

Briefing for Blue Plains Regional Committee on IMA Flow Information for Blue Plains Service Area

January 24, 2006



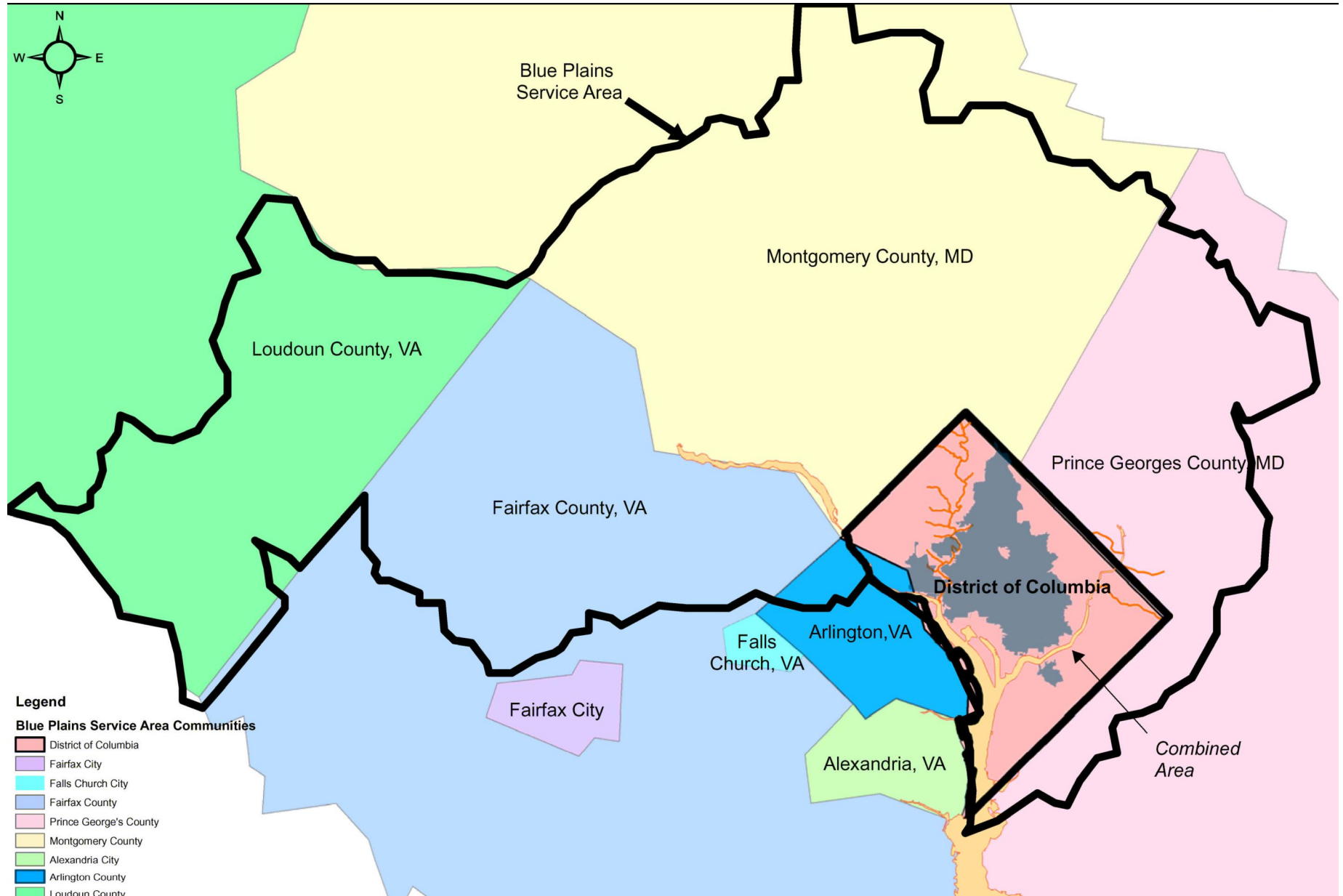
District of Columbia
Water and Sewer Authority 1

Agenda

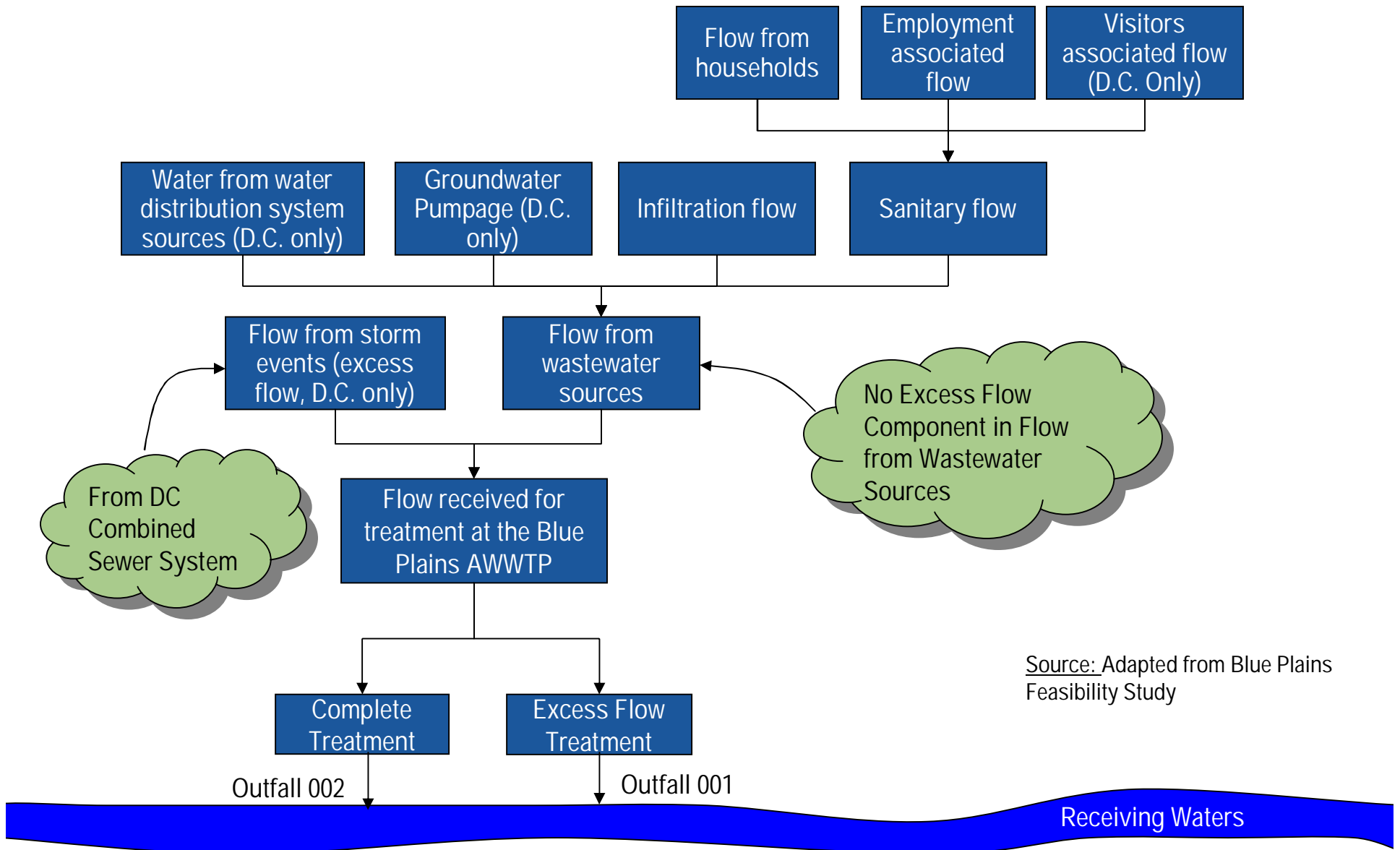
- < Blue Plains Feasibility Study (BPFS)
- < Blue Plains NPDES Permit
- < Blue Plains Service Area Flow Records
- < Long Term Control Plan (LTCP) and Future Needs
- < Total Nitrogen Removal



Blue Plains Service Area



Flow Components from IMA Users that Receive Treatment at Blue Plains



Source: Adapted from Blue Plains Feasibility Study

BPFS Treatment Capacity Projections for Blue Plains

Process Loading Condition	Load Variation (1)	Wastewater Quantity (mgd)
Annual Average or Dry Weather Flow (DWF)	1.00	370
Maximum Day	1.38	511
DWF Peak Rate	2.00	740

Notes:

(1) Ratio to Annual Average



IMA Allocation of Annual Average DWF Treatment Capacity at Blue Plains

User	User's Allocation of BPDWF Treatment Capacity (mgd) (1)
District	
Reserved for the District	148.0
Reserved for Potomac Interceptor Flow	10.0
District Total	158.0
Other Potomac Interceptor Users	11.4
WSSC	169.6
Fairfax County	31.0
Total	370.0

Current Allocation of PI flow

User	Allocation (mgd)
Loudoun County Sanitation Authority	13.80
Small PI Users	
Town of Vienna	1.50
Dulles Airport	1.50
Navy	0.07
NPS	0.03
Reserved for Future PI Users	4.50
Total	21.4



Notes:
(1) Section 3.A.I of IMA

Components of DWF Receiving Treatment at Blue Plains

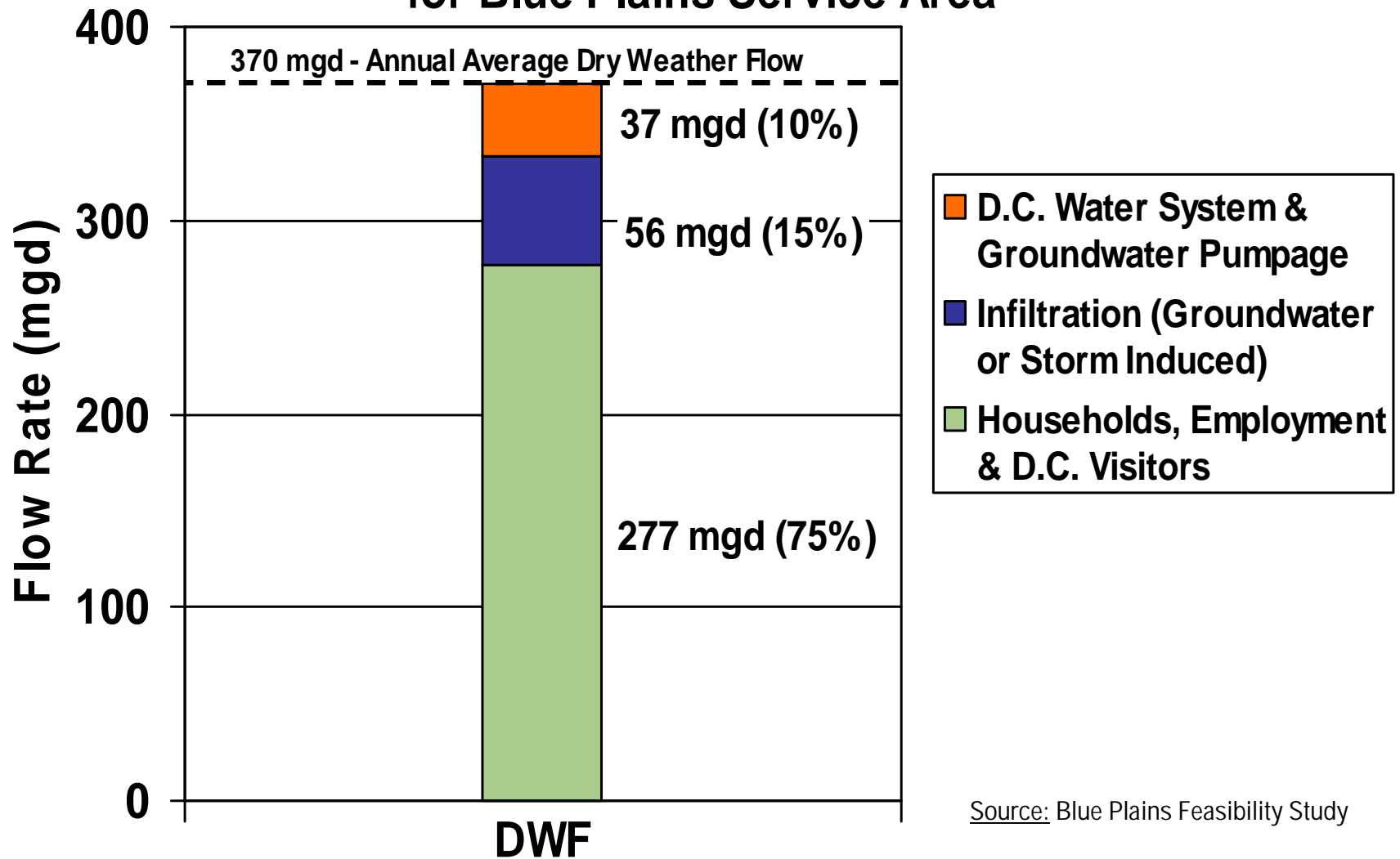
Flow Components	DWF Quantity (mgd)
Households	196
Employment	68
Visitors (D.C. only)	13
Infiltration (Groundwater or storm induced)	56
Water Distribution System (D.C. only)	32
Groundwater Pumpage (D.C. only)	5
Total DWF	370

Flow from Wastewater Sources. No Excess Flow Component

Source: Blue Plains Feasibility Study



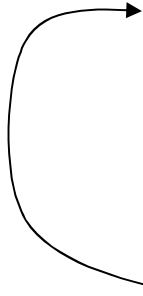
Dry Weather Flow (DWF) Components and Quantities for Blue Plains Service Area



Source: Blue Plains Feasibility Study

Maximum Flow Rate Receiving Treatment at Blue Plains

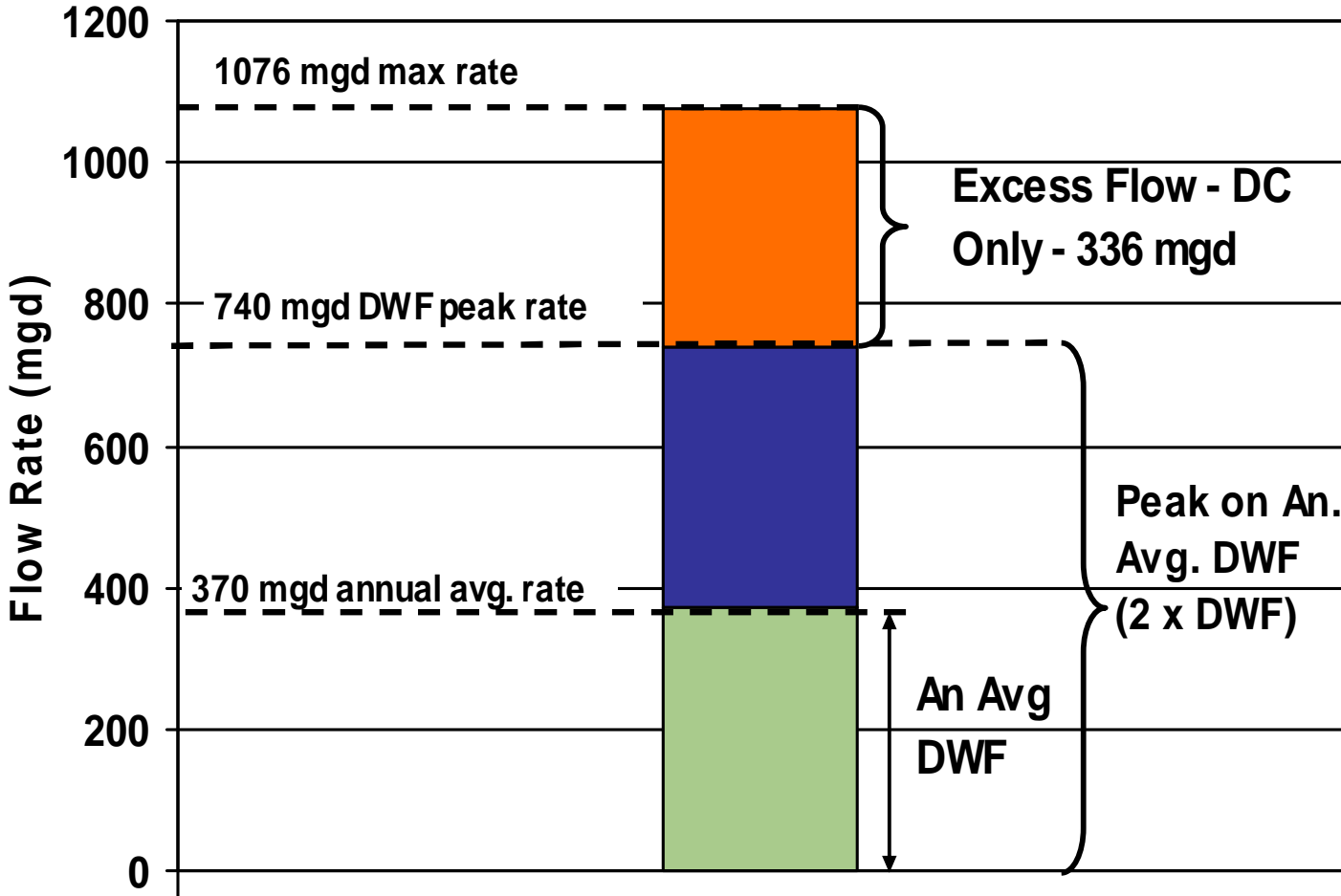
Flow Component	DWF Quantity (mgd)
DWF Peak Rate (2 x Annual Average)	740
Excess Flow (D.C. Only)	336
Maximum Rate	1076



Capacity included in Blue Plains design for flow from storm events in D.C. combined sewer system

Source: Blue Plains Feasibility Study and NPDES Permit

Maximum Flow to be Delivered to Blue Plains



DWF & Peak Rates

Source: Blue Plains Feasibility Study

Blue Plains NPDES Permit Treatment Conditions

- < NPDES Permit history

- § Pre 1985 – 740 mgd thru complete treatment (continuous/instantaneous)

- § Post 1985 – 740 mgd for 4 hrs, then 511 mgd thereafter thru complete treatment



Not Feasible

- < DWF conditions exist when total plant influent (TPI) is equal to or less than 511 mgd

- < Excess Flow (Combined Sewer System Flow or CSSF) conditions exist and are deemed to start when TPI is greater than 511 mgd

- < Excess Flow (CSSF) conditions end 4 hours after TPI drops to a rate less than 511 mgd or a period of 4 hours has elapsed since the start of excess flow conditions, whichever occurs last



Source: NPDES Permit

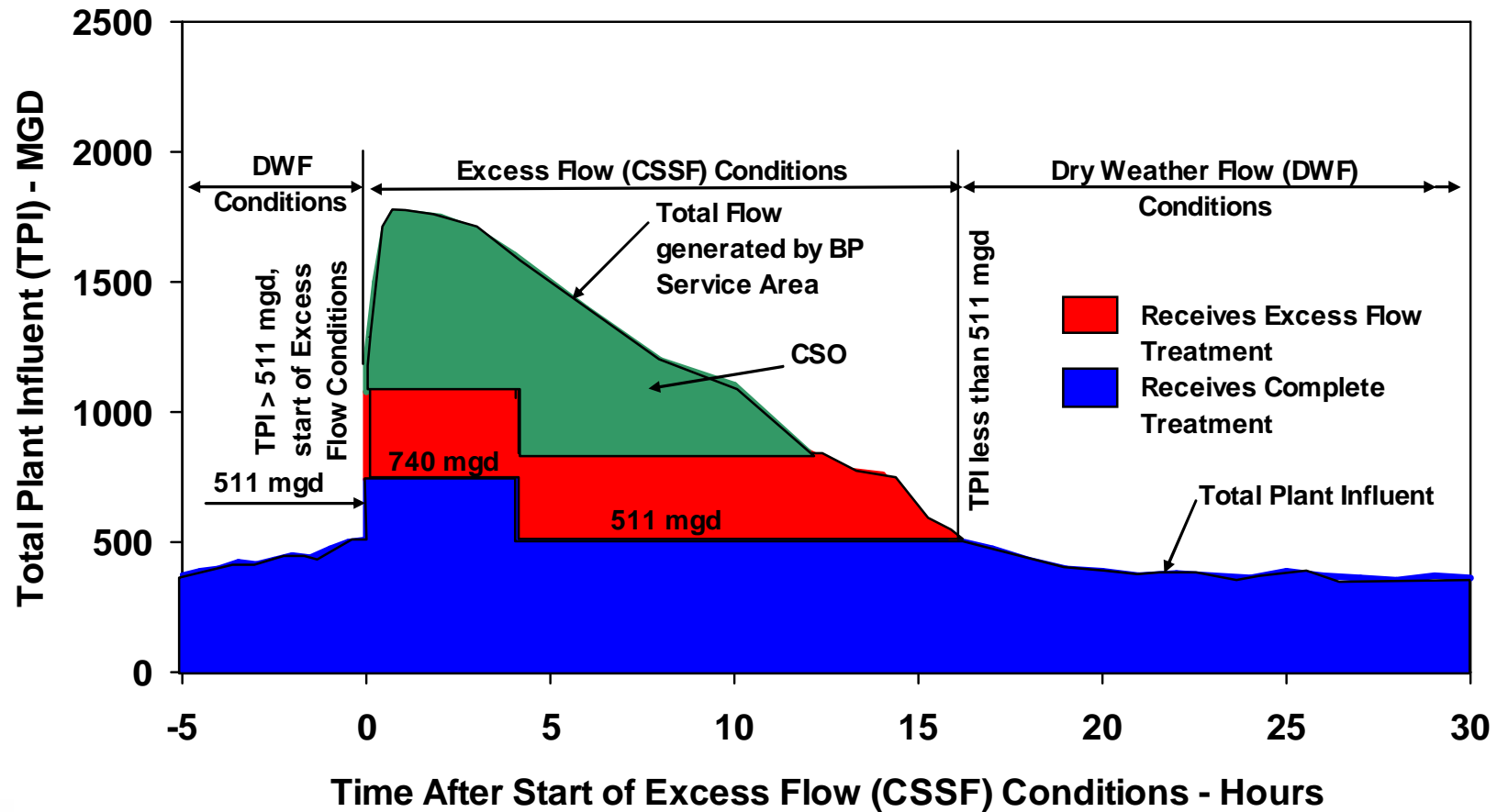
Blue Plains NPDES Permit Treatment Requirements

- < For DWF conditions, the TPI receives complete treatment
- < For excess flow (CSSF) conditions:
 - § TPI \leq 740 mgd receives complete treatment for 4 hours
 - § TPI > 740 mgd receives excess flow treatment up to 336 mgd
 - § After 4 hours, TPI up to 511 mgd receives complete treatment and flow above 511 mgd up to 336 mgd receives excess flow treatment



Source: NPDES Permit

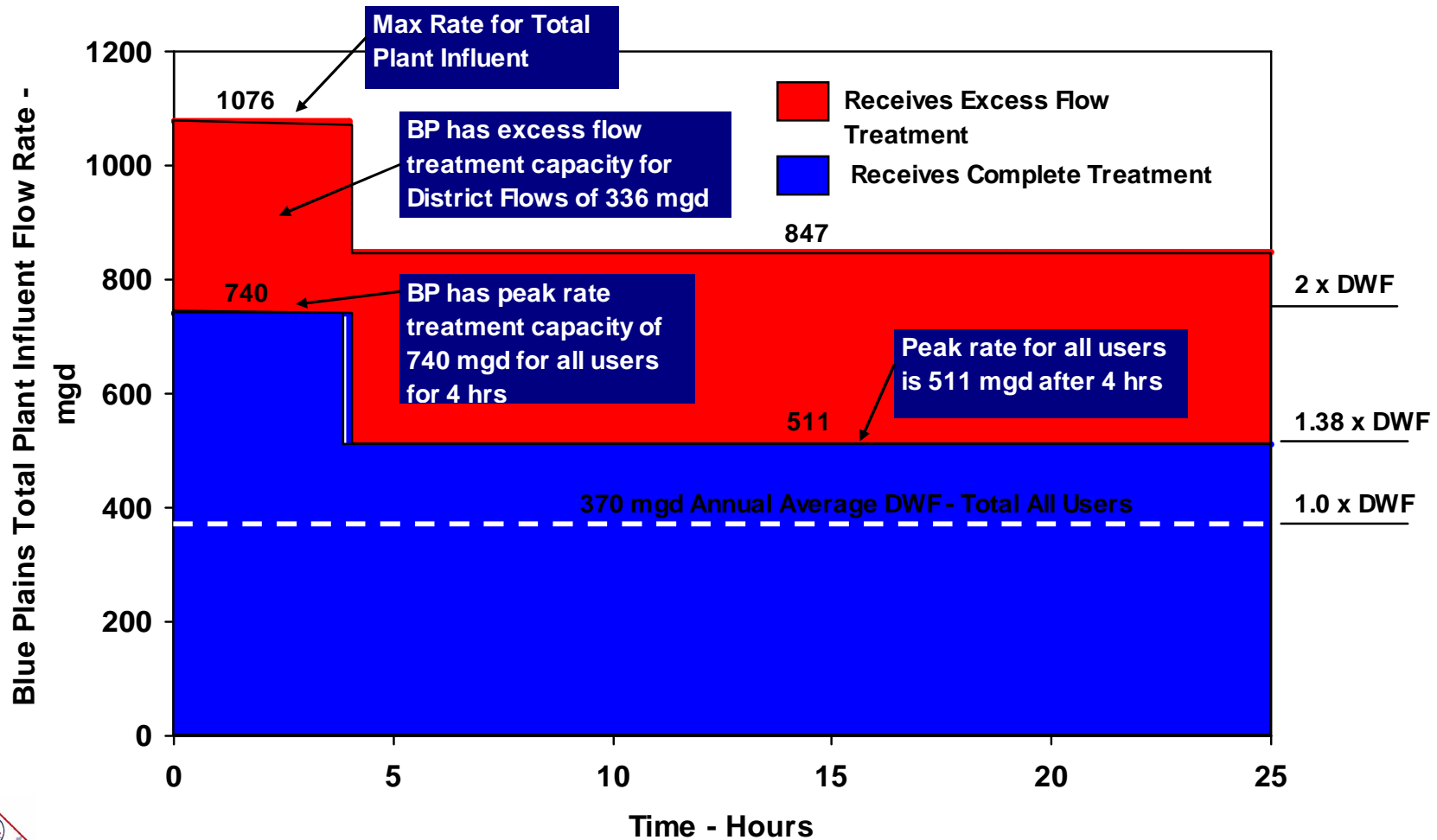
Treatment Requirements at Blue Plains for Wet Weather or Excess Flow Events



Source: Blue Plains Feasibility Study and NPDES Permit



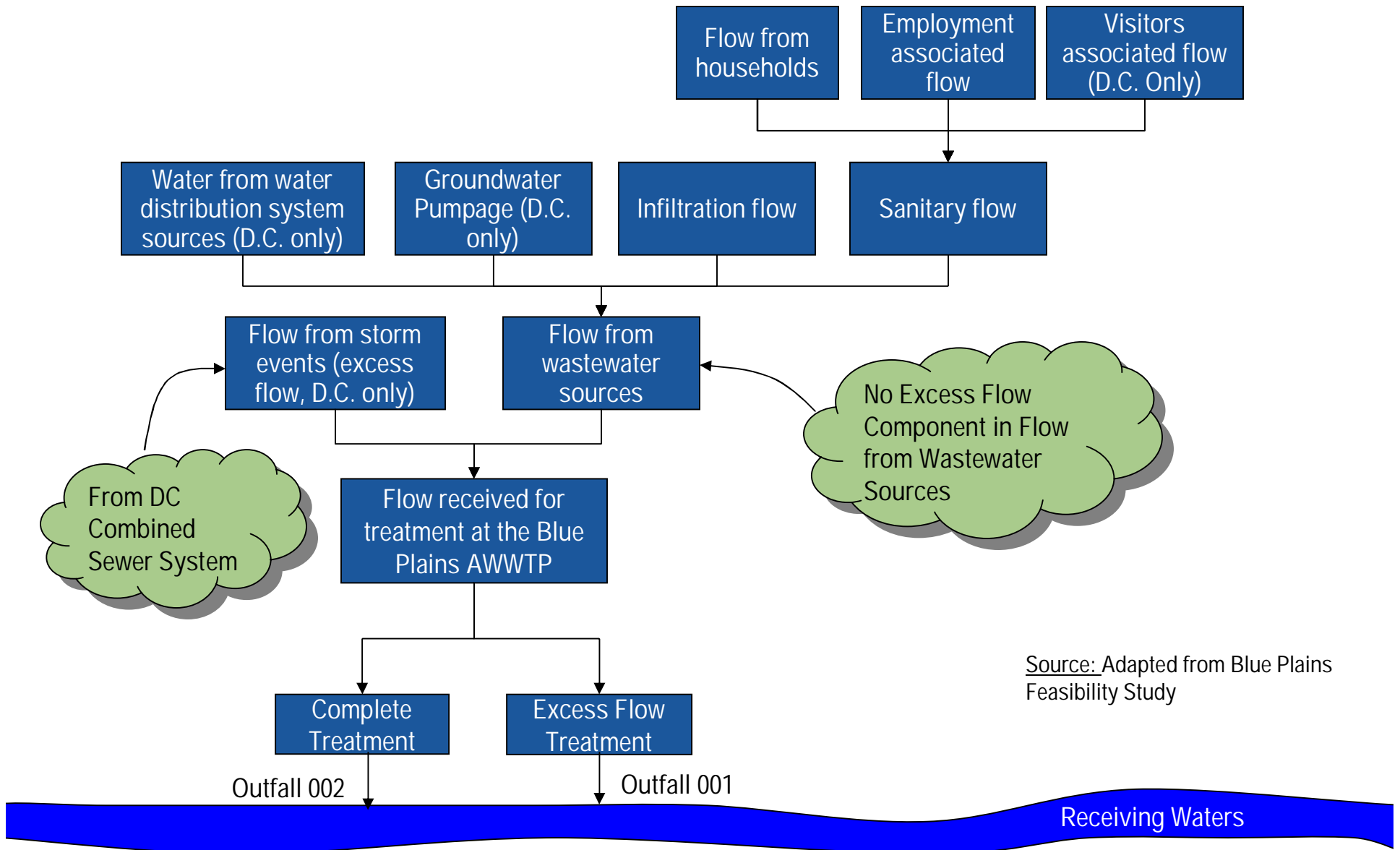
Treatment Capacities for Users at Blue Plains



Source: Blue Plains Feasibility Study and NPDES Permit



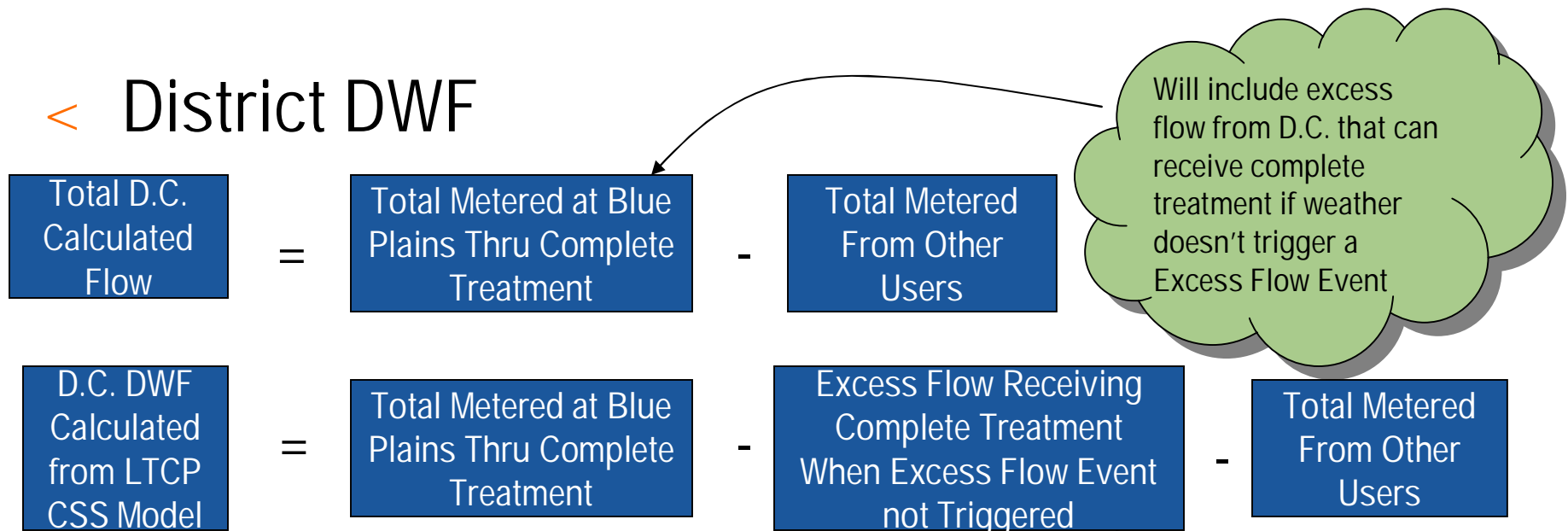
Flow Components from IMA Users that Receive Treatment at Blue Plains



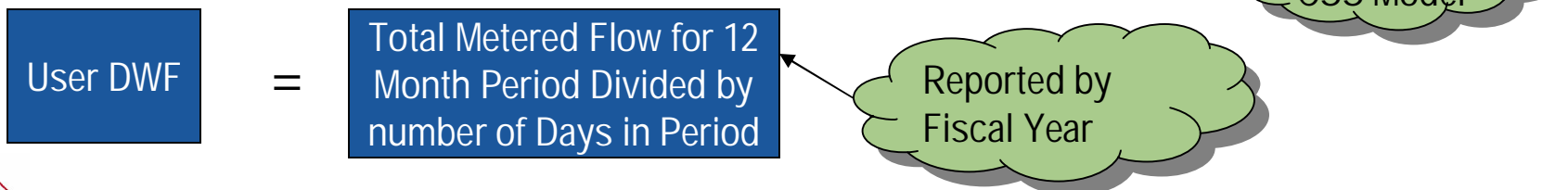
Source: Adapted from Blue Plains Feasibility Study

Blue Plains Service Area Record of Flows – Dry Weather Flow (DWF)

< District DWF



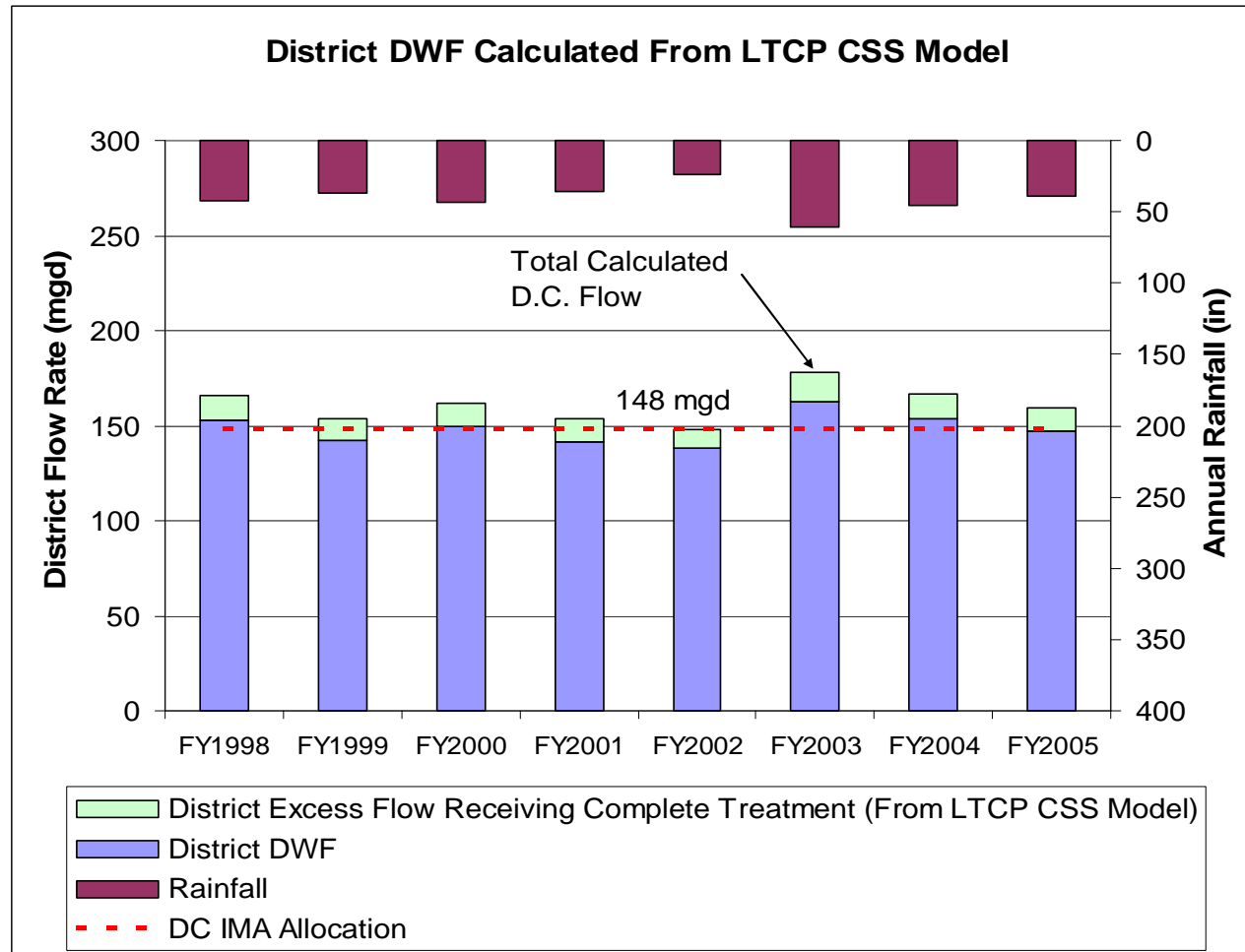
< DWF all other users



Source: Blue Plains Feasibility Study and IMA



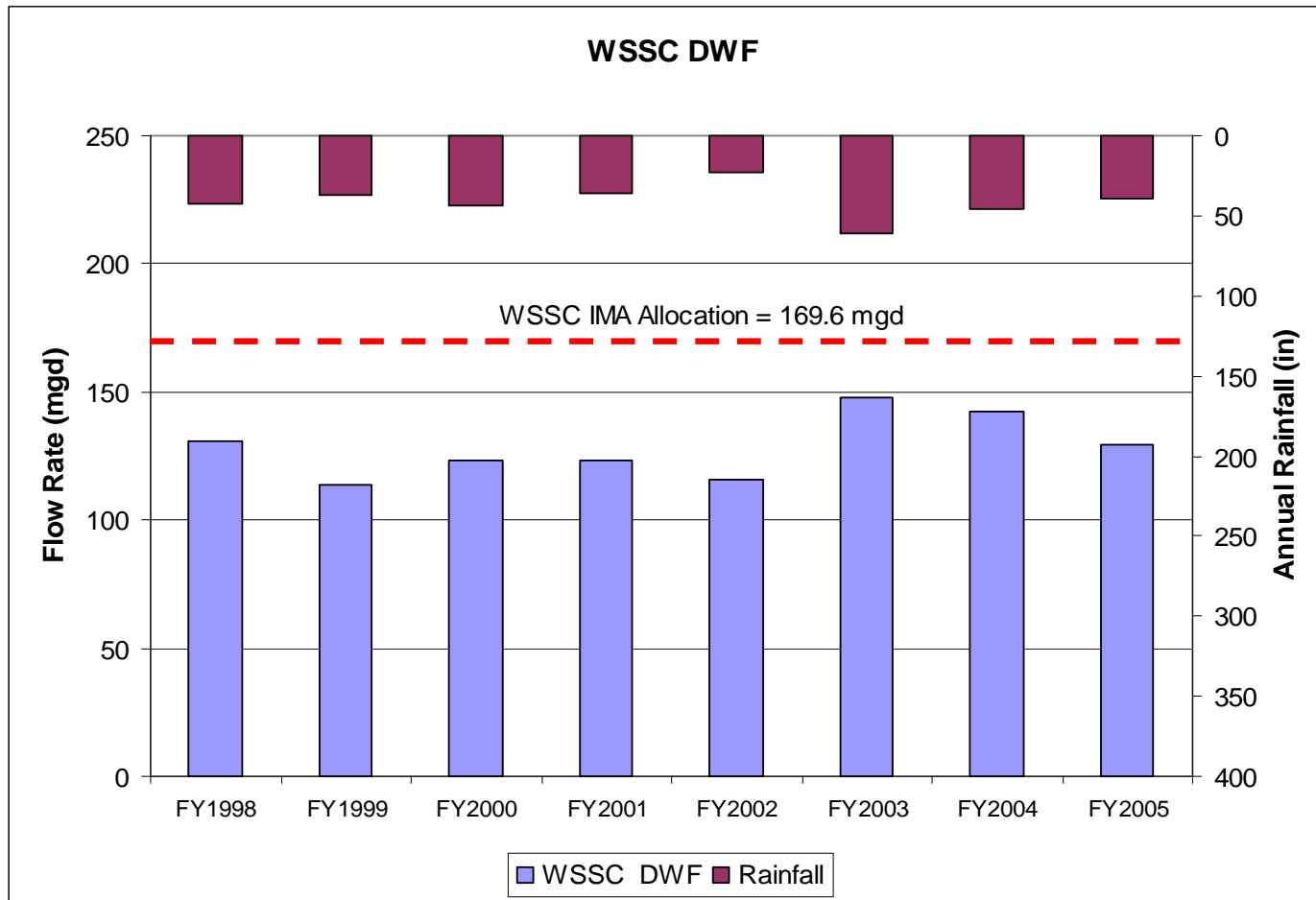
District DWF - Annual Average



Source: IMA Flow Reports and WASA's Model of Combined Sewer System



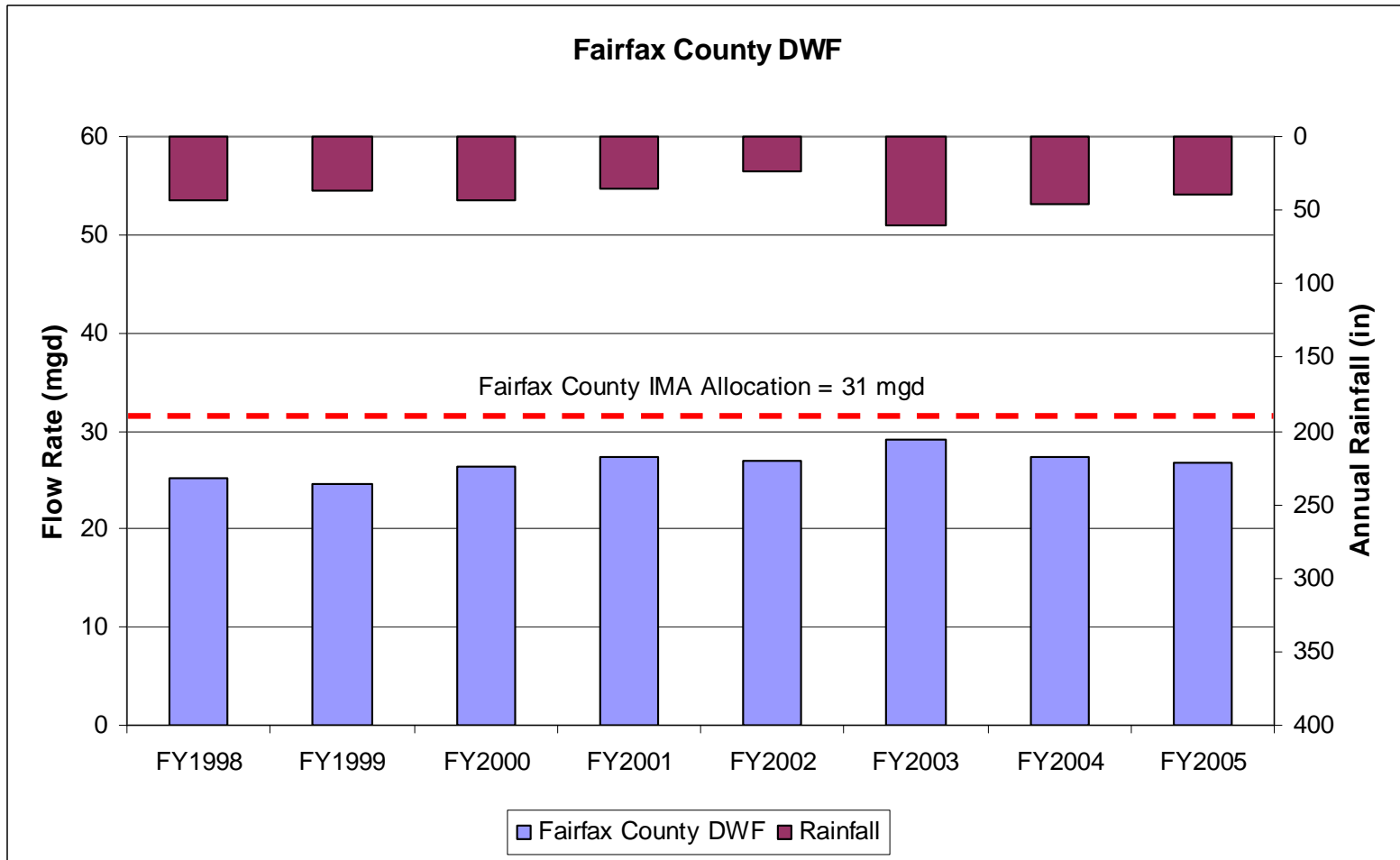
WSSC DWF – Annual Average



Source: IMA Flow Reports



Fairfax County DWF – Annual Average



Source: IMA Flow Reports



Blue Plains Service Area Record of Flows – Peak Flows

		Blue Plains Capacities – IMA/BPFS		
BP Users	DWF	2 x DWF 4 hr Peak	1.38 x DWF Cont. Peak	Excess Flow
All Users	370	740	511	(1)
District	148	296	204	336
Other Users	222	444	306	None

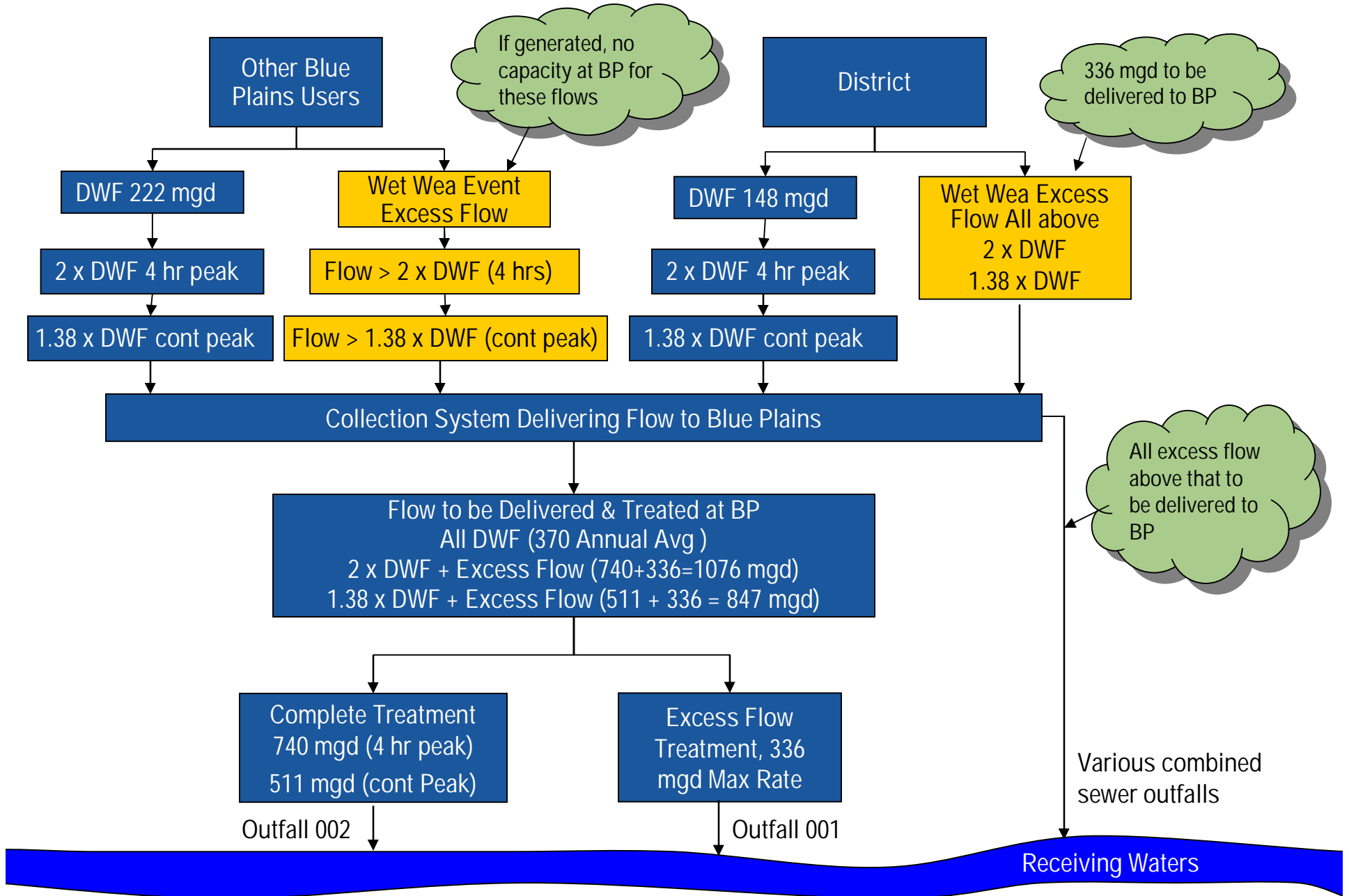
Notes:

(1) District only

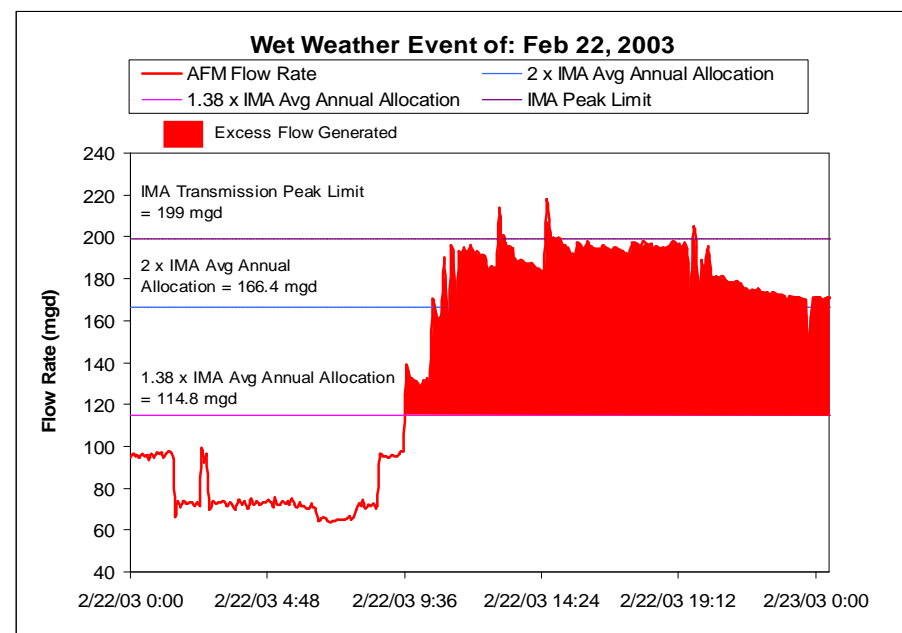
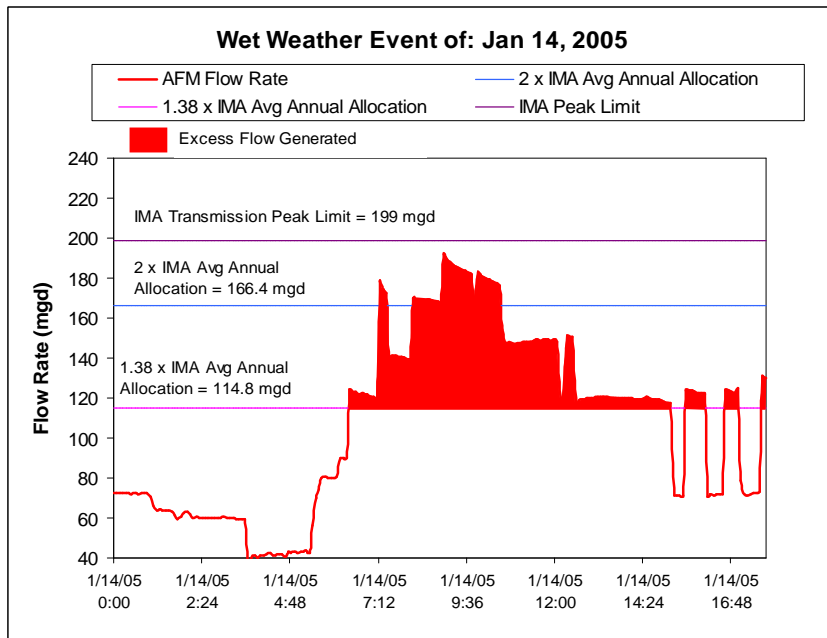
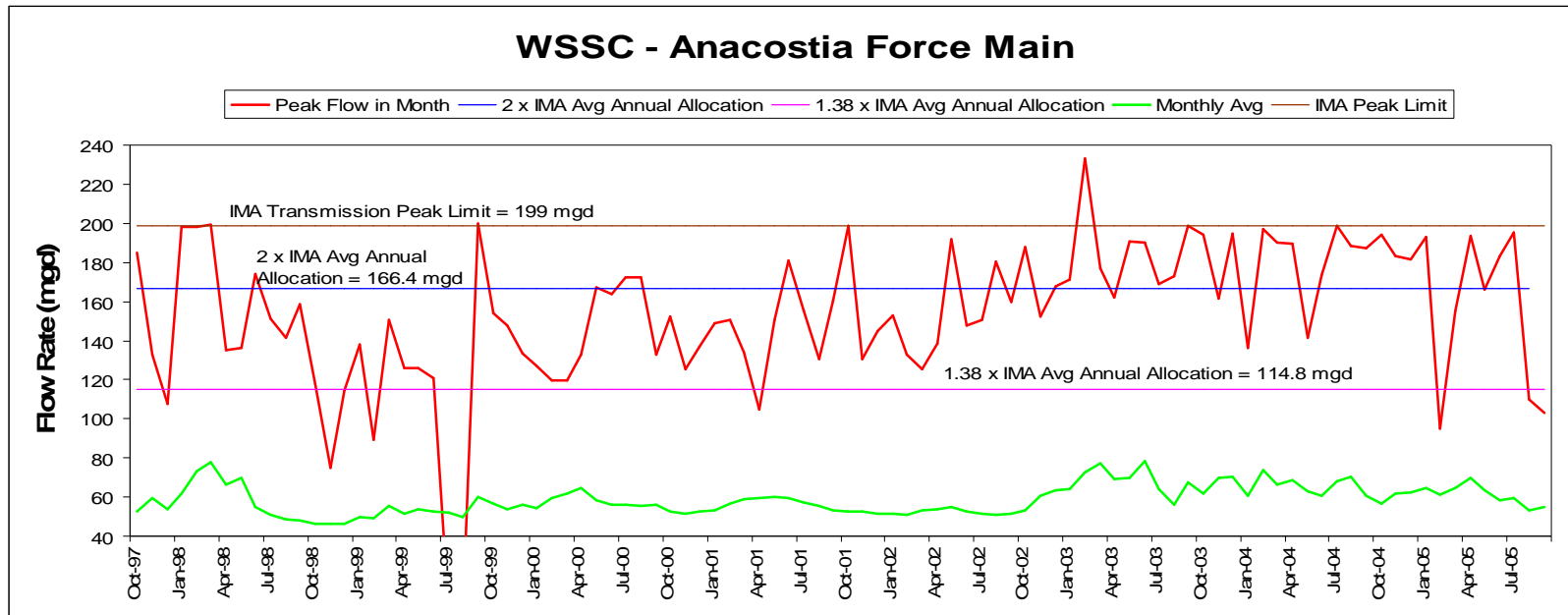
Source: Blue Plains Feasibility Study and IMA



Wet Weather Collection and Treatment Conditions



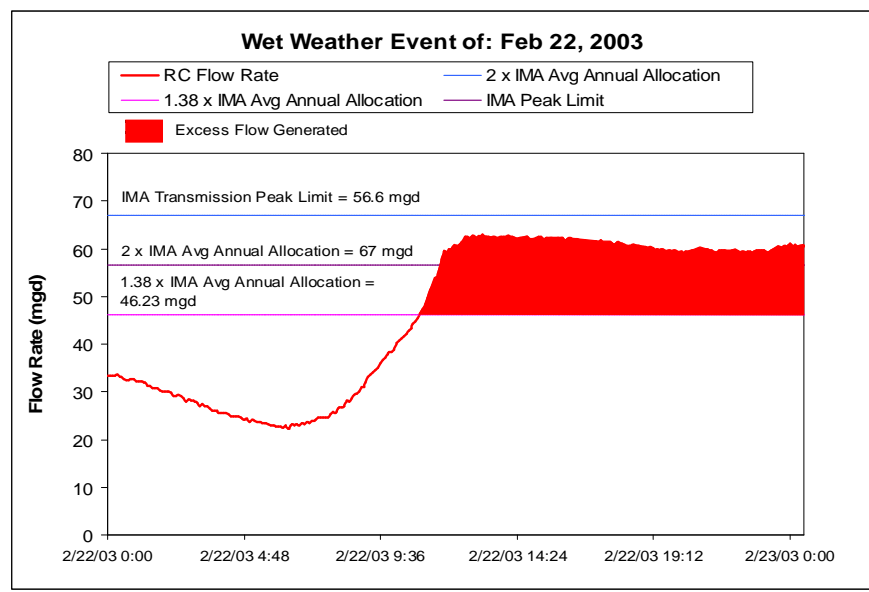
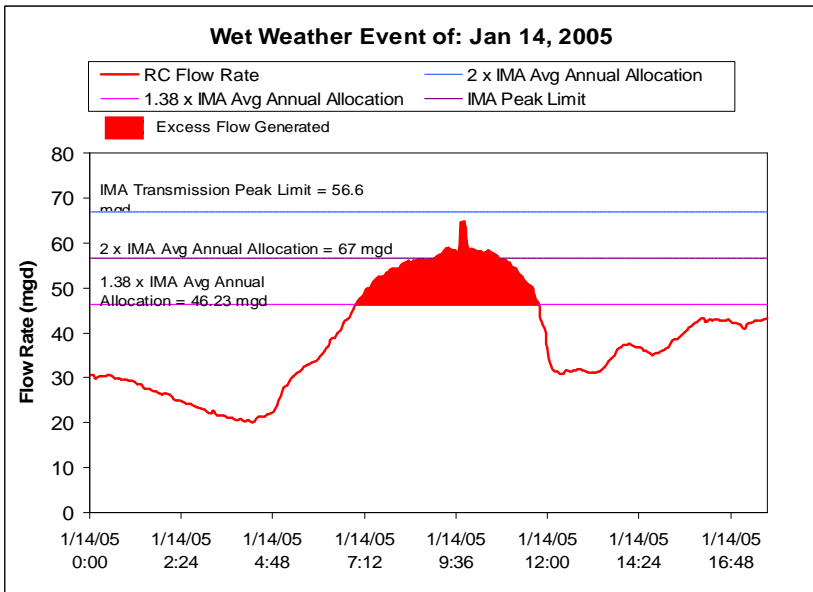
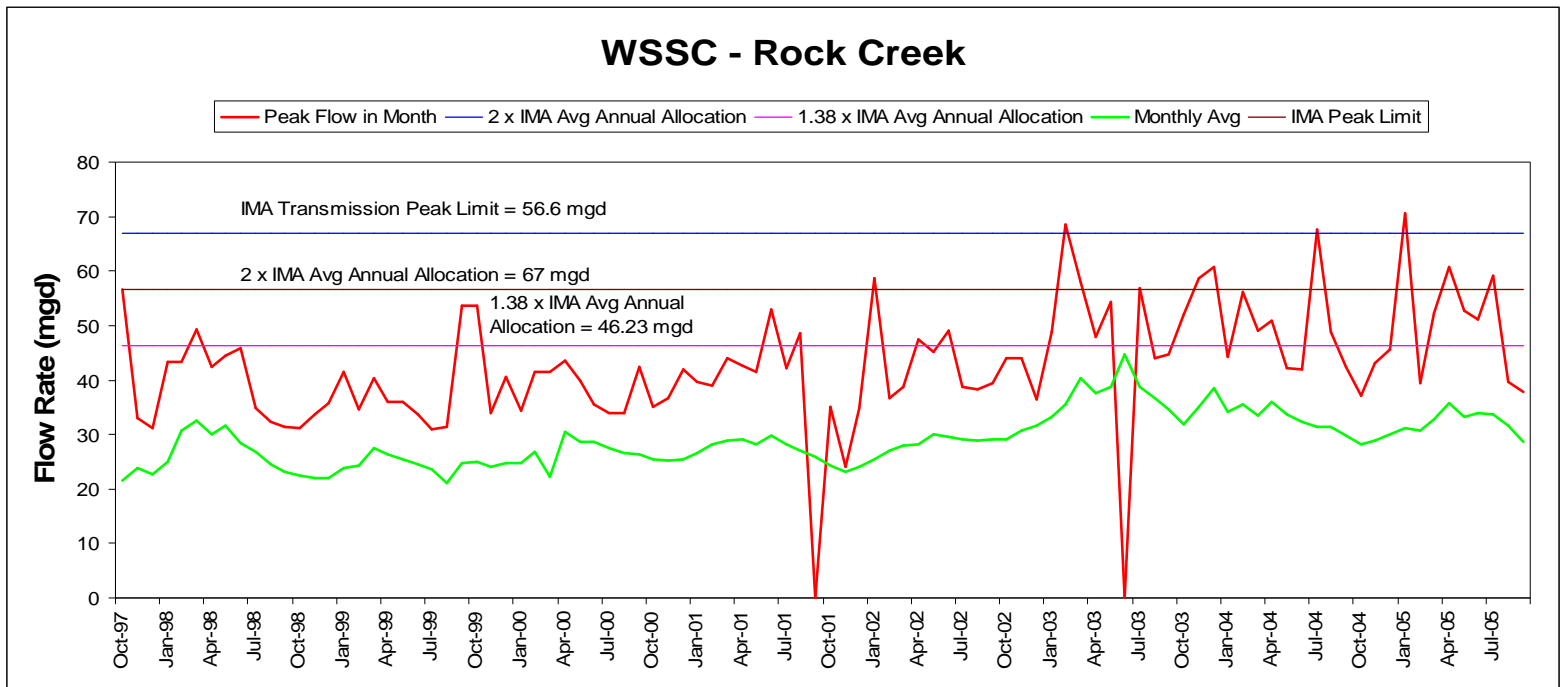
Record of Flow – WSSC Anacostia Force Main



Notes: Flow values include 14 mgd of D.C. flow which is conveyed to MD and is then pumped back to D.C.

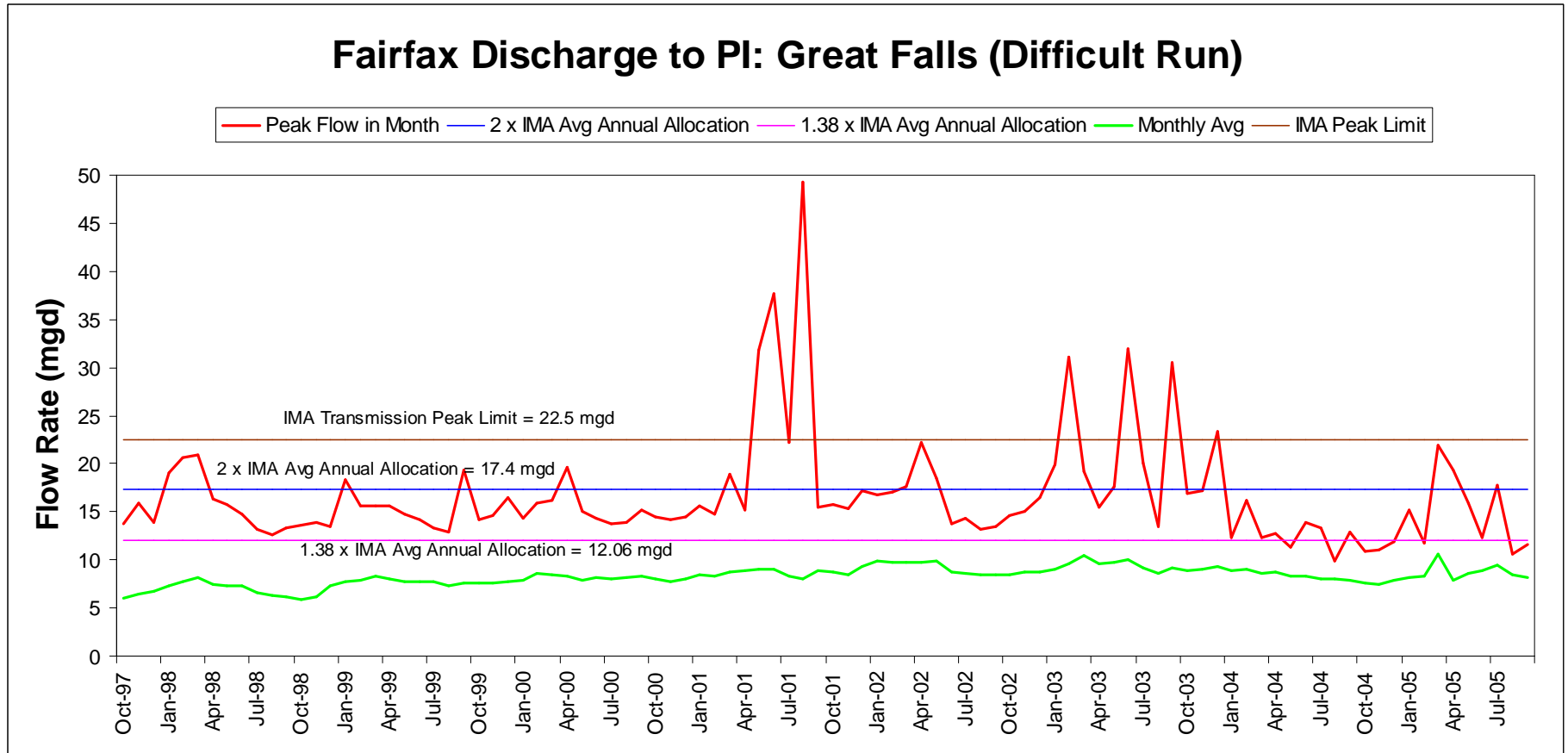
Source: IMA Flow Reports and WASA SCADA data

Record of Flow – WSSC Rock Creek



Source: IMA Flow Reports and WASA SCADA data

Record of Flow – Fairfax County (Difficult Run)

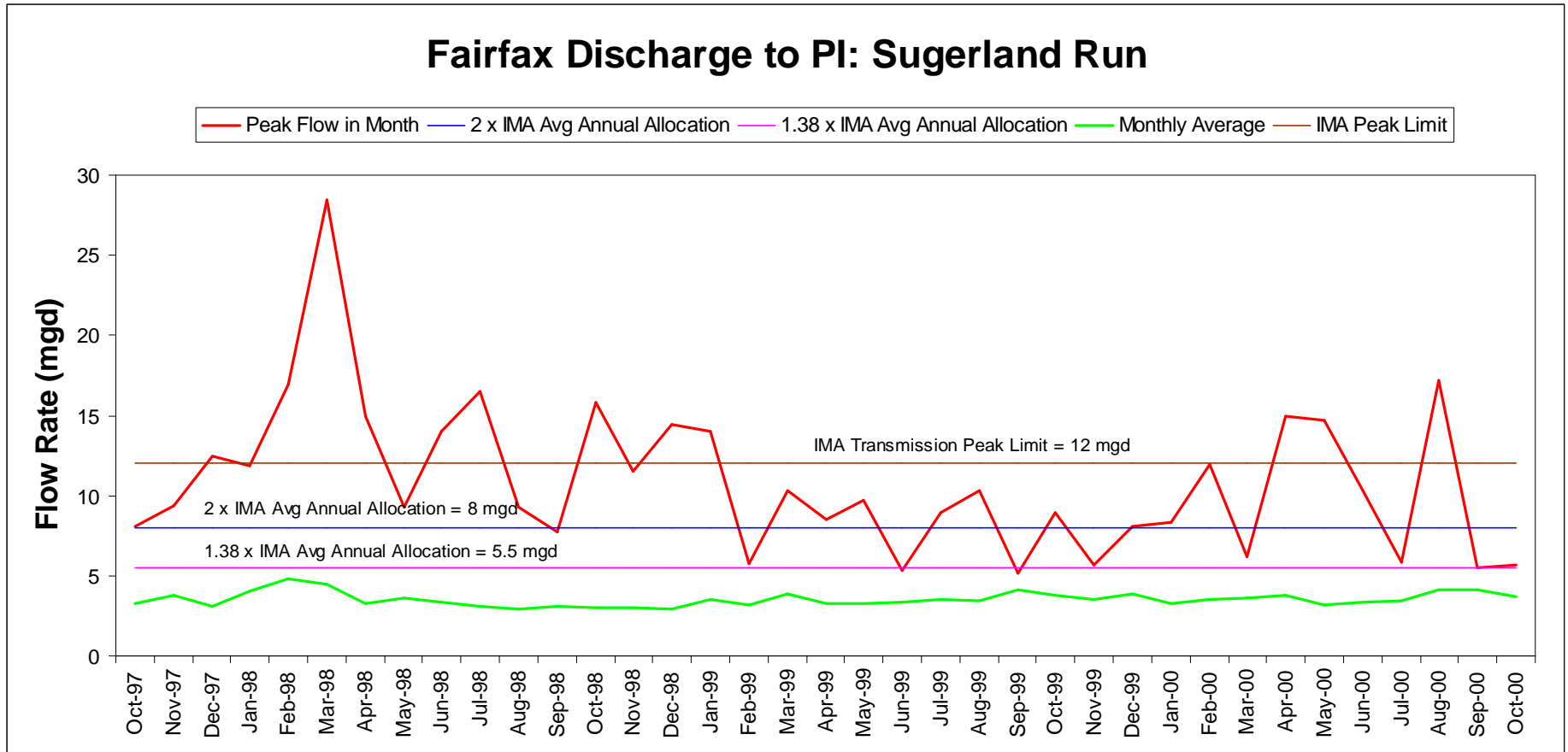


Source: IMA Flow Reports

No storm by storm flow data available



Record of Flow – Fairfax County Sugerland Run



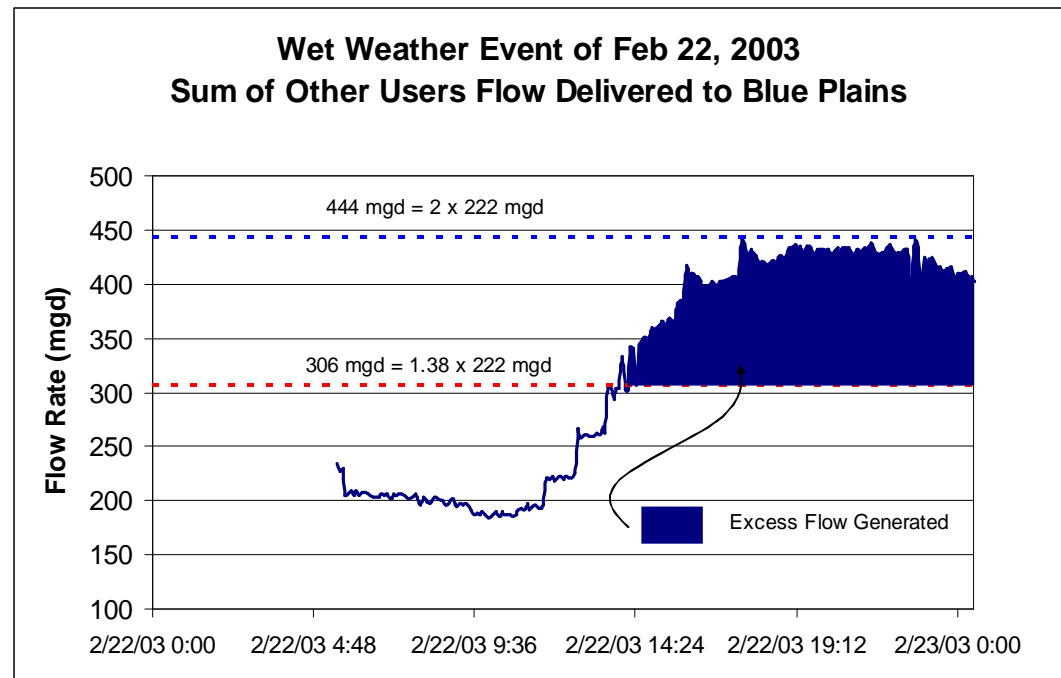
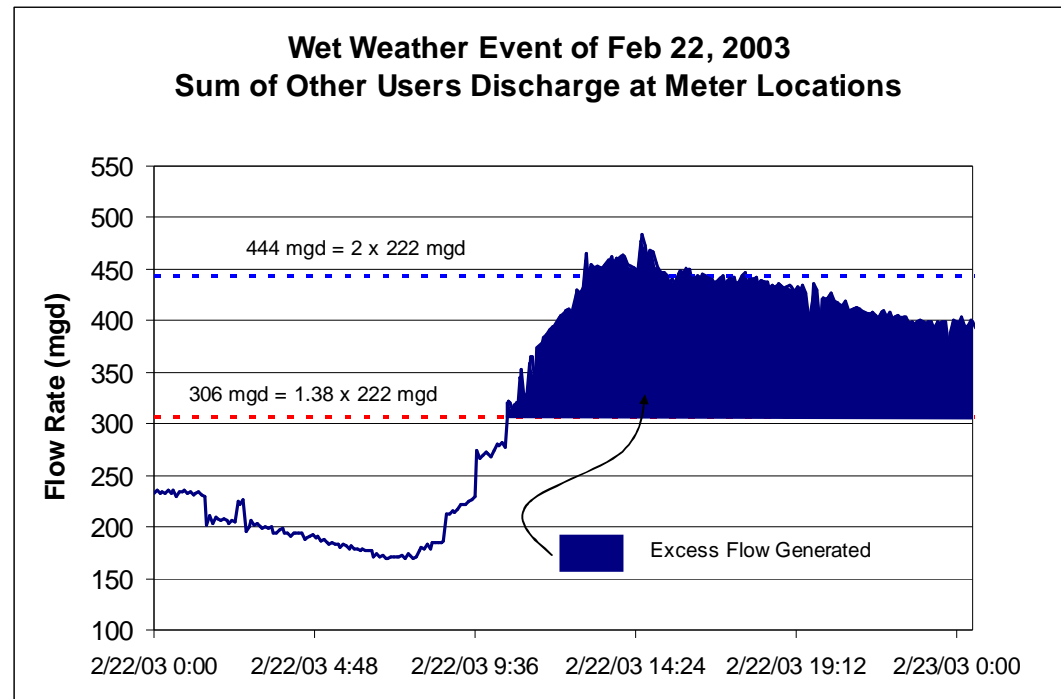
Source: IMA Flow Reports



No storm by storm flow data available

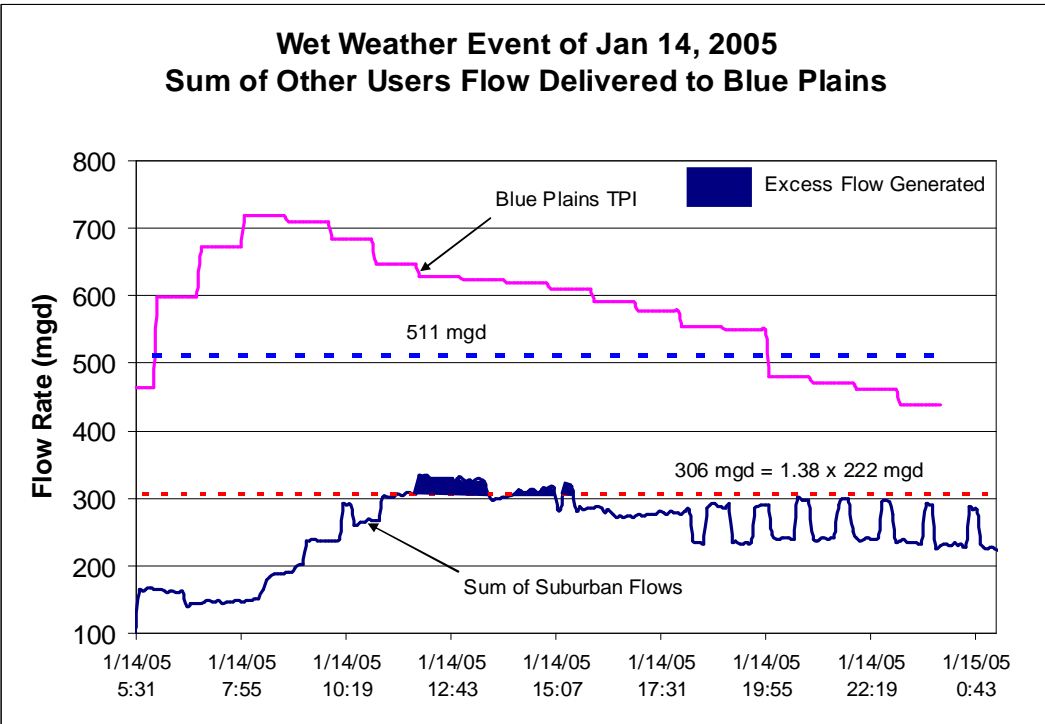
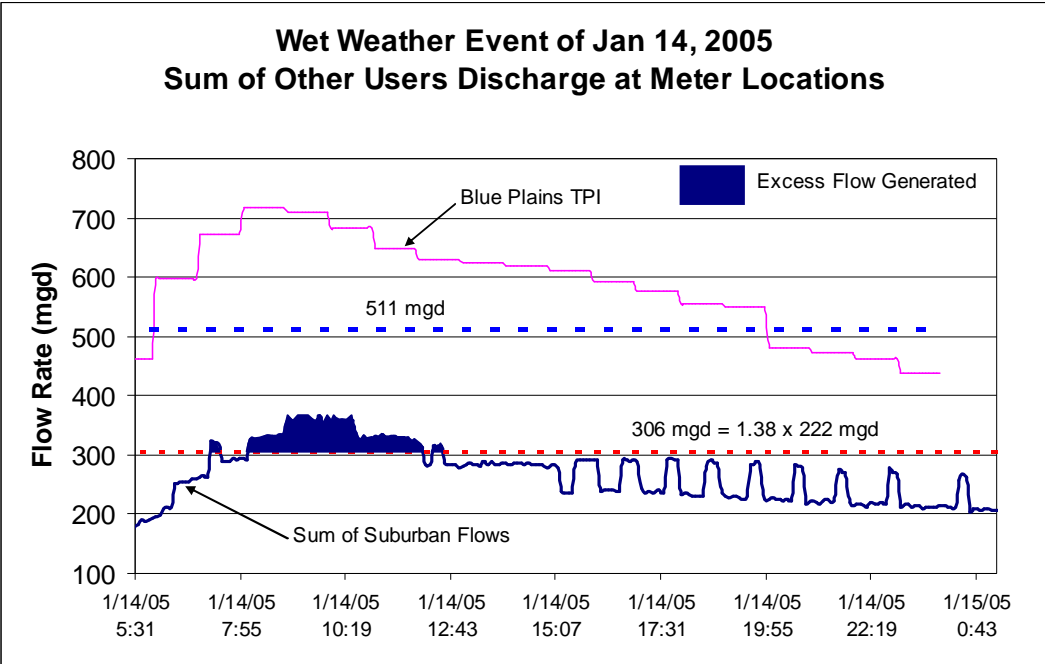


Wet Weather Record of Flows – Other Blue Plains Users



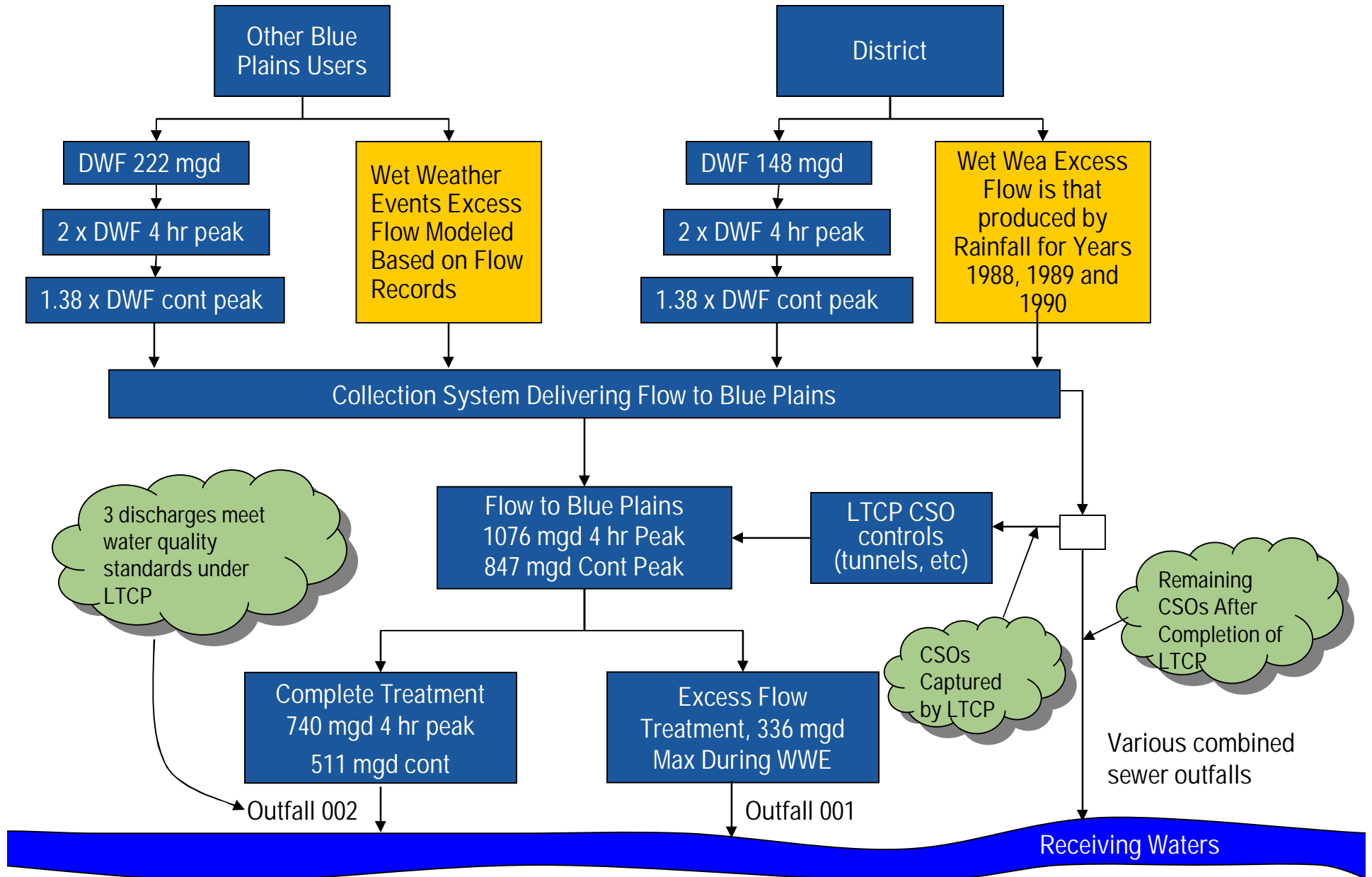
Source: WASA SCADA data

Wet Weather Record of Flows – Other Blue Plains Users



Source: WASA SCADA data

Blue Plains Service Area-System Model for LTCP CSO Controls and Water Quality Modeling



LTCP Development and Modeling

- < Modeling includes wet weather excess flow discharges from D.C. and other Blue Plains Users
- < BP User flows greater than Blue Plains capacity (including excess flow capacity) captured by CSO controls
- < CSOs remaining after completion of LTCP meet water quality standards without regard to source
- < After completion, LTCP performance to be evaluated by post construction monitoring

LTCP Post Construction Monitoring

- < 3 Phase Program
 - § Phase 1 – After Dams & Pumping Stations rehabilitation
 - § Phase 2 - After each tunnel (Anacostia, Potomac, Rock Creek) placed in operation
 - § Phase 3 – After all LTCP CSO controls placed in operation
- < LTCP completion scheduled for 2025
- < Phase 3 monitoring completion is 2026
- < Assessments of LTCP performance likely to extend to 2030
- < Any program to modify LTCP would be beyond 2030

LTCP Benefits for Blue Plains Users

- < BPWWTP and LTCP can accommodate:
 - § Existing DWF allocations (370 mgd)
 - § Historical wet weather peaks (excess flow)
- < User request for changes in DWF allocations or magnitude/nature of peak flows will need to be evaluated

Blue Plains – Nitrogen Removal Expectations

- < Nitrogen removal in existing NPDES permit is a goal not a permit limit
- < Effluent total nitrogen (TN) goal is 7.5 mg/L, annual average
- < EPA proposes to place a TN effluent limit in Blue Plains NPDES permit when reissued
- < EPA proposes to reopen and reissue permit by mid 2006
- < EPA has indicated TN effluent limit will be 3.0 or 4.0 mg/L in conformance with Chesapeake Bay Plan



Blue Plains – Nitrogen Removal – Initial Process Studies

- < Existing permit requires treating a peak rate of 2 x DWF or 740 mgd through complete treatment for 4 hours
- < Initial process studies show that it will be very expensive to add TN removal at EPA levels and maintain 740 mgd peak rate
- < A more cost effective approach would be to reduce peak rate thru complete treatment to 1.5 x DWF or 555 mgd
 - § Better receiving water quality at about 60%± of the cost
- < Reducing peak rate involves:
 - § Treating difference between 2.0 and 1.5 peak through excess flow
 - § Excess flow treatment technology would be changed from primary clarification to enhanced clarification
 - § LTCP tunnel pump-out would also be treated through excess flow

Blue Plains-Nitrogen Removal

Item	Existing Permit	Anticipated from EPA	Option Presented to EPA
Annual Average DWF – mgd	370	370	370
Total Nitrogen Effluent Limit – mg/L	7.5 goal	3.0 - 4.0 permit limit an. avg.	3.0 - 4.0 permit limit an. avg.
Peak Flow to Complete Treatment			
< Ratio to DWF	2 x DWF	2 x DWF	1.5 x DWF
< Rate – mgd	740	740	555
< Duration – hrs	4	4	4
Complete Treatment after 4 hours			
< Ratio to DWF	1.38 x DWF	1.38 x DWF	1.38 x DWF
< Rate – mgd	511	511	511
< Duration – hrs	Continuous	Continuous	24 hours
Complete Treatment after 28 hours			
< Ratio to DWF	N/A	N/A	1.22
< Rate – mgd	N/A	N/A	450
< Duration – hrs	N/A	N/A	Continuous

