Environmental Services Division
Public Works Department

SUPERIOR
WISCONSIN
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Phone: (715) 394-0392 Ext. 158
Fax: (715) 394-0406
E-mail: finka@ci.superior.wi.us
Website: www.ci.superior.wi.us

H/H Modeling Specialist
Asher Fink
51 E 1st Street
Superior, WI 54880

March 25, 2009

TO: Mr. Tom Fennessey
Director of Facilities Management
University of Wisconsin-Superior
801 North 28th St.
Superior, WI 54880

FROM: Asher Fink
H/H Modeling Specialist
City of Superior ESDPW

RE: Stage 1 Pollutant Loading Analysis Results

Stage 1 Total Suspended Solids [TSS] and Total Phosphorous [TP] mass loading estimates and reporting requirements at University of Wisconsin-Superior [UWS] have been completed. Modeling results yield theoretical annual TSS mass reduction of 7.39%. TP mass loading was calculated at 0.081 tons/yr.

1.0 Introduction

The objective of this report is to document reporting compliance by UWS with Stage 1 storm water quality management objectives contained in WPDES Permit WI-S050075-1, NR151 and NR216 Wisconsin Administration Code. Section 2.7.1 of the WPDES permit states: *"To the maximum extent practicable, implementation of storm water management practices necessary to achieve a 20% reduction in the annual average mass of total suspended solids discharging from the MS4 to surface waters of the state as compared to implementing no storm water management controls, by March 10, 2008..."*. Wis. Admn. Code NR216.07 (6) (b) requires a general permit holder to conduct a pollutant loading analysis using an approved computer model such as P8 or WinSLAMM. Under a cooperative agreement, the City of Superior ESDPW performed the pollutant loading analysis on behalf of UWS.

2.0 Conceptual Model Design

Pollutant analysis modeling software, P8 version 3.2, was used to evaluate the efficiency of UWS-owned and/or operated non-structural reduction controls [i.e. street sweeping, parking control, debris management] compared to pollutant loads without controls [baseline loading] in reducing annual mass TSS. Based on information supplied by UWS, there are no structural controls [detention basins, vegetated infiltration swales, propriety sediment removal devices] within the UWS permit area. Pollutant removal evaluation consisted of non-structural controls and practices only. A comprehensive assessment would be required to identify those structural features and practices that meet criteria described in WDNR Conservation Practice Standards.

The modeling effort consisted of determining the aerial extent of the model region owned by UWS. Three hydrologically disconnected sub-regions were identified: UWS Wessman Arena, UWS Main Campus, and UWS Heating Plant. The model sub-regions were then quantified using unique input parameters describing the surface rainfall-runoff characteristics. Sub-region specific input data were derived from field observations, ArcGis surface feature analyses, construction plans, and published

information. Non-unique or 'general' model inputs consisted of calibrated datasets identified by WDNR technical documents. Attachment 1.0 depicts the three model sub-regions included in the modeling study.

Two simulations were conducted for each model sub-region. The first simulation predicted the pollutant-loading rate assuming no reduction controls were applied ['baseline loading']. The second simulation predicted the pollutant reduction efficiency using the identified non-structural controls. Results were compared for each sub-region to determine the annual percent of TSS removal calculated by the model. Percent TSS reduction was determined by comparing the relative differences between the baseline or 'no controls' mass loading results against loading rates generated using existing non-structural controls.

3.0 Model Results

Total annual TSS reduction applying existing controls was estimated at 7.39% for the combined model sub-regions. Simulated TP mass generated under baseline loading conditions was 0.081 tons/yr. A summary of the modeling results is presented below:

MODEL SUB-REGION	Acres	TSS Generated [tons/yr]	TSS Removed [tons/yr]	TSS % Reduction	TP Generated [tons/yr]
Baseline Loading [No Controls]					
UWS Wessman Arena	68.42	10.38	0.0	0.0	0.032
UWS Main Campus	65.64	15.79	0.0	0.0	0.048
UWS Heating Plant	2.54	0.34	0.0	0.0	0.001
Loading [Non-Structural Controls Applied]					
UWS Wessman Arena	68.42	--	0.72	6.94	--
UWS Main Campus	65.64	--	1.21	7.66	--
UWS Heating Plant	2.54	--	0.03	8.82	--
Totals	**136.60**	**26.51**	**1.96**	**7.39**	**0.081**

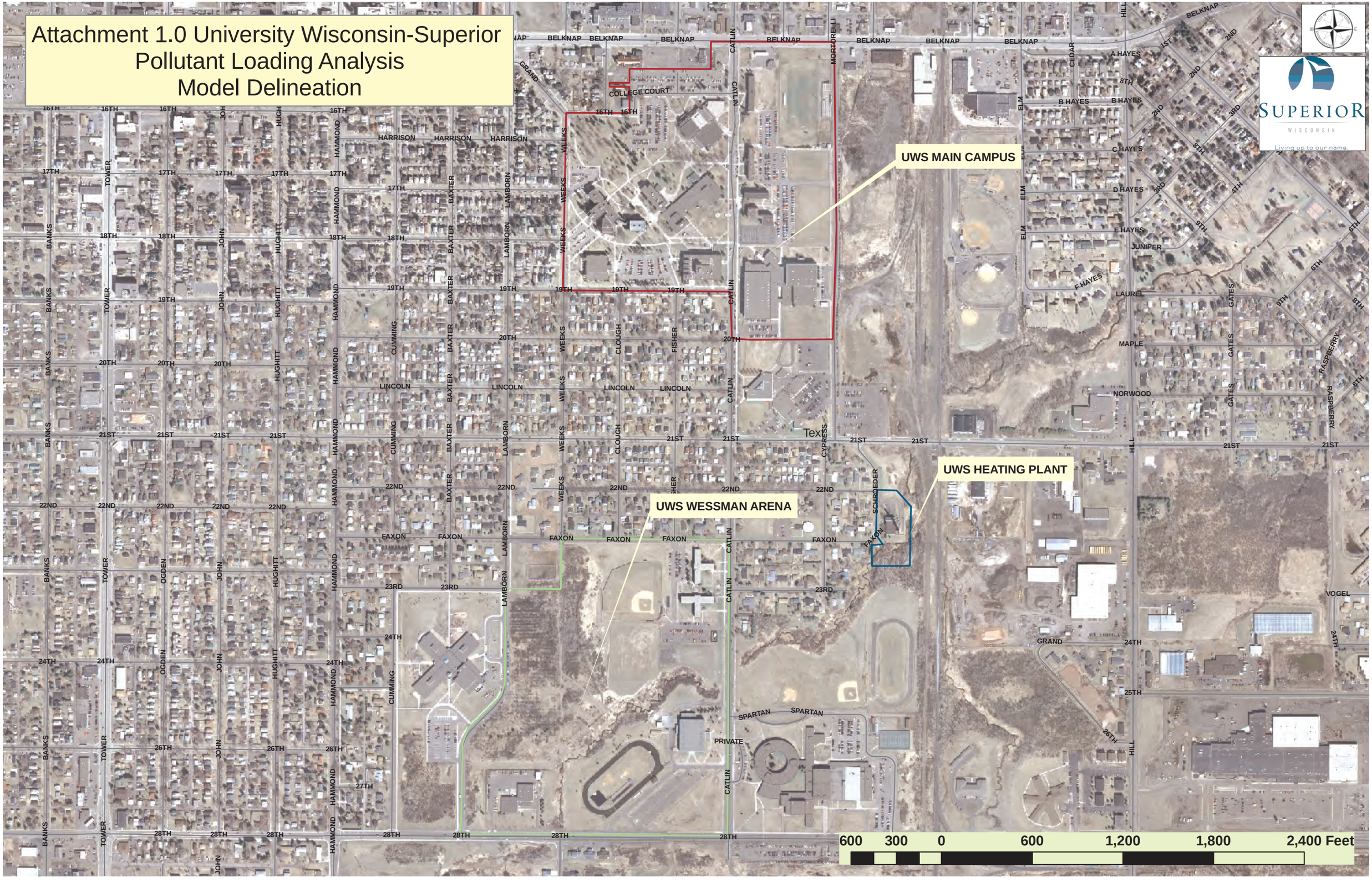
Stage 1 pollutant loading analysis and reporting requirements has been qualitatively documented using the pollutant/particle transport model, P8 version 3.2. Detailed model input and output for each baseline simulation are provided as Attachments 2.0 through 2.2, while Attachments 3.0 through 3.2 present the non-structural control simulations.

JAF/jaf

c: Diane R. Nelson, Steve Roberts

Enclosures: Model region delineation map; P8 baseline loading input/output files, P8 non-structural controls applied input/output files.

Attachment 1.0 University Wisconsin-Superior
Pollutant Loading Analysis
Model Delineation



ATTACHMENT 2.0
UWS POLLUTANT LOADING ANALYSIS
WESSMAN ARENA SHED
P8 INPUT
BASELINE LOADING

P8 Urban Catchment Model, Version 3.2							Run Date	03/12/09
Case	UWS_wessman_shed_baseline1.p8c			FirstDate	03/24/75		Precip(in)	21.1
Title	UWS_wssmen_baseline			LastDate	11/19/75		Rain(in)	21.13
PrecFile	DLTH6095.PCP			Events	65		Snow(in)	0.00
PartFile	nurp50.p8p			TotalHrs	5769		TotalYrs	0.66
Case Title			UWS_wssmen_baseline					
Case Data File			UWS_wessman_shed_baseline1.p8c					
Path			C:\Program Files\P8 Urban Catchment Model\P8 Version 3.2\UWS\					
Case Notes:			UWS Wessman area shed baseline loading					
Storm Data File			DLTH6095.PCP					
Particle File			nurp50.p8p					
Air Temp File File			Dlth6095.TMP					
Time Steps Per Hour			10					
Minimum Inter-Event Time (hrs)			10					
Precipitation Scale Factor			1					
Air Temp Offset (deg-F)			0					
Loops Thru Storm File			1					
Simulation Dates								
Start			1/1/1975					
Keep			3/24/1975					
Stop			11/19/1975					
Max Snowfall Temperature (deg-f)			-999.0					
SnowMelt Temperature (deg-f)			-999.0					
Snowmelt Coef (in/degF-Day)			0.06					
Soil Freeze Temp (deg-F)			-999.0					
Snowmelt Abstraction Factor			1.00					
Evapo-Trans. Calibration Factor			1.00					
Growing Season Start Month			5					
Growing Season End Month			10					
5-Day Antecedent Rainfall + Runoff (inches)								
CN Antecedent Moisture Condition			AMC-II	AMC-III				
Growing Season			1.40	2.10				
NonGrowing Season			0.50	1.10				
Watershed Data								
Watershed Name			UWS_wessman					
Runoff to Device			outfall					
Infiltration to Device								
Watershed Area			68.42					
SCS Curve Number (Pervious)			79.25					
Scale Factor for Pervious Runoff Load			1					
UnSwept Impervious Fraction			0.04					
UnSwept Depression Storage (inches)			0.02					
UnSwept Imperv. Runoff Coefficient			0.98					
UnSwept Scale Factor for Particle Loads			1					
Swept Impervious Fraction			0.31					
Swept Depression Storage (inches)			0.042					
Swept Imperv. Runoff Coefficient			0.95					
Swept Scale Factor for Particle Loads			1					
Sweeping Frequency			0					
Sweeping Efficiency			1					
Sweeping Start Date (MMDD)			1231					
Sweeping Stop Date (MMDD)			101					
Device Data								
Device Name			outfall					
Device Type			PIPE					
Infiltration Outlet								
Normal Outlet								
Spillway Outlet								
Particle Removal Scale Factor								
Bottom Elevation (ft)								
Bottom Area (acres)								

ATTACHMENT 2.0
UWS POLLUTANT LOADING ANALYSIS
WESSMAN ARENA SHED
P8 INPUT
BASELINE LOADING

Permanent Pool Area (acres)								
Permanent Pool Volume (ac-ft)								
Perm Pool Infilt Rate (in/hr)								
Flood Pool Area (acres)								
Flood Pool Volume (ac-ft)								
Flood Pool Infilt Rate (in/hr)								
Infilt Basin Void Fraction (%)								
Detention Pond Outlet Parameters								
Outlet Type								
Outlet Orifice Diameter (in)								
Orifice Discharge Coef								
Outlet Weir Length (ft)								
Weir Discharge Coef								
Perforated Riser Height (ft)								
Number of Holes in Riser								
Holes Diameter								
Flood Pool Drain Time (hrs)								
Swale Parameters								
Length of Flow Path (ft)								
Slope of Flow Path %								
Bottom Width (ft)								
Side Slope (ft-v/ft-h)								
Maximum Depth of Flow (ft)								
Mannings n								
Pipe, Splitter, Aquifer Parameter								
Hydraulic Res. Time (hrs)			0					
Particle Data								
Particle File		nurp50.p8p						
Particle Class		P0%	P10%	P30%	P50%	P80%		
Filtration Efficiency (%)		90	100	100	100	100		
Settling Velocity (ft/hr)		0	0.03	0.3	1.5	15		
First Order Decay Rate (1/day)		0	0	0	0	0		
2nd Order Decay (1/day-ppm)		0	0	0	0	0		
Impervious Runoff Conc (ppm)		1	0	0	0	0		
Pervious Runoff Conc (ppm)		1	100	100	100	200		
Pervious Conc Exponent		0	1	1	1	1		
Accum. Rate (lbs-ac-day)		0	1.75	1.75	1.75	3.5		
Particle Removal Rate (1/day)		0	0.25	0.25	0.25	0.25		
Washoff Coefficient		0	20	20	20	20		
Washoff Exponent		0	2	2	2	2		
Sweeper Efficiency		0	4	8	12	16		
Water Quality Component Data								
Component Name		TSS	TP	TKN	CU	PB	ZN	HC
Water Quality Criteria (ppm)								
	Level 1	5	0.025	2	2	0.02	5	0.1
	Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5
	Level 3	20	0.1	0.5	0.02	0.15	0.38	1
Content Scale Factor		1	1	1	1	1	1	1
Particle Composition (mg/kg)								
P0%		0	99000	600000	13600	2000	640000	250000
P10%		1000000	3850	15000	340	180	1600	22500
P30%		1000000	3850	15000	340	180	1600	22500
P50%		1000000	3850	15000	340	180	1600	22500
P80%		1000000	0	0	340	180	0	22500

ATTACHMENT 2.0
UWS POLLUTANT LOADING ANALYSIS
WESSMAN ARENA SHED
P8 OUTPUT
BASELINE LOADING

P8 Urban Catchment Model, Version 3.2							Run Date	03/12/09
Case	UWS_wessman_shed_baseline1.p8c			FirstDate	03/24/75		Precip(in)	21.1
Title	UWS_wssmen_baseline			LastDate	11/19/75		Rain(in)	21.13
PrecFile	DLTH6095.PCP			Events	65		Snow(in)	0.00
PartFile	nurp50.p8p			TotalHrs	5769		TotalYrs	0.66
Mass Balances by Device and Variable								
Device: outfall		Type: PIPE			Variable: TSS			
Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm			
01 watershed inflows	38.79	0.08	13666.2	20765.9	129.62			
06 normal outlet	38.79	0.08	13666.2	20765.9	129.62			
09 total inflow	38.79	0.08	13666.2	20765.9	129.62			
10 surface outflow	38.79	0.08	13666.2	20765.9	129.62			
12 total outflow	38.79	0.08	13666.2	20765.9	129.62			
Reduction (%)	0.00	0.00	0.0	0.0				
Device: outfall		Type: PIPE			Variable: TP			
Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm			
01 watershed inflows	38.79	0.08	42.0	63.8	0.40			
06 normal outlet	38.79	0.08	42.0	63.8	0.40			
09 total inflow	38.79	0.08	42.0	63.8	0.40			
10 surface outflow	38.79	0.08	42.0	63.8	0.40			
12 total outflow	38.79	0.08	42.0	63.8	0.40			
Reduction (%)	0.00	0.00	0.0	0.0				

ATTACHMENT 2.1

UWS POLLUTANT LOADING ANALYSIS
MAIN CAMPUS SHED
P8 INPUT
BASELINE LOADING

P8 Urban Catchment Model, Version 3.2						Run Date	03/12/09
Case	UWS_maincampusbaseline1.p8c	FirstDate	03/24/75			Precip(in)	21.1
Title	maincampus baseline	LastDate	11/19/75			Rain(in)	21.13
PrecFile	DLTH6095.PCP	Events	65			Snow(in)	0.00
PartFile	nurp50.p8p	TotalHrs	5769			TotalYrs	0.66
Case Title	maincampus baseline						
Case Data File	UWS_maincampusbaseline1.p8c						
Path	C:\Program Files\P8 Urban Catchment Model\P8 Version 3.2\UWS\						
Case Notes:	simple main campus wshed, outfall to storm, basrline						
Storm Data File	DLTH6095.PCP						
Particle File	nurp50.p8p						
Air Temp File File	Dlth6095.TMP						
Time Steps Per Hour	10						
Minimum Inter-Event Time (hrs)	10						
Precipitation Scale Factor	1						
Air Temp Offset (deg-F)	0						
Loops Thru Storm File	1						
Simulation Dates							
Start	1/1/1975						
Keep	3/24/1975						
Stop	11/19/1975						
Max Snowfall Temperature (deg-f)	-999.0						
SnowMelt Temperature (deg-f)	-999.0						
Snowmelt Coef (in/degF-Day)	0.06						
Soil Freeze Temp (deg-F)	-999.0						
Snowmelt Abstraction Factor	1.00						
Evapo-Trans. Calibration Factor	1.00						
Growing Season Start Month	5						
Growing Season End Month	10						
5-Day Antecedent Rainfall + Runoff (inches)							
CN Antecedent Moisture Condition	AMC-II	AMC-III					
Growing Season	1.40	2.10					
NonGrowing Season	0.50	1.10					
Watershed Data							
Watershed Name	main campus						
Runoff to Device	storm outfall						
Infiltration to Device							
Watershed Area	65.64						
SCS Curve Number (Pervious)	81						
Scale Factor for Pervious Runoff Load	1						
UnSwept Impervious Fraction	0.02						
UnSwept Depression Storage (inches)	0.02						
UnSwept Imperv. Runoff Coefficient	0.98						
UnSwept Scale Factor for Particle Loads	1						
Swept Impervious Fraction	0.54						
Swept Depression Storage (inches)	0.042						
Swept Imperv. Runoff Coefficient	0.95						
Swept Scale Factor for Particle Loads	1						
Sweeping Frequency	0						
Sweeping Efficiency	1						
Sweeping Start Date (MMDD)	101						
Sweeping Stop Date (MMDD)	1231						
Device Data							
Device Name	storm outfall						
Device Type	PIPE						
Infiltration Outlet							
Normal Outlet							
Spillway Outlet							
Particle Removal Scale Factor							
Bottom Elevation (ft)							
Bottom Area (acres)							

ATTACHMENT 2.1

UWS POLLUTANT LOADING ANALYSIS
MAIN CAMPUS SHED
P8 INPUT
BASELINE LOADING

Permanent Pool Area (acres)								
Permanent Pool Volume (ac-ft)								
Perm Pool Infilt Rate (in/hr)								
Flood Pool Area (acres)								
Flood Pool Volume (ac-ft)								
Flood Pool Infilt Rate (in/hr)								
Infilt Basin Void Fraction (%)								
Detention Pond Outlet Parameters								
Outlet Type								
Outlet Orifice Diameter (in)								
Orifice Discharge Coef								
Outlet Weir Length (ft)								
Weir Discharge Coef								
Perforated Riser Height (ft)								
Number of Holes in Riser								
Holes Diameter								
Flood Pool Drain Time (hrs)								
Swale Parameters								
Length of Flow Path (ft)								
Slope of Flow Path %								
Bottom Width (ft)								
Side Slope (ft-v/ft-h)								
Maximum Depth of Flow (ft)								
Mannings n								
Pipe, Splitter, Aquifer Parameter								
Hydraulic Res. Time (hrs)			0					
Particle Data								
Particle File		nurp50.p8p						
Particle Class		P0%	P10%	P30%	P50%	P80%		
Filtration Efficiency (%)		90	100	100	100	100		
Settling Velocity (ft/hr)		0	0.03	0.3	1.5	15		
First Order Decay Rate (1/day)		0	0	0	0	0		
2nd Order Decay (1/day-ppm)		0	0	0	0	0		
Impervious Runoff Conc (ppm)		1	0	0	0	0		
Pervious Runoff Conc (ppm)		1	100	100	100	200		
Pervious Conc Exponent		0	1	1	1	1		
Accum. Rate (lbs-ac-day)		0	1.75	1.75	1.75	3.5		
Particle Removal Rate (1/day)		0	0.25	0.25	0.25	0.25		
Washoff Coefficient		0	20	20	20	20		
Washoff Exponent		0	2	2	2	2		
Sweeper Efficiency		0	4	8	12	16		
Water Quality Component Data								
Component Name		TSS	TP	TKN	CU	PB	ZN	HC
Water Quality Criteria (ppm)								
	Level 1	5	0.025	2	2	0.02	5	0.1
	Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5
	Level 3	20	0.1	0.5	0.02	0.15	0.38	1
Content Scale Factor		1	1	1	1	1	1	1
Particle Composition (mg/kg)								
P0%		0	99000	600000	13600	2000	640000	250000
P10%		1000000	3850	15000	340	180	1600	22500
P30%		1000000	3850	15000	340	180	1600	22500
P50%		1000000	3850	15000	340	180	1600	22500
P80%		1000000	0	0	340	180	0	22500

ATTACHMENT 2.1
UWS POLLUTANT LOADING ANALYSIS
MAIN CAMPUS SHED
P8 OUTPUT
BASELINE LOADING

P8 Urban Catchment Model, Version 3.2							Run Date	03/12/09
Case	UWS_maincampusbaseline1.p8c			FirstDate	03/24/75		Precip(in)	21.1
Title	maincampus baseline			LastDate	11/19/75		Rain(in)	21.13
PrecFile	DLTH6095.PCP			Events	65		Snow(in)	0.00
PartFile	nurp50.p8p			TotalHrs	5769		TotalYrs	0.66
Mass Balances by Device and Variable								
Device: storm outfall		Type: PIPE			Variable: TSS			
Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm			
01 watershed inflows	56.99	0.12	20786.0	31584.4	134.19			
06 normal outlet	56.99	0.12	20786.0	31584.4	134.19			
09 total inflow	56.99	0.12	20786.0	31584.4	134.19			
10 surface outflow	56.99	0.12	20786.0	31584.4	134.19			
12 total outflow	56.99	0.12	20786.0	31584.4	134.19			
Reduction (%)	0.00	0.00	0.0	0.0				
Device: storm outfall		Type: PIPE			Variable: TP			
Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm			
01 watershed inflows	56.99	0.12	63.4	96.3	0.41			
06 normal outlet	56.99	0.12	63.4	96.3	0.41			
09 total inflow	56.99	0.12	63.4	96.3	0.41			
10 surface outflow	56.99	0.12	63.4	96.3	0.41			
12 total outflow	56.99	0.12	63.4	96.3	0.41			
Reduction (%)	0.00	0.00	0.0	0.0				

ATTACHMENT 2.2
UWS POLLUTANT LOADING ANALYSIS
HEATING PLANT SHED
P8 INPUT
BASELINE LOADING

P8 Urban Catchment Model, Version 3.2						Run Date	03/12/09
Case	UWS_plant_baseline1.p8c		FirstDate	03/24/75		Precip(in)	21.1
Title	baseline at power plant shed		LastDate	11/19/75		Rain(in)	21.13
PrecFile	DLTH6095.PCP		Events	65		Snow(in)	0.00
PartFile	nurp50.p8p		TotalHrs	5769		TotalYrs	0.66
Case Title		baseline at power plant shed					
Case Data File		UWS_plant_baseline1.p8c					
Path		C:\Program Files\P8 Urban Catchment Model\P8 Version 3.2\UWS\					
Case Notes:		baseline UWS power plant shed					
Storm Data File		DLTH6095.PCP					
Particle File		nurp50.p8p					
Air Temp File File		Dlth6095.TMP					
Time Steps Per Hour		10					
Minimum Inter-Event Time (hrs)		10					
Precipitation Scale Factor		1					
Air Temp Offset (deg-F)		0					
Loops Thru Storm File		1					
Simulation Dates							
Start		1/1/1975					
Keep		3/24/1975					
Stop		11/19/1975					
Max Snowfall Temperature (deg-f)		-999.0					
SnowMelt Temperature (deg-f)		-999.0					
Snowmelt Coef (in/degF-Day)		0.06					
Soil Freeze Temp (deg-F)		-999.0					
Snowmelt Abstraction Factor		1.00					
Evapo-Trans. Calibration Factor		1.00					
Growing Season Start Month		5					
Growing Season End Month		10					
5-Day Antecedent Rainfall + Runoff (inches)							
CN Antecedent Moisture Condition		AMC-II	AMC-III				
Growing Season		1.40	2.10				
NonGrowing Season		0.50	1.10				
Watershed Data							
Watershed Name		UWS_power_plant					
Runoff to Device		outfall					
Infiltration to Device							
Watershed Area		2.54					
SCS Curve Number (Pervious)		80					
Scale Factor for Pervious Runoff Load		1					
UnSwept Impervious Fraction		0					
UnSwept Depression Storage (inches)		0.02					
UnSwept Imperv. Runoff Coefficient		0.98					
UnSwept Scale Factor for Particle Loads		1					
Swept Impervious Fraction		0.31					
Swept Depression Storage (inches)		0.042					
Swept Imperv. Runoff Coefficient		0.95					
Swept Scale Factor for Particle Loads		1					
Sweeping Frequency		0					
Sweeping Efficiency		1					
Sweeping Start Date (MMDD)		1231					
Sweeping Stop Date (MMDD)		101					
Device Data							
Device Name		outfall					
Device Type		PIPE					
Infiltration Outlet							
Normal Outlet							
Spillway Outlet							
Particle Removal Scale Factor							
Bottom Elevation (ft)							
Bottom Area (acres)							

ATTACHMENT 2.2
UWS POLLUTANT LOADING ANALYSIS
HEATING PLANT SHED
P8 INPUT
BASELINE LOADING

Permanent Pool Area (acres)								
Permanent Pool Volume (ac-ft)								
Perm Pool Infilt Rate (in/hr)								
Flood Pool Area (acres)								
Flood Pool Volume (ac-ft)								
Flood Pool Infilt Rate (in/hr)								
Infilt Basin Void Fraction (%)								
Detention Pond Outlet Parameters								
Outlet Type								
Outlet Orifice Diameter (in)								
Orifice Discharge Coef								
Outlet Weir Length (ft)								
Weir Discharge Coef								
Perforated Riser Height (ft)								
Number of Holes in Riser								
Holes Diameter								
Flood Pool Drain Time (hrs)								
Swale Parameters								
Length of Flow Path (ft)								
Slope of Flow Path %								
Bottom Width (ft)								
Side Slope (ft-v/ft-h)								
Maximum Depth of Flow (ft)								
Mannings n								
Pipe, Splitter, Aquifer Parameter								
Hydraulic Res. Time (hrs)			0					
Particle Data								
Particle File		nurp50.p8p						
Particle Class		P0%	P10%	P30%	P50%	P80%		
Filtration Efficiency (%)		90	100	100	100	100		
Settling Velocity (ft/hr)		0	0.03	0.3	1.5	15		
First Order Decay Rate (1/day)		0	0	0	0	0		
2nd Order Decay (1/day-ppm)		0	0	0	0	0		
Impervious Runoff Conc (ppm)		1	0	0	0	0		
Pervious Runoff Conc (ppm)		1	100	100	100	200		
Pervious Conc Exponent		0	1	1	1	1		
Accum. Rate (lbs-ac-day)		0	1.75	1.75	1.75	3.5		
Particle Removal Rate (1/day)		0	0.25	0.25	0.25	0.25		
Washoff Coefficient		0	20	20	20	20		
Washoff Exponent		0	2	2	2	2		
Sweeper Efficiency		0	4	8	12	16		
Water Quality Component Data								
Component Name		TSS	TP	TKN	CU	PB	ZN	HC
Water Quality Criteria (ppm)								
	Level 1	5	0.025	2	2	0.02	5	0.1
	Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5
	Level 3	20	0.1	0.5	0.02	0.15	0.38	1
Content Scale Factor		1	1	1	1	1	1	1
Particle Composition (mg/kg)								
P0%		0	99000	600000	13600	2000	640000	250000
P10%		1000000	3850	15000	340	180	1600	22500
P30%		1000000	3850	15000	340	180	1600	22500
P50%		1000000	3850	15000	340	180	1600	22500
P80%		1000000	0	0	340	180	0	22500

ATTACHMENT 2.2
UWS POLLUTANT LOADING ANALYSIS
HEATING PLANT SHED
P8 OUTPUT
BASELINE LOADING

P8 Urban Catchment Model, Version 3.2							Run Date	03/12/09
Case	UWS_plant_baseline1.p8c			FirstDate	03/24/75		Precip(in)	21.1
Title	baseline at power plant shed			LastDate	11/19/75		Rain(in)	21.13
PrecFile	DLTH6095.PCP			Events	65		Snow(in)	0.00
PartFile	nurp50.p8p			TotalHrs	5769		TotalYrs	0.66
Mass Balances by Device and Variable								
Device: outfall		Type: PIPE			Variable: TSS			
Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm			
01 watershed inflows	1.29	0.0027	447.9	680.5	127.55			
06 normal outlet	1.29	0.0027	447.9	680.5	127.55			
09 total inflow	1.29	0.0027	447.9	680.5	127.55			
10 surface outflow	1.29	0.0027	447.9	680.5	127.55			
12 total outflow	1.29	0.0027	447.9	680.5	127.55			
Reduction (%)	0.00	0.0000	0.0	0.0				
Device: outfall		Type: PIPE			Variable: TP			
Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm			
01 watershed inflows	1.29	0.00	1.4	2.1	0.39			
06 normal outlet	1.29	0.00	1.4	2.1	0.39			
09 total inflow	1.29	0.00	1.4	2.1	0.39			
10 surface outflow	1.29	0.00	1.4	2.1	0.39			
12 total outflow	1.29	0.00	1.4	2.1	0.39			
Reduction (%)	0.00	0.00	0.0	0.0				

ATTACHMENT 3.0
UWS POLLUTANT LOADING ANALYSIS
WESSMAN ARENA SHED
P8 INPUT
NON-STRUCTURAL CONTROLS APPLIED

P8 Urban Catchment Model, Version 3.2						Run Date	03/12/09
Case	UWS_wessman_shed_swpon.p8c		FirstDate	03/24/75		Precip(in)	21.1
Title	UWS_wssmen_swpon		LastDate	11/19/75		Rain(in)	21.13
PrecFile	DLTH6095.PCP		Events	65		Snow(in)	0.00
PartFile	nurp50.p8p		TotalHrs	5769		TotalYrs	0.66
Case Title		UWS_wssmen_swpon					
Case Data File		UWS_wessman_shed_swpon.p8c					
Path		C:\Program Files\P8 Urban Catchment Model\P8 Version 3.2\UWS\					
Case Notes:		UWS Wessman area shed sweep on					
Storm Data File		DLTH6095.PCP					
Particle File		nurp50.p8p					
Air Temp File File		Dlth6095.TMP					
Time Steps Per Hour		10					
Minimum Inter-Event Time (hrs)		10					
Precipitation Scale Factor		1					
Air Temp Offset (deg-F)		0					
Loops Thru Storm File		1					
Simulation Dates							
Start		1/1/1975					
Keep		3/24/1975					
Stop		11/19/1975					
Max Snowfall Temperature (deg-f)		-999.0					
SnowMelt Temperature (deg-f)		-999.0					
Snowmelt Coef (in/degF-Day)		0.06					
Soil Freeze Temp (deg-F)		-999.0					
Snowmelt Abstraction Factor		1.00					
Evapo-Trans. Calibration Factor		1.00					
Growing Season Start Month		5					
Growing Season End Month		10					
5-Day Antecedent Rainfall + Runoff (inches)							
CN Antecedent Moisture Condition		AMC-II	AMC-III				
Growing Season		1.40	2.10				
NonGrowing Season		0.50	1.10				
Watershed Data							
Watershed Name		UWS_wessman					
Runoff to Device		outfall					
Infiltration to Device							
Watershed Area		68.42					
SCS Curve Number (Pervious)		79.25					
Scale Factor for Pervious Runoff Load		1					
UnSwept Impervious Fraction		0.04					
UnSwept Depression Storage (inches)		0.02					
UnSwept Imperv. Runoff Coefficient		0.98					
UnSwept Scale Factor for Particle Loads		1					
Swept Impervious Fraction		0.31					
Swept Depression Storage (inches)		0.042					
Swept Imperv. Runoff Coefficient		0.95					
Swept Scale Factor for Particle Loads		1					
Sweeping Frequency		1					
Sweeping Efficiency		2					
Sweeping Start Date (MMDD)		324					
Sweeping Stop Date (MMDD)		1119					
Device Data							
Device Name		outfall					
Device Type		PIPE					
Infiltration Outlet							
Normal Outlet							
Spillway Outlet							
Particle Removal Scale Factor							
Bottom Elevation (ft)							
Bottom Area (acres)							

ATTACHMENT 3.0
UWS POLLUTANT LOADING ANALYSIS
WESSMAN ARENA SHED
P8 INPUT
NON-STRUCTURAL CONTROLS APPLIED

Permanent Pool Area (acres)								
Permanent Pool Volume (ac-ft)								
Perm Pool Infilt Rate (in/hr)								
Flood Pool Area (acres)								
Flood Pool Volume (ac-ft)								
Flood Pool Infilt Rate (in/hr)								
Infilt Basin Void Fraction (%)								
Detention Pond Outlet Parameters								
Outlet Type								
Outlet Orifice Diameter (in)								
Orifice Discharge Coef								
Outlet Weir Length (ft)								
Weir Discharge Coef								
Perforated Riser Height (ft)								
Number of Holes in Riser								
Holes Diameter								
Flood Pool Drain Time (hrs)								
Swale Parameters								
Length of Flow Path (ft)								
Slope of Flow Path %								
Bottom Width (ft)								
Side Slope (ft-v/ft-h)								
Maximum Depth of Flow (ft)								
Mannings n								
Pipe, Splitter, Aquifer Parameter								
Hydraulic Res. Time (hrs)			0					
Particle Data								
Particle File		nurp50.p8p						
Particle Class		P0%	P10%	P30%	P50%	P80%		
Filtration Efficiency (%)		90	100	100	100	100		
Settling Velocity (ft/hr)		0	0.03	0.3	1.5	15		
First Order Decay Rate (1/day)		0	0	0	0	0		
2nd Order Decay (1/day-ppm)		0	0	0	0	0		
Impervious Runoff Conc (ppm)		1	0	0	0	0		
Pervious Runoff Conc (ppm)		1	100	100	100	200		
Pervious Conc Exponent		0	1	1	1	1		
Accum. Rate (lbs-ac-day)		0	1.75	1.75	1.75	3.5		
Particle Removal Rate (1/day)		0	0.25	0.25	0.25	0.25		
Washoff Coefficient		0	20	20	20	20		
Washoff Exponent		0	2	2	2	2		
Sweeper Efficiency		0	4	8	12	16		
Water Quality Component Data								
Component Name		TSS	TP	TKN	CU	PB	ZN	HC
Water Quality Criteria (ppm)								
	Level 1	5	0.025	2	2	0.02	5	0.1
	Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5
	Level 3	20	0.1	0.5	0.02	0.15	0.38	1
Content Scale Factor		1	1	1	1	1	1	1
Particle Composition (mg/kg)								
P0%		0	99000	600000	13600	2000	640000	250000
P10%		1000000	3850	15000	340	180	1600	22500
P30%		1000000	3850	15000	340	180	1600	22500
P50%		1000000	3850	15000	340	180	1600	22500
P80%		1000000	0	0	340	180	0	22500

ATTACHMENT 3.0
UWS POLLUTANT LOADING ANALYSIS
WESSMAN ARENA SHED
P8 OUTPUT
NON-STRUCTURAL CONTROLS APPLIED

P8 Urban Catchment Model, Version 3.2							Run Date	03/12/09
Case	UWS_wessman_shed_swpon.p8c			FirstDate	03/24/75		Precip(in)	21.1
Title	UWS_wssmen_swpon			LastDate	11/19/75		Rain(in)	21.13
PrecFile	DLTH6095.PCP			Events	65		Snow(in)	0.00
PartFile	nurp50.p8p			TotalHrs	5769		TotalYrs	0.66
Mass Balances by Device and Variable								
Device: outfall		Type: PIPE			Variable: TSS			
Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm			
01 watershed inflows	38.79	0.08	12714.3	19319.4	120.59			
06 normal outlet	38.79	0.08	12714.3	19319.4	120.59			
09 total inflow	38.79	0.08	12714.3	19319.4	120.59			
10 surface outflow	38.79	0.08	12714.3	19319.4	120.59			
12 total outflow	38.79	0.08	12714.3	19319.4	120.59			
Reduction (%)	0.00	0.00	0.0	0.0				
Device: outfall		Type: PIPE			Variable: TP			
Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm			
01 watershed inflows	38.79	0.08	40.4	61.4	0.38			
06 normal outlet	38.79	0.08	40.4	61.4	0.38			
09 total inflow	38.79	0.08	40.4	61.4	0.38			
10 surface outflow	38.79	0.08	40.4	61.4	0.38			
12 total outflow	38.79	0.08	40.4	61.4	0.38			
Reduction (%)	0.00	0.00	0.0	0.0				

ATTACHMENT 3.1
UWS POLLUTANT LOADING ANALYSIS
MAIN CAMPUS SHED
P8 INPUT
NON-STRUCTURAL CONTROLS APPLIED

P8 Urban Catchment Model, Version 3.2						Run Date	03/12/09
Case	UWS_maincampusswpon1.p8c		FirstDate	03/24/75		Precip(in)	21.1
Title	maincampus_swponly		LastDate	11/19/75		Rain(in)	21.13
PrecFile	DLTH6095.PCP		Events	65		Snow(in)	0.00
PartFile	nurp50.p8p		TotalHrs	5769		TotalYrs	0.66
Case Title		maincampus_swponly					
Case Data File		UWS_maincampusswpon1.p8c					
Path		C:\Program Files\P8 Urban Catchment Model\P8 Version 3.2\UWS\					
Case Notes:		simple main campus wshed, outfall to storm, swp only					
Storm Data File		DLTH6095.PCP					
Particle File		nurp50.p8p					
Air Temp File File		Dlth6095.TMP					
Time Steps Per Hour		10					
Minimum Inter-Event Time (hrs)		10					
Precipitation Scale Factor		1					
Air Temp Offset (deg-F)		0					
Loops Thru Storm File		1					
Simulation Dates							
Start		1/1/1975					
Keep		3/24/1975					
Stop		11/19/1975					
Max Snowfall Temperature (deg-f)		-999.0					
SnowMelt Temperature (deg-f)		-999.0					
Snowmelt Coef (in/degF-Day)		0.06					
Soil Freeze Temp (deg-F)		-999.0					
Snowmelt Abstraction Factor		1.00					
Evapo-Trans. Calibration Factor		1.00					
Growing Season Start Month		5					
Growing Season End Month		10					
5-Day Antecedent Rainfall + Runoff (inches)							
CN Antecedent Moisture Condition		AMC-II	AMC-III				
Growing Season		1.40	2.10				
NonGrowing Season		0.50	1.10				
Watershed Data							
Watershed Name		main campus					
Runoff to Device		storm outfall					
Infiltration to Device							
Watershed Area		65.64					
SCS Curve Number (Pervious)		81					
Scale Factor for Pervious Runoff Load		1					
UnSwept Impervious Fraction		0.02					
UnSwept Depression Storage (inches)		0.02					
UnSwept Imperv. Runoff Coefficient		0.98					
UnSwept Scale Factor for Particle Loads		1					
Swept Impervious Fraction		0.54					
Swept Depression Storage (inches)		0.042					
Swept Imperv. Runoff Coefficient		0.95					
Swept Scale Factor for Particle Loads		1					
Sweeping Frequency		1					
Sweeping Efficiency		2					
Sweeping Start Date (MMDD)		324					
Sweeping Stop Date (MMDD)		1119					
Device Data							
Device Name		storm outfall					
Device Type		PIPE					
Infiltration Outlet							
Normal Outlet							
Spillway Outlet							
Particle Removal Scale Factor							
Bottom Elevation (ft)							
Bottom Area (acres)							

ATTACHMENT 3.1
UWS POLLUTANT LOADING ANALYSIS
MAIN CAMPUS SHED
P8 INPUT
NON-STRUCTURAL CONTROLS APPLIED

Permanent Pool Area (acres)								
Permanent Pool Volume (ac-ft)								
Perm Pool Infilt Rate (in/hr)								
Flood Pool Area (acres)								
Flood Pool Volume (ac-ft)								
Flood Pool Infilt Rate (in/hr)								
Infilt Basin Void Fraction (%)								
Detention Pond Outlet Parameters								
Outlet Type								
Outlet Orifice Diameter (in)								
Orifice Discharge Coef								
Outlet Weir Length (ft)								
Weir Discharge Coef								
Perforated Riser Height (ft)								
Number of Holes in Riser								
Holes Diameter								
Flood Pool Drain Time (hrs)								
Swale Parameters								
Length of Flow Path (ft)								
Slope of Flow Path %								
Bottom Width (ft)								
Side Slope (ft-v/ft-h)								
Maximum Depth of Flow (ft)								
Mannings n								
Pipe, Splitter, Aquifer Parameter								
Hydraulic Res. Time (hrs)			0					
Particle Data								
Particle File		nurp50.p8p						
Particle Class		P0%	P10%	P30%	P50%	P80%		
Filtration Efficiency (%)		90	100	100	100	100		
Settling Velocity (ft/hr)		0	0.03	0.3	1.5	15		
First Order Decay Rate (1/day)		0	0	0	0	0		
2nd Order Decay (1/day-ppm)		0	0	0	0	0		
Impervious Runoff Conc (ppm)		1	0	0	0	0		
Pervious Runoff Conc (ppm)		1	100	100	100	200		
Pervious Conc Exponent		0	1	1	1	1		
Accum. Rate (lbs-ac-day)		0	1.75	1.75	1.75	3.5		
Particle Removal Rate (1/day)		0	0.25	0.25	0.25	0.25		
Washoff Coefficient		0	20	20	20	20		
Washoff Exponent		0	2	2	2	2		
Sweeper Efficiency		0	4	8	12	16		
Water Quality Component Data								
Component Name		TSS	TP	TKN	CU	PB	ZN	HC
Water Quality Criteria (ppm)								
	Level 1	5	0.025	2	2	0.02	5	0.1
	Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5
	Level 3	20	0.1	0.5	0.02	0.15	0.38	1
Content Scale Factor		1	1	1	1	1	1	1
Particle Composition (mg/kg)								
P0%		0	99000	600000	13600	2000	640000	250000
P10%		1000000	3850	15000	340	180	1600	22500
P30%		1000000	3850	15000	340	180	1600	22500
P50%		1000000	3850	15000	340	180	1600	22500
P80%		1000000	0	0	340	180	0	22500

ATTACHMENT 3.1
UWS POLLUTANT LOADING ANALYSIS
MAIN CAMPUS SHED
P8 OUTPUT
NON-STRUCTURAL CONTROLS APPLIED

P8 Urban Catchment Model, Version 3.2							Run Date	03/12/09
Case	UWS_maincampusswpon1.p8c			FirstDate	03/24/75		Precip(in)	21.1
Title	maincampus_swponly			LastDate	11/19/75		Rain(in)	21.13
PrecFile	DLTH6095.PCP			Events	65		Snow(in)	0.00
PartFile	nurp50.p8p			TotalHrs	5769		TotalYrs	0.66
Mass Balances by Device and Variable								
Device: storm outfall		Type: PIPE			Variable: TSS			
Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm			
01 watershed inflows	56.99	0.12	19195.2	29167.1	123.92			
06 normal outlet	56.99	0.12	19195.2	29167.1	123.92			
09 total inflow	56.99	0.12	19195.2	29167.1	123.92			
10 surface outflow	56.99	0.12	19195.2	29167.1	123.92			
12 total outflow	56.99	0.12	19195.2	29167.1	123.92			
Reduction (%)	0.00	0.00	0.0	0.0				
Device: storm outfall		Type: PIPE			Variable: TP			
Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm			
01 watershed inflows	56.99	0.12	60.6	92.2	0.39			
06 normal outlet	56.99	0.12	60.6	92.2	0.39			
09 total inflow	56.99	0.12	60.6	92.2	0.39			
10 surface outflow	56.99	0.12	60.6	92.2	0.39			
12 total outflow	56.99	0.12	60.6	92.2	0.39			
Reduction (%)	0.00	0.00	0.0	0.0				

ATTAHCMENT 3.2
UWS POLLUTANT LOADING ANALYSIS
HEATING PLANT SHED
P8 INPUT
NON-STRUCTURAL CONTROLS APPLIED

P8 Urban Catchment Model, Version 3.2						Run Date	03/12/09
Case	UWS_plant_swp_on.p8c		FirstDate	03/24/75		Precip(in)	21.1
Title	baseline at power plant shed		LastDate	11/19/75		Rain(in)	21.13
PrecFile	DLTH6095.PCP		Events	65		Snow(in)	0.00
PartFile	nurp50.p8p		TotalHrs	5769		TotalYrs	0.66
Case Title		baseline at power plant shed					
Case Data File		UWS_plant_swp_on.p8c					
Path		C:\Program Files\P8 Urban Catchment Model\P8 Version 3.2\UWS\					
Case Notes:		baseline UWS power plant shed					
Storm Data File		DLTH6095.PCP					
Particle File		nurp50.p8p					
Air Temp File File		Dlth6095.TMP					
Time Steps Per Hour		10					
Minimum Inter-Event Time (hrs)		10					
Precipitation Scale Factor		1					
Air Temp Offset (deg-F)		0					
Loops Thru Storm File		1					
Simulation Dates							
Start		1/1/1975					
Keep		3/24/1975					
Stop		11/19/1975					
Max Snowfall Temperature (deg-f)		-999.0					
SnowMelt Temperature (deg-f)		-999.0					
Snowmelt Coef (in/degF-Day)		0.06					
Soil Freeze Temp (deg-F)		-999.0					
Snowmelt Abstraction Factor		1.00					
Evapo-Trans. Calibration Factor		1.00					
Growing Season Start Month		5					
Growing Season End Month		10					
5-Day Antecedent Rainfall + Runoff (inches)							
CN Antecedent Moisture Condition		AMC-II	AMC-III				
Growing Season		1.40	2.10				
NonGrowing Season		0.50	1.10				
Watershed Data							
Watershed Name		UWS_power_plant					
Runoff to Device		outfall					
Infiltration to Device							
Watershed Area		2.54					
SCS Curve Number (Pervious)		80					
Scale Factor for Pervious Runoff Load		1					
UnSwept Impervious Fraction		0					
UnSwept Depression Storage (inches)		0.02					
UnSwept Imperv. Runoff Coefficient		0.98					
UnSwept Scale Factor for Particle Loads		1					
Swept Impervious Fraction		0.31					
Swept Depression Storage (inches)		0.042					
Swept Imperv. Runoff Coefficient		0.95					
Swept Scale Factor for Particle Loads		1					
Sweeping Frequency		1					
Sweeping Efficiency		2					
Sweeping Start Date (MMDD)		324					
Sweeping Stop Date (MMDD)		1119					
Device Data							
Device Name		outfall					
Device Type		PIPE					
Infiltration Outlet							
Normal Outlet							
Spillway Outlet							
Particle Removal Scale Factor							
Bottom Elevation (ft)							
Bottom Area (acres)							

ATTAHCMENT 3.2
UWS POLLUTANT LOADING ANALYSIS
HEATING PLANT SHED
P8 INPUT
NON-STRUCTURAL CONTROLS APPLIED

Permanent Pool Area (acres)								
Permanent Pool Volume (ac-ft)								
Perm Pool Infilt Rate (in/hr)								
Flood Pool Area (acres)								
Flood Pool Volume (ac-ft)								
Flood Pool Infilt Rate (in/hr)								
Infilt Basin Void Fraction (%)								
Detention Pond Outlet Parameters								
Outlet Type								
Outlet Orifice Diameter (in)								
Orifice Discharge Coef								
Outlet Weir Length (ft)								
Weir Discharge Coef								
Perforated Riser Height (ft)								
Number of Holes in Riser								
Holes Diameter								
Flood Pool Drain Time (hrs)								
Swale Parameters								
Length of Flow Path (ft)								
Slope of Flow Path %								
Bottom Width (ft)								
Side Slope (ft-v/ft-h)								
Maximum Depth of Flow (ft)								
Mannings n								
Pipe, Splitter, Aquifer Parameter								
Hydraulic Res. Time (hrs)			0					
Particle Data								
Particle File		nurp50.p8p						
Particle Class		P0%	P10%	P30%	P50%	P80%		
Filtration Efficiency (%)		90	100	100	100	100		
Settling Velocity (ft/hr)		0	0.03	0.3	1.5	15		
First Order Decay Rate (1/day)		0	0	0	0	0		
2nd Order Decay (1/day-ppm)		0	0	0	0	0		
Impervious Runoff Conc (ppm)		1	0	0	0	0		
Pervious Runoff Conc (ppm)		1	100	100	100	200		
Pervious Conc Exponent		0	1	1	1	1		
Accum. Rate (lbs-ac-day)		0	1.75	1.75	1.75	3.5		
Particle Removal Rate (1/day)		0	0.25	0.25	0.25	0.25		
Washoff Coefficient		0	20	20	20	20		
Washoff Exponent		0	2	2	2	2		
Sweeper Efficiency		0	4	8	12	16		
Water Quality Component Data								
Component Name		TSS	TP	TKN	CU	PB	ZN	HC
Water Quality Criteria (ppm)								
	Level 1	5	0.025	2	2	0.02	5	0.1
	Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5
	Level 3	20	0.1	0.5	0.02	0.15	0.38	1
Content Scale Factor		1	1	1	1	1	1	1
Particle Composition (mg/kg)								
P0%		0	99000	600000	13600	2000	640000	250000
P10%		1000000	3850	15000	340	180	1600	22500
P30%		1000000	3850	15000	340	180	1600	22500
P50%		1000000	3850	15000	340	180	1600	22500
P80%		1000000	0	0	340	180	0	22500

ATTACHMENT 3.2
UWS POLLUTANT LOADING ANALYSIS
HEATING PLANT SHED
P8 OUTPUT
NON-STRUCTURAL CONTROLS APPLIED

P8 Urban Catchment Model, Version 3.2							Run Date	03/12/09
Case	UWS_plant_swp_on.p8c			FirstDate	03/24/75		Precip(in)	21.1
Title	baseline at power plant shed			LastDate	11/19/75		Rain(in)	21.13
PrecFile	DLTH6095.PCP			Events	65		Snow(in)	0.00
PartFile	nurp50.p8p			TotalHrs	5769		TotalYrs	0.66
Mass Balances by Device and Variable								
Device: outfall		Type: PIPE			Variable: TSS			
Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm			
01 watershed inflows	1.29	0.00	412.5	626.8	117.48			
06 normal outlet	1.29	0.00	412.5	626.8	117.48			
09 total inflow	1.29	0.00	412.5	626.8	117.48			
10 surface outflow	1.29	0.00	412.5	626.8	117.48			
12 total outflow	1.29	0.00	412.5	626.8	117.48			
Reduction (%)	0.00	0.00	0.0	0.0				
Device: outfall		Type: PIPE			Variable: TP			
Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm			
01 watershed inflows	1.29	0.00	1.3	2.0	0.38			
06 normal outlet	1.29	0.00	1.3	2.0	0.38			
09 total inflow	1.29	0.00	1.3	2.0	0.38			
10 surface outflow	1.29	0.00	1.3	2.0	0.38			
12 total outflow	1.29	0.00	1.3	2.0	0.38			
Reduction (%)	0.00	0.00	0.0	0.0				