and periodically haul.

Alternatives 24 through 26 anticipate constructing residuals facilities at the Dalecarlia WTP. They consist of the following alternatives:

- Alternative 24: Coprocess Forebay and water treatment residuals at the Dalecarlia WTP. Dispose of residuals via contract hauling from the Dalecarlia WTP.
- Alternative 25: Process water treatment residuals at the Dalecarlia WTP and dispose via contract hauling. Process Forebay residuals via current methods and periodically haul.
- Alternative 26: Use plasma oven technology to process Forebay and water treatment residuals at the Dalecarlia WTP. Dispose of residuals via contract hauling from the Dalecarlia WTP.

The EFS was prepared for further detailed evaluation of these residuals management alternatives and provides detailed technical information on the identified alternatives. The EFS also documents the evaluation of the alternative methods for the collection and disposal of Forebay residuals and water treatment residuals (produced at the Dalecarlia Water Treatment Plant and Georgetown Reservoir). The results of the study included a determination of feasible alternatives with consideration given to the most environmentally sound, economical, and practical methods. This document was finalized on May 28, 2004, and will be available for review in the Document Repository as part of the DEIS Administrative Record and is currently available for review on the project website referenced in section 4.1.2.7 of this report.

2.4.2 May 2004 Alternatives Screening Results

Table 2-2 describes each of the 26 alternatives considered in this analysis and summarizes the results of the screening process. Three of the alternatives were found to be feasible based upon the screening analysis. In addition, the no-action alternative will be carried forward into the DEIS, as required by the NEPA process. The three feasible alternatives are described in more detail in Section 2.7 of this report.

The remaining 22 alternatives did not meet one or more of the screening criteria. Table 2-2 provides a brief list of the screening criteria that were not satisfied for each of these 22 alternatives. The reasons for considering these alternatives infeasible are also described in more detail following Table 2-2.

More extensive details on each alternative and the associated screening process are also provided in the EFS. A "Scope of Statement" that identifies the detailed studies, investigations, and evaluations, which will be carried out for each of the final alternatives, was issued for public review before preparation of the DEIS.

TABLE 2-2
May 2004 Alternatives Screening Results Summary

No.	Description	Screening Result (Consistent/ Inconsistent with Screening Criteria)	Unsatisfied Screening Criteria
1	No Action	Analyzed in detail in the DEIS per NEPA requirements	• N/A
Alternatives 2 to 8: Alternatives That Do Not Include Continuous Trucking from the Dalecarlia WTP			
2	Process water treatment residuals at Dalecarlia WTP and dispose in Dalecarlia monofill. Process Forebay residuals by current methods and periodically haul.	Consistent	• None
3	Coprocess water treatment and Forebay residuals at Dalecarlia WTP and codispose in Dalecarlia monofill.	Inconsistent	• Reliability and redundancy
4	Pump unthickened water treatment residuals via Potomac Interceptor to DC WASA Blue Plains Advanced Wastewater Treatment Plant. Process Forebay residuals by current methods and periodically haul.	Inconsistent	• Reliability and redundancy • Economic • Zoning, land use, and Federal and local regulations
5	Thicken water treatment residuals at Dalecarlia WTP, and then pump via a new pipeline to DC WASA Blue Plains Advanced Wastewater Treatment Plant. Process Forebay residuals by current methods and periodically haul.	Consistent	• None

TABLE 2-2
May 2004 Alternatives Screening Results Summary

No.	Description	Screening Result (Consistent/ Inconsistent with Screening Criteria)	Unsatisfied Screening Criteria
6	Thicken water treatment residuals at Dalecarlia WTP, and then transport by barge to DC WASA Blue Plains Advanced Wastewater Treatment Plant. Process Forebay residuals by current methods and periodically haul.	Inconsistent	• Reliability and redundancy • Zoning, land use, and local regulations • Proven methods
7	Thicken water treatment residuals at Dalecarlia WTP, and then pump via pipeline to neighboring water utility. Process Forebay residuals by current methods and periodically haul.	Inconsistent	• Economic (FCWA) • Institutional constraints (FCWA, WSSC)
8	Thicken water treatment residuals at Dalecarlia WTP and pump via pipeline to new dewatering location. Process Forebay residuals by current methods and periodically haul.	Inconsistent	• FFCA • Economic
Alternatives 9 to 11: Alternatives with a Discharge to the Potomac River			
9	Process most water treatment residuals at Dalecarlia WTP and haul offsite, but dilute some residuals for discharge back to Potomac River. Process Forebay residuals by current methods and periodically haul.	Inconsistent	• Reliability and redundancy • NPDES
10	Renegotiate NPDES Permit to allow discharge of all residuals to Potomac River.	Inconsistent	• NPDES
11	Process water treatment residuals at Dalecarlia WTP and haul offsite. Process Forebay residuals by current methods and periodically haul. Dilute treatment side streams and discharge to the Potomac River.	Inconsistent	• Reliability and redundancy • NPDES
Alternatives 12 to 15: Alternatives Involving the Dalecarlia Reservoir			
12	Store all residuals in the Dalecarlia Reservoir prior to processing at the Dalecarlia WTP. Coprocess Forebay and water treatment residuals. Dispose in Dalecarlia & McMillan monofills.	Inconsistent	• Reliability and redundancy
13	Store all residuals in the Dalecarlia Reservoir prior to processing at the Dalecarlia WTP. Coprocess Forebay and water treatment residuals and haul to offsite disposal.	Inconsistent	• Reliability and redundancy
14	Construct new sedimentation basins at the Dalecarlia Reservoir and process all residuals at Dalecarlia WTP. Coprocess Forebay and water treatment residuals and haul to offsite disposal.	Inconsistent	• Reliability and redundancy

TABLE 2-2
May 2004 Alternatives Screening Results Summary

No.	Description	Screening Result (Consistent/ Inconsistent with Screening Criteria)	Unsatisfied Screening Criteria
15	Coagulate all flow in the Dalecarlia Reservoir and process all residuals at the Dalecarlia WTP. Coprocess Forebay and water treatment residuals and haul to offsite disposal.	Inconsistent	• Reliability and redundancy
Alternatives 16 to 23: Alternatives with Facilities at the McMillan WTP			
16	Thicken water treatment residuals at the McMillan WTP and dewater at an existing wholesale customer's treatment facility. Contract haul dewatered residuals. Process Forebay residuals by current methods and periodically haul.	Inconsistent	• FFCA • Reliability and redundancy • Economic • Proven methods
17	Coprocess Forebay and water treatment residuals at the McMillan WTP. Disposal of residuals via contract hauling from McMillan WTP. *(Same as Alternative 18 w/ coprocessing)*	Inconsistent	• Reliability and redundancy • FFCA • Economic and proven methods
18	Process water treatment residuals at the McMillan WTP and haul offsite. Process Forebay residuals by current methods and periodically haul.	Inconsistent	• FFCA • Reliability and redundancy • Economic • Proven methods
19	Thicken water treatment residuals at the McMillan WTP and dewater at an existing wholesale customer's treatment facility. Dispose of residuals via contract hauling from the existing facility. Discharge Forebay residuals to the Potomac River.	Inconsistent	• FFCA • Reliability and redundancy • Economic • Proven methods • NPDES

TABLE 2-2
May 2004 Alternatives Screening Results Summary

No.	Description	Screening Result (Consistent/ Inconsistent with Screening Criteria)	Unsatisfied Screening Criteria
20	Thicken water treatment residuals at the Dalecarlia WTP and the Georgetown Reservoir and dewater at the McMillan WTP. Dispose of water treatment residuals via contract hauling from McMillan WTP. Process Forebay residuals by current methods and periodically haul.	Inconsistent	• FFCA • Reliability and redundancy • Economic • Proven methods
21	Store residuals in lagoons at Forebay, Dalecarlia WTP, and McMillan WTP. Thicken and dewater residuals with portable equipment and dispose via contract hauling from all locations.	Inconsistent	• FFCA • Reliability and redundancy • Economic • Proven methods
22	Store water treatment residuals in Dalecarlia and Georgetown Reservoirs, prior to thickening and dewatering at the Dalecarlia and McMillan WTPs. Dispose of water treatment residuals via contract hauling from the Dalecarlia and McMillan WTPs. Process Forebay residuals by current methods and periodically haul.	Inconsistent	• FFCA • Reliability and redundancy • Economic • Proven methods
23	Store water treatment residuals in McMillan Reservoir prior to dewatering at the McMillan WTP. Dispose of water treatment residuals via contract hauling from the McMillan WTP. Process Forebay residuals by current methods and periodically haul.	Inconsistent	• FFCA • Reliability and redundancy • Economic • Proven methods
Alternatives 24 through 26: Alternatives with Facilities at the Dalecarlia WTP			
24	Coprocess Forebay and water treatment residuals at Dalecarlia WTP. Dispose of residuals via contract hauling from the Dalecarlia WTP. *(Same as Alternative 25 w/ coprocessing)*	Inconsistent	• Reliability and redundancy
25	Process water treatment residuals at the Dalecarlia WTP; and dispose via contract hauling. Process Forebay residuals by current methods and periodically haul.	Consistent	• None
26	Use plasma oven technology to process Forebay and water treatment residuals at the Dalecarlia WTP. Dispose of residuals via contract hauling from the Dalecarlia WTP. *(Same as Alternative 25 w/ coprocessing and plasma oven step)*	Inconsistent	• Reliability and redundancy • Economic • Proven methods

2.4.3 Description of May 2004 Alternatives Inconsistent with Screening Criteria

2.4.3.1 Alternative 3: Coprocess Water Treatment and Forebay Residuals at Dalecarlia WTP and Codispose in Dalecarlia Monofill

This alternative is the same as Alternative 2 except that it provides for coprocessing of Forebay and water treatment residuals, rather than processing the Forebay residuals separately as is currently practiced. Alternative 2 was selected as a feasible alternative, and is therefore described further in Section 2.7.

Reliability and Redundancy. Except for Alternative 26, all options involving the coprocessing of Forebay residuals with water treatment residuals were eliminated in the EFS due to reliability and redundancy concerns. The Forebay residuals contain a much higher percentage of grit and sand than do the water treatment residuals. Coprocessing the two materials would require all processes to be sized for a much greater volume of flow. Additionally, coprocessing would result in a greater volume of dewatered residuals (in all cases except for Alternative 26), which is not consistent with the purpose and need. Coprocessing would also result in an unacceptable level of wear on process equipment. This rationale does not apply to Alternative 26 because there is no disadvantage in volume reduction from coprocessing both residual streams with this technology. Therefore, coprocessing of residuals for Alternative 26 was not eliminated under this rationale.

2.4.3.2 Alternative 4: Pump Unthickened Water Treatment Residuals via Potomac Interceptor to Blue Plains. Process Forebay Residuals by Current Methods and Periodically Haul

This alternative calls for residuals to be discharged directly to the Potomac Interceptor for conveyance to Blue Plains Advanced Wastewater Treatment Plant. The residuals would be commingled with the wastewater in the interceptor and processed as part of the influent at Blue Plains. Note that Alternative 5, which calls for transporting residuals to Blue Plains using a separate pipeline in the Potomac Interceptor right-of-way, was selected as feasible and is described in Section 2.7.

Reliability and Redundancy. Discussions with the DC WASA, which operates the Blue Plains plant, identified several issues that would affect DC WASA's operational capabilities to handle the residuals with incoming flow.

Peak quantities of residuals would constitute up to 80 percent of the typical amount of residuals currently processed at Blue Plains. This amount of additional solids loading cannot be accommodated at the Blue Plains plant without providing equalization to significantly decrease the peak quantities sent to the plant. An extremely large volume of storage (an infeasible amount) would be required to equalize the solids loading.

It is anticipated that a significant percentage of the residuals associated with this alternative would settle in the Blue Plains primary clarifiers. However, the primary clarifiers are one of the limiting treatment processes at the plant, making it difficult to accommodate this amount of additional loading.

Residuals passed on to secondary treatment would not, as inert material, be beneficial to the biological treatment operations. The additional material would also compromise the operations because secondary clarifiers would be overloaded by this degree of additional loading, effectively reducing the treatment capacity of the existing plant.

The digesters, which would ultimately process the residuals, are also a biological process that would not benefit from inert material. DC WASA does not have capacity in the digesters currently; new digesters will be online in 2008.

This alternative would have a significantly negative impact on the operations at Blue Plains. Because DC WASA does not have the capacity to accept all of the residuals as influent from the Potomac Interceptor, this alternative fails to provide a reliable method that protects the ability of Washington Aqueduct to produce drinking water.

Economic Consideration. The economic impact of discharging Washington Aqueduct's water treatment residuals into the Potomac Interceptor was not calculated. However, the cost would likely be considerable. Additional flow into the Potomac Interceptor would exacerbate the existing DC WASA Combined Sewer Overflow (CSO) problem. Thus, during wet weather events the water treatment residuals, along with raw sanitary sewage, could overflow and be discharged to the Potomac River. The Combined Sewer System Long Term Control Plan has identified $250 million in improvements to solve the existing problems in Potomac River portion of the conveyance system. These proposed improvements include the rehabilitation of the Potomac Pumping Station, the consolidation of CSOs in the Georgetown waterfront area, and the construction of a 58-million-gallon Potomac Storage Tunnel. Although DC WASA is actively working on this program, the Long-Term Control Plan is so extensive that it has an implementation period of 15 to 40 years.

At the Blue Plains facility, impacts were identified for most of the major treatment processes:

- Primary clarification
- Biological treatment and secondary clarification
- Anaerobic digestion
- Dewatering

Because of the number of processes impacted, and the complexities of the programs that are currently underway to address treatment and capacity issues at the plant, a detailed cost estimate for the impact of the discharge of water treatment residuals to Blue Plains through the Potomac Interceptor was not developed for this evaluation. Using a conservative estimate of $5 to $10 to construct a gallon of treatment capacity (assuming that biological treatment can be excluded), and assuming that treatment capacity for at least an additional 4 mgd would be required (the approximate difference between Washington Aqueduct average and peak flows), then it could be assumed that an impact to the existing facilities of $20 million to $40 million could be established. This impact would not include the cost of residuals collection and thickening facilities at the Washington Aqueduct. In addition, Washington Aqueduct would need to provide extensive storage and flow equalization facilities to help minimize the impact of water treatment residual flows on the existing CSO situation and on treatment processes at Blue Plains. Since these costs are at least equal to the costs of providing processing facilities at the Washington Aqueduct, this option can be eliminated on the basis of economic considerations.

Zoning, Land Use, Institutional Constraints, and Federal and Local Regulations. The discharge of water treatment residuals to Blue Plains via sewer would have major impacts on the treatment processes at this facility. In many communities, the discharge of water treatment residuals to the sewer system is a common practice. However, the representative of DC WASA who was contacted for this evaluation indicated that operations staff already find it challenging to adjust the treatment processes to accommodate the current highly variable flow and load conditions. Therefore, discharge to the sewer system is not feasible in this case.

Previous work conducted by Whitman Requardt & Associates evaluated this option in detail. As part of the previous effort, the District of Columbia Department of Public Works (the entity that operated Blue Plains before the creation of DC WASA) stated that this alternative was not acceptable to their agency. In response to a more recent request by another jurisdiction for the discharge of biosolids into the Potomac Interceptor, DC WASA cited Section 4, Paragraph 3 of District of Columbia Order No 64-1680 (Regulations for use of the Potomac Interceptor), which prohibits "sludges or other materials from sewage or industrial waste treatment plants or from water treatment plants."

In the time since the writing of the EFS (May 2004) DC WASA has indicated to Washington Aqueduct, in writing, that it is not willing to accept water treatment residuals from the Washington Aqueduct. The reasons cited relate primarily to the potential need to provide additional facilities at Blue Plains for future treatment needs related to goals for the protection of the Chesapeake Bay and the handling of wet weather flows.

Therefore, Alternative 4 can be eliminated from further consideration due to institutional constraints, based on discussions with DC WASA and on past responses to requests of this nature.

Additional Consideration. Until the combined sewer issue is addressed for the DC WASA conveyance system, there is no way to guarantee that residuals discharged to the interceptor will not be discharged to the Potomac River as part of a CSO event. Management techniques (e.g., equalization storage, instrumentation and controls, etc.) required to completely control overflows would be cost prohibitive and operationally difficult. Since the elimination of discharges of water treatment residuals to the Potomac River is a fundamental goal of the purpose and need of this project, Alternative 4 is in violation of this requirement.

2.4.3.3 Alternative 6: Thicken Water Treatment Residuals at Dalecarlia WTP, Then Transport by Barge to Blue Plains. Process Forebay Residuals by Current Methods and Periodically Haul

This alternative attempts to eliminate local truck traffic associated with residuals by transporting all residuals via barge to the Blue Plains Advanced Wastewater Treatment Plant for further processing and disposal.

Reliability and Redundancy. Barge size must be limited because of water depths and bridge clearances along the route:

- Arlington Memorial Bridge: clear width of 80 ft with vertical clearance of 30 ft
- 14th St. Bridge Complex: clear width of 104 ft with vertical clearance of 18 ft above mean high water (MHW), resulting in maximum air draft of 14 to 16 ft for barge/pushboat operation
- Obstructions (old stone bridge piers) at 10 ft below mean low water (MLW) just north of Key Bridge
- Minimum water depth of 10 ft below MLW resulting in maximum water draft of 7 ft for barge/pushboat operation

Considering these limitations as many as six barges per day (each way) must be used. These barges must negotiate difficult navigational conditions, including limited water depths, horizontal and vertical bridge clearances, and bottom conditions along the route. Figure 2-1 illustrates the route along the Potomac River. With six barges per day in each direction negotiating these conditions, the risk of accidents would be unacceptably high. An accident would halt residuals processing and could jeopardize the water treatment process. In addition, the channel freezes and at times navigation is curtailed for security reasons. Thus the combinations of potential accidents and non-navigational periods put the production of potable water significantly at risk and the alternative does not meet the criterion.

Zoning, Land Use, Institutional Constraints, and Local and Federal Regulations. The industrial-scale barging operation would not be compatible with current land uses or the purpose and objectives of the Chesapeake & Ohio (C&O) National Historic Park, which is zoned for "parks, recreation, and open space." If the route of the barging operation were to extend beyond the Key Bridge, the barging operation (including potential dredging to widen the channel) would have major impacts on the park and its operation.

Proven Methods. There is no existing barging operation in the Georgetown Channel or in Washington Harbor. To initiate such an operation would involve a major commitment of planning, permitting, engineering, and financial resources. In addition, the risks associated with the reliability and redundancy of such an operation are clear, making the concept "unproven."

2.4.3.4 Alternative 7: Thicken Water Treatment Residuals at Dalecarlia WTP, Then Pump via Pipeline to Neighboring Water Utility. Process Forebay Residuals by Current Methods and Periodically Haul

This alternative eliminates local truck traffic associated with residuals by transporting all residuals by pipeline to either the Washington Suburban Sanitary Commission's (WSSC's) Potomac Water Treatment Plant or the Fairfax County Water Authority's (FCWA's) Corbalis Water Treatment Plant for further processing and disposal.

Economic Considerations. Preliminary cost estimates indicate that the FCWA alternative, which requires a new pipeline approximately 18 miles in length, would exceed the cost criterion.

Zoning, Land Use, Institutional Constraints, and Local and Federal Regulations. The Washington Aqueduct does not have any formalized relationship with WSSC or FCWA.

Each of these entities serves different jurisdictions and customer bases, and they have had no previous need to enter into cooperative agreements with Washington Aqueduct. In discussions and written correspondence with both WSSC and FCWA both entities declined the opportunity to consider accepting Washington Aqueduct residuals for processing or serving as a regional residuals processing operation stating that it is not in the utility's best interest to do so. In addition, because there exist alternatives that work within present institutional frameworks and better meet the mission of the stakeholders, this alternative is eliminated from consideration.

2.4.3.5 Alternative 8: Thicken Water Treatment Residuals at Dalecarlia WTP and Pump via Pipeline to a New Dewatering Location. Process Forebay Residuals by Current Methods and Periodically Haul

This alternative attempts to eliminate local truck traffic associated with residuals by transporting all residuals by pipeline to a new dewatering facility for further processing and disposal.

FFCA. This alternative would require additional time to identify, evaluate, and obtain a parcel of land suitable for a new dewatering facility. This effort would also require time to obtain easements for a new pipeline route. The EFS includes the development of a time line (Figure 2-2) to incorporate these siting and routing evaluations, which must be completed before the comparison of alternatives can be conducted as part of the engineering options analysis and DEIS. The additional effort would prevent Washington Aqueduct from meeting the FFCA schedule, which requires the completion of engineering options analysis by December 20, 2004 and identification of engineering option by June 2005.

Economic Considerations. Preliminary cost estimates indicate that this alternative, which requires acquisition of approximately 10 acres of suitable industrial or commercial land and a new pipeline, would exceed the cost criterion.

2.4.3.6 Alternatives 9–11: Alternatives with a Discharge to the Potomac River

These alternatives incorporate a discharge of the residuals or the liquid waste stream from the dewatering process to the Potomac River. Alternative 10 calls for a renegotiation of the permit, whereas Alternatives 9 and 11 attempt to meet the current permit by diluting the waste stream to meet the allowable total suspended solids (TSS) concentration. Because the river water is too high in TSS concentration to serve as dilution water, Dalecarlia Reservoir water must be used. Preliminary calculations indicate that at least 17 percent of the Dalecarlia WTP production capacity would be needed for this dilution. Following wet weather events, the Dalecarlia Reservoir water is also too high in TSS to serve as dilution water, and therefore additional storage of low-turbidity water would have be provided for the waste stream.

Reliability and Redundancy. Alternatives 9 and 11 fail to provide a reliable and redundant system for handling the residuals and would significantly reduce the reliability and redundancy of the Dalecarlia WTP production process by diverting production capacity to dilution of the waste stream.

NPDES. Alternative 10 fails to meet the current NPDES permit, which has been finalized after several years of negotiation.

Additional Considerations. Alternatives 9 through 11 fail to meet the purpose and need of the project because they do not minimize or eliminate the residuals discharge to the Potomac River. Alternatives 9 and 11 additionally fail to meet the purpose and need due to the significant interference with process operations associated with diverting reservoir water to the waste stream.

2.4.3.7 Alternatives 12–15: Alternatives Involving the Dalecarlia Reservoir

These alternatives relied on storage of residuals with periodic dredging in various combinations of reservoirs and new sedimentation basins.

Reliability and Redundancy. These alternatives fail to meet the reliability and redundancy criterion due to the reduction or elimination of the Dalecarlia Reservoir's storage capacity.

In addition, the Dalecarlia Reservoir acts as a sedimentation basin and dampens the large swings in turbidity that occur in the Potomac River, stabilizing the amount of treatment that is required in the downstream plant. Without the reservoir serving that purpose, there would be an impact to plant operations. Additional dredging would also degrade water quality in the reservoir with similar impact on plant operations.

2.4.3.8 Alternatives 16–23: Alternatives with Facilities at the McMillan WTP

Eight alternatives were identified with residuals processing at the McMillan WTP. The specifics of each alternative differ, but each involves constructing conveyance pipelines, including one or more within the City Tunnel to the McMillan WTP. Since the residuals pipeline in the City Tunnel is the most critical element in of these alternatives, the feasibility evaluation was based primarily on the feasibility of this pipeline.

FFCA. Construction in the City Tunnel adds complexity and interdependency to the residuals construction project. It would require that the Georgetown Reservoir and the McMillan WTP be out of service for the duration of construction in the tunnel. During this time, all production would need to occur at the Dalecarlia WTP, and therefore work on the sedimentation basins could not occur concurrently with the tunnel work. The FFCA schedule allows approximately 1.5 years of construction time for compliance in at least one sedimentation basin, and 3 years for full compliance. With an estimated duration of 12 to 24 months dedicated to the construction of the pipeline in the City Tunnel, there would not be adequate time for design, permitting approvals, and construction of the other elements of the alternative to meet the FFCA deadlines.

Reliability and Redundancy. These alternatives would have both short-term and long-term impacts on reliability and redundancy. Short-term impacts will occur during construction of the pipeline in the City Tunnel. As discussed above, the Dalecarlia WTP would need to meet the demand for 12 to 24 months during this construction. The Dalecarlia WTP has a maximum finished water capacity of 220 mgd and the peak historical demand during summer months is 260 mgd. Thus, Washington Aqueduct will be unable to meet the demand and provide a reliable supply of water during the peak demand periods if construction in the City Tunnel is allowed to occur 12 months per year. Discontinuing construction in the City Tunnel during the high demand periods of the year, to allow the McMillan WTP to be placed back into service, could allow the Washington Aqueduct to meet peak demands, but it would likely lengthen the timeframe required to complete the

City Tunnel piping work. This could further restrict the amount of time available to construct the continuous residuals removal facilities at each of the existing Dalecarlia sedimentation basins and reduce the overall reliability and redundancy of the treatment process during the construction period.

Long-term impacts include maintenance and repair of the pipeline in the City Tunnel. The tunnel is the only means of providing the McMillan WTP with settled water. A failure of the residuals pipeline could result in contamination of a major portion of the water supply and possibly an inability to process residuals. Since the tunnel is rarely taken out of service, maintenance of the pipeline to prevent failures, and repair if a failure were to occur, will be extremely difficult. Even redundant and double-walled installation of the pipeline would not eliminate this risk.

Economic Considerations. Preliminary cost estimates indicate that all of the McMillan alternatives would fail to meet the cost criterion due to the construction of the pipeline in the City Tunnel.

Proven Methods. Although the construction of the residuals pipeline within the tunnel is feasible in concept, the tunnel has not been dewatered for inspection in many years. Therefore, the current condition of the tunnel is unknown. The risks associated with undertaking such an operation without a thorough evaluation of the tunnel's condition are clear, making the whole concept "unproven."

2.4.3.9 Alternative 24: Coprocess Forebay and Water Treatment Residuals at Dalecarlia WTP. Dispose of Residuals via Contract Hauling from the Dalecarlia WTP

This alternative is the same as Alternative 25 except that it provides for coprocessing of Forebay and water treatment residuals rather than the processing of Forebay residuals separately, as is currently practiced. Alternative 25 was selected as a feasible alternative, and is therefore described further in Section 2.7.

Reliability and Redundancy. Coprocessing would create a much larger quantity and volume of residuals, which would both increase the operations and maintenance requirements for thickening and dewatering and require additional trucks to haul the residuals to the offsite disposal location. Thus, no advantages were identified for coprocessing, and Alternative 25 was selected as the feasible alternative.

2.4.3.10 Alternative 26: Use Plasma Oven Technology to Process Forebay and Water Treatment Residuals at Dalecarlia WTP. Dispose of Residuals via Contract Hauling from the Dalecarlia WTP

This alternative involves the utilization of plasma oven technology for the processing of both Forebay and water treatment residuals. The process would convert the residuals to an inorganic slag material and a combustible gas. The technology could be used for either water treatment residuals alone, or for coprocessed water treatment and Forebay residuals. Coprocessing of Forebay and water treatment residuals, while not recommended due to reliability and redundancy considerations, was included in this alternative because, unlike the other coprocessing alternatives, there is no disadvantage in terms of volume reduction resulting from the plasma treatment of the residuals.

Reliability and Redundancy. This technology has been typically used in the treatment of hazardous waste and contaminated materials, such as soil. To our knowledge, this technology has not been applied to the processing of water treatment residuals. The degree of residual volume reduction and gas generation is anticipated to be lower than what is found in typical applications due to the lower levels of organic constituents in the Forebay and water treatment residuals. The uncertainty with the operation and effectiveness of a plasma oven system and uncertainty in terms of the options for disposal or use of the final product creates concern over the continual management of residuals with such a system, proving that this alternative fails the reliability and redundancy criterion.

Economic Considerations. This technology requires a significant capital investment and has presumably high long-term maintenance and operating costs, primarily due to the large amounts of heat required to maintain the process. According to plasma oven technology system vendors, a 20 percent to 30 percent solid cake material is preferred for inputting into the system, which means that equipment is required for both thickening and dewatering in addition to the plasma oven equipment. The savings that this technology may provide in terms of reduced residual handling and disposal costs is not expected to offset the expected high capital, operations and maintenance costs. The additional electricity requirement for this technology alone is expected to be on the order of 10 percent of the current annual Washington Aqueduct operating budget.

It is estimated that it would cost a minimum of $20 million to install a plasma system at the Washington Aqueduct (in addition to all other costs associated with residuals, collection, conveyance, and processing). Therefore, this alternative can be eliminated as inconsistent with the screening criterion for economic considerations because these additional costs are greater than 30 percent of the $50 million baseline budget for the project.

Proven Methods. To our knowledge, this technology has not been applied to the processing of water treatment residuals. Therefore, it is unproven and inconsistent with the screening criterion.

2.4.4 Description of May 2004 Alternatives Consistent with Screening Criteria

This section includes a short description of the alternatives that will be evaluated in more detail during the EFS. Additional details of these alternatives will be available in the draft DEIS.

2.4.4.1 Alternative 1: No Action Alternative

This alternative is retained as a NEPA requirement.

2.4.4.2 Alternative 2: Process Water Treatment Residuals at Dalecarlia WTP and Dispose in Dalecarlia Monofill. Process Forebay Residuals by Current Methods and Periodically Haul

Residuals from the Dalecarlia Sedimentation Basins and the Georgetown Reservoir would be collected and thickened/dewatered at the Dalecarlia WTP before being disposed of in the Dalecarlia monofill. Residuals from the Forebay would be processed separately as is currently practiced and periodically hauled offsite.

Facilities. Figure 2-3 shows a graphic description of facilities for this alternative. The figure indicates the sedimentation basins to be modified, the preliminary location of thickening and dewatering facilities, and the approximate footprint of the monofill. As currently conceived, the monofill would be approximately 50 ft tall on the Dalecarlia Parkway side and 80 ft tall on the Dalecarlia Reservoir side. The footprint of the monofill is anticipated to occupy approximately 30 acres.

Conveyance and Transport. Pipelines would convey coagulated residuals from both the Dalecarlia sedimentation basins and the Georgetown Reservoir to the Dalecarlia thickening facility. After thickening and dewatering, onsite trucks would be used to haul the residuals to the monofill. On average, six onsite truck trips per day (6 days per week) would be required.

2.4.4.3 Alternative 5: Thicken Water Treatment Residuals at Dalecarlia WTP, Then Pump via a New Pipeline to Blue Plains. Process Forebay Residuals by Current Methods and Periodically Haul

This alternative would eliminate truck traffic associated with residuals on the roads surrounding the Washington Aqueduct Reservation by conveying coagulated residuals to the Blue Plains Advanced Wastewater Treatment Plant for further processing and disposal. Residuals from the Forebay would be processed separately for onsite disposal as is currently practiced. Figure 2-4 illustrates an overview of this alternative.

Facilities. This alternative would involve similar sedimentation basin modifications and new thickening facilities in locations as shown in Figures 2-5 and 2-6. Dewatering facilities would be located at Blue Plains.

Conveyance and Transport. Pipelines would convey coagulated residuals from both the onsite sedimentation basins and the Georgetown Reservoir to the Dalecarlia thickening facility. Another dedicated pipeline within the right-of-way of the Potomac Interceptor would convey the thickened residuals to Blue Plains for final processing. This pipe would be approximately 10 miles in length and 12 inches in diameter.

2.4.4.4 Alternative 25: Process Water Treatment Residuals at the Dalecarlia WTP and Dispose via Contract Hauling. Process Forebay Residuals by Current Methods and Periodically Haul

This alternative consists of thickening and dewatering water treatment residuals at the Dalecarlia WTP. Residuals from the Dalecarlia sedimentation basins and the Georgetown Reservoir would be collected and thickened/dewatered at the Dalecarlia WTP. The disposal method would be contract hauling from Dalecarlia WTP to a permitted disposal facility.

Facilities. Figures 2-5 and 2-7 show a graphic description of facilities for this alternative. The figures indicate the locations of the sedimentation basins to be modified and the preliminary location of thickening and dewatering facilities.

Conveyance and Transport. Pipelines would convey water treatment residuals from both the onsite sedimentation basins and the Georgetown Reservoir to the Dalecarlia thickening facility. After thickening and dewatering, the residuals would be hauled by truck to a permitted offsite disposal facility. The estimated average number of truck trips is approximately eight per day (5 days per week.)

2.5 Public Alternatives Description and Screening Results

This section of the report evaluates alternatives that were provided by the public during the time period between the publication of the EFS in May 2004 and the cutoff date for the submission of alternatives by members of the public through the extended public involvement process (November 15, 2004). Many alternatives, and variations of new and previously identified alternatives, were provided during this time frame.

The public alternatives were evaluated using the same screening criteria presented in the EFS and used to evaluate the 26 original alternatives discussed in that document. The results of the screening process for the public alternatives are presented herein. Many of the public alternatives are similar to the other alternatives screened in the EFS. Where applicable, similar alternatives have been identified in the public alternative summary tables.

A supplement to the EFS will provide the same level of engineering evaluation for the public alternatives as was provided in the original EFS for the original 26 alternatives considered. This supplement to the EFS will be presented in the Administrative Record when the DEIS is published.

2.5.1 Public Alternative and Option Description

The public alternatives and options received between mid-September 2004 and November 15, 2004 are summarized in Table 2-3. The public contributed a total of 102 public alternatives and options.

Some of the alternatives were identified by more than one contributor, or are similar in nature. Consequently, there is some repetition within Table 2-3. The public alternatives have been assigned numbers in the approximate order by which they were accumulated into the table. To facilitate the screening process, and to make it easier for the reader to cross-reference this document with the EFS, the public alternatives were then grouped into categories, using the same category groupings developed to summarize alternatives within the EFS. These categories of alternatives are as follows:

- No action alternative
- Alternatives that do not require continuous trucking from the Dalecarlia WTP
- Alternatives with a discharge to the Potomac River
- Alternatives involving the Dalecarlia Reservoir
- Alternatives with facilities at the McMillan WTP
- Alternatives with facilities at the Dalecarlia WTP

In addition to the categories of alternatives listed above, the Supplement to the EFS will also examine a number of raw water intake improvement and treatment process optimization options provided by the public. These options could be common to a number of alternatives. For example, residuals collection is required for a number of alternatives, regardless of the chosen residuals processing or disposal method. As in the EFS, these options are discussed and evaluated separately from the alternatives.

2.5.2 Public Alternative and Option Screening Results

Table 2-4 describes each of the 94 public alternatives and 8 options considered in this analysis and summarize the results of the screening process. Two of the alternatives were found to be consistent with the screening criteria and 85 were found to be inconsistent with the screening criteria. The remaining 7 alternatives are still under evaluation. One of the two feasible alternatives (P84) represents a new disposal option for an existing alternative and will, therefore, not be evaluated in detail in the DEIS. The other consistent alternative (P71) will be evaluated in detail in the DEIS and is discussed further in Section 3 of this report.

Of the 8 public options, 6 were found to be inconsistent with the screening criteria and 2 were found to be consistent.

Table 2-4 provides a brief list of the screening criteria that were not satisfied for each of the inconsistent alternatives or options. The reasons for considering these alternatives or options infeasible are also described in more detail following Table 2-4.

More extensive details on each alternative and the associated screening process will also be provided in the Supplement to the EFS, which will be published as a part of the Draft Environmental Impact Statement in January, 2005.

2.5.3 Description of Public Alternatives Inconsistent with Screening Criteria

2.5.3.1 No Action Alternative

None of the public alternatives directly pertained to this alternative.

2.5.3.2 Alternatives That Do Not Require Continuous Trucking from Dalecarlia WTP

Many of the public alternatives were placed into this category. As noted on Table 2-3, they include Public Alternatives P1 through P67, P68, P70, P73, P74, P75, P85, P86, P88, P89, P90, P93 through 96, P98, P100 and P102. Table 2-5 summarizes the ultimate processing destination for these alternatives.

TABLE 2-5
Proposed Processing Locations for Alternatives That Do Not Require Continuous Trucking from Dalecarlia WTP

Processing Location	Alternative(s)
Blue Plains AWWTP (WASA)	P1–P48, P60 - P66, P70, P74, P75, P85, P86, P88, P89, P90, P95
Potomac WFP (WSSC)	P49–P53, P90, P101
Naval Surface Warfare Center at Carderock	P54–P57, P93
Corbalis WTP (FCWA)	P58–P59
Barge to a Bioreactor Landfill or an Island	P73, P98
Georgetown Reservoir	P68
Capital Crescent Trail to CSX Railroad	P94
Construct Tunnel to Dalecarlia Reservoir Monofill	P96
	P102

As shown on Table 2-3, the majority of these alternatives involve the transport of water treatment residuals from the Washington Aqueduct via pipeline to the Blue Plains Advanced Wastewater Treatment Facility for processing. These alternatives are similar to (or variations of) Alternatives 4 and 5 of the EFS. They typically involve the use of different construction methods, pipe materials, or pipe routes to address the issues associated with these alternatives.

As noted in the EFS, Alternative 4 involved the use of the Potomac Interceptor (PI), and downstream forcemains, for conveying *unthickened* water treatment residuals to Blue Plains. This alternative was screened out of consideration due to reliability and redundancy issues, economic considerations, and institutional constraints, based on conversations with operations staff at Blue Plains regarding the potential impact of the water treatment residuals on operations at Blue Plains.

Alternative 5 was developed for the conveyance of *thickened* water treatment residuals to Blue Plains via the existing Potomac Interceptor piping, and the downstream forcemains. By thickening residuals before conveying them to Blue Plains, the total volume of residuals that would be conveyed to Blue Plains for processing could be greatly reduced. Because a large number of issues related to the use of the Potomac Interceptor and the processing of water treatment residuals along with sewage at Blue Plains were identified, Alternative 5 was modified to include a separate pipeline that would be dedicated to water treatment residuals only. This alternative was carried forward into the DEIS for further evaluation.

Alternatives Designating Blue Plains as the Processing Destination. Public Alternatives P1 through P48 and Public Alternative P75 are variations to EFS Alternatives 4 and 5. They each would use segments of the WASA gravity and pressure collection system to convey water treatment residuals to Blue Plains for processing. This approach would separate the water treatment residuals from the sewage to avoid impacts on treatment processes at Blue

Plains by literally constructing a "pipe-in-a-pipe" within the existing gravity sewer lines of forcemains. The large number of alternatives in this category reflects various choices of piping material or pipeline route. This approach could, in principle, eliminate many of the construction, pipeline routing, and permitting issues associated with the construction of a new pipeline between the Dalecarlia WTP and the Blue Plains AWWTP.

The "pipe-in-a-pipe" concept was not discussed in the EFS with regard to the existing sewage delivery system. It was, however, discussed in detail with regard to the existing Georgetown and Washington City Tunnels. For alternatives involving the Washington City Tunnel, the approach was found to be inconsistent with screening factors related to the FFCA schedule, reliability and redundancy, economic considerations, and proven methods. For alternatives involving the Georgetown Tunnel (any alternative that would require water treatment residuals to be pumped from the Georgetown Reservoir to the Dalecarlia WTP) this alternative was considered to be feasible.

Several of the public alternatives use the pipe-in a-pipe concept. Therefore, further evaluation of this construction approach for the Supplement to the EFS is warranted. A preliminary evaluation indicates that actual implementation of the "pipe-in-a-pipe" concept within an active pipeline, such as the Potomac Interceptor, or by any of the alternative interceptor routes, would be challenging. At the time of this writing, the following issues associated with the construction of these 48 alternatives have been identified:

- Construction of medium to large diameter (12-inch) piping within an operational interceptor will be difficult. Pipe usually comes in standard 20-foot lengths, so just getting straight pipe lengths into the interceptor through the manhole openings will be a challenge. Consequently, construction would likely involve the temporary removal of manholes to obtain access to the interceptor system, and the subsequent bypass pumping of sewage around the segment of piping under construction. These activities would create the very same disturbances that this approach was intended to avoid.
- Several different choices of pipe materials are suggested in the list of public alternatives. These include ductile iron, high-density polyethylene (HDPE), stainless steel, and composite materials. Preliminary conversations with WASA have indicated that they would only be willing to accept stainless steel pipe. Therefore, alternatives using materials other than stainless steel should be eliminated from consideration.
- The public alternatives generally anticipate that *unthickened* residuals would be conveyed to Blue Plains. Since the flow rate for unthickened residuals would be about four times as great as for thickened residuals, the pipe diameters proposed in the public alternatives (i.e., 6-inch, 12-inch, or a trio of one 12-inch and two six-inch pipes) would not be large enough to convey the unthickened residuals flow. Minimum pipe diameters of approximately 24 - 30 inches would be required to convey unthickened residuals to Blue Plains. In the area near the Darlecarlia WTP, one 30-inch pipe would use approximately 15 percent of the total area in the 96-inch Potomac Interceptor.
- Access to the piping for inspection or maintenance will be limited due to the active nature of the interceptor piping.
- Access to pressurized, downstream forcemains is impossible due to the very nature of the pressurized pipe system.

Screening Evaluation. Public alternatives P1 through P48, P75, P86, and P88 use the pipe-in-a-pipe concept to route dedicated residuals pipeline to Blue Plains. Other alternatives that use Blue Plains for the processing of water treatment residuals include the following:

- Alternatives P60 through P66, and P74 would use alternate routes to reach Blue Plains (i.e., through Virginia, within the riverbed, etc.).
- Alternatives P70 and P85 would utilize existing or future CSO holding facilities, or other storage facilities, to regulate the flow of residuals to Blue Plains in an effort to minimize the impact on treatment processes.
- Alternative P89 would use existing Washington Metropolitan Area Transit Authority (WMATA) tunnels to route pipelines to Blue Plains.
- Alternative P90 would use abandoned sewer lines to route a residuals pipeline to either Blue Plains or the Potomac WFP.
- Public Alternative P95 would involve piping the residuals along the Capital Crescent Trail to a pipeline that would convey the residuals on to Blue Plains.

In the time since the writing of the EFS (May 2004), and in response to the evaluation of Alternative 5 for the DEIS, DC WASA has indicated to Washington Aqueduct, in writing, that it is not willing to accept water treatment residuals from the Washington Aqueduct. The reasons cited relate primarily to the potential need to provide additional facilities at Blue Plains for future treatment needs related to goals for the protection of the Chesapeake Bay and the handling of wet weather flows.

Consequently, all public alternatives which use Blue Plains as the processing location for water treatment residuals are inconsistent with the screening criterion for Institutional Constraints. Alternative 5, which was carried through the previous screening exercise to the DEIS, will also need to eliminated from consideration as a result of this new information from DC WASA. A copy of the letter from DC WASA is included in Appendix A of this document.

Alternatives Designating the Potomac WFP as the Processing Destination. Alternative 7 of the EFS identified the Potomac Water Filtration Plant (WFP) as a potential location for a dewatering facility. The Washington Suburban Sanitary Commission (WSSC) operates the plant. In the EFS, this alternative was eliminated from consideration as inconsistent with the Institutional Constraints criterion because WSSC will not accept water treatment residuals for processing.

Public Alternatives P49 through P53 would route piping to the WSSC by a variety of alternative routes:

- Public Alternative P49 would route pipelines on top of the Potomac Interceptor
- Public Alternative P50 would route pipelines inside the Potomac Interceptor
- Public Alternative P51 would route pipelines over the raw water conduit
- Public Alternative P52 would route pipelines inside the raw water conduit

- Public Alternative P53 would route pipelines via River Road
- Public Alternative P90 would use abandoned sewer lines to route a residuals pipeline to either Blue Plains or the Potomac WFP.

These alternatives have varying levels of viability, constructability, and reliability. For example, construction of a major pipeline on top of another major pipeline (Public Alternatives P49 and P51) creates reliability and maintenance concerns. The routing of pipelines within the Potomac Interceptor (Public Alternative P50) would not be recommended due to accessibility concerns and capacity issues associated with the interceptor, as discussed in the EFS. Consequently, Public Alternatives P49 through P51 could all be eliminated due to reliability and redundancy concerns.

The routing of pipelines within the raw water conduit (Public Alternative P52) would also be of concern, but is more feasible due to the existing raw water supply redundancy between the two gravity conduits and Little Falls Pumping Station. Additional evaluations would be need to determine whether Public Alternative P52 is feasible. Construction along major roads (Alternative P53), such as River Road, was previously determined to be potentially costly and time consuming.

Using existing abandoned sewer lines, such as suggested in Public Alternative P90 could potentially be a beneficial use of previously obsolete infrastructure. However, no abandoned sewer lines have been identified at the time of this writing.

None of these alternatives are feasible because WSSC is not willing to accept the water treatment residuals for processing.

Alternatives Designating Carderock as the Processing Destination. Several of the public alternatives identified the Naval Surface Warfare Center (NSWF) at Carderock as a potential site for a water treatment residuals processing facility. Public Alternatives P54 through P57 would route piping to Carderock by the following methods and routes:

- Public Alternative P54 would route pipelines on top of the Potomac Interceptor
- Public Alternative P55 would route pipelines inside the Potomac Interceptor
- Public Alternative P56 would route pipelines over the raw water conduit
- Public Alternative P57 would route pipelines inside the raw water conduit
- Public Alternative P93 would build the thickening and dewatering facility at Carderock
- Public Alternative P100 would build the facilities at Carderock or some other federal facility

The feasibility associated with the construction of these pipeline alternatives is similar to that described for the Potomac WFP alternatives. Therefore, Public Alternatives P54 through P56 are eliminated based on reliability and redundancy concerns. Pipeline routing within the raw water conduit would potentially be feasible, provided that the integrity of the conduit could be established through further evaluation, therefore P57, P93 and P100 are still under evaluation.

The Rock Run AWT project is still listed in the 2004 Capital Improvement Plan (CIP) for WSSC, despite that fact that is was conceived over 20 years ago. At the present time, it appears unlikely that the project will ever be built because the capacity of the Blue Plains

AWWTP has been expanded, making the need for plant questionable. Growth controls and water conservation efforts have also led to a decrease in wastewater flow projections over the years.

The WSSC CIP includes a realistic assessment of the issues associated with the effluent conveyance aspects of the project, that in many ways mirrors the findings of the various pipeline route screening evaluations conducted for this project. The assessment highlights some of the difficulties that would be encountered when trying to implement a major pipeline project along the Potomac River:

"…actual project costs will be heavily dependent upon whether agreement can be reached with the National Park Service concerning the location and construction of the effluent conveyance system within the George Washington Memorial Parkway corridor and on whether it is deemed environmentally acceptable to place the effluent pipe within the Rock Run Stream Valley Park, managed by the MNCPPC (Maryland-National Capital Park & Planning Commission). Negotiations with the United States Department of the Navy for rights-of-way for the influent and effluent conveyance system would also be necessary. Upon successful completion of negotiations, construction could begin. The currently planned discharge pipe would be approximately seven miles long and would run along MacArthur Boulevard for approximately three miles. The planned route would require the removal of roadside and streamside trees for most of its length."

Officials at Carderock have been contacted by the Washington Aqueduct, and further discussions are underway. Preliminary indications are that it would be time consuming, or potentially even not possible, to obtain land at the Carderock site due to the large number of competing needs for this parcel, the classified nature of some of the government work at this site, the need to protect historic resources, and the location of the site between a residential area and National Park Service property. Washington Aqueduct discussions with the Carderock Division indicated that if it were possible to obtain property for facilities it would take a significant amount of time to develop a basis of agreement between the various parties. Based on this preliminary information, this alternative needs further evaluation.

Alternatives Designating the Corbalis WTP as the Processing Destination. Public Alternatives P58 and P59 describe alternate routes to the Corbalis WTP in Herndon, Virginia, which is operated by the Fairfax County Water Authority (FCWA). In the EFS, one pipeline route to the Corbalis WTP was evaluated. However, it was eliminated due to the Economic Considerations criterion. It is unlikely that an alternate route would be considerably less expensive, given that the distance between the two plants is approximately 22 miles.

Moreover, FCWA has indicated that it will not accept Washington Aqueduct's water treatment residuals. Therefore, all alternatives to the Corbalis WTP are eliminated because they are inconsistent with the Institutional Constraints criterion.

Alternatives that Barge Residuals to either a Bioreactor Landfill or an Island in the Potomac River or Chesapeake Bay. Public Alternative P73 would use barges to transfer thickened residuals to a bioreactor landfill for disposal. This alternative would eliminate the need for siting a processing location, such as Blue Plains.

Bioreactor landfills represent an emerging concept in the field of solid-waste management. A bioreactor landfill accepts controlled quantities of liquid wastes, whereas traditional landfills generally limit the amount of "liquid wastes" that can be placed in the landfill. Liquid (i.e., leachate) is recirculated through the waste to accelerate the rate of biodegradation within the landfill compared to a traditional landfill. This approach should result in decreased landfill gas emissions, improved leachate quality, and increased landfill capacity. The concept is currently undergoing demonstration testing at two landfills in Virginia (Maplewood Recycling and Waste Disposal Facility in Amelia County, and King George County Landfill and Recycling Center). The demonstration testing program is supported by the U.S. Environmental Protection Agency.

Bioreactor landfills may represent a technology breakthrough for the operation of landfills. However, they do not appear to be a "Proven Method," for managing water treatment residuals. Therefore, this alternative is eliminated from further consideration.

The EFS addressed the issue of barge transfer under the discussion of Alternative 6. This alternative was eliminated from consideration as inconsistent with the screening criteria for Reliability and Redundancy, Zoning, Land Use, Institutional Constraints, and Proven Methods. Public Alternative P73 would eliminate navigational hazards near Marbury Point and Blue Plains, but would not eliminate the hazards in the channel to the Georgetown area.

Issues associated with increasing the navigability of the Potomac above the Key Bridge would not be addressed by barging the residuals to another location. Facility siting and permitting for the facility would likely be the most difficult issue to address for the barging operation. It is unlikely that these issues could be addressed within the context of the FFCA schedule. For example, Georgetown University is currently working on a project to build a boathouse for its rowing teams just upstream of the Key Bridge. The University has been working on resolving land use issues associated with this project for approximately 10 years, despite that fact that several important agencies, such as the National Park Service have generally been supportive of the project.

Based on the experience of Georgetown University, it can be assumed that it might take as long to site and permit a barge-loading facility on the Potomac River. Therefore, all barge alternatives are likely to also be inconsistent with the FFCA screening criteria.

Public Option P98 involves creating an island in the Potomac or some other water body such as the Chesapeake Bay and barging residuals to this island. The EFS addressed the issue of barge transfer under the discussion of the May 2004 Alternative 6. This alternative was eliminated from consideration as inconsistent with the screening criteria for Reliability and Redundancy, Zoning, Land Use, Institutional Constraints, and Proven Methods. Because of the constraints associated with barging, Alternative P98 is screened out.

Alternatives Designating the Georgetown Reservoir as the Processing Destination. Alternative P68 proposed to install plate settlers at the Georgetown Reservoir and build a thickening and dewatering complex in one of the existing basins. According to the proposal, the building would be constructed below grade within Basin No. 2, so that it would not be visible from the street.

Option 4 of Alternative P25 in the EFS evaluated the option of providing a plate settler system at the Georgetown Reservoir. The order-of-magnitude estimate for this option was approximately $57,400,000 in 2004 dollars, approximately $7,000,000 more than the base case estimate of $50,000,000 for the project.

A preliminary estimate of the cost to locate the thickening and dewatering building at the Georgetown Reservoir indicates that excavation costs for this proposal would approximately double the cost of the dewatering building (i.e., from approximately $20,0000,000 to approximately $40,000,000. Therefore, the total cost of the alternative would sum to approximately $77,000,000.

This estimate did not take into account the extensive roadway improvements that would be necessary to allow large residuals trucks to access both the site and the building. This alternative does not reduce the number of trucks in the Palisades community; it simply relocates them. These cost estimates are currently being defined further. However, based on this information, Public Alternative P68 is screened from consideration as inconsistent with the criteria for Economic Considerations. The total cost of the project would be more than 30 percent greater than the base cost estimate of $50,000,000.

Alternatives that Transport Residuals via the Capital Crescent Trail to the CSX Railroad. Public Alternative P94 involves piping residuals along the Capital Crescent Trail to the CSX train line in Silver Spring, Maryland. The residuals would then be transported by rail to a land application or disposal site somewhere along the rail line. This alternative has some logistical limitations due to the high volume of liquid residuals that would be piped to the rail line and transported by tank cars. If it is assumed that no thickening or dewatering facilities are built as part of this alternative prior to utilizing the rail line, the volume of residuals to be transported is approximately 1.5 million gallons per day. Assuming that each tank car can transport 20,000 gallons of unthickened residuals, on average 75 tanks cars per day would be required. In addition to this limitation, it is anticipated that extensive and time-consuming negotiations would be required to procure the rights to an easement along the Capital Crescent Trail and also to arrange for use of rail cars on the CSX train line. Some type of transfer facility would be necessary at a minimum. In addition, if a disposal location cannot be identified that could take the unthickened residuals, a thickening and dewatering facility would be necessary accessible to the rail line. It is unlikely that these issues could be addressed within the context of the FFCA schedule. Therefore, this alternative is screened out.

Alternatives that Transport Dewatered Residuals to the Monofill via a Tunnel Under MacArthur Boulevard. Public Alternative P96 is no longer under consideration because it is inconsistent with the FFCA because it is dependent upon Alternative 2 (Monofill alternative). It is also anticipated that it would be difficult to construct a new truck access tunnel under MacArthur Boulevard in the vicinity of the front entrance to the Dalecarlia WTP because the tunnel would need to be installed beneath both the road and the Georgetown Tunnel, which transports raw water from the Dalecarlia Reservoir to the Georgetown Reservoirs.

Alternatives that Include Dewatering at an Undetermined Location. Public Alternative P102 involves moving the entire Dalecarlia Water Treatment Plant to an alternate, upriver location. The economic impact of this alternative was not calculated. However, the cost would be considerable and would not meet the economic considerations screening criteria. In addition, this alternative would require additional time to identify, evaluate, and obtain a parcel of land suitable for a new facility, similar to Alternative 8. The additional effort would prevent Washington Aqueduct from meeting the FFCA schedule.

2.5.3.3 Alternatives with a Discharge to the Potomac River

One of the Public Alternatives (P101) involves challenging the provisions of the existing NPDES permit and returning water treatment residuals to the Potomac River. This alternative is the same as alternative number 10 of the original 26 alternatives. This alternative is screened out as it is inconsistent with the NPDES permit.

2.5.3.4 Alternatives Involving the Dalecarlia Reservoir

Public Alternative P82 proposes that water treatment residuals be stored temporarily in a sectioned-off portion of the Dalecarlia Reservoir prior to processing them. This option is inconsistent with reliability and redundancy criteria because it would use reservoir capacity that can best be used to dampen fluctuations in influent raw water quality. As with all Dalecarlia Reservoir alternatives in the EFS, this alternative is screened from further consideration.

2.5.3.5 Alternatives with Facilities at the McMillan WTP

None of the Public Alternatives involved the siting of facilities at the McMillan WTP.

2.5.3.6 Alternatives with Facilities at the Dalecarlia WTP

Public Alternatives P72, P79, P80, P87, P91, P97, and P99 generally involve facilities that would be located at the Dalecarlia WTP:

- Public Alternative P72 would provide an underground thickening and dewatering facility at the Dalecarlia site. In this proposal, the facility would be built into the side of the hillside created when fill was piled onsite during the construction of the WMATA transit system.
- Public Alternative P79 would build a dedicated roadway from the Dalecarlia site to the Clara Barton Parkway to minimize the impact of truck traffic on neighborhoods to the north of the Dalecarlia WTP.
- Public Alternative P80 does not specify a particular location for the facilities, but proposes that an alternative location be found.
- Public Alternative P87 provided some suggestions about burying the thickeners in the ground or burying the truck entrance/exit to the processing building in the ground.
- Public Alternative P91 also made suggestions about the location and configuration of the thickening and dewatering facilities. Carderock, the Georgetown Reservoir (both discussed elsewhere in this document), the currently unused portion of the Dalecarlia WTP West Filter Building, and the top of the sedimentation basins were specifically mentioned.
- Public Alternative P99 would involve substantially replacing water treatment process components in order to minimize or eliminate the generation of coagulant-associated water treatment residuals.

For the purposes of this evaluation, Public Alternatives P72, P80, P87, and P91 will be combined and considered as one group. The overall purpose of all of these alternatives is to select a location and configuration for the thickening and dewatering facilities on the Dalecarlia site that will address the concerns residents in the surrounding neighborhoods. The following locations were considered:

- The currently proposed site (described in the EFS) on the western side of Dalecarlia WTP property. The site is south of MacArthur Boulevard, and between the Capital Crescent Trail and the property line. This site was reserved for residuals-handling facilities on the 1971 Master Plan for the site, and will be referred to in this document as the "Master Plan site".
- The Master Plan site, with the facilities partially buried into the ground to provide an underground entrance/exit to the dewatering facility. Much of the site consists of fill that was placed at this location during the construction of the WMATA transit system.
- A site to the west of the West Filter Building, which is currently reserved for a potential future ozone/carbon treatment facility. This site is not considered consistent with the screening criteria because it is reserved for future treatment facilities, which would need to be constructed in close proximity to the existing liquid treatment facilities.
- The West Filter Building. The unequipped filters in this building are reserved for future flows and/or change in filtration technology. This alternative is not considered consistent with the screening criteria for the project. These existing filters must be reserved for future liquid treatment facilities or the installation of new treatment processes associated with changing water treatment regulations. Modifying the existing filters to function as residuals processing facilities is not considered a wise use of this existing infrastructure.
- The top of the sedimentation basins. This alternative is not considered consistent with the screening criteria for the project. The new residuals removal equipment planned for installation in the existing sedimentation basins will require open access for routine maintenance to maintain safe and reliable operation of the treatment facilities.

Public Alternative P97 is similar to Alternative 25 in that it includes processing water treatment residuals at the Dalecarlia WTP and disposal via contract hauling. However, this alternative proposes using a combination of thickening and dewatering followed by heat drying technology to further reduce the volume of residuals to be hauled, thereby reducing the number of trucks required per day. Heat drying is a technology that is not typically used for water treatment residuals, mainly because of high moisture content and low fuel value of the residuals. This translates into relatively high capital and operating costs for the dryer. Dewatered residuals are dried at very high temperatures to further reduce the water content of the material. Heat drying is used at wastewater treatment facilities to produce very high quality stabilized biosolids that can be sold as fertilizer, thereby providing a vehicle for recovering some of the operating costs. Wastewater solids can be dried by this method and used as a fertilizer because of their relatively high organic content. Water treatment residuals generally contain little to no organic content and would therefore not be attractive as a fertilizer product. It is anticipated, based on experience with heat drying applications at wastewater treatment plants producing similar solids volumes, that the cost of a heat drying facility would be greater than $15 million. Therefore, Public Alternative P97 is screened from consideration as inconsistent with the criteria for Economic Considerations.

Public Alternative P99 involves the utilization of a combination of MIEX ® water treatment technology, followed by microfiltration and granular activated carbon (GAC) for processing all of the water treated at the Dalecarlia and McMillan WTPs. This combination of proposed treatment processes can be contrasted with the conventional rapid mix, flocculation, sedimentation, and filtration treatment processes currently used by the Washington Aqueduct. MIEX ® water treatment technology is a relatively new water treatment technology that uses a magnetically charged ion exchange resin to remove naturally occurring organic compounds, including disinfection byproduct precursors. This treatment function is currently being performed at the Dalecarlia and McMillan WTP's by adding alum to the raw water, flocculating the water (which forms larger, settleable particles containing the alum, river silt, and organic compounds), and then allowing the larger particles to deposit out in the sedimentation basins. The use of MIEX ® treatment technology in lieu of the existing Dalecarlia and McMillan treatment processes would eliminate the formation of an alum residual byproduct. However, the MIEX ® treatment process requires periodic regeneration with a brine solution. This recycle stream is unsuitable to recycle back to the Washington Aqueduct treatment process. MIEX ® would not eliminate the production of water treatment residuals. Instead, it would substitute a new liquid brine form of residuals for the solid form of alum residuals currently produced at the Washington Aqueduct treatment facilities.

The second treatment process recommended by the public in this alternative, microfiltration membranes, is similar to MIEX ® in that it also doesn't produce a solid waste by-product. However, microfiltration membranes do require periodic cleaning with a strong solution of sodium hypochlorite and citric acid to maintain stable operation of the membranes. The liquid waste stream produced during each cleaning would need to be neutralized and discharge offsite because it is not suitable for recycle to the head end of the water treatment plants. This adds to the implementation complexity of this alternative and confirms that this option tends to substitute one waste stream for another, rather than truly eliminating all water treatment residuals.

The combination of the proposed treatment technologies is quite complex and innovative when compared with the existing technology currently being used by the Washington Aqueduct. While it is likely that the proposed new technologies would produce a higher quality finished water than the existing plants, were they retrofitted with the proposed technologies, they would be among a very small number of plants in the world to use this combination of treatment technologies. The modified plants would also be among a relatively small number of MIEX ® water treatment plants in the world. The relative newness of the MIEX ® water treatment process and the lack of "large" water treatment plant experience, makes both MIEX ® and the proposed combination of treatment technologies raises questions about their reliability for this application.

In addition to the uncertainties associated with the MIEX ® water treatment process, it is uncertain whether the proposed microfiltration membranes would be capable of reliably and cost effectively treating Potomac River water without requiring frequent cleaning.

Membrane cleaning frequencies are typically assessed by performing a pilot scale demonstration test of the proposed treatment processes on the actual water to be treated. Cleaning cycle intervals more frequent that every 30-days could render this combination of treatment technologies infeasible and unreliable. Given the variability of the Potomac River water supply, a 12-month pilot test would be appropriate to assess the feasibility of the proposed combination of water treatment technologies. This piloting duration would allow the performance of this innovative combination of treatment technologies to be assessed throughout one complete set of seasonal variations. Given the uncertainties about the potential performance of this combination of treatment technologies when applied to Potomac River water and the significant cost associated with this alternative, it would also be appropriate to delay start of design until the pilot testing is successfully completed. This delay would negatively impact the Washington Aqueduct's ability to meet the project FFCA schedule.

The proposed combination of treatment technologies would require a much more significant capital investment at both existing Washington Aqueduct water treatment plants than the proposed residuals processing facilities. New treatment facilities with a total treatment capacity of 320 mgd would be required for this option. While a detailed cost estimate was not been prepared for this alternative, costs for similar water treatment retrofit projects would indicate that this treatment alternative should cost between $1.00/gallon and $3.00/gallon of treatment capacity. This translates into an anticipated project capital cost of between $320,000,000.00 and $960,000,000.00. This cost range violates the cost screening criteria used for this project.

This alternative is considered unproven and inconsistent with the screening criterion because there are only a limited number of water treatment plants currently using the combination of treatment technologies proposed in this alternative. A modified Washington Aqueduct water treatment facility equipped with the proposed combination of water treatment technologies would also have a significantly larger capacity than typical installations currently using the proposed technology.

This alternative, therefore, is inconsistent with the screening criteria due to concerns with complying with the FFCA, cost considerations, and it is an uproven technology with the Washington Aqueduct scale of water production as well as with the source water.

2.5.4 Description of Public Alternatives Consistent with Screening Criteria

Public Alternative P71 would evaluate alternative sites for the residuals thickening and processing facilities with the goal of finding a site that would be further from residential housing. A new site on the Dalecarlia Reservoir site, located adjacent to the Sibley Hospital property, is being evaluated for the residuals thickening and dewatering facilities. Siting the dewatering facility in this location is consistent with the screening criteria for the project.

Public Alternative P84 would evaluate alternative disposal locations, such as cement plants. This option identifies a potential beneficial reuse disposal alternative for dewatered water treatment residuals. It would not necessarily change the form of processing, the method of transport (i.e., trucks), or reduce the number of trucks when compared with other trucking alternatives. This option is consistent with the screening criteria for the project.

2.6 Additional Treatment and Residuals Processing Options

Chapter 4 of the EFS included a discussion of residuals processing options. These options primarily include alternative configurations for the sedimentation basins and are grouped into "May 2004 treatment options" below.

Options related more directly to the water treatment processes employed by the Washington Aqueduct at the Dalecarlia WTP are also of interest. Public Alternatives P67, P69, P76, P77, P78, P81, P83, and P92 fall into this category.

- Public Alternatives P67, P76, P77, P81, and P92 refer to improvements to the location, configuration, or operation of the intake structure at Great Falls. For the purposes of this evaluation, these alternatives will be categorized into "raw water intake improvement options."
- Public Alternative P69 refers to a residuals management concept described as "smart pumping." Public Alternatives P78 and P83 would seek to reduce and minimize the quantity of water treatment residuals through the selection of water treatment processes or of chemical coagulants to be used for the treatment of the raw water. The alternatives will be grouped together into "water treatment optimization options."

2.6.1 May 2004 Treatment Options

In order to enhance performance, reduce cost, and mitigate environmental impacts, options were identified for May 2004 Alternatives 2, 5, and 25. The options considered include the following:

- Forebay residuals removal and treatment technologies, including the installation of a new mechanical silt removal system in the Forebay and the addition of Forebay residuals treatment equipment in the residuals dewatering building, planned for construction on the Dalecarlia WTP site. In addition, Forebay residuals may be integrated into the monofill instead of disposed of through offsite trucking. Except for as related to the monofill disposal option, this option is considered consistent with the screening criteria for the project and is being evaluated in more detail in the DEIS.
- Sedimentation and residuals collection technologies for the Georgetown Reservoir site, including installing small electric dredges in the existing the first two cells of the reservoir and construction of a new plate settler-type sedimentation basin in a portion of the Georgetown Reservoir to serve the same sedimentation basin function as the existing reservoir. The new sedimentation basin would be equipped with continuous residuals removal equipment, similar to that planned for the Dalecarlia sedimentation basins. Dredging of the remainder of the Georgetown Reservoir would not be required if a new sedimentation basin were installed in the reservoir. These options are inconsistent with the screening criteria for the project because they do not comply with the cost screening criteria.
- Dalecarlia sedimentation basin configurations, including installation of continuous residuals removal equipment in all four existing basins, installation of plate settlers and chain and flight residuals removal equipment in Basin 1 and conversion of existing sedimentation Basin 2 to a flocculation basin to allow the entire design plant flow to be

treated through Basins 1 and 2, and construction of a new sedimentation basin on the Dalecarlia plant site sized to replace the sedimentation basin function currently being performed by the Georgetown Reservoir. These options are inconsistent with the screening criteria for the project because they do not comply with the cost screening criteria.

- Alternate residuals dewatering technologies such as centrifuges and belt filter presses. This option will be evaluated during the design phase of the project. The residuals dewatering building is configured to allow either technology to be used without requiring modifications to the buildings overall dimensions.

2.6.2 Raw Water Intake Improvement Options Identified by the Public

The common objective of all of the raw water intake improvement options is to substantially improve the quality of the raw water being conveyed to the Dalecarlia WTP for treatment. This could potentially be accomplished through a variety of means by relocating, reconfiguring, or modifying the operation of the intake facilities.

The Washington Aqueduct raw water intakes on the Potomac River are located at Great Falls, Maryland, approximately 9 miles from the Dalecarlia WTP and at Little Falls, in Maryland, approximately one half mile from the Dalecarlia WTP. At Great Falls the intake structure consists of a stone dam that extends from the Maryland shore to the Virginia shore. The dam does not create a large impoundment, but is designed to divert water to the two intake conduits that convey water to the Dalecarlia WTP. Likewise, at Little Falls the pumping station intake is upstream of the Little Falls Dam. Downstream of the intakes, the raw water is stored in the Dalecarlia Reservoir prior to treatment. The function of the reservoir was to settle out suspended material.

Public Alternative P67 proposes that Washington Aqueduct evaluate a relocation of the intake. The FCWA has recently relocated its intake from the Virginia shoreline to the middle of the river, at a cost of approximately $15,000,000, and the WSSC is considering doing the same for its intake. Without a major evaluation it cannot be determined whether relocation of the intake would result in substantial benefits for the Washington Aqueduct however, based on knowledge of the nature of the intakes and the river and sound engineering judgment, it is unlikely to expect that there would be a substantial benefit. The FCWA intake is a "run-of-the-river " configuration and the WSSC Potomac intake is highly influenced by the discharge from Watts Branch under storm conditions, whereas both of the Washington Aqueduct intakes are a river diversion upstream of a dam. The dam creates a "pooling" effect, much different from the "run-of-the-river " configuration. Unlike the focused areas of high turbidity noted under storm conditions at the FCWA and WSSC Potomac intake locations, the river near the Washington Aqueduct intakes have a much more uniform turbidity across its cross section. This minimizes the potential water quality benefits of relocating the Washington Aqueduct intake.

Public Alternative P76 was similar to Public Alternative P67, and Public Alternative P77 proposing that the Washington Aqueduct actively manage the intake to optimize the quality of the water being conveyed to the Dalecarlia WTP. Public Alternative P81 proposed that the silt removal system discussed in Chapter 4 of the EFS be sited at the raw water intake.

All of these options are worthy of consideration as part of a long-term strategy for improving raw water quality, optimizing treatment and operations, providing better finished-water quality, and minimizing residuals quantities, and Washington Aqueduct should consider them in that light. However, none of them would actually eliminate water treatment residuals. Therefore, they are not consistent with the Purpose and Need of this project and the DEIS. In addition, they could not be implemented with the schedule set by the FFCA because of the location of the current intake facilities (adjacent to National Park Service property) and the historic nature of the current facilities. The silt removal system, in particular, would require a significant amount of land to construct, and this land is not readily available.

Public Alternative P92 proposes that the intake system be redesigned as a well intake to reduce the silt load to the plant. This option, described by various names including riverbank filtration (RBF), riverbank infiltration (RBI), or river*bed* filtration or infiltration is used extensively in Europe and often in the Midwest of the United States. Typically, though, this method of collecting water is used in areas that are underlain with large expanses of alluvial sands through which water will readily travel. Due to limitations of local geology, etc., these systems are generally designed to produce less than 50 million gallons per day (mgd), although a few larger systems exist.

RBF systems are typically constructed by building a concrete caisson into a large-diameter hole that is drilled or augered into unconsolidated sediments. Once the caisson is installed, perforated collector piping (well casing) is drilled horizontally into the surrounding sediment layers. These collector wells can extend under the riverbed. The collected water drains into the caisson, and from there it is pumped to the surface for treatment or distribution. A series of vertical wells, drilled adjacent to the river, can also sometimes be used.

RBF systems are of increasing interest in the United States because they can result in substantial increases in raw water quality, compared to a typical intake system. RBF offers several possible advantages:

- Total organic carbon (TOC) concentrations are generally less than those of the main river
- Some protection from microorganisms is provided
- Water quality fluctuations are generally dampened
- RBF systems may be less susceptible to security threats

While RBF systems offer many potential benefits, they require extensive and time-consuming hydrologic and geologic evaluations before they can be properly implemented to ensure that the potential benefits can truly be attained for a particular site/river system. Consequently, permitting for these systems may also be time-consuming.

The RBF concept was recently evaluated for the Loudoun County Sanitation Authority (LCSA). LCSA is planning for a future intake on the Potomac River near Leesburg, Virginia, several miles upstream from the Washington Aqueduct intake. The evaluation determined that much of the area surrounding LCSA's property is underlain by various shallow formations of sandstone. Consequently, a conventional RBF system would be not be practical (i.e., could not yield the 30 mgd of water desired by LCSA) for this installation.

In place of a conventional RBF system, LCSA considered the use of riverbed infiltration system. To install this system, a cofferdam would be built to allow the riverbed to be completely excavated to a depth of approximately eight feet below the existing river bottom. A network of well screens would then be installed within the excavated area and a bed of fine sand would be placed over and around the piping. A one-foot thick rock blanket would then be placed over the sand to protect it from erosion.

For the 30-mgd LCSA system, it was estimated that an area approximately 100-feet wide and 150-feet long would need to be excavated (a total of 15,000 square feet of area). The estimated cost of the system was $1,700,000 (2003 dollars). Geologic conditions at Great Falls are likely to be similar to those further upstream (i.e., it appears that there is a lot of rock at the intake area). A 200-mgd intake system, then, would require at least 100,000 square feet of area, or approximately 2.3 acres.

The RBF alternative has many potential advantages however the feasibility of such a process would take considerable study and is uncertain at the scale of the Washington Aqueduct operation. It would not eliminate the generation of water treatment residuals, and it could only be implemented as part of a long-term plan. Therefore, this alternative is screened from consideration as inconsistent with the Purpose and Need and FFCA screening criteria.

2.6.3 Water Treatment Optimization Options Identified by the Public

Public Alternative P69 refers to a residuals management concept described as "smart pumping." This option would regulate the use of existing pipelines and facilities in a manner that would allow them to be used for multiple purposes. For example, a pipeline might be used as a sewer pipeline for part of the day, and used as a residuals pipeline for the remainder of a day. Regulation of the system would be accomplished through the use of instrumentation and computers that would direct flows to the most appropriate facility for treatment or processing.

As noted in the EFS, existing conveyance systems are generally being utilized according to their design intent. Conveyance systems are at their approximate design capacity during peak hours and have some extra capacity during night hours. Implementation of this option would require a system-wide, region-wide change in approach for the conveyance, treatment, and processing of sewage and residuals. For example, large volumes of storage for both residuals and raw sewage would need to be constructed to implement this option.

Because multiple jurisdictions would be involved (i.e., Washington Aqueduct, DC WASA, WSSC, FCWA, etc.), this option would be very difficult to implement. Neither jurisdiction currently has facilities available for the conveyance or processing of the residuals. Therefore, multiple options do not currently exist. DC WASA, WSSC, and FCWA have all indicated that they will not accept Washington Aqueduct residuals. This option has some intriguing and thought-provoking components. However, it is screened from consideration as inconsistent with the Institutional Constraints criterion.

Public Alternatives 78 and 83 would seek to reduce and minimize the quantity of water treatment residuals through the selection of water treatment processes or of chemical coagulants to be used for the treatment of the raw water.

Washington Aqueduct is currently evaluating alternative coagulants, such as polyaluminum chloride (PACL), and similar compounds. Other regional producers (e.g., FCWA, WSSC) have found that PACL can provide superior water quality at lower cost, while producing less residuals. As with other options evaluated in the EFS and this Supplement to the EFS, a change in coagulants, or even a change in treatment technology will not eliminate residuals. More detailed analysis will appear in the DEIS.

2.7 Alternatives Screening Summary

Alternative P71 (alternate site for residuals processing facility on Dalecarlia campus) and P84 (alternate disposal locations) are the only alternatives considered consistent with the screening criteria for the project. These alternatives will be evaluated in detail in the DEIS. In addition, the following alternatives are still under evaluation: P57 (Carderock), P93 (Carderock), P100 (Carderock), P96 (Tunnel to monofill), P72 (Dalecarlia Campus Underground), P79 (Clara Barton Parkway), P80 (Relocated facilities at Dalecarlia WTP), and P87 (bury part of residuals facilities).

2.8 Designation of Alternatives Evaluated in Detail in the Draft EIS

The five alternatives currently recommended for detailed evaluation in the DEIS are re-named following the alternative screening process to simplify the associated discussion. New designators, A through E, are assigned to the remaining alternatives. No order of preference was intended in the new designation. Should one or more of the alternatives currently under evaluation be found to be consistent with the screening criteria it will be added to the list for detailed evaluation in the DEIS. The revised alternative designations for the current alternatives recommended for detailed evaluation are as follows:

- **Alternative A:** Process Water Treatment Residuals at Dalecarlia WTP and Dispose in Dalecarlia Monofill. Process Forebay Residuals by Current Methods and Periodically Haul (*formerly Alternative 2*)
- **Alternative B:** Process Water Treatment Residuals at the Dalecarlia WTP and Dispose via Contract Hauling. Process Forebay Residuals by Current Methods and Periodically Haul (f*ormerly Alternative 25*)
- **Alternative C:** Thicken Water Treatment Residuals at Dalecarlia WTP, Then Pump via a New Pipeline to Blue Plains. Process Forebay Residuals by Current Methods and Periodically Haul (*formerly Alternative 5*)
- **Alternative D:** No Action Alternative (*formerly Alternative 1*)
- **Alternative E:** Process Water Treatment Residuals at Dalecarlia Reservoir Site and Dispose via Contract Hauling. Process Forebay Residuals by Current Methods and Periodically Haul (*Public Alternative P71*)

These revised designators are used to refer to the alternatives throughout the remainder of this report.

Table 2-3
Public Alternative and Option Description

Supplement to EFS: Public Alternative No.	Alternative Reference No. Assigned by Public	Title Assigned by Public	Description	Similar Alternative No. Described Previously in EFS
Alternatives That Do Not Require Continuous Trucking from the Dalecarlia WTP				
P1	Sludge Stopper - 1	Single 12" Iron Pipe-in-Pipe Potomac	Build a 12" iron pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains	Alternatives 4 and 5
P2	Sludge Stopper - 2	Single 12" Plastic Pipe-in-Pipe Potomac	Build a 12" HDPE (high density polyethylene) piping inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P3	Sludge Stopper - 3	Single 12" Stainless Pipe-in-Pipe Potomac	Build 12" stainless steel pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P4	Sludge Stopper - 4	Single 12" Composite Pipe-in-Pipe Potomac	Build a 12" composite pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is one the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5
P5	Sludge Stopper - 5	Single 6" Iron Pipe-in-Pipe Potomac	Building a 6" iron pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P6	Sludge Stopper - 6	Single 6" Plastic Pipe-in-Pipe Potomac	Build a 6" HDPE (high density polyethylene) piping inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P7	Sludge Stopper - 7	Single 6" Stainless Pipe-in-Pipe Potomac	Build a 6" stainless steel pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P8	Sludge Stopper - 8	Single 6" Composite Pipe-in-Pipe Potomac	Build a 6" composite pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5
P9	Sludge Stopper - 9	Trio 6-12-6" Iron Pipe-in-Pipe Potomac	Build a 6-12-6" trio of iron pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The three pipes would be nestled in the crown of the existing conduits and would provide bi-directional redundancy and flexible flow rate capacity.	Alternatives 4 and 5
P10	Sludge Stopper - 10	Trio 6-12-6" Plastic Pipe-in-Pipe Potomac	Build a 6-12-6" trio of HDPE (high density polyethylene) pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The three pipes would be nestled in the crown of the existing conduits and would provide bi-directional redundancy and flexible flow rate capacity.	Alternatives 4 and 5
P11	Sludge Stopper - 11	Trio 6-12-6" Stainless Pipe-in-Pipe Potomac	Build a 6-12-6" trio of stainless steel pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The three pipes would be nestled in the crown of the existing conduits and would provide bi-directional redundancy and flexible flow rate capacity.	Alternatives 4 and 5
P12	Sludge Stopper - 12	Trio 6-12-6" Composite Pipe-in-Pipe Potomac	Build a 6-12-6" trio of composite pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5
P13	Sludge Stopper - 13	Single 12" Iron Pipe-in-Pipe Rock Creek	Build a 12" iron pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P14	Sludge Stopper - 14	Single 12" Plastic Pipe-in-Pipe Rock Creek	Build a 12" HDPE (high density polyethylene) piping inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P15	Sludge Stopper - 15	Single 12" Stainless Pipe-in-Pipe Rock Creek	Build a 12" stainless steel pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P16	Sludge Stopper - 16	Single 12" Composite Pipe-in-Pipe Rock Creek	Build 1 12" composite pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continued inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5
P17	Sludge Stopper -17	Single 6" Iron Pipe-in-Pipe Rock Creek	Build a 6" iron pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P18	Sludge Stopper - 18	Single 6" Plastic Pipe-in-Pipe Rock Creek	Build a 6" HDPE (high density polyethylene) piping inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5

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P19	Sludge Stopper - 19	Single 6" Stainless Pipe-in-Pipe Rock Creek	Build a 6" stainless steel pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P20	Sludge Stopper - 20	Single 6" Composite Pipe-in-Pipe Rock Creek	Build a 12" stainless steel pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P21	Sludge Stopper - 21	Trio 6-12-6" Iron Pipe-in-Pipe Rock Creek	Build a 6-12-6" trio of iron pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P22	Sludge Stopper - 22	Trio 6-12-6" Plastic Pipe-in-Pipe Rock Creek	Build a 6-12-6" HDPE (high density polyethylene) pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P23	Sludge Stopper - 23	Trio 6-12-6" Stainless Pipe-in-Pipe Rock Creek	Build a 6-12-6" trio of stainless steel pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P24	Sludge Stopper - 24	Trio 6-12-6" Composite Pipe-in-Pipe Rock Creek	Build a 6-12-6" trio of composite pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P25	Sludge Stopper - 25	Single 12" Iron Pipe-in-Pipe Potomac via Main	Build a 12" iron pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P26	Sludge Stopper - 26	Single 12" Plastic Pipe-in-Pipe Potomac via Main	Build a 12" HDPE (high density polyethylene) pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P27	Sludge Stopper - 27	Single 12" Stainless Pipe-in-Pipe Potomac via Main	Build a 12" stainless steel pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P28	Sludge Stopper - 28	Single 12" Composite Pipe-in-Pipe Potomac via Main	Build a 12" composite pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5
P29	Sludge Stopper - 29	Single 6" Iron Pipe-in-Pipe Potomac via Main	Build a 6" iron pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P30	Sludge Stopper - 30	Single 6" Plastic Pipe-in-Pipe Potomac via Main	Build a 6" HDPE (high density polyethylene) pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P31	Sludge Stopper - 31	Single 6" Stainless Pipe-in-Pipe Potomac via Main	Build a 6" stainless steel pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P32	Sludge Stopper - 32	Single 6" Composite Pipe-in-Pipe Potomac via Main	Build a 6" composite pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5
P33	Sludge Stopper - 33	Trio 6-12-6" Iron Pipe-in-Pipe Potomac via Main	Build a 6-12-6" trio of pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The three pipes would be nestled in the crown of the existing conduits and would provide bi-directional redundancy and flexible flow rate capacity.	Alternatives 4 and 5
P34	Sludge Stopper - 34	Trio 6-12-6" Plastic Pipe-in-Pipe Potomac via Main	Build a 6-12-6" trio of HDPE (high density polyethylene) pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The three pipes would be nestled in the crown of the existing conduits and would provide bi-directional redundancy and flexible flow rate capacity.	Alternatives 4 and 5
P35	Sludge Stopper - 35	Trio 6-12-6" Stainless Pipe-in-Pipe Potomac via Main	Build a 6-12-6" trio of stainless steel pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The three pipes would be nestled in the crown of the existing conduits and would provide bi-directional redundancy and flexible flow rate capacity.	Alternatives 4 and 5

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P36	Sludge Stopper - 36	Trio 6-12-6" Composite Pipe-in-Pipe Potomac via Main	Build a 6-12-6" trio of composite pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5
P37	Sludge Stopper - 37	Single 12" Iron Pipe-in-Pipe Rock Creek via Main	Build a 12" iron pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P38	Sludge Stopper - 38	Single 12" Plastic Pipe-in-Pipe Rock Creek via Main	Build a 12" HDPE (high density polyethylene) pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P39	Sludge Stopper - 39	Single 12" Stainless Pipe-in-Pipe Rock Creek via Main	Build a 12" stainless steel pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P40	Sludge Stopper - 40	Single 12" Composite Pipe-in-Pipe Rock Creek via Main	Build a 12" composite pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5
P41	Sludge Stopper - 41	Single 6" Iron Pipe-in-Pipe Rock Creek via Main	Build a 6" iron pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residuals to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P42	Sludge Stopper - 42	Single 6" Plastic Pipe-in-Pipe Rock Creek via Main	Build a 6" HDPE (high density polyethylene) pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P43	Sludge Stopper - 43	Single 6" Stainless Pipe-in-Pipe Rock Creek via Main	Build a 6" stainless steel piping inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P44	Sludge Stopper - 44	Single 6" Composite Pipe-in-Pipe Rock Creek via Main	Build a 12" stainless steel pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P45	Sludge Stopper - 45	Trio 6-12-6" Iron Pipe-in-Pipe Rock Creek via Main	Build a 6-12-6" trio of iron pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Truck Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P46	Sludge Stopper - 46	Trio 6-12-6" Plastic Pipe-in-Pipe Rock Creek via Main	Build a 6-12-6" trio of HDPE (high density polyethylene) pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P47	Sludge Stopper - 47	Trio 6-12-6" Stainless Pipe-in-Pipe Rock Creek via Main	Build a 6-12-6" trio of stainless steel pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to the Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P48	Sludge Stopper - 48	Trio 6-12-6" Composite Pipe-in-Pipe Rock Creek via Main	Build a 6-12-6" trio of composite pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5
P49	Sludge Stopper - 49	Dalecarlia to WSSC Potomac Over Interceptor	Build a new single, double, or quad pipeline on top of the Potomac Interceptor to the WSSC Potomac Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7
P50	Sludge Stopper - 50	Dalecarlia to WSSC Potomac Inside Interceptor	Build a new single, double, or quad pipeline inside the Potomac Interceptor to the WSSC Potomac Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7
P51	Sludge Stopper - 51	Dalecarlia to WSSC Potomac Over Raw Water Conduit	Build a new single, double, or quad pipeline over the Great Falls raw water conduits to the WSSC Potomac Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7
P52	Sludge Stopper - 52	Dalecarlia to WSSC Potomac In Raw Water Conduit	Build a new single, double, or quad pipeline inside one of the Great Falls raw water conduits to the WSSC Potomac Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7
P53	Sludge Stopper - 53	Dalecarlia to WSSC Potomac Via River Road	Build a new single, double, or quad pipeline along River Road, to the WSSC Potomac Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7
P54	Sludge Stopper - 54	Dalecarlia to New Carderock Over Interceptor	Build a new single, double, or quad pipeline on top of the Potomac Interceptor to a new thickening and dewatering plant on the Carderock Naval Research Center grounds, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 8
P55	Sludge Stopper - 55	Dalecarlia to New Carderock Inside Interceptor	Build a new single, double, or quad pipeline inside the Potomac Interceptor to a new thickening and dewatering plant on the Carderock Naval Research Center grounds, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 8

Supplement to EFS: Public Alternative No.	Alternative Reference No. Assigned by Public	Title Assigned by Public	Description	Similar Alternative No. Described Previously in EFS
P56	Sludge Stopper - 56	Dalecarlia to New Carderock Over Raw Water Conduit	Build a new single, double, or quad pipeline above the Great Falls raw water conduit to a new thickening and dewatering plan on the Carderock Naval Research Center grounds, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 8
P57	Sludge Stopper - 57	Dalecarlia to New Carderock Inside Raw Water Conduit	Build a new single, double, or quad pipeline inside the Great Falls raw water conduit to a new thickening and dewatering plan on the Carderock Naval Research Center grounds, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 8
P58	Sludge Stopper - 58	Dalecarlia to FCWA Corbalis Via Little Falls	Build a new single, double, or quad pipeline across the Potomac at Little Falls dam, to the FCWA Corbalis Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7
P59	Sludge Stopper - 59	Dalecarlia to FCWA Corbalis Via Chain Bridge	Build a new single, double, or quad pipeline across the Potomac at the Chain Bridge, to the FCWA Corbalis Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7
P60	Sludge Stopper - 60	Blue Plains Via Potomac Channel	Build a new single, double, or quad pipeline and lay it in the Potomac Channel from Dalecarlia to Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternatives 4 and 5
P61	Sludge Stopper - 61	Blue Plains Via Virginia Riverbank from Little Falls Dam	Build a new single, double, or quad pipeline from Dalecarlia, across the Potomac at Little Falls dam, then down the Virginia riverbank to a river crossing near Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternatives 4 and 5
P62	Sludge Stopper - 62	Blue Plains Via Virginia Riverbank from Chain Bridge	Build a new single, double, or quad pipeline from Dalecarlia, across the Potomac at Chain Bridge, then down the Virginia riverbank to a river crossing near Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternatives 4 and 5
P63	Sludge Stopper - 63	Blue Plains Via Virginia Riverbank from Key Bridge	Build a new single, double, or quad pipeline from Dalecarlia, across the Potomac at Key Bridge, then down the Virginia riverbank to a river crossing near Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternatives 4 and 5
P64	Sludge Stopper - 64	Blue Plains Via George Washington Parkway form Little Falls Dam	Build a new single, double, or quad pipeline from Dalecarlia, across the Potomac at Little Falls damn, then down the George Washington Parkway to a river crossing near Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, stainless steel, and composite, etc.	Alternatives 4 and 5
P65	Sludge Stopper - 65	Blue Plains Via GEORGE WASHINGTON Parkway from Chain Bridge	Build a new single, double, or quad pipeline from Dalecarlia, across the Potomac at Chain Bridge, then down the George Washington Parkway to a river crossing near Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternatives 4 and 5
P66	Sludge Stopper - 66	Blue plains Via GEORGE WASHINGTON Parkway from Key Bridge	Build a new single, double, or quad pipeline from Dalecarlia, across the Potomac at Key Bridge, then down the George Washington Parkway to a river crossing near Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternatives 4 and 5
P68	Sludge Stopper - 68	Dalecarlia to Drained Georgetown 2	Implement plate settlers or other high efficiency technologies at Dalecarlia and/or Georgetown basins such that Georgetown 2 can be drained and the new thickening and dewatering plant built on the floor of the basin, below grade and out of site.	Chapter 4 of EFS
P70	Sludge Stopper - 70	Georgetown Waterfront CSO Holding Tanks	In conjunction with the DCWASA CIP, utilize or expand upon the current 58 MG Georgetown Waterfront CSO holding tank to store the residual flushes, then dewater the holding tank in a controlled manner via new or existing pumping stations and pipeline to Blue Plains for final processing.	Alternative 5
P73	SCS-1	Barge to Bioreactor Landfill	Use new of existing outfall piping to transport residuals to the Potomac River without dewatering, and then transport via barge to a bioreactor landfill	Alternative 6
P74	SCS-2	Transport Unthickened to Blue Plains via Riverbed Pipeline	Using the existing outfall piping to transport residuals to the Potomac River without dewatering, and transport via new riverbed pipeline to Blue Plains for treatment.	Alternative 5
P75	SCS-3	Pipe in a Pipe to Blue Plains	Construct new pipeline within existing pipelines.	Alternative 5
P85	S Deschler 11/15/2004 e mail	Store Residuals and Discharge to Potomac Interceptor During Dry Conditions	Add more storage to alt. 4 so thickened residuals can be discharged to Potomac Interceptor only during dry weather conditions.	Alternatives 4 and 5
P86	S Deschler 11/15/2004 e mail	Transport Unthickened to Blue Plains via Pipeline, Install in Potomac Interceptor During Dry Conditions	Convey dewatered residuals from Dalecarlia to Blue Plains in a dedicated pipe. Install pipe during dry days when sewer is near empty. Relatively easy to access Potomac Interceptor.	Alternatives 4 and 5
P88	Stuart Ross 11/15/2004 e-mail		Adopt pipeline to Blue Plains alternative.	Alternatives 4 and 5
P89	Attach B from M Greenwald letter dated 11/15/2004	Residuals Pipeline to Blue Plains via Metro Tunnels	Attachment B: 2. Option B - Route residuals pipeline in Metro ROWs' to Blue Plains	Alternatives 4 and 5
P90	Attach B from M Greenwald letter dated 11/15/2004	Route Residuals Pipeline to Blue Plains via Abandoned Sewer Pipeline	Attachment B: 3. Option B - Use an abandoned sewer line to route residuals pipeline to Blue Plains or WSSC Potomac WFP.	Alternatives 5 and 7
P93	Kent Slowinski 11/5/2004 e-mail	Build Residuals Facilities at Carderock	Build residuals thickening and dewatering at Carderock or move entire WTP upriver.	Alternative 8
P102	Kent Slowinski 11/5/2004 e-mail	Move entire plant	Move the entire water treatment plant upriver	N/A
P94	Steve Shapiro 11/15/2004 e-mail	Capital Crescent Pipeline to CSX Railroad	Pipe residuals along Capital Crescent Trail to CSX train line rail cars in Silver Spring, MD	N/A
P95	Steve Shapiro 11/15/2004 e-mail	Capital Crescent Pipeline to Blue Plains	Pipe residuals along Capital Crescent Trail to DC and connect into pipeline to Blue Plains	Alternatives 4 and 5
P96	Steve Shapiro 11/15/2004 e-mail	Tunnel from Dalecarlia WTP to Monofill	If a landfill is built - build an underground tunnel from Dalecarlia WTP to landfill	Alternative 2
P98	Steve Shapiro 11/15/2004 e-mail	Residuals Island on the Potomac	Create an island in the Potomac to store residuals	Alternative 6
P99	Eric Morrison 9/21/2004 e-mail	Alternate Treatment Processes	Switch to new water treatment processes that do not produce residuals, such as MIEX, GAC, ultrafiltration membranes, etc.	N/A

Supplement to EFS: Public Alternative No.	Alternative Reference No. Assigned by Public	Title Assigned by Public	Description	Similar Alternative No. Described Previously in EFS
P100	Steve Shapiro 11/15/2004 e-mail	Facilities at Carderock or some other Federal facility	Relocate facilities to Carderock or some other Federal facility	Alternative 8
Alternatives with a Discharge to the Potomac River				
P101	William Harrop 11/9/04 e-mail	Return to the river	Challenge provisions of NPDES permit and discharge to the river	Alternative 10
Alternatives Involving the Dalecarlia Reservoir				
P82	Steve Luckman 9/30/2004 e-mail	Waste Residuals Lake Alternative	Store water treatment residuals temporarily in a sectioned-off portion of the Dalecarlia Reservoir prior to processing them	Alternatives 12 to 15
Alternatives with Facilities at the McMillan WTP				
None of the public alternatives recommend constructing facilities at the McMillan WTP.				
Alternatives with Facilities at the Dalecarlia WTP				
P71	Sludge Stopper - 71	Dalecarlia Campus Alternate Sites	Only as a last resort, build the thickening and dewatering plant on the Dalecarlia property, but on one of several alternative sites further away from residential property.	Alternative 25
P72	Sludge Stopper - 72	Dalecarlia Campus Underground	Only as the very last resort, build the thickening and dewatering plan on the Dalecarlia property, but underground. Build the equipment "floors" in a shaft dug from the back lot metro fill. Dewatered cake could easily be brought to the surface via a conveyor belt. The shaft fill would be used to build a high berm surrounding the facility which would be heavily planted.	Alternative 25
P79	Alma Gates 9/30/2004 e-mail	Alternate Truck Route to Clara Barton Parkway	Alternative truck route to Clara Barton Parkway or Canal Road	Alternative 25
P80	Brookmont meeting Request	Relocate Residuals Facilities on Dalecarlia WTP Site	Relocate residuals processing facility on the Dalecarlia WTP site	Alternative 25
P84	Lehigh Cement 9/28/2004 e-mail	Cement Disposal Alternative	Consider alternate disposal locations such as cement manufacturing plants.	Alternative 25
P87	Attach B from M Greenwald letter dated 11/15/2004	Bury Part of Residuals Facilities	Project approach suggestions: bury thickeners in ground and cover with a slab, bury truck entrance/exit from building, answer questions about residuals disposal sites, prepare digital model of surrounding community, etc.	Alternative 25
P91	Attach B from M Greenwald letter dated 11/15/2004	Relocate Residuals Facilities on Dalecarlia WTP Site or elsewhere	Attachment B: 4. Option B - Consider alternate sites for thickening/dewatering facilities (Carderock, Georgetown Reservoir, Unused West Filter Building, On Top of Sedimentation Basins)	Alternative 26
P-97	Steve Shapiro 11/15/2004 e-mail	Heat Drying	Use heat drying as part of the dewatering facilities to reduce the number of trucks required per day	Alternative 25
Raw Water Intake Improvement Options				
P67	Sludge Stopper - 67	Raw Water Intake Relocation	Regardless of the residual processing solution selected, efforts should be made to improve the quality (lower the residual content) of the raw water BEFORE it is sent to Dalecarlia. All solutions researched by FCWA for their intake should be reviewed for the Washington Aqueduct.	N/A
P76	SCS-4	Redesign Intake to Minimize Residuals Withdrawn from the River	Reduce the volume of residuals requiring management by relocating or redesigning the intake structure(s)	N/A
P77	SCS-5	Actively Manage Raw Water Intake to Reduce Residuals Withdrawn from the River	Reduce the volume of residuals requiring management through active management of raw water intake	N/A
P81	Leonard Sullivan 9/22/2004 email	Silt Removal at Great Falls	Relocate silt removal facility to Great Falls intake area	N/A
P92	Fred Wright 11/14/2004 e-mail	Riverbank Filtration	Convert surface intake on river to well intake to reduce silt load to the plant and decommission the Little Falls Intake.	N/A
Treatment Process Optimization Options				
P69	Sludge Stopper - 69	Smart Pumping	For any or all piping solutions put forth, investigate the engineering issues associated with "smart pumping", or the co-utilization of existing pipelines for different purposes, i.e.: a pressurized sewer line could be used for primary transport, but when needed, would be temporarily converted to a residual pipeline for a day or portion thereof to drain a residual holding tank/basin with the contents being intelligently redirected at the processing plant to the most appropriate treatment facility for the contents.	N/A
P78	SCS-6	Use Alternate Coagulant to Reduce Residuals Quantities	Use alternative processes for coagulation of sediments to reduce the volume of residuals requiring management	N/A
P83	Eric Morrison 9/22/2004 e-mail	Alternate Coagulant	Switch from aluminum chloride (alum) to an alternate coagulant, such as polyaluminum chloride, to reduce the volume of residuals produced	N/A

Table 2-4

Public Alternative and Option Screening Summary

Supplement to EFS: Public Alternative No.	Alternative Reference No. Assigned by Public	Title Assigned by Public	Description	Similar Alternative No. Described Previously in EFS	Screening Result (Consistent/ Inconsistent with Screening Criteria)	Unsatisfied Screening Criteria	Primary Screening Issue	Secondary Screening Issues
Alternatives That Do Not Require Continuous Trucking from the Dalecarlia WTP								
P1	Sludge Stopper - 1	Single 12" Iron Pipe-in-Pipe Potomac	Build a 12" iron pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P2	Sludge Stopper - 2	Single 12" Plastic Pipe-in-Pipe Potomac	Build a 12" HDPE (high density polyethylene) piping inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P3	Sludge Stopper - 3	Single 12" Stainless Pipe-in-Pipe Potomac	Build 12" stainless steel pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P4	Sludge Stopper - 4	Single 12" Composite Pipe-in-Pipe Potomac	Build a 12" composite pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is one the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P5	Sludge Stopper - 5	Single 6" Iron Pipe-in-Pipe Potomac	Building a 6" iron pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P6	Sludge Stopper - 6	Single 6" Plastic Pipe-in-Pipe Potomac	Build a 6" HDPE (high density polyethylene) piping inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P7	Sludge Stopper - 7	Single 6" Stainless Pipe-in-Pipe Potomac	Build a 6" stainless steel pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities
P8	Sludge Stopper - 8	Single 6" Composite Pipe-in-Pipe Potomac	Build a 6" composite pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P9	Sludge Stopper - 9	Trio 6-12-6" Iron Pipe-in-Pipe Potomac	Build a 6-12-6" trio of iron pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The three pipes would be nestled in the crown of the existing conduits and would provide bi-directional redundancy and flexible flow rate capacity.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	DC WASA would require SST pipe; two 6" diameter pipes do not carry equivalent flow to one 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24"; more land required at Blue Plains for thickening facilities.
P10	Sludge Stopper - 10	Trio 6-12-6" Plastic Pipe-in-Pipe Potomac	Build a 6-12-6" trio of HDPE (high density polyethylene) pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The three pipes would be nestled in the crown of the existing conduits and would provide bi-directional redundancy and flexible flow rate capacity.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	DC WASA would require SST pipe; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24"; more land required at Blue Plains for thickening facilities.

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P11	Sludge Stopper - 11	Trio 6-12-6" Stainless Pipe-in-Pipe Potomac	Build a 6-12-6" trio of stainless steel pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The three pipes would be nestled in the crown of the existing conduits and would provide bi-directional redundancy and flexible flow rate capacity.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Two 6" diameter pipes do not carry equivalent flow to 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24";more land required at Blue Plains for thickening facilities.
P12	Sludge Stopper - 12	Trio 6-12-6" Composite Pipe-in-Pipe Potomac	Build a 6-12-6" trio of composite pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	DC WASA would require SST pipe; two 6" diameter pipes do not carry equivalent flow to 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24"; more land required at Blue Plains for thickening facilities.
P13	Sludge Stopper - 13	Single 12" Iron Pipe-in-Pipe Rock Creek	Build a 12" iron pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P14	Sludge Stopper - 14	Single 12" Plastic Pipe-in-Pipe Rock Creek	Build a 12" HDPE (high density polyethylene) piping inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P15	Sludge Stopper - 15	Single 12" Stainless Pipe-in-Pipe Rock Creek	Build a 12" stainless steel pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P16	Sludge Stopper - 16	Single 12" Composite Pipe-in-Pipe Rock Creek	Build 1 12" composite pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continued inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P17	Sludge Stopper -17	Single 6" Iron Pipe-in-Pipe Rock Creek	Build a 6" iron pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P18	Sludge Stopper - 18	Single 6" Plastic Pipe-in-Pipe Rock Creek	Build a 6" HDPE (high density polyethylene) piping inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P19	Sludge Stopper - 19	Single 6" Stainless Pipe-in-Pipe Rock Creek	Build a 6" stainless steel pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities
P20	Sludge Stopper - 20	Single 6" Composite Pipe-in-Pipe Rock Creek	Build a 12" stainless steel pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P21	Sludge Stopper - 21	Trio 6-12-6" Iron Pipe-in-Pipe Rock Creek	Build a 6-12-6" trio of iron pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	DC WASA would require SST pipe; two 6" diameter pipes do not carry equivalent flow to one 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24"; more land required at Blue Plains for thickening facilities.

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P22	Sludge Stopper - 22	Trio 6-12-6" Plastic Pipe-in-Pipe Rock Creek	Build a 6-12-6" HDPE (high density polyethylene) pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	DC WASA would require SST pipe; two 6" diameter pipes do not carry equivalent flow to one 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24"; more land required at Blue Plains for thickening facilities.
P23	Sludge Stopper - 23	Trio 6-12-6" Stainless Pipe-in-Pipe Rock Creek	Build a 6-12-6" trio of stainless steel pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Two 6" diameter pipes do not carry equivalent flow to 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24";more land required at Blue Plains for thickening facilities.
P24	Sludge Stopper - 24	Trio 6-12-6" Composite Pipe-in-Pipe Rock Creek	Build a 6-12-6" trio of composite pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the Potomac Force Mains to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	DC WASA would require SST pipe; two 6" diameter pipes do not carry equivalent flow to 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24"; more land required at Blue Plains for thickening facilities.
P25	Sludge Stopper - 25	Single 12" Iron Pipe-in-Pipe Potomac via Main	Build a 12" iron pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P26	Sludge Stopper - 26	Single 12" Plastic Pipe-in-Pipe Potomac via Main	Build a 12" HDPE (high density polyethylene) pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P27	Sludge Stopper - 27	Single 12" Stainless Pipe-in-Pipe Potomac via Main	Build a 12" stainless steel pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P28	Sludge Stopper - 28	Single 12" Composite Pipe-in-Pipe Potomac via Main	Build a 12" composite pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P29	Sludge Stopper - 29	Single 6" Iron Pipe-in-Pipe Potomac via Main	Build a 6" iron pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P30	Sludge Stopper - 30	Single 6" Plastic Pipe-in-Pipe Potomac via Main	Build a 6" HDPE (high density polyethylene) pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P31	Sludge Stopper - 31	Single 6" Stainless Pipe-in-Pipe Potomac via Main	Build a 6" stainless steel pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities
P32	Sludge Stopper - 32	Single 6" Composite Pipe-in-Pipe Potomac via Main	Build a 6" composite pipeline inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.

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P33	Sludge Stopper - 33	Trio 6-12-6" Iron Pipe-in-Pipe Potomac via Main	Build a 6-12-6" trio of pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The three pipes would be nestled in the crown of the existing conduits and would provide bi-directional redundancy and flexible flow rate capacity.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	DC WASA would require SST pipe; two 6" diameter pipes do not carry equivalent flow to one 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24"; more land required at Blue Plains for thickening facilities.
P34	Sludge Stopper - 34	Trio 6-12-6" Plastic Pipe-in-Pipe Potomac via Main	Build a 6-12-6" trio of HDPE (high density polyethylene) pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The three pipes would be nestled in the crown of the existing conduits and would provide bi-directional redundancy and flexible flow rate capacity.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	DC WASA would require SST pipe; two 6" diameter pipes do not carry equivalent flow to one 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24"; more land required at Blue Plains for thickening facilities.
P35	Sludge Stopper - 35	Trio 6-12-6" Stainless Pipe-in-Pipe Potomac via Main	Build a 6-12-6" trio of stainless steel pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The three pipes would be nestled in the crown of the existing conduits and would provide bi-directional redundancy and flexible flow rate capacity.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Two 6" diameter pipes do not carry equivalent flow to 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24";more land required at Blue Plains for thickening facilities.
P36	Sludge Stopper - 36	Trio 6-12-6" Composite Pipe-in-Pipe Potomac via Main	Build a 6-12-6" trio of composite pipes inside the existing Potomac Relief Sewer to the Potomac Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	DC WASA would require SST pipe; two 6" diameter pipes do not carry equivalent flow to 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24"; more land required at Blue Plains for thickening facilities.
P37	Sludge Stopper - 37	Single 12" Iron Pipe-in-Pipe Rock Creek via Main	Build a 12" iron pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P38	Sludge Stopper - 38	Single 12" Plastic Pipe-in-Pipe Rock Creek via Main	Build a 12" HDPE (high density polyethylene) pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P39	Sludge Stopper - 39	Single 12" Stainless Pipe-in-Pipe Rock Creek via Main	Build a 12" stainless steel pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P40	Sludge Stopper - 40	Single 12" Composite Pipe-in-Pipe Rock Creek via Main	Build a 12" composite pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains. The emphasis in this alternative is on the use of composite piping that would be impervious to all known sewer environments.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P41	Sludge Stopper - 41	Single 6" Iron Pipe-in-Pipe Rock Creek via Main	Build a 6" iron pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residuals to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P42	Sludge Stopper - 42	Single 6" Plastic Pipe-in-Pipe Rock Creek via Main	Build a 6" HDPE (high density polyethylene) pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P43	Sludge Stopper - 43	Single 6" Stainless Pipe-in-Pipe Rock Creek via Main	Build a 6" stainless steel piping inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities

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P44	Sludge Stopper - 44	Single 6" Composite Pipe-in-Pipe Rock Creek via Main	Build a 12" stainless steel pipeline inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Proposal does not include redundancy; DC WASA would require SST pipe; 18" to 24" diameter required for unthickened flow; more land required at Blue Plains for thickening facilities.
P45	Sludge Stopper - 45	Trio 6-12-6" Iron Pipe-in-Pipe Rock Creek via Main	Build a 6-12-6" trio of iron pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Truck Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	DC WASA would require SST pipe; two 6" diameter pipes do not carry equivalent flow to one 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24"; more land required at Blue Plains for thickening facilities.
P46	Sludge Stopper - 46	Trio 6-12-6" Plastic Pipe-in-Pipe Rock Creek via Main	Build a 6-12-6" trio of HDPE (high density polyethylene) pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	DC WASA would require SST pipe; taking longer to install; two 6" diameter pipes do not carry equivalent flow to one 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24"; more land required at Blue Plains for thickening facilities.
P47	Sludge Stopper - 47	Trio 6-12-6" Stainless Pipe-in-Pipe Rock Creek via Main	Build a 6-12-6" trio of stainless steel pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to the Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	Two 6" diameter pipes do not carry equivalent flow to 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24";more land required at Blue Plains for thickening facilities.
P48	Sludge Stopper - 48	Trio 6-12-6" Composite Pipe-in-Pipe Rock Creek via Main	Build a 6-12-6" trio of composite pipes inside the existing Upper Potomac Interceptor to the Rock Creek Pumping Station and continue inside the B Street Trunk Sewer to the Main Sewage Pumping Station then to Blue Plains WWTP. Use this pipeline to pump unthickened residual to Blue Plains and dewater at Blue Plains.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	DC WASA would require SST pipe; two 6" diameter pipes do not carry equivalent flow to 12"; three suggested pipes are not sufficiently sized to transport unthickened residuals flow - total pipe diameter must be equivalent to 18" - 24"; more land required at Blue Plains for thickening facilities.
P49	Sludge Stopper - 49	Dalecarlia to WSSC Potomac Over Interceptor	Build a new single, double, or quad pipeline on top of the Potomac Interceptor to the WSSC Potomac Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7	Inconsistent	Institutional Constraints (WSSC)	WSSC will not accept Washington Aqueduct residuals	
P50	Sludge Stopper - 50	Dalecarlia to WSSC Potomac Inside Interceptor	Build a new single, double, or quad pipeline inside the Potomac Interceptor to the WSSC Potomac Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7	Inconsistent	Institutional Constraints (WSSC)	WSSC will not accept Washington Aqueduct residuals	
P51	Sludge Stopper - 51	Dalecarlia to WSSC Potomac Over Raw Water Conduit	Build a new single, double, or quad pipeline over the Great Falls raw water conduits to the WSSC Potomac Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7	Inconsistent	Institutional Constraints (WSSC)	WSSC will not accept Washington Aqueduct residuals	
P52	Sludge Stopper - 52	Dalecarlia to WSSC Potomac In Raw Water Conduit	Build a new single, double, or quad pipeline inside one of the Great Falls raw water conduits to the WSSC Potomac Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7	Inconsistent	Institutional Constraints (WSSC)	WSSC will not accept Washington Aqueduct residuals	
P53	Sludge Stopper - 53	Dalecarlia to WSSC Potomac Via River Road	Build a new single, double, or quad pipeline along River Road, to the WSSC Potomac Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7	Inconsistent	Institutional Constraints (WSSC)	WSSC will not accept Washington Aqueduct residuals	
P54	Sludge Stopper - 54	Dalecarlia to New Carderock Over Interceptor	Build a new single, double, or quad pipeline on top of the Potomac Interceptor to a new thickening and dewatering plant on the Carderock Naval Research Center grounds, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 8	Inconsistent	Reliability and Redundancy; FFCA; Institutional Constraints	Reliability issues associated with building a pipeline over the Potomac Interceptor; FFCA Schedule	Based on preliminary conversations, Carderock is not anticipated to be able to commit to accepting residuals processing facilities on their site within the timeline of the FFCA.
P55	Sludge Stopper - 55	Dalecarlia to New Carderock Inside Interceptor	Build a new single, double, or quad pipeline inside the Potomac Interceptor to a new thickening and dewatering plant on the Carderock Naval Research Center grounds, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 8	Inconsistent	Reliability and Redundancy; FFCA; Institutional Constraints	Reliability issues associated with building a pipeline inside the Potomac Interceptor; FFCA Schedule	Based on preliminary conversations, Carderock is not anticipated to be able to commit to accepting residuals processing facilities on their site within the timeline of the FFCA.
P56	Sludge Stopper - 56	Dalecarlia to New Carderock Over Raw Water Conduit	Build a new single, double, or quad pipeline above the Great Falls raw water conduit to a new thickening and dewatering plan on the Carderock Naval Research Center grounds, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 8	Inconsistent	Reliability and Redundancy; FFCA; Institutional Constraints	Reliability issues associated with building a pipeline over the raw water conduit; FFCA Schedule	Based on preliminary conversations, Carderock is not anticipated to be able to commit to accepting residuals processing facilities on their site within the timeline of the FFCA.
P57	Sludge Stopper - 57	Dalecarlia to New Carderock Inside Raw Water Conduit	Build a new single, double, or quad pipeline inside the Great Falls raw water conduit to a new thickening and dewatering plan on the Carderock Naval Research Center grounds, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 8	**Under Evaluation**		Based on preliminary conversations, Carderock is not anticipated to be able to commit to accepting residuals processing facilities on their site within the timeline of the FFCA.	

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P58	Sludge Stopper - 58	Dalecarlia to FCWA Corbalis Via Little Falls	Build a new single, double, or quad pipeline across the Potomac at Little Falls dam, to the FCWA Corbalis Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7	Inconsistent	Institutional Constraints (FCWA)	FCWA will not accept Washington Aqueduct residuals	
P59	Sludge Stopper - 59	Dalecarlia to FCWA Corbalis Via Chain Bridge	Build a new single, double, or quad pipeline across the Potomac at the Chain Bridge, to the FCWA Corbalis Water Filtration Plant for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternative 7	Inconsistent	Institutional Constraints (FCWA)	FCWA will not accept Washington Aqueduct residuals	
P60	Sludge Stopper - 60	Blue Plains Via Potomac Channel	Build a new single, double, or quad pipeline and lay it in the Potomac Channel from Dalecarlia to Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P61	Sludge Stopper - 61	Blue Plains Via Virginia Riverbank from Little Falls Dam	Build a new single, double, or quad pipeline from Dalecarlia, across the Potomac at Little Falls dam, then down the Virginia riverbank to a river crossing near Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P62	Sludge Stopper - 62	Blue Plains Via Virginia Riverbank from Chain Bridge	Build a new single, double, or quad pipeline from Dalecarlia, across the Potomac at Chain Bridge, then down the Virginia riverbank to a river crossing near Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P63	Sludge Stopper - 63	Blue Plains Via Virginia Riverbank from Key Bridge	Build a new single, double, or quad pipeline from Dalecarlia, across the Potomac at Key Bridge, then down the Virginia riverbank to a river crossing near Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P64	Sludge Stopper - 64	Blue Plains Via George Washington Parkway form Little Falls Dam	Build a new single, double, or quad pipeline from Dalecarlia, across the Potomac at Little Falls damn, then down the George Washington Parkway to a river crossing near Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, stainless steel, and composite, etc.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P65	Sludge Stopper - 65	Blue Plains Via George Washington Parkway from Chain Bridge	Build a new single, double, or quad pipeline from Dalecarlia, across the Potomac at Chain Bridge, then down the George Washington Parkway to a river crossing near Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P66	Sludge Stopper - 66	Blue plains Via George Washington Parkway from Key Bridge	Build a new single, double, or quad pipeline from Dalecarlia, across the Potomac at Key Bridge, then down the George Washington Parkway to a river crossing near Blue Plains for dewatering, considering all applicable sizes - 6", 12", 24" etc., and materials - iron, HDPE, stainless steel, and composite, etc.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P68	Sludge Stopper - 68	Dalecarlia to Drained Georgetown 2	Implement plate settlers or other high efficiency technologies at Dalecarlia and/or Georgetown basins such that Georgetown 2 can be drained and the new thickening and dewatering plant built on the floor of the basin, below grade and out of site.	Section 4 of EFS	Inconsistent	Economic Considerations	Cost of facility at Georgetown	
P70	Sludge Stopper - 70	Georgetown Waterfront CSO Holding Tanks	In conjunction with the DC WASA CIP, utilize or expand upon the current 58 MG Georgetown Waterfront CSO holding tank to store the residual flushes, then dewater the holding tank in a controlled manner via new or existing pumping stations and pipeline to Blue Plains for final processing.	Alternative 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P73	SCS Engineers-1	Barge to Bioreactor Landfill	Use new of existing outfall piping to transport residuals to the Potomac River without dewatering, and then transport via barge to a bioreactor landfill	Alternative 6	Inconsistent	Reliability and Redundancy; Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	See barge discussion in Feasibility Study
P74	SCS Engineers-2	Transport Unthickened Residuals to Blue Plains via Riverbed Pipeline	Using the existing outfall piping to transport residuals to the Potomac River without dewatering, and transport via new riverbed pipeline to Blue Plains for treatment.	Alternative 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P75	SCS Engineers-3	Pipe in a Pipe to Blue Plains	Construct new pipeline within existing pipelines.	Alternative 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P85	S Deschler 11/15/2004 e-mail	Store Residuals and Discharge to Potomac Interceptor During Dry Conditions	Add more storage to alt. 4 so thickened residuals can be discharged to Potomac Interceptor only during dry weather conditions.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P86	S Deschler 11/15/2004 e-mail	Transport Unthickened to Blue Plains via Pipeline, Install in Potomac Interceptor During Dry Conditions	Convey dewatered residuals from Dalecarlia to Blue Plains in a dedicated pipe. Install pipe during dry days when sewer is near empty. Relatively easy to access Potomac Interceptor.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P88	Stuart Ross 11/15/2004 e-mail		Adopt pipeline to Blue Plains alternative.	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P89	Attach B from M Greenwald letter dated 11/15/2004	Residuals Pipeline to Blue Plains via Metro Tunnels	Attachment B: 2. Option B - Route residuals pipeline in Metro ROWs' to Blue Plains	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P90	Attach B from M Greenwald letter dated 11/15/2004	Route Residuals Pipeline to Blue Plains via Abandoned Sewer Pipeline	Attachment B: 3. Option B - Use an abandoned sewer line to route residuals pipeline to Blue Plains or WSSC Potomac WFP.	Alternatives 5 and 7	Inconsistent	Institutional Constraints (DC WASA)	DC WASA and WSSC will not accept Washington Aqueduct residuals	

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P93	Kent Slowinski 11/5/2004 e-mail	Build Residuals Facilities at Carderock	Build residuals thickening and dewatering at Carderock or move entire WTP upriver.	Alternative 8	**Under Evaluation**		Based on preliminary conversations, Carderock is not anticipated to be able to commit to accepting residuals processing facilities on their site within the timeline of the FFCA. Moving entire WTP upriver is cost prohibitive and violates cost screeing criteria.	
P102	Kent Slowinski 11/5/2004 e-mail	move entire plant	Move the entire water treatment plant upriver	N/A	Inconsistent	NPDES	Does not meet requirements of NPDES permit	
P94	Steve Shapiro 11/15/2004 e-mail	Capital Crescent Pipeline to CSX Railroad	Pipe residuals along Capital Crescent Trail to CSX train line rail cars in Silver Spring, MD	Alternative 8	Inconsistent	Economic considerations; FFCA, Institutional Constraints	Unthickened residuals are not suitable form for land application. A thickening and dewatering plant would be necessary in another location within access of the CSX train line.	It is anticipated that extensive and time-consuming negotiations would be required to procure the rights to an easement along the Capital Crescent Trail and also to arrange for use of rail cars on the CSX train line. It is unlikely that these issues could be addressed within the context of the FFCA schedule.
P95	Steve Shapiro 11/15/2004 e-mail	Capital Crescent Pipeline to Blue Plains	Pipe residuals along Capital Crescent Trail to DC and connect into pipeline to Blue Plains	Alternatives 4 and 5	Inconsistent	Institutional Constraints (DC WASA)	DC WASA will not accept Washington Aqueduct residuals	
P96	Steve Shapiro 11/15/2004 e-mail	Tunnel from Dalecarlia WTP to Monofill	If a landfill is built - build an underground tunnel from Dalecarlia WTP to landfill	Alternative 2	Inconsistent	Economic Considerations plus FFCA relative to monofill option	Relative to the monofill option, a portion of the monofill footprint occupies an area that is targeted for further investigation by the Spring Valley American University Experiment Station (AUES) Formerly Used Defense Site (FUDS) project. Investigations can not be completed in sufficient time to design, permit, construct and have a monofill operational by the FFCA 2009 deadline.	It is anticipated that it would be difficult to construct a new truck access tunnel under MacArthur Boulevard in the vicinity of the front entrance to the Dalecarlia WTP because the tunnel would need to be installed beneath both the road and the Georgetown Tunnel, which transports raw water from the Dalecarlia Reservoir to the Georgetown Reservoirs. Option is anticipated to exceed the cost screening criteria.
P98	Steve Shapiro 11/15/2004 e-mail	Residuals Island on the Potomac	Create an island in the Potomac to store residuals	Alternative 6	Inconsistent	Reliability and Redundancy		See barge discussion in Feasibility Study
P99	Eric Morrison 9/21/2004 e-mail	Alternate Treatment Processes	Switch to new water treatment processes that do not produce alum-associated residuals, such as MIEX, GAC, ultrafiltration membranes, etc.	N/A	Inconsistent	FFCA, Economic Considerations, Unproven technologies	This would involve an overhaul of the water treatment processes with this newly emerging technology. The technology is unproven for large scale water treatment processes. Time required for pilot testing would be is not possible within the FFCA schedule. The cost associated with this alternative exceeds the screening threshold.	
P100	Steve Shapiro 11/15/2004 e-mail	Facilities at Carderock or some other Federal facility	Relocate facilities to Carderock or some other Federal facility	Alternative 8	**Under Evaluation**		Based on preliminary conversations, Carderock is not anticipated to be able to commit to accepting residuals processing facilities on their site within the timeline of the FFCA.	
Alternatives with a Discharge to the Potomac River								
P101	William Harrop 11/9/04 e-mail	Return to the river	Challenge provisions of NPDES permit and discharge to the river	Alternative 10	Inconsistent	NPDES	Permit was finalized after years of negotiation. Permit authority is from the Clean Water Act.	
Alternatives Involving the Dalecarlia Reservoir								
P82	Steve Luckman 9/30/2004 e-mail	Waste Residuals Lake Alternative	Store water treatment residuals temporarily in a sectioned-off portion of the Dalecarlia Reservoir prior to processing them	Alternatives 12 to 15	Inconsistent	Reliability and Redundancy	Silt removal function provided by reservoir cannot be compromised.	
Alternatives with Facilities at the McMillan WTP								
None of the public alternatives recommend constructing facilities at the McMillan WTP.								
Alternatives with Facilities at the Dalecarlia WTP								
P71	Sludge Stopper - 71	Dalecarlia Campus Alternate Sites	Only as a last resort, build the thickening and dewatering plant on the Dalecarlia property, but on one of several alternative sites further away from residential property.	Alternative 25	Consistent			
P72	Sludge Stopper - 72	Dalecarlia Campus Underground	Only as the very last resort, build the thickening and dewatering plan on the Dalecarlia property, but underground. Build the equipment "floors" in a shaft dug from the back lot metro fill. Dewatered cake could easily be brought to the surface via a conveyor belt. The shaft fill would be used to build a high berm surrounding the facility which would be heavily planted.	Alternative 25	**Under Evaluation**		Costs associated with burying thickeners and a portion of the buildingwill be evaluated, along with equipment maintenance impacts associated with covering thickeners.	Feasibility of burying building is impacted by size and topography of site and allowable road grades.
P79	Alma Gates 9/30/2004 e-mail	Alternate Truck Route to Clara Barton Parkway	Alternative truck route to Clara Barton Parkway or Canal Road	Alternative 25	**Under Evaluation**		Based on preliminary conversations, the NPS is not anticipated to allow construction of a new access road through park land or the truck transport of residaus on the Clara Barton Parkway.	
P80	Brookmont meeting Request	Relocate Residuals Facilities on Dalecarlia WTP Site	Relocate residuals processing facility on the Dalecarlia WTP site	Alternative 25	**Under Evaluation**			

Supplement to EFS: Public Alternative No.	Alternative Reference No. Assigned by Public	Title Assigned by Public	Description	Similar Alternative No. Described Previously in EFS	Screening Result (Consistent/ Inconsistent with Screening Criteria)	Unsatisfied Screening Criteria	Primary Screening Issue	Secondary Screening Issues
P84	Lehigh Cement 9/28/2004 e-mail	Cement Disposal Alternative	Consider alternate disposal locations such as cement manufacturing plants.	Alternative 25	Consistent/Option, potential disposal option for Alternative 25			
P87	Attach B from M Greenwald letter dated 11/15/2004	Bury Part of Residuals Facilities	Project approach suggestions: bury thickeners in ground and cover with a slab, bury truck entrance/exit from building, answer questions about residuals disposal sites	Alternative 25	**Under Evaluation**		Costs associated with burying thickeners and a portion of the buildingwill be evaluated, along with equipment maintenance impacts asociated with covering thickeners.	Feasibility of burying building is impacted by size and topography of site and allowable road grades.
P91	Attach B from M Greenwald letter dated 11/15/2004	Relocate Residuals Facilities on Dalecarlia WTP Site or elsewhere	Consider alternate sites for thickening/dewatering facilities (Carderock, Georgetown Reservoir, Unused West Filter Building, On Top of Sedimentation Basins) - Note that P91 will address facilities at Dalecarlia only. Facitlities at Georgetown and Carderock are addressed under other items.	Alternative 25	Inconsistent	Reliability and Redundancy	Alternate residuals processing location that conflict with current or anticipated water treatment facilities will not be evaluated in detail.	
P97	Steve Shapiro 11/15/2004 e-mail	Heat Drying	Use heat drying as part of the dewatering facilities to reduce the number of trucks required per day	Alternative 25 + 26	Inconsistent	Economic Considerations	Alternative would require construction of all residuals facilities required for other trucking alternatives plus new drying facility. Construction cost of this alternative does not meet screening criteria.	
Raw Water Intake Improvement Options								
P67	Sludge Stopper - 67	Raw Water Intake Relocation	Regardless of the residual processing solution selected, efforts should be made to improve the quality (lower the residual content) of the raw water BEFORE it is sent to Dalecarlia. All solutions researched by FCWA for their intake should be reviewed for the Washington Aqueduct.	N/A	Inconsistent	FFCA, Institutional Constraints, Economic Considerations, Reliability and Redundancy	Land is not currently available to construct new intake facilities. The NPS would need to grant permission to construction of a new intake facility on their property. It is not anticipated that this permission could be obtained within the limitations of the FFCA schedule. Intake improvements would be required at both the Great Falls and Little Falls locations to take full advantage of the suggested improvements. The cost of these improvements is anticipated to exceed the cost screening criteria for the project.	Because of the nature of the exsiting intakes, it is not anticipated that significant improvement will be achieved by relocating intakes, which would come at considerable cost.
P76	SCS Engineers-4	Redesign Intake to Minimize Residuals Withdrawn from the River	Reduce the volume of residuals requiring management by relocating or redesigning the intake structure(s)	N/A	Inconsistent	FFCA, Institutional Constraints, Economic Considerations, Reliability and Redundancy	See P67	See P67
P77	SCS Engineers-5	Actively Manage Raw Water Intake to Reduce Residuals Withdrawn from the River	Reduce the volume of residuals requiring management through active management of raw water intake	N/A	Inconsistent		See P67	See P67
P81	Leonard Sullivan 9/22/2004 email	Silt Removal at Great Falls	Relocate silt removal facility to Great Falls intake area	N/A	Inconsistent	FFCA	In addition to the need for further study to confirm feasibility, the silt removal system would require a significant amount of land to construct. This land is owned by the National Park Service and is not readily available.	
P92	Fred Wright 11/14/2004 e-mail	Riverbank Filtration	Convert surface intake on river to well intake to reduce silt load to the plant and decommission the Little Falls Intake.	N/A	Inconsistent	FFCA	Feasibility of such a process would take considerable study and is uncertain at the scale of the Washington Aqueduct operation. It would not eliminate the generation of water treatment residuals, and it could only be implemented as part of a long-term plan.	
Treatment Process Optimization Options								
P69	Sludge Stopper - 69	Smart Pumping	For any or all piping solutions put forth, investigate the engineering issues associated with "smart pumping", or the co-utilization of existing pipelines for different purposes, i.e.: a pressurized sewer line could be used for primary transport, but when needed, would be temporarily converted to a residual pipeline for a day or portion thereof to drain a residual holding tank/basin with the contents being intelligently redirected at the processing plant to the most appropriate treatment facility for the contents.	N/A	Inconsistent	Institutional Constraints	Implementation of this option would require a system-wide, region-wide change in approach for the conveyance, treatment, and processing of sewage and residuals. Because multiple jurisdictions would be involved (i.e., Washington Aqueduct, DC WASA, WSSC, FCWA, etc.), this option would be very difficult to implement	
P78	SCS-6	Use Alternate Coagulant to Reduce Residuals Quantities	Use alternative processes for coagulation of sediments to reduce the volume of residuals requiring management	N/A	**Under Evaluation**		Washington Aqueduct is considering alternate coagulants but they must ensure that they do not negatively impact other water treatment goals, such as corrosion control or disinfection by-product formation. Pilot and full scale testing will be required to confirm these goals can be achieved. This testing cannot be completed in time to meet the FFCA deadlines. However, the proposed facilities will be designed to allow the use of alternate coagulants in the future if proven feasible and reliable.	
P83	Eric Morrison 9/22/2004 e-mail	Alternate Coagulant	Switch from aluminum chloride (alum) to an alternate coagulant, such as polyaluminum chloride, to reduce the volume of residuals produced	N/A	**Under Evaluation**		see P78 discussion above.	

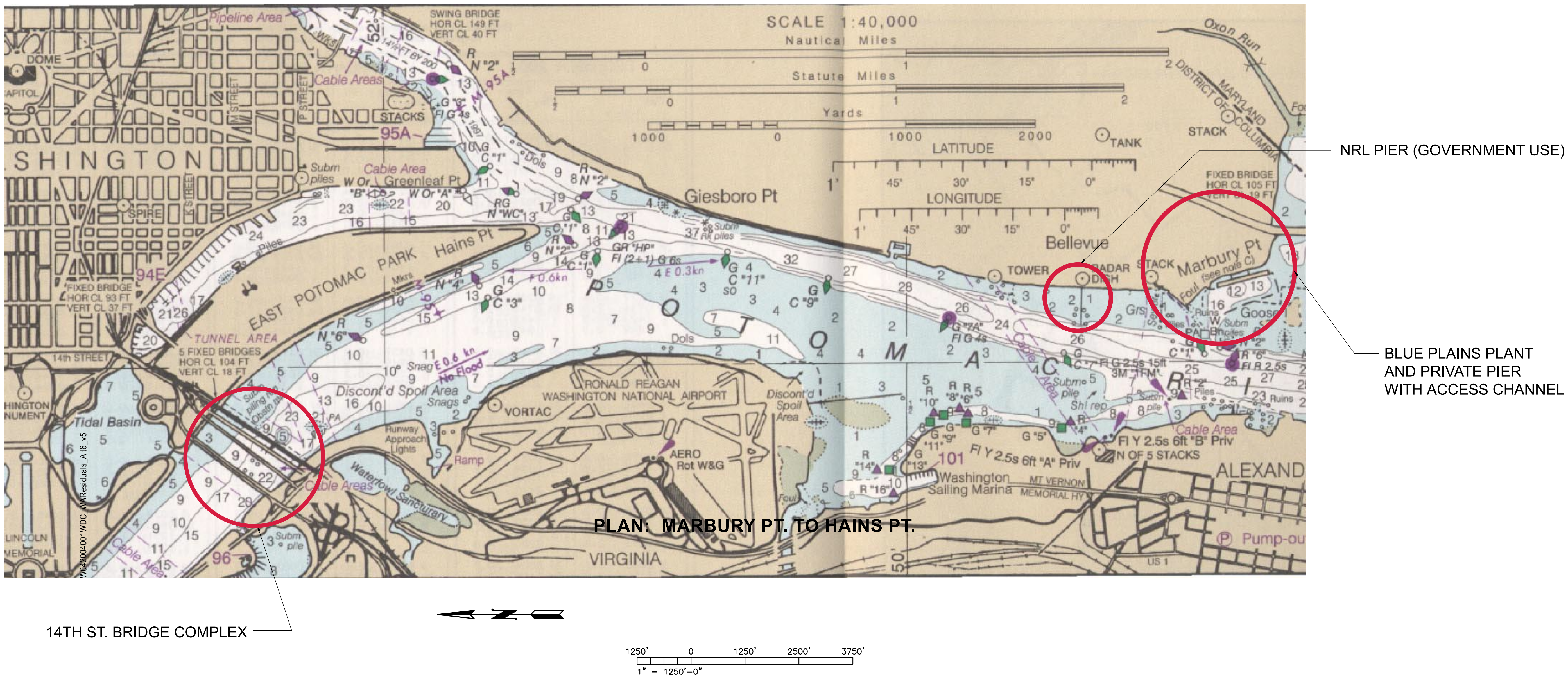
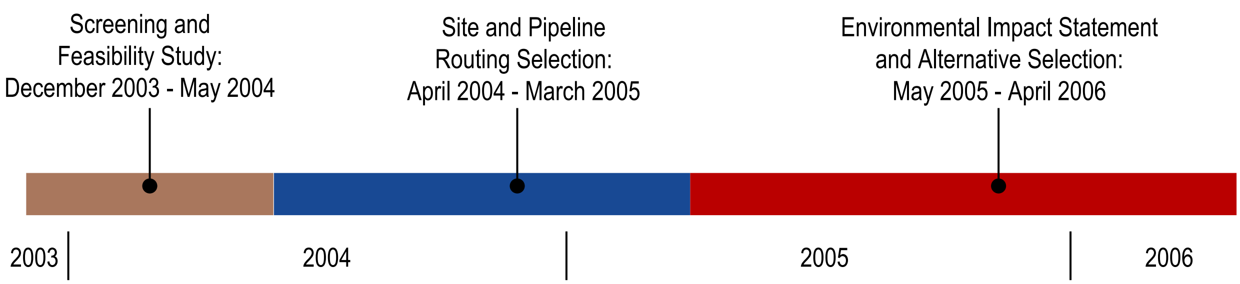


FIGURE 2-1
Navigational Constraints for Alternative 6

FIGURE 2-2
Alternative 8 Time Line



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Legend

- Approximate Location of New/Modified Facilities
- County Boundary
- Existing Buildings
- Roads

The geographic information shown on this map is based on data from the District of Columbia Geographic Information System (DC GIS). The District Government makes no warranty, express or implied, and disclaims all implied warranties of suitability of the DC GIS product for a particular purpose.

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Figure 2-3
Monofill at Reservoir

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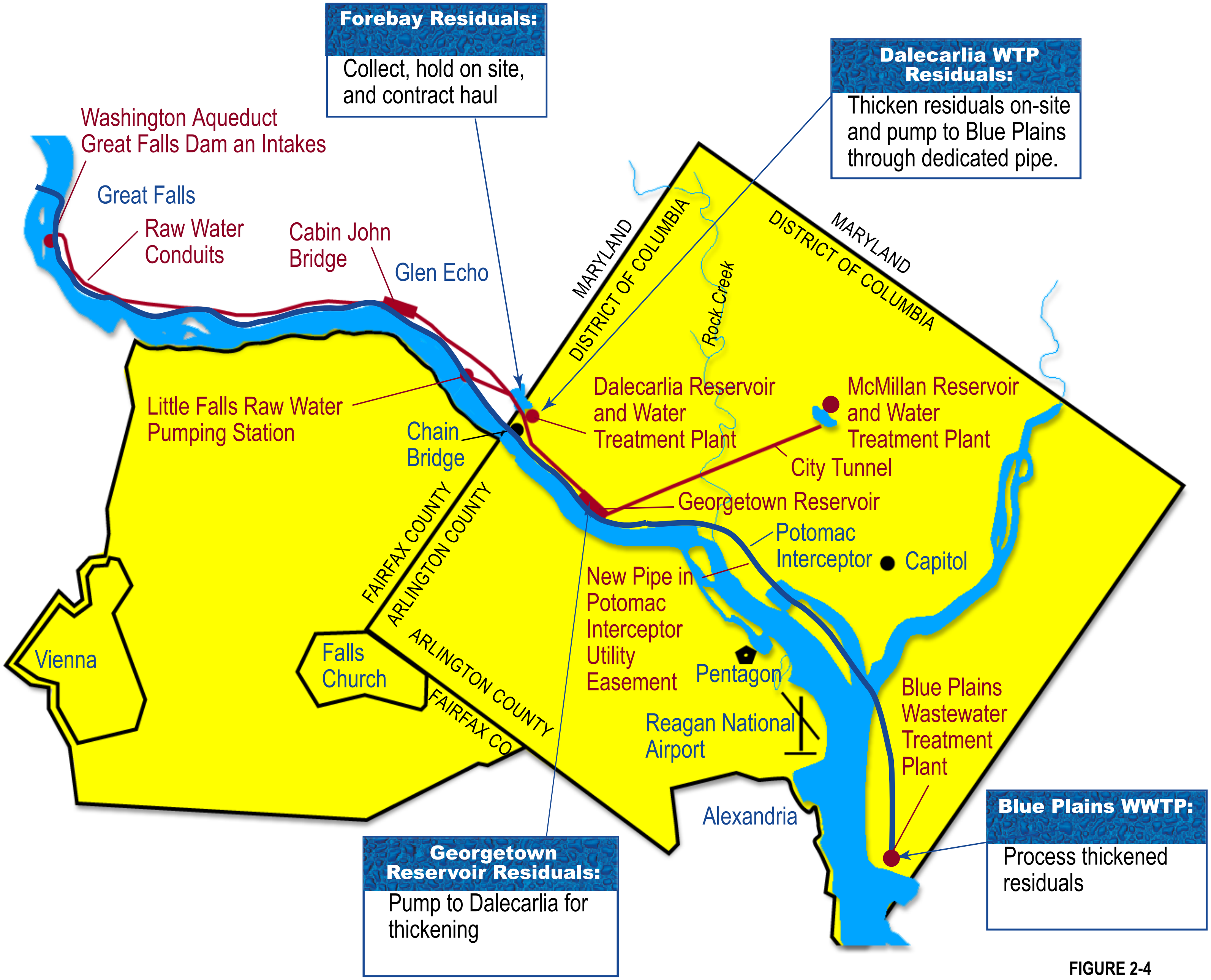

FIGURE 2-4
Overview of Blue Plains Alternatives

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Figure 2-5
Georgetown Reservoir

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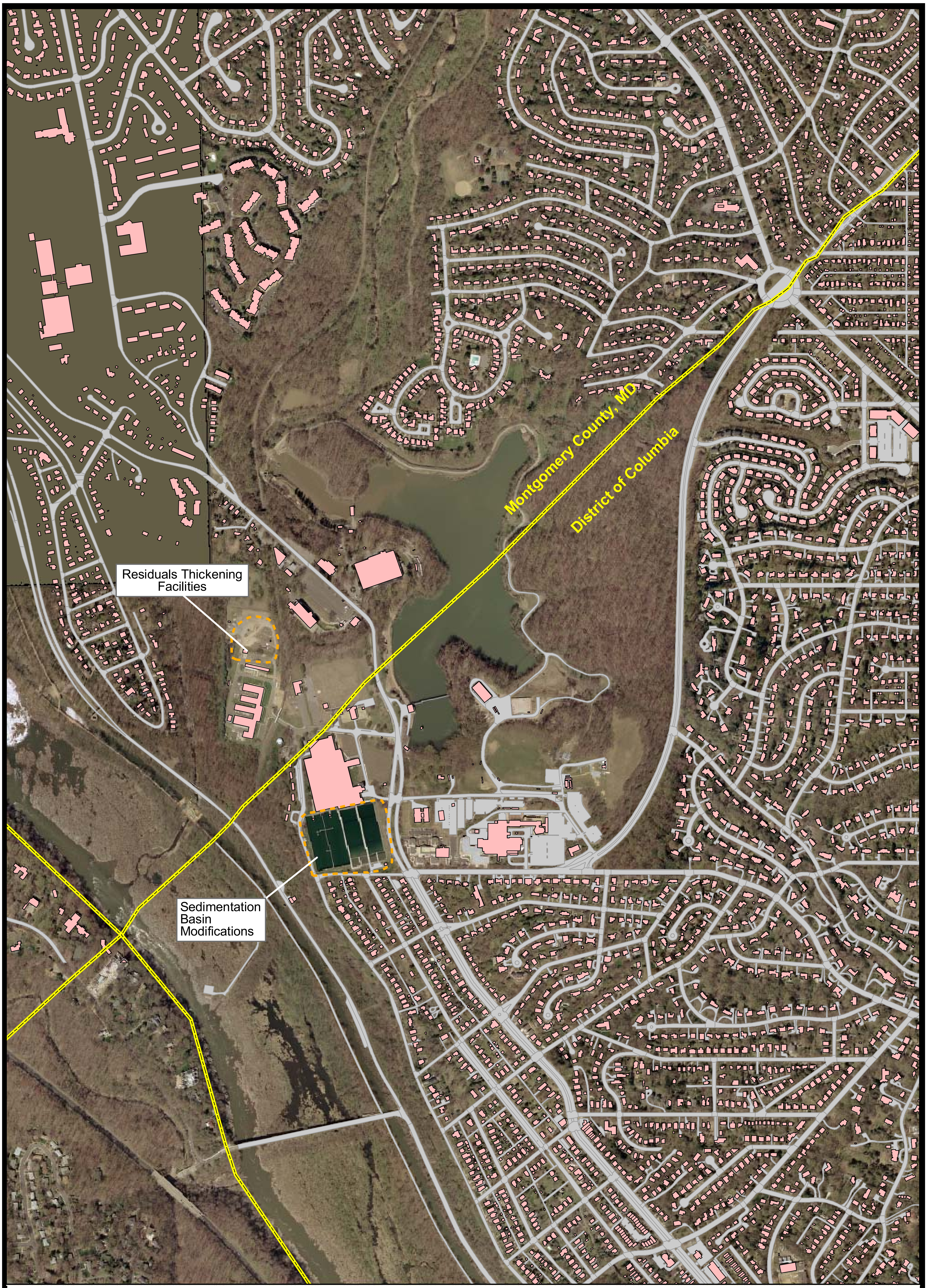

Legend

- Approximate Location of New/Modified Facilities
- County Boundary
- Existing Buildings
- Roads

The geographic information shown on this map is based on data from the District of Columbia Geographic Information System (DC GIS). The District Government makes no warranty, express or implied, and disclaims all implied warranties of suitability of the DC GIS product for a particular purpose.

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Figure 2-6
Residuals Management at Dalecarlia for the Blue Plains Alternative

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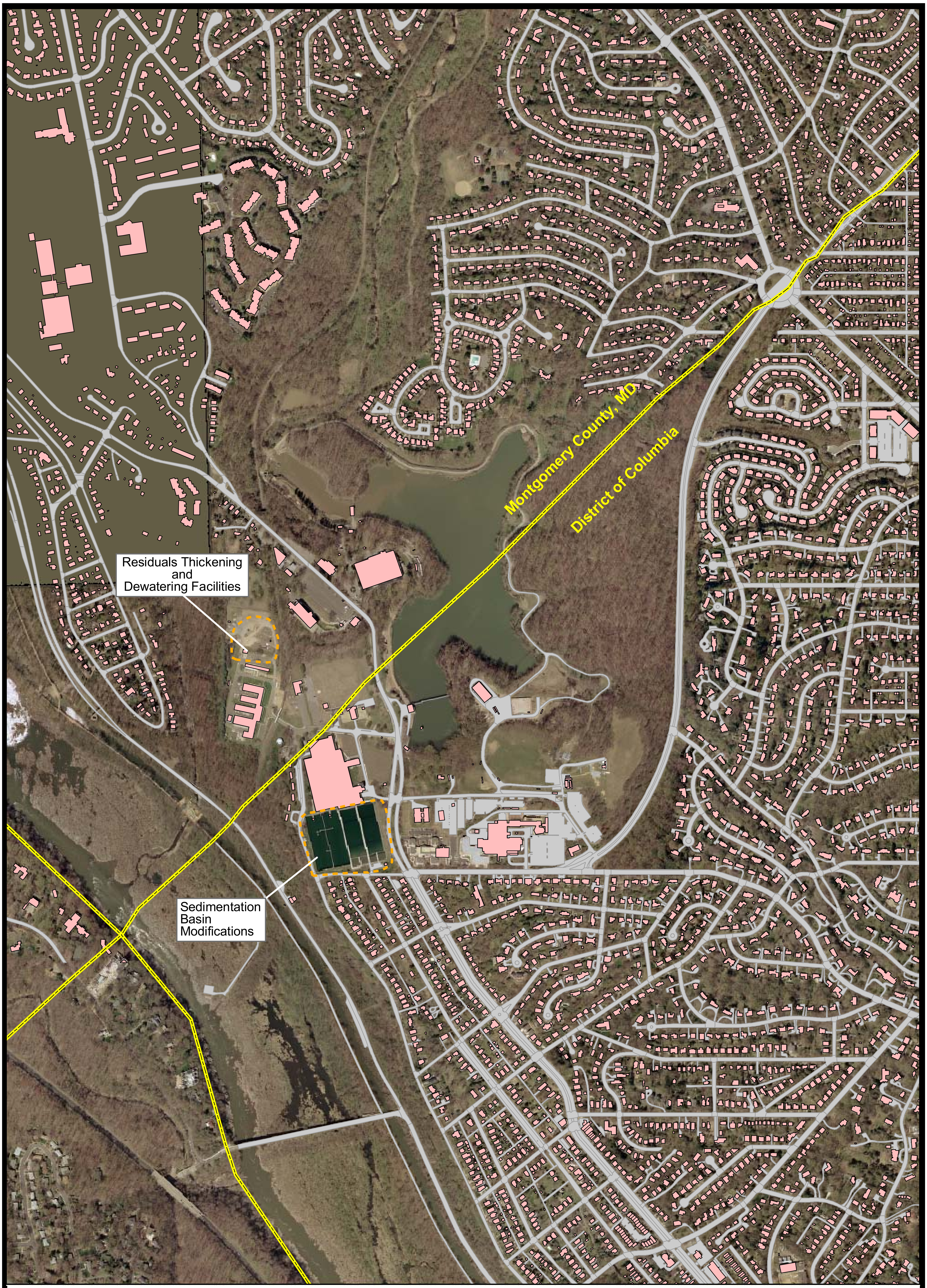

Legend

- Approximate Location of New/Modified Facilities
- County Boundary
- Existing Buildings
- Roads

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Figure 2-7
Residuals Management at Dalecarlia

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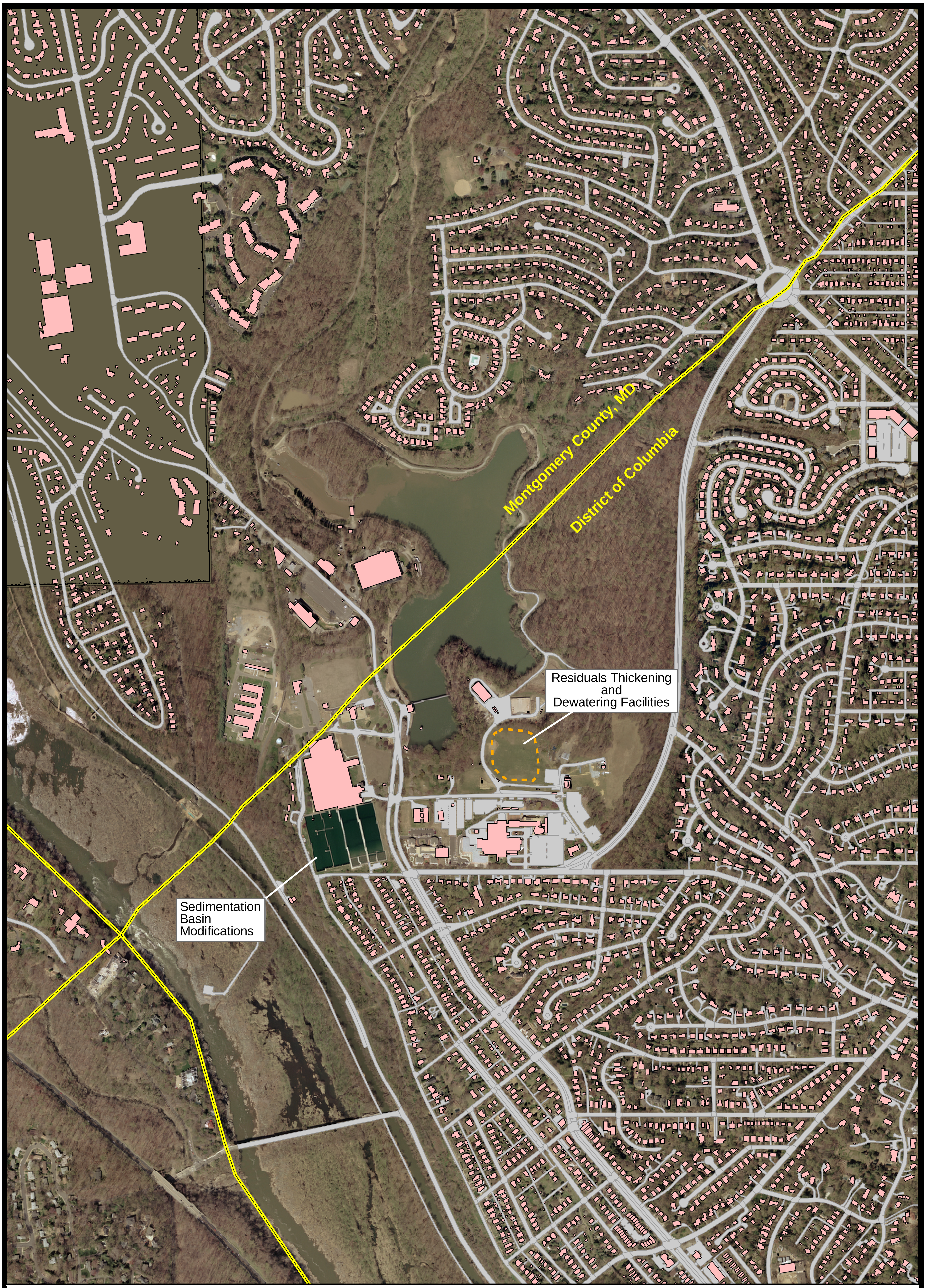

Legend

- Approximate Location of New/Modified Facilities
- County Boundary
- Existing Buildings
- Roads

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Figure 2-8
Residuals Management at Dalecarlia Reservoir

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SECTION 3

Alternative Analysis Summary

Each of the alternatives under evaluation (with the exception of the no-action alternative) necessitates developing infrastructure in an urban setting characterized by important natural and man-made resources. All alternatives under evaluation to meet this federally mandated action will carry some degree of impact. Of particular concern is the ability of an alternative to meet the project's purpose and need while minimizing impacts to the communities surrounding the Dalecarlia Water Treatment Plant and Georgetown Reservoir facilities.

Section 2 describes the process used to identify the five alternatives that will be evaluated in detail in the DEIS. Further information on the complete set of 26 alternatives initially developed is contained within the EFS published by the Washington Aqueduct in May 2004. A Supplement to the EFS is currently being prepared. This document will evaluate the feasibility of the new alternatives and options provided by the public from mid-September through November 15, 2004.

This section presents a summary of the current alternatives analysis, which will be presented in greater detail in Section 4 of the DEIS, which will be released to the public in late January 2005. This section also includes a description of the decision-making rationale that will be used to determine the proposed action. At the time of this writing, three alternatives, including the no-action alternative, are unsuitable to be recommended as the proposed action. The rationale leading to these conclusions is summarized in this section.

Two alternatives are still under analysis at this time. Should one or more of the alternatives currently under evaluation be found to be consistent with the screening criteria it will be added to the list for detailed evaluation. One of the list of alternatives undergoing detailed evaluation will be identified as the proposed action in the DEIS. The on-going analysis is considering recently received alternatives contributed by the public through November 15, 2004. This complete analysis could not be completed at the time of this writing.

3.1 Decision-Making Rationale

In order to determine the proposed action out of the five possible alternatives the Washington Aqueduct considered the following sources of information:

- The information on the potential impacts revealed by the technical evaluation (to be detailed in Sections 3 and 4 of the DEIS),
- The ideas and concerns raised by the public during five meetings or submitted directly to Washington Aqueduct staff, and
- Consultations with regulatory authorities at the federal, state and local levels (detailed in Section 4 of this document).

The **Proposed Action** for the DEIS will be the one that best meets the objectives of the project as put forth in the Notice of Intent (published in the *Federal Register* on January 12, 2004). These include the following:

- To allow Washington Aqueduct to achieve complete compliance with NPDES Permit DC00000019 and all other federal and local regulations.
- To design a process that will not impact current or future production of safe drinking water reliably for the Washington Aqueduct customers.
- To reduce, if possible, the quantities of solids generated by the water treatment process through optimized coagulation or other means.
- To minimize, if possible, impacts on various local and regional stakeholders and minimize impacts on the environment.
- To design a process that is cost-effective in design, implementation, and operation.

3.2 Non-Recommended Alternatives

Both Alternatives A (Process Water Treatment Residuals at Dalecarlia WTP and Dispose in Dalecarlia Monofill) and C (Thicken Water Treatment Residuals at Dalecarlia WTP, Then Pump via a New Pipeline to Blue Plains) have beneficial elements in that they each contribute to the objectives of the Clean Water Act by enabling the Washington Aqueduct to stop discharging residuals into the Potomac River, and they each prevent residuals-bearing trucks from using roads through the area communities. However, implementation of Alternatives A and C would not allow Washington Aqueduct to comply with the Federal Facility Compliance Agreement schedule issued by EPA. Regardless, when each alternative is thoroughly evaluated, and balanced against the purpose and need for the project, each one presents impacts that preclude selection as the preferred alternative.

Some of the impacts associated with these alternatives could be mitigated to lesser levels, but none of the work is possible within the schedule required by the FFCA. Alternative C is not consistent with the District of Columbia Water and Sewer Authority's long-term plans for its Blue Plains Advanced Wastewater Treatment Plant and is more than double the cost of each of the other alternatives. The development of Alternative A is not consistent with the schedule for investigations of this site by the U.S. Army Corps of Engineers for its ongoing remediation efforts for the Spring Valley FUDS project.

3.2.1 Detailed Reasons for Not Selecting Alternative A, Process Water Treatment Residuals at the Dalecarlia WTP and Dispose in Dalecarlia Monofill

3.2.1.1 Biological and Resources

The project would necessitate clear-cutting approximately 30 acres of mature woodland within Washington, DC. While not strictly prohibited, the action is counter to the intent of the District's Urban Forest Preservation Act which is to maintain urban forest benefits of heat mitigation, improved air quality, reduced water pollution, and quieter and more beautiful neighborhoods.

3.2.1.2 Cultural Resources

The footprint of the proposed monofill occupies a high-probability area for pre-historic and historic in-ground cultural resources. While the potential presence of these resources does not preclude monofill development, their investigation, documentation and potential recordation and preservation may prevent the project from being developed in time to meet the FFCA 2009 deadline.

3.2.1.3 Hazardous, Toxic and Radioactive Waste

A portion of the monofill footprint occupies an area historically known as the Government Woods. This area is targeted for further investigation by the Spring Valley American University Experiment Station (AUES) Formerly Used Defense Site (FUDS) project. Onsite investigations to support project design and project construction can not begin until the site has been investigated and cleared of any materials of concern. These investigations are scheduled to begin in 2008 and expected to be complete in two years following the start. The possible results are unknown at this time. Even under the best case scenario of finding no materials associated with the American University Experimental Station, there would not be sufficient time to design, permit, construct and have a monofill operational by the FFCA 2009 deadline.

3.2.1.4 Land Use

Any monofill development that would take place on Federally owned land is not in violation of DC regulations. However, it does represent a significant change in existing land use, is potentially incompatible with adjacent land uses, and runs counter to a number of the National Capital Planning Commission's policies on the management of federal land within the National Capital Region, specifically those that seek to preserve open space character and forested areas.

3.2.1.5 Visual

The views of the Dalecarlia reservoir property are moderately high to high level of visual quality. If constructed, the view of the monofill facility from some of the adjacent property owners, nearby residences, and motorists on MacArthur Blvd would be affected. While phased construction, site topography, and landscaped buffers offer the potential to reduce impacts associated with viewing the monofill, some views will be partially and permanently altered.

3.2.1.6 Implementation Uncertainty

Because it is operating under a Federal Facility Compliance Agreement, the Washington Aqueduct must select and develop an alternative that is known to be capable of meeting the Agreement's compliance deadlines. The implementation of this alternative within the required time frame is unlikely because of the schedule for the related investigations for hazardous materials and cultural resources, and the potential for further action based on the resulting findings.

3.2.2 Detailed Reasons for Not Selecting Alternative C, Thicken Water Treatment Residuals at Dalecarlia WTP, Then Pump via a New Pipeline to DC WASA Blue Plains Advanced Wastewater Treatment Plant

3.2.2.1 Biological resources

Consultation with the National Park Service, through whose land much of the pipeline will pass, revealed their preference for directional drilling to minimize impacts to important resource areas. Even with this technology, there will be a need for approximately 27 150′ x 100′ staging areas for the pipeline construction. Some of the areas are likely to require a significant amount of tree cutting-particularly in the portion of the route passing through the Chesapeake and Ohio Canal National Historical Park and Trail. This long-term damage has the potential to impact wetland resources and runs counter to both the District's Urban Forest Preservation Act and the National Capital Planning Commission's policies for Parks and Open Space.

3.2.2.2 Cultural Resources

The entire route, with the exception of the portion crossing military facilities, intersects with high value historic and pre-historic resources as well as important cultural resources in the form of national parks and monuments. While directional drilling has been evaluated for its potential to minimize impacts to these resources, detailed corridor alternatives analyses and cultural resources investigations would still need to be conducted to meet the Park Service interest in resource documentation and preservation. These studies would prevent the design and construction of the project from being completed before reaching the Washington Aqueduct's FFCA deadlines.

3.2.2.3 Hazardous Toxic and Radioactive Waste

The project corridor is in a highly urban setting and includes two military facilities. As a result it intersects with locations where hazardous substances may have been released into the environment. While directional drilling holds potential to reduce impact to and from these sites, the construction of the staging areas and the handling and disposal of the drilling mud and excess excavated material may create the potential for managing regulated material. This could create further project delays beyond the Washington Aqueduct's FFCA deadlines.

3.2.2.4 Infrastructure

In consultation with the District of Columbia Water and Sewer Authority, the owner and operator of the Blue Plains Advanced Wastewater Treatment Plant, there is insufficient space at the Blue Plains facility to construct and operate the proposed residuals processing facilities. WASA's long-term operational needs necessitate that the currently available land is preserved for the future development of both CSO control facilities and facilities to reduce the nutrient loading to the Chesapeake Bay watershed. Implementation of this alternative is impossible without the ability to construct facilities to dewater the residuals and load them onto trucks for offsite disposal originating from the Blue Plains facility.

3.2.2.5 Land Use

With the use of directional drilling, staging areas to support the operation will impact approximately 10 acres of land collectively along the pipeline corridor. These impacts will be long-term and significant if they involve the clear-cutting of trees in the C &O National Historical Park. Significant short-term impacts are likely as the construction operation in the proposed corridor restricts tourist access to important national monuments and reduces the quality of their viewing experience.

3.2.2.6 Visual

Construction of the pipeline will involve operation of heavy machinery, noise, and muddy staging areas along a corridor prized for its visual character. This visual character contributes significantly to the park experience for its users. Construction-related impacts are not considered to be long term. However, any tree removal along the corridor is considered to be significant and long term.

3.2.2.7 Implementation Uncertainty

Because it is operating under a Federal Facility Compliance Agreement, the Washington Aqueduct must select and develop an alternative that is known to be capable of meeting the compliance deadlines. Further refinement of the pipeline alignment aimed at minimizing impacts on biological, visual, land use and cultural resources holds the potential for delay well beyond the FFCA compliance deadlines. Coordination with a myriad of federal and local agencies affected by the corridor creates further uncertainty for schedule compliance.

3.2.2.8 Cost

The cost of each alternative has been evaluated. The pipeline alternative's construction cost, escalated to midpoint of construction, was previously estimated to be $74,000,000. This cost was based on the assumption that the pipeline could be installed using conventional cut and cover installation techniques. Since that time, the National Park Service has indicated that they would require that trenchless technology be used to install the pipeline throughout its entire route. This change has caused the construction cost of the pipeline alternative to increase to approximately $165,000,000 (escalated to the mid-point of construction). This cost is more than double the comparable cost for Alternative A ($66,000,00) and Alternative B ($58,000,000).

3.2.3 Reasons for Not Selecting Alternative D, No Action Alternative

Alternative D, the no-action alternative, cannot be selected by the Washington Aqueduct because it would place it in violation of the Federal Clean Water Act, the terms of their NPDES permit, and the Federal Facility Compliance Agreement issued the Environmental Protection Agency. Throughout the DEIS preparation process, EPA has confirmed that they would be unwilling to modify the NPDES permit to allow the Washington Aqueduct to return to a residuals disposal practice consistent with the No Action alternative.

3.3 Alternatives Under Evaluation

3.3.1 Alternative B, Process Water Treatment Residuals at the Dalecarlia WTP and Dispose via Contract Hauling

As stated at the beginning of this section, there is no alternative for this federally mandated action that will not carry some degree of impact. Particular concerns with this alternative include the potential soil contamination on the proposed site of the residuals management facility, the visual impact from the residuals management facility, and the impact from trucks carrying residuals through the neighborhoods in the vicinity of the Dalecarlia Water Treatment Plant. Each of these concerns is capable of being mitigated. Additionally, this alternative can be implemented within the required timeframe with a much greater degree of certainty than either alternative A or C can be implemented. The costs of this alternative are consistent with the project budget. For these reasons, Alternative B has been retained**.**

3.3.1.1 Hazardous, Toxic and Radioactive Waste

As 1995 study on the portion of Washington Aqueduct property designated for the residuals management facility under this alternative noted strong solvent and/or petroleum odors at 5 to 10 feet below ground surface (bgs). Further investigation will need to be done during the project design phase to determine the degree of soil contamination and it's potential to impact either the construction or operation of the residuals facility, or the facility to cause these materials to impact other resources.

3.3.1.2 Traffic

Traffic impacts have been studied in detail and indicate that all of the haul routes have available capacity to accommodate the described truck volume without disrupting traffic or jeopardizing the physical safety of people along the routes. Seven haul routes have been designated for the purpose of maintaining operational flexibility during changing traffic conditions. These routes also offer the potential to disperse the volume of trucks over a wider network of roads. Visual

The residuals management facility may be up to 78 feet tall and will be directly visible by users of the Capital Crescent Trail and some residents along the northern border of the property. Smaller portions of the facility may also be visible particularly during the winter from some residences in the Brookmont Area. Unlike the monofill planned for construction on the reservoir property in Alternative B, the proposed residuals processing facilities site adjoins existing facilities with a similar non-residential function. The appearance of the proposed residual facility will be closely coordinated with the National Capital Planning Commission and the Commission of Fine Arts. The Washington Aqueduct plans to construct the buildings with materials selected to match its other facilities and allow them to blend in with the campus-like setting of its facilities.

3.3.1.3 Noise

The residuals processing facility will be constructed of sound proofing materials so that noise levels outside of the buildings as measured at the border of the property do not exceed the existing background noise measurements of the area. Noise from the trucks has been modeled and compared to background conditions. Particular attention was paid to impacts to residential areas and took into account the steep grade of Loughboro Road adjacent to Sibley Hospital. The analysis showed that the noise generated by the trucks did not violate the standard criteria for a significantly adverse impact. Trucks will not operate at night, which is the quietest time when the noise would be more noticeable.

3.3.1.4 Groundwater Resources

Perchlorate contaminated groundwater may be encountered while the residuals facilities are constructed on the Dalecarlia site. Ongoing perchlorate investigations, focused on determining potential sources, the extent of the contamination, and the direction of groundwater flow, together with perchlorate analysis being performed at various steps in the water treatment process will help determine the potential impact of any perchlorate present in the groundwater on drinking water quality and construction activities associated with the residuals facilities.

3.3.1.5 Implementation Uncertainty

There is some potential for unresolved and poorly understood issues to affect the constructability of the facility. These include the emerging issue of perchlorate contamination in area groundwater.

3.3.2 Alternative E, Process Water Treatment Residuals at Dalecarlia Reservoir Site and Dispose via Contract Hauling

This alternative was derived from a significant period of public consultation and comment from mid-September to November 15, 2004. All ideas for project alternatives received by the Washington Aqueduct during this period were subjected to the screening criteria applied to the alternatives developed during the project's feasibility study. This screening was completed in December 2004. Full analysis for the DEIS was not completed at the time of this writing.

There are several issues that are likely to form the basis for evaluating tradeoffs between selection of Alternative B and Alternative E as the proposed action. These are presented in the following subsections.

3.3.2.1 Traffic

The routes for hauling the processed residuals to an off-site disposal location are the same for this alternative as for Alternative B. However, the localized traffic patterns around Sibley Hospital, particularly the parking areas accessed by Little Falls Road, need to be evaluated in greater detail. Twenty-ton trucks passing through the hospital's parking areas may represent a safety concern due to the dimensions and construction of the existing roadways. An access road leading directly from the Residuals processing area to the Dalecarlia Parkway may mitigate this potential concern. The impact of such a road on traffic patterns on the Dalecarlia Parkway, Little Falls Road and Loughboro Road is being evaluated in greater detail.

3.3.2.2 Visual

While locating the facilities on Washington Aqueduct property away from residential areas eliminates the potential visual impact to the Dalecarlia Treatment Plant neighbors in

Brookmont and Bon Air Heights and users of the Capital Crescent Trail, the visual impact of the residuals processing facilities on patients and visitors to the Sibley Hospital as well as on Overlook, Spring Valley and Westmoreland Hills needs to be further evaluated. The potential for facilities at this location to create visual impacts needs to be identified.

3.3.2.3 Biological Resources

Construction of an access road to eliminate the potential for vehicle and pedestrian conflicts around Sibley Hospital may create necessitate cutting down some mature trees on the Washington Aqueduct property. The presence of wetlands on the route for the access road needs to be determined.

3.3.2.4 Socioeconomic and Cultural Resources

Construction of residuals treatment facilities at the location south of the storage building and north of Sibley hospital grounds, as opposed to facilities north of the sedimentation basins, allows construction of these facilities to occur entirely in the District of Columbia as opposed to Maryland. There are different agencies with primacy over land development. The effects of the move from Maryland to District of Columbia need to be further evaluated.

3.3.2.5 Implementation Uncertainty

Several issues may create some amount of uncertainty for the implementation of this alternative. The presence of biological resources and the need to negotiate mitigation requirements with appropriate agencies could delay implementation. There is some potential for unresolved and poorly understood issues to affect the constructability of the facility.

SECTION 4

Consultation and Coordination

4.1 Public Involvement

The NEPA process is the systematic examination of possible and probable environmental consequences of implementing a proposed action. The requirement for public involvement (40 CFR 1506.6) recognizes that all potentially interested or affected parties will be involved when practicable. Public comments are to be invited and two-way communication is to be encouraged. Public involvement is specifically provided for in a scoping process and also in the preparation of draft and final Environmental Impact Statements.

4.1.1 Scoping Process

The scoping process (40 CFR 1501.7) is intended to help determine the range of actions, alternatives and impacts for consideration in the DEIS. A scoping meeting is typically held as an informal meeting during this process where the gathering and evaluation of information relating to potential environmental impacts can be initiated. The initial scope of the DEIS is determined by the project proponent, in this case the Washington Aqueduct, during and after the scoping process.

A Notice of Intent (NOI) to prepare a Draft Environmental Impact Statement appeared in the *Federal Register* on January 12, 2004. The NOI described the regulatory mandate for the project, the objectives of the proposed action and the range of alternatives that may be considered. The NOI also described the date and location of the Public Scoping Meeting and the overall scoping process.

A public scoping meeting was held on Wednesday January 28, 2004 at the St. Patrick's Episcopal Church and Day School from 7:00 to 9:00 P.M. A display advertisement for the Scoping Meeting ran in both the Washington Post and the Northwest Current on January 22, 2004. A personal invitation letter was mailed on January 14, 2004 to 63 agency officials, community representatives, and private citizens previously associated with Washington Aqueduct environmental issues.

The scoping meeting was conducted as a public open house. Participants were able to attend at any point during the two-hour period of availability and view a series of eight exhibit boards illustrating different aspects of the project. Each of the exhibits was staffed by an employee of the Washington Aqueduct knowledgeable about that particular aspect of the project. Topics discussed on the boards included:

- historical information about Washington Aqueduct including treatment process used to produce potable water,
- summary of content of the new NPDES permit explaining the reasoning for mandating that Washington Aqueduct to remove residuals from the Potomac river,

- a description of some potential methods to collect, convey, process and dispose of residuals,
- background on the NEPA process, the process for screening alternatives as well as the suggested criteria used for screening which meet the project's purpose and need,
- a listing of the disciplines that will be evaluated in the detailed DEIS, for example air quality,
- and the project schedule.

A stenographer was available to record comments of individuals wishing to have their concerns incorporated into the project record.

The potential impact of truck traffic in the neighboring communities emerged as a dominant theme of the comments during the scoping meeting and during the entire 30-day Scoping Period, which ran from January 12, 2004 to February 11, 2004. Additional comments focused on processing technologies, non-trucking alternatives, and concerns related to continued river discharge of the residuals.

After the meeting, a copy of the exhibit boards and a summary of the Scoping Meeting was posted on a public webpage developed exclusively for this project. This summary also stated that the Washington Aqueduct would hold a public forum to discuss the alternatives that would be evaluated in detail in the DEIS.

In response to the dominant Scoping Period theme of truck traffic concerns, the Washington Aqueduct worked in its technical feasibility study to identify and include project alternatives that did not feature the use of trucks to transport residuals to processing or disposal locations. During the scoping process two ideas were received by the public for new project alternatives. One alternative included the use of Plasma Oven technology to reduce the quantity of residuals and another alternative feature the use of barges on the Potomac River to transport residuals to the Blue Plains Advanced Wastewater Treatment Plant in Southwest DC. Both of these ideas were fleshed out technically and then evaluated carefully to see if they met the purpose and need of the project. This process is discussed thoroughly in the Project Feasibility Study and the herein with the Description of Proposed Action and Alternatives

4.1.2 Public Involvement During the Preparation of the DEIS

During the preparation of the DEIS, a minimum of four (4) public forums were hosted by the Washington Aqueduct to provide interested members of the public with an opportunity to better understand the project and the proposed alternatives. The Washington Aqueduct also participated by invitation in a variety of forums hosted by other groups to continue to describe the project and the alternatives being evaluated in the DEIS.

4.1.2.1 First Public Forum

The Washington Aqueduct hosted a public outreach meeting on May 26, 2004 at the Sibley Hospital Ernst Auditorium from 7:00 to 9:00 P.M. to describe the screening process and the detailed alternatives in order that interested members of the public could understand how the project was progressing and better anticipate the content of the DEIS.

A display advertisement ran in the *Northwest Current* on Thursday, May 20, 2004 and in the *Washington Post* on Monday, May 24, 2004. A personal invitation was mailed to 144 neighbors living in the vicinity of the Dalecarlia Reservoir grounds in Maryland and 88 letters were sent to residents in the District of Columbia in addition to the letters sent to the list of agency officials, community representatives, and private citizens contacted directly during the scoping period.

The public meeting started with a slide presentation followed by an open house question and answer session. The appearance and operation of the proposed residuals monofill emerged as a dominant theme during the question and answer period that followed the presentation. Additional comments focused on truck traffic, other alternatives to consider for the Feasibility Study and residuals disposal technologies.

4.1.2.2 Second Public Forum

In response to increasing public interest in the project, the Washington Aqueduct hosted a public forum on September 7, 2004 at its Dalecarlia Treatment Facility. This meeting was advertised by mailing 1,040 letters to Maryland and DC residents in the broad vicinity of the Dalecarlia facilities and to the list of agency officials, community representatives and private citizens contacted previously. Also, display advertisements were printed in the *Northwest Current*, the *Bethesda Gazette*, and the *Washington Post.* This meeting was conducted as a public open house with participants able to attend exhibit stations focused on the alternatives screening process and presenting details on the three project action and no-action alternatives being evaluated in the DEIS. The appearance of the proposed residuals monofill was again a dominant theme of the public comments. Additional comments focused on the desire of the area residents for greater engagement in the screening process and the shortcomings of the open house format for large-group question and answers.

4.1.2.3 Third Public Forum

As a follow-up to the expressed public concerns, the Washington Aqueduct hosted a third public forum on September 28, 2004 at the Sibley Hospital Ernst Auditorium from 7:00 to 10:30 PM. This meeting was advertised similarly by mailing approximately 1,200 letters to neighbors, community representatives and agency representatives, and by printing display advertisements in the *Northwest Current*, the *Bethesda Gazette*, and the *Washington Post.* The meeting featured an update on the technical analyses on the project alternatives. This update included descriptions of the range of topics to be evaluated in the DEIS and information about aspects of each alternative that affected their ability to be implemented as a Proposed Action in the DEIS. Public comments during this forum focused on the public notification for the Scoping Meeting, the alternatives screening process, the monofill and its relation to the Spring Valley Formerly Used Defense Site project, the physical appearance of the proposed residuals management facilities, the toxicity of the residuals, truck traffic, and the EPA's enforcement of the Clean Water Act.

4.1.2.4 Fourth Public Forum

As a follow-up to the previous public meetings, the Washington Aqueduct held a fourth public forum on November 16, 2004 at the Sibley Hospital Ernst Auditorium from 7:00 to 10:00 PM. This meeting was advertised similarly by mailing approximately 1,200 letters to neighbors, community representatives and agency representatives, and by printing display advertisements in the *Northwest Current*, the *Bethesda Gazette*, and the *Washington Post.* The meeting featured an update on the technical analysis of the project alternatives, with particular emphasis paid to the feasibility of the Blue Plains alternative. The status of the other alternatives being evaluated in detail was also discussed. Public comments focussed on their desire for Washington Aqueduct to locate another site for the residuals facilities that did not require construction of a large processing building near the Brookmont community or to develop an alternative that did not require trucking residuals through neighborhood streets. Some public participants expressed concern that compliance with the FFCA schedule was a factor in preventing alternatives from becoming the proposed action. The Washington Aqueduct maintains that the FFCA schedule compliance is an essential element of the project's purpose and need and would continue to help determine the feasibility of any alternative.

4.1.2.5 Public Hearing Held by the District of Columbia Committee on Public Works and the Environment

The Public Works and Environment Committee of the Council of the District of Columbia held a public hearing was held on November 17, 2004 at 4:00 PM in the John Wilson Building to discuss the Washington Aqueduct's Proposed Disposal of Solids from Its Water Treatment Process. The hearing was chaired by Councilperson Carol Schwartz. The hearing included public testimony by four members of the public and Tom Jacobus of the Washington Aqueduct. The Washington Aqueduct portion of the testimony summarized the status of the DEIS project, including a description of the feasible alternatives and the issues limiting the implementation of some of the alternatives. The contribution of approximately 100 new public alternatives, submitted during the recently closed public alternative suggestion period was also noted.

4.1.2.6 Additional Stakeholder Outreach

Washington Aqueduct also worked to respond to specific inquiries made by individuals when possible. This included meeting with individual stakeholders and representatives of groups of stakeholders. The following is a project-related listing of meetings, presentations, and tours involving Washington Aqueduct:

- Meeting with Montgomery County Department of Environmental Protection representatives (February 2004)
- Meeting with DC Council Staff (May 2004)
- Meeting with ANC 3D Commissioners (July 2004)
- Meeting with Montgomery County Councilmember Denis, Montgomery County Department of Environmental Protection representative, and Westmoreland Citizens Association Copresidents (July 2004)
- Meeting with individual Westmoreland Hills resident (July 2004)
- Coordinating Committee on Friendship Heights meeting (July 2004)
- Meeting with Maryland Congressional Staff (July 2004)
- Meeting with Bon Air Heights residents (August 2004)

- Meeting with Westmoreland Citizens Association Copresidents, other Westmoreland residents, attorneys, a Spring Valley resident, and Maryland congressional staff member (September 2004)
- Several meetings with (including a tour for) Brookmont residents (September – October 2004)
- Tour for Westmoreland Citizens Association Copresidents and another Westmoreland resident (November 2004)
- Meeting with "SludgeStopper" representative (November 2004)
- Presentation at Spring Valley Restoration Advisory Board (November 2004)
- Meeting with Bon Air Heights residents (November 2004)
- Palisades Citizens Association meeting (December 2004)
- Tour for a Brookmont resident and Westmoreland Citizens Association attorneys and engineer (December 2004)

4.1.2.7 Project Website

Washington Aqueduct created and maintained a website specifically for this project. The address of the website is: http://washingtonaqueduct.nab.usace.army.mil/aqueduct.htm. The website was available to the public is January 2004. It has been updated periodically with specific documents related to the NPDES Permit and compliance agreement, as well as documents generated as part of the NEPA process. In addition, contact information and a comment form is available on the website.

4.1.3 Extension of Alternatives Identification Period

At the September 28, 2004 Public Forum the Washington Aqueduct re-opened the opportunity for interested members of the public to provide suggestions on project alternatives. The second alternative suggestion period remained open until November 15, 2004.

Participants at the meeting were informed that the screening process applied to the set of alternatives in the Feasibility Study would be applied to any new alternatives put forward by the public. If new alternatives met the project's purpose and need as expressed in the screening criteria they would be included in the DEIS.

4.2 Agency Consultation

As part of the DEIS, the Washington Aqueduct consulted with those agencies with jurisdiction over environmental resources within the project area. This section includes a summary of the consultation with these agencies and the dates when consultation occurred.

4.2.1.1 April 7, 2004 Project Team Meeting with WASA

Discussed feasibility of sending water treatment residuals to Blue Plains for treatment via Potomac Interceptor

4.2.1.2 June 10, 2004, Project Team Meeting with EPA Region 3

Held in Philadelphia, PA. Submitted the draft EFS to EPA for their review and presented the DOPAA public meeting information.

4.2.1.3 July 15, 2004, Project Team Meeting with the Spring Valley project team at Baltimore District Headquarters, U.S. Army Corps of Engineers

Discussed status of Spring Valley cleanup activities and associated issues related to the Dalecarlia Reservoir site.

4.2.1.4 August 16, 2004, Project Team meeting with WASA

Held at the Dalecarlia WTP. Continued to discuss feasibility of sending water treatment residuals to the Blue Plains AWWTP.

4.2.1.5 September 1, 2004, Project Team Meeting with National Park Service representatives for the C&O Canal National Historical Park

Held at C&O Canal Park offices in Hagerstown, MD. Discussed the feasibility of obtaining a construction permit for a new residuals pipeline parallel to the existing Potomac Interceptor.

4.2.1.6 September 22, 2004 Project Team Meeting with National Park Service representatives for the National Capital Region

Held at the Dalecarlia WTP. Discussed the feasibility of obtaining a construction permit for a new residuals pipeline parallel to the existing Potomac Interceptor.

4.2.1.7 September 24, 2004 Project Team Meeting with the Office of the Attorney General for the District of Columbia

Held at the Attorney General's offices in Washington DC. Confirmed that the construction of a monofill on the Dalecarlia Reservoir site is not prohibited by DC regulations.

4.2.1.8 October 13, 2004 Project Team Meeting with EPA Region 3

Held in Washington DC at EPA Headquarters. Reviewed status of DEIS project including agency coordination activities and public comments and discussed path forward for remainder of project.

4.2.1.9 October 26, 2004, Project Team Meeting with National Capital Planning Commission (NCPC)

Held in Washington DC at NCPC Headquarters. Reviewed progress of DEIS project to date and discussed their involvement and requirements for the project.

4.2.1.10 December 2, 3, and 14 2004, Conference Calls with Various Agencies Involved with the NPDES Permit

A conference call was held with the various agencies previously involved with the NPDES permit to brief the agencies on the status of the residuals DEIS project and solicit their input. Agencies involved included the Environmental Protection Agency, the Department of Interior (including representatives from the National Park Service and the U.S. Fish and Wildlife), National Marine Fisheries Service, and the District of Columbia Department of Health.

4.2.1.11 December 2, 2004, Project Team Meeting with the National Park Service

Held at the George Washington Memorial Parkway Headquarters at Turkey Run Park in McLean, VA. Reviewed the overall status of the residuals DEIS project and asked the National Park Service to comment on the feasibility and impacts associated with two new residuals suggested by the public:, including constructing an alternate truck access route from the west side of the existing Dalecarlia WTP site to the Clara Barton Parkway, and constructing residuals processing facilities at Carderock. The Carderock alternative might involve transporting dewatered residuals on the Clara Barton Parkway from the Carderock site to the Beltway.

4.2.1.12 November 29, 2004 Meeting with Carderock Facility Staff

Held at the Carderock site and included a windshield tour of the facility. Carderock staff was briefed on the project, the current status and the nature of the suggested alternative involving use of property on the Carderock site for dewatering facilities. In addition to the use of land, Carderock staff indicated that other concerns – including preservation of viewshed, transportation issues with both NPS and neighboring communities, visual impacts on neighboring communities – would all need to be considered.

APPENDIX A

DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY

5000 OVERLOOK AVENUE, S.W., WASHINGTON, D.C. 20032

OFFICE OF THE GENERAL MANAGER
TEL: 202-787-2609
FAX: 202-787-2333

October 28, 2004

Mr. Thomas P. Jacobus
General Manager
Washington Aqueduct Division
U.S. Army Corps of Engineers, Baltimore District
5900 MacArthur Blvd, N.W.
Washington, DC 20016-2514

SUBJECT: Residuals Project – Draft EIS Alternatives

Dear Mr. Jacobus:

The District of Columbia Water and Sewer Authority (DCWASA) has received your letters, dated September 10th and 17th, 2004, welcoming our participation in the subject project as well as to advise us of the public meeting that was held on September 28, 2004. I appreciate your coordination with DCWASA, and would like to express our committed involvement to this project. As you know, DCWASA contributes approximately 75% of the cost for capital and operating expenses by the Washington Aqueduct Division (WAD), and as such we have a vested interest in serving our ratepayers with potable water at the highest quality and lowest possible cost, while protecting the environment.

It is our understanding that the WAD has developed 26 alternatives that were screened as part of their Environmental Impact Statement (EIS) process. Of the 26 screened alternatives, it was indicated that three were determined to be feasible, not including the 'not action' alternative. While each of these three alternatives are of great interest to DCWASA, the alternative that proposes piping the thickened residuals to the Blue Plains Advanced Wastewater Treatment Plant (AWTP) for dewatering and offsite disposal poses the greatest concern. Based on our understanding of this alternative (Alternative C) we must conclude that it is, in fact not feasible.

Alternative C in the screened alternatives would require a dual 12-inch diameter forcemain to be constructed from the Dalecarlia Water Treatment Plant to the Blue Plains AWTP. Thickened residuals would be pumped to the Blue Plains AWTP where it is envisioned that a newly constructed dewatering facility would be used to dewater the thickened residuals for offsite disposal by trucking. While DCWASA understands that this option has yet to be fully evaluated, we would like to state our concerns with this alternative.

Current regulatory initiatives require that we conserve the limited Blue Plains AWTP site to construct additional facilities needed to meet near term changes expected in the Plants NPDES Permit. The regulatory initiatives include the following:

1) Chesapeake Bay Program (CBP) goals and TMDLs for the District, as well as our joint users in Maryland and Virginia and associated increased nutrient removal by the Blue Plains AWTP.

2) Combined Sewer Overflow (CSO) Long Term Control Plan (LTCP), which will require Storage of CSO in newly constructed tunnels and the subsequent pump-out for treatment at Blue Plains AWTP.

3) Draft Blending Policy that will result in more stringent permit limits for the Plant's excess flow outfall.

In addition, future growth in the Metropolitan Washington region may require the need for additional treatment capacity at the Blue Plains AWTP by the District of Columbia and our joint suburban users. As you are aware, the Blue Plains facility has limited space available as it is confined to the north by the Naval Research Laboratory, to the east by I-295, and to the west and south by the Potomac River.

Additionally, WASA's Biosolids Management Program (BMP) is based on utilization of our biosolids, which are organic in nature, in a land application program. The biosolids are land applied predominately in Virginia and at this point the State of Virginia is proposing increased regulatory requirements on land application. This is merely the latest in a series of regulatory and legislative actions that could impact DCWASA's BMP. Large amounts of inorganic solids, such as the water treatment residuals proposed for piping to Blue Plains AWTP in Alternative C, would add considerable pressure to a valuable recycling program already facing constant regulatory and public pressures.

For the reasons stated above WASA concludes that Alternate C is not feasible due to both site constraints at the Blue Plains AWTP and incompatibility with WASA's Biosolids Management Plan.

Please feel free to contact me at 202-787-2610 should you wish to discuss any of the project issues. In addition, please have appropriate staff at the WAD coordinate project activities with Mr. John Trypus in our Department of Engineering and Technical Services. Mr. Trypus has been designated as DCWASA's primary contact for coordinating efforts related to our interests in the project, and he may be reached at 202-787-2406 or jtrypus@dcwasa.com.

Sincerely,

John T. Dunn, P.E.
Chief Engineer/Deputy General Manager

c: Jerry Johnson, General Manager, DCWASA
John Trypus, Project Manager, DCWASA