WADSWORTH WASTEWATER TREATMENT PLANT

2013

ANNUAL REPORT

Submitted by
John Clark, superintendent
Wastewater Treatment

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CITY OF WADSWORTH
SINCE 1814
WATER & WASTE WATER DISTRIBUTION

2013 closed with very few operational changes at the wastewater treatment plant. Influent flow to the plant totaled ***one billion, two hundred seventy million, one hundred thirty thousand (2,270,130,000)*** gallons of raw sewage. This is an average daily flow of ***three million, four hundred eighty thousand (3,480,000)*** gallons of flow coming to the plant from the city's collection system and the contributing system from Medina County. ***One billion, two hundred two million, nine hundred forty thousand (1,202,940,000)*** gallons of treated water was released to the plant receiving stream, River Styx. The remaining sixty seven million, one hundred ninety thousand (67,190,000) gallons (the difference of influent minus effluent flows) is treated water that was used in the plant to support various operations, including running the gravity belt thickener, the belt filter press, backwashing of the tertiary filters and hosing and cleaning the various structures. The influent numbers show that the plant operated at ±70% capacity (the design capacity of the plant is five [5] million gallons per day).

2013 is the first year the phosphorus removal was in operation for all twelve months. Close to 179,000 pounds (14,600 gallons) of sodium aluminate was introduced in the flow stream to remove phosphorus so our effluent lessens the nutrient impact on the stream. The cost of this chemical process was ± $43,000.00. While operators continue to "tweak" the system to guarantee an economical feed rate, the plant experienced no problems complying with the NPDES limits.

Two of our plant personnel tested for and received advanced operation licensing in 2013. Laboratory technician Penny Schwanger has received her Class III operations certificate. Operator I Dillon Miller passed the Class II operations exam and will receive his certificate in May of 2014, after he completes his third year in plant operations. Congratulations to both of these employees on their effort.

The wastewater plant is currently working with Honeywell on a plant efficiency audit to determine whether improvements can be made at the facility to create a more efficient, money saving operating environment. Equipment will be reviewed to see if electric use can be shaved, we will determine if operations can be modified to enhance biological nutrient removal to reduce chemical costs, and various other processes will be looked at with the hopes of saving money on operations. Data from some other local plants that have undertaken this audit has shown some considerable savings are available.

The mission of plant personnel is to create the best, cleanest product introduced to the stream in the most efficient and economical way we can. We have in the past and will continue in the future to strive to achieve this goal.

Respectfully submitted,

John Clark, superintendent
Wadsworth regional Wastewater Treatment Plant

CITY OF WADSWORTH
WASTEWATER TREATMENT PLANT

EMPLOYEE	DATE of HIRE	EXPERIENCE	CERTIFICATION	POSITION
John Clark	3/29/2010	26 years	WW-IV/ WS-II	SUPERINTENDENT
Mike Lucas	6/11/1975	38 years	WW-III	CHIEF OPERATOR
Penny Schwanger	5/23/2011	13 years	Lab Analyst II/ WW-III	LAB TECHNICIAN
Larry Morgan	5/1/1986	27 years	WW-I	OPERATOR i
Rex Randolph	9/6/1995	18 years	WW-I	OPERATOR II
Robert Stonerock	9/2/2002	11 years		MECHANIC
Brett Rooks	11/8/2004	9 years	WW-II	OPERATOR II
Tuck Wade	5/12/2008	5 years	WW-I	OPERATOR I
Dillon Miller	5/9/2011	2 years	WW-I	OPERATOR II (OIT)
TOTAL EXPERIENCE		149 YEARS		
AVERAGE EXPERIENCE		16.5 YEARS		

Design Data Summary

Design Flows and Loadings

Average Daily Influent Flow (ADF): 5 mgd

Peak Daily Influent Flow (PDF): 10 mgd

Peak Hourly Influent Flow (PHF): 15 mgd

Headworks

Capacity: 20 mgd (screen/grit tanks)/ 16.2 mgd (influent pumps)

Equipment:

- One (1) mechanical screen with 3/8" punch plate holes
- Four (4) dry pit horizontal non-clog centrifugal pumps @3750 gpm with VFD's
- One (1) Smith and Loveless grit removal system

Primary Treatment

Capacity: 15 mgd

Equipment:

- Two (2) 70' diameter settling tanks with 12' side water depth. Scraper type sludge collection mechanism

Second Treatment

Capacity: 10 mgd

Equipment:

- Aeration Tanks
  - Tanks 1-4: 20' x 80' x 15' deep; 24,000 cf volume each
  - Tanks 5-8: 20' x 70' x 15' deep; 21,000 cf volume each
  - Tanks 9-12: 20' x 80' x 10' deep; 16,000 cf volume each
  - Total volume: 244,00 cf or 1.825 MG
  - Fine bubble, rubber membrane diffusers
- Two (2) 84' diameter final settling tanks with 14' side water depth, suction header type sludge collector mechanism

Tertiary Treatment

Capacity: 15 mgd

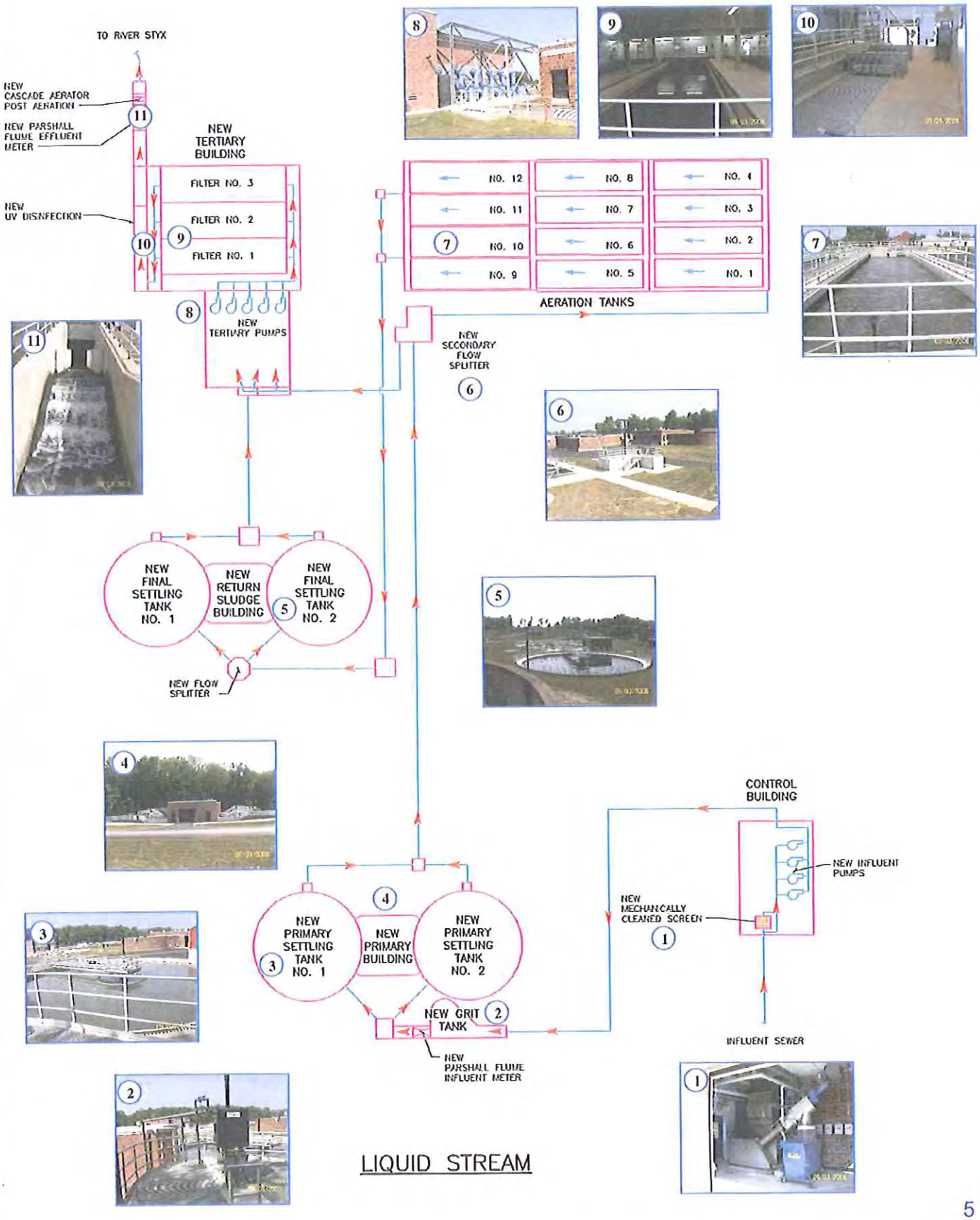
Equipment:

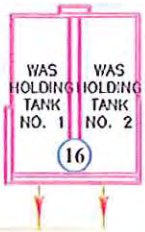
- Five (5) vertical can pumps with submersible propellers and VFD: 2 @ 1390 gpm and 3 @ 4650 gpm
- Three (3) traveling bridge sand filters @ 4.65 gpm/sf
- Two (2) modules, in series, of low pressure ultraviolet lights for disinfection

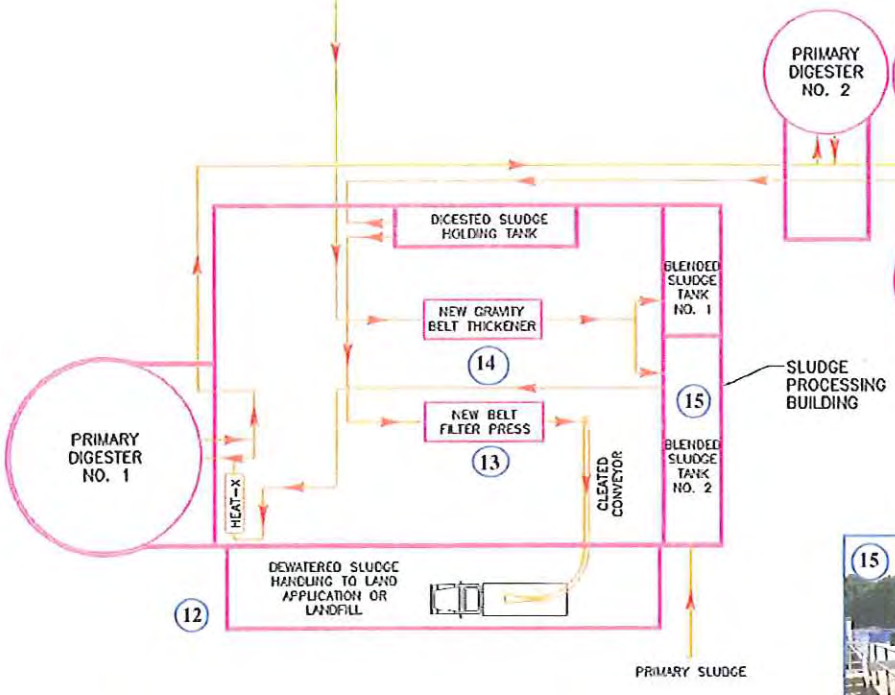
Solids Stream

Equipment:

- Class B dewatered sludge to landfill or land application (preferred)
- Two (2) 23' x 60' x 15' waste holding Tanks with coarse bubble diffusers
- One (1) two (2) meter WAS gravity belt thickener
- Two (2) primary and two (2) secondary digesters
  - Primary no.1: 60' diameter with 19.3' side water depth
  - Primary no. 2: 45' diameter With 18' side water depth
  - Secondary tanks: 45' diameter with 19' side water depth
- One (1) 2-meter Ashebrook belt filter press
- One (1) 50,000 sq ft pole building for sludge cake storage


TO RIVER STYX
NEW CASCADE AERATOR POST AERATION
11
NEW PARSHALL FLUME EFFLUENT METER
NEW TERTIARY BUILDING
FILTER NO. 3
FILTER NO. 2
FILTER NO. 1
NEW UV DISINFECTION
10
9
8
NEW TERTIARY PUMPS
NO. 12
NO. 8
NO. 4
NO. 11
NO. 7
NO. 3
7
NO. 10
NO. 6
NO. 2
NO. 9
NO. 5
NO. 1
AERATION TANKS
NEW SECONDARY FLOW SPLITTER
6
NEW FINAL SETTLING TANK NO. 1
NEW RETURN SLUDGE BUILDING
5
NEW FINAL SETTLING TANK NO. 2
NEW FLOW SPLITTER
4
CONTROL BUILDING
NEW INFLUENT PUMPS
NEW MECHANICALLY CLEANED SCREEN
1
3
NEW PRIMARY SETTLING TANK NO. 1
NEW PRIMARY BUILDING
NEW PRIMARY SETTLING TANK NO. 2
NEW GRIT TANK
2
INFLUENT SEWER
NEW PARSHALL FLUME INFLUENT METER
LIQUID STREAM

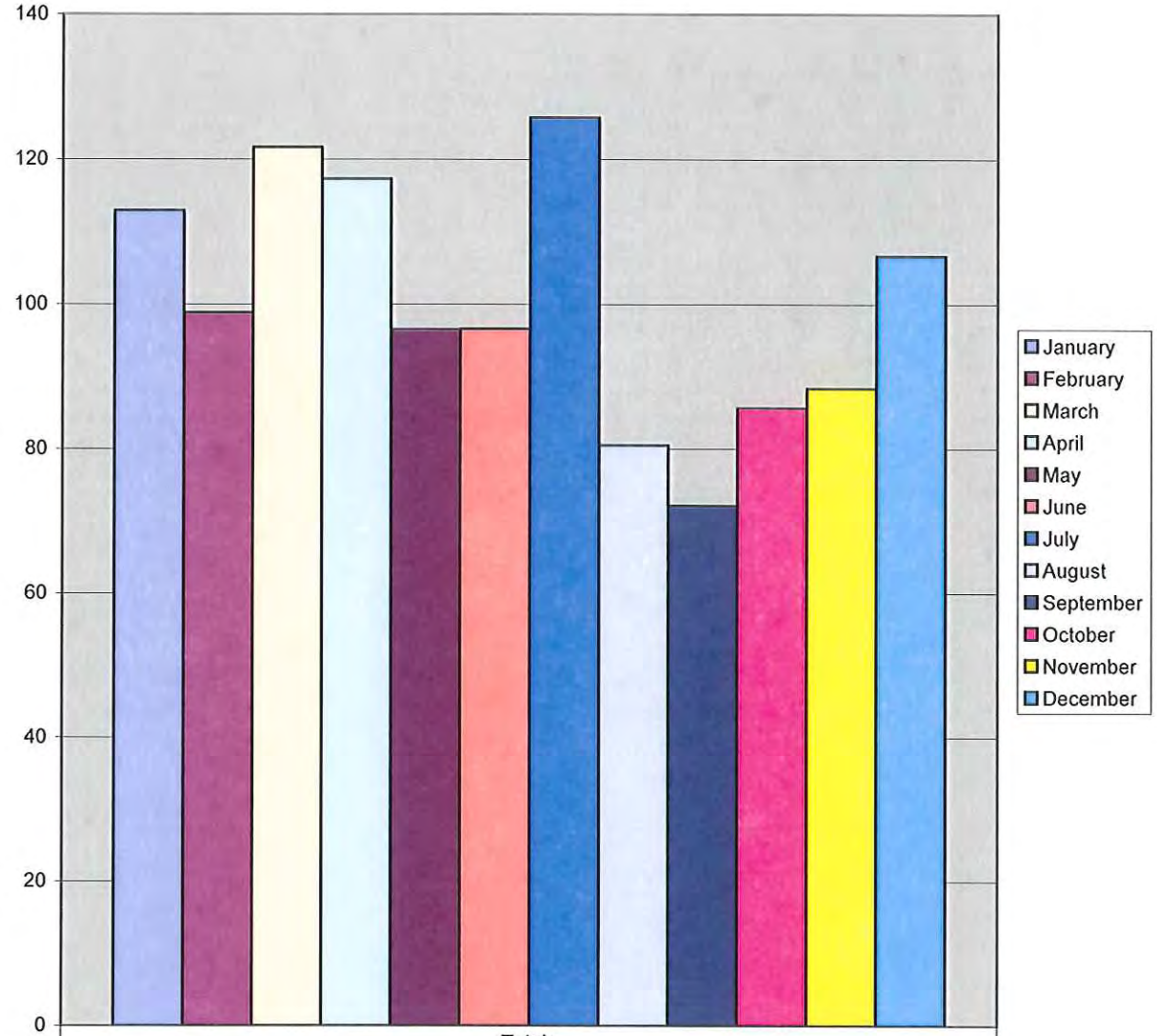




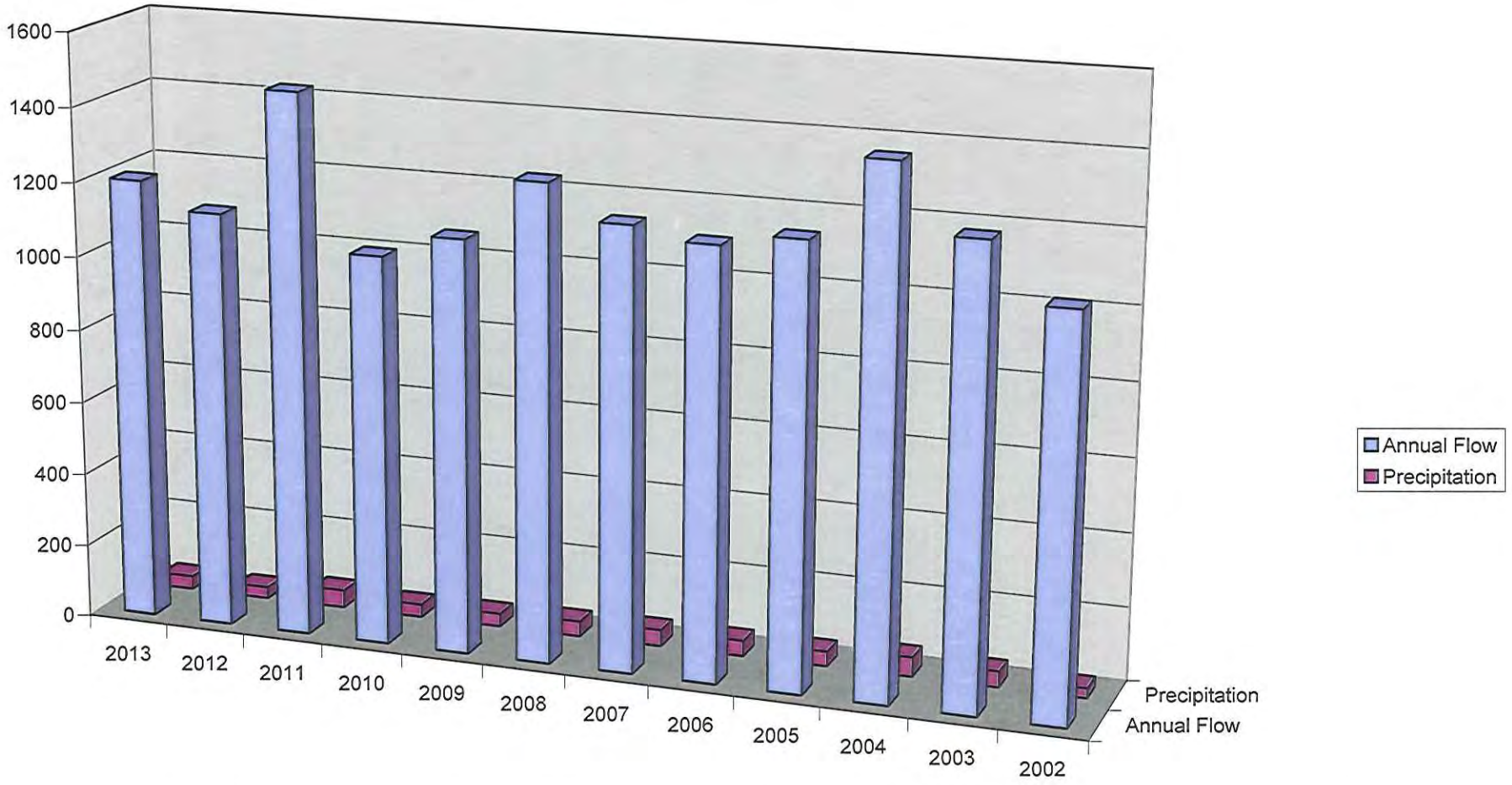
Plant Schematic

SOLID STREAM

Effluent Flow by Month

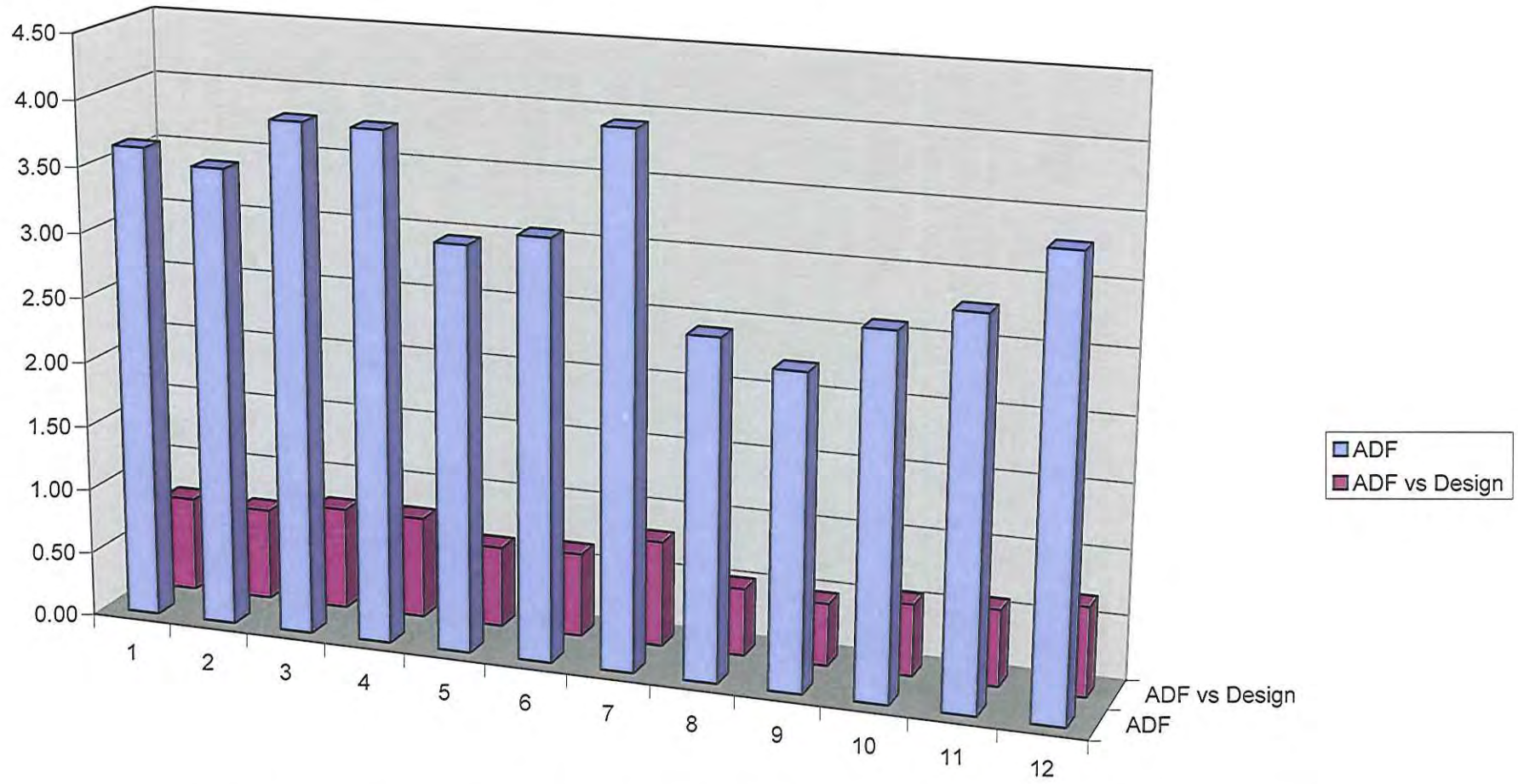


	Totals
January	112.91
February	98.815
March	121.663
April	117.321
May	96.509
June	96.586
July	125.743
August	80.528
September	72.148
October	85.681
November	88.361
December	106.678



	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Annual Flow	1202.94	1131.08	1470.29	1055.24	1118.86	1284.56	1192.53	1159.57	1191.95	1407.62	1229.1	1074.93
Precipitation	36.42	30.84	48.53	34.44	35.29	40.71	43.89	42.24	40.6	53.1	43.23	26.86

Average Daily Flow vs. Design



	1	2	3	4	5	6	7	8	9	10	11	12
ADF	3.64	3.53	3.92	3.91	3.11.	3.22	4.06	2.60	2.40	2.76	2.95	3.44
ADF vs Design	72.85%	70.58%	78.49%	78.21%	62.26%	64.39%	81.12%	51.95%	48.10%	55.28%	58.91%	68.82%

ANNUAL SLUDGE REPORT

	GALLONS POLYMER USED	COST	HAULING COST	TOTAL COST
2009	3780	$51,840.00	$38,595.57	$90,435.57
2010	2970	$32,250.00	$19,615.76	$51,865.76
2011	1890	$24,045.00	$16,963.40	$41,008.40
2012	2700	$34,350.00	$23,647.37	$57,997.37
2013	2160	$28,212.80	$17,007.43	$45,220.23

	SLUDGE PRESSED (GALS)	DRY TONS PRODUCED	COST PER DRY TON
2009	4,203,297	368	$245.75
2010	3,179,058	281	$184.58
2011	1,603,593	245	$167.38
2012	2,229,599	324	$179.00
2013	2,682,421	342	$132.35