

CITY OF SCOTTS VALLEY
Wastewater Reclamation Facility
2011 Annual Report



CITY OF SCOTTS VALLEY WASTEWATER TREATMENT FACILITY ANNUAL REPORT 2011

Plant Summary and Compliance

We are proud to report that for the third straight year, as with 11 of the past 12 years, the City did not record a single discharge violation. For the year 2011, effluent suspended solids averaged 7.0 mg/L (a 97.4% removal rate), effluent cBOD's averaged 3 mg/L (a 98.7% removal rate), and effluent BOD's averaged 4 mg/L (a 98.7% removal rate). Many thanks to a very knowledgeable and dedicated treatment plant staff. Without them, the continued high standards the City has become accustomed to would not be possible. For their efforts the City was awarded the 2011 Small Plant of the Year Award for the Monterey Bay Section of the California Water Environment Association.

A record 54.72 million gallons of recycled water was used in 2011. The Scotts Valley Water District continues to pursue additional recycled water users so we anticipate that we will continue to see increased recycled water usage.

Laboratory

The City of Scotts Valley Wastewater Reclamation Facility laboratory maintained its certification requirements upon successful completion of CA Dept. Public Health Environmental Laboratory Accreditation onsite audit. Keeping the lab current with new regulations in the Federal Register 40 CFR Parts 136 and 503 and making necessary upgrades in the lab to stay up to date on EPA approved test methods as per Standard Methods has been the focus of the lab during the year of 2011. We hope to upgrade the lab in 2012 by integrating wireless technology.

Laboratories used during 2011 were:

Inorganic Chemistry and Microbiology:
City of Scotts Valley WWTP
700 Lundy Lane
Scotts Valley, CA 95066
ELAP Certificate No. 1062

Metals/ Inorganic and Organic chemistry:
BC Laboratories, Inc.
4100 Atlas Ct.
Bakersfield, CA 93308
ELAP Certificate No. 1186

Annual HVWS:
Frontier Analytical Laboratory
5172 Hillside Circle
El Dorado Hills, CA 95762
NELAP Certification No. CA02113

Aquatic Testing Labs:
4350 Transport St., Unit 7
Ventura, CA 93003
NPDES Certificate No. CA0048828

Lift Stations

The City of Scotts Valley owns and operates seven lift stations at various locations throughout the City. All stations are inspected three times each week. During these routine inspections, hour readings are taken to verify normal running times and flow throughput. Each pump is individually started and stopped to ensure proper operation, and wet-wells are visually inspected to confirm water levels with digital level reading on automatic pump controllers. Once each week, stations equipped with permanent emergency generators are tested on emergency power to ensure proper operation. Five stations are equipped with permanent emergency stand-by power. At this time, no other stations require permanent on-site emergency power, as limited flows allow ample time for City staff to respond to alarm conditions and provide portable generator power prior to overflows occurring.

All of the City's seven stations have back-up pumps and alarm systems that automatically call 24-hour emergency personnel in case of a power outage or high-level conditions.

Collection System

Following is a summary of the seven collection system overflows reported by the City in 2011:

- January 10 – Pipe failure caused spill of less than 50 gallons to occur at the Bethany College maintenance yard. SSO Event ID 760783.
- February 13 - Partially plugged line caused estimated spill of 10 gallons to spill from a manhole in front of 350 Tabor Drive. SSO Event ID 762953.
- March 21 – A pump station level control failure caused a 300 gallon spill at 75 Mt. Hermon Road. SSO Event ID 764650.
- March 28 – Broken pipe in force main leaving the Monteville Pump Station caused 600 gallon spill. SSO Event ID 764872.
- July 5 – Partially blocked line caused 200 gallon spill from manhole at 12 Purple Hills Court. SSO Event ID 768174.
- September 22 – Plugged line caused spill of 50 gallons at 1500 Green Hills Road. SSO Event ID 771370.
- November 5 – Plugged sewer line in Kings Village Shopping Center caused spill of 100 gallons. SSO Event ID 772811.

The City's sanitary sewer collection system is made up of approximately 40 miles of pipeline. City crews spend an average of two days each week performing preventative maintenance using a combination vacuum/hydro-jet truck to clean the lines.

Source Control Program

Industrial:

There is one remaining significant industrial user (SIU) in the City of Scotts Valley: ThermoFisher, a categorical metal finishing industry (40 CFR 433.15). There have been no industrial discharge violations during 2011.

AVIZA Technology, Inc., previously also an SIU, is no longer discharging any industrial process wastewater. They are only discharging domestic wastewater; therefore they are no longer permitted as an industrial discharger. A commercial leasing company has taken over the majority of the Aviza campus, leasing to technology companies that have no industrial wastewater discharges.

Groundwater Remediation: There is a groundwater pump and treat site discharging to the sewer in the City of Scotts Valley, under a permit. The responsible parties for the site are Shell Oil Products US and ConocoPhillips, and the treatment system and reporting was managed by Delta Consultants, but is now managed by Conestoga-Rovers & Associates (CRA). Discharge began on March 7, 2008. The site has met all permit conditions to date.

All categorical industries and the groundwater pump and treat site in the City were monitored and permitted through the pretreatment program in 2010.

The City began strictly enforcing stormwater regulations at light industries such as auto repair shops and restaurants. As a result, there were several exterior washing and exterior storage operations that were eliminated or revamped to have proper treatment before discharge to the sanitary sewer.

Grease Trap Installation and Maintenance

The fats, oils, and greases (FOG) program is in place with most facilities operating in compliance with local ordinances. Source Control continues to routinely inspect and monitor the conditions of the grease interceptors operating in Scotts Valley. A Best Environmental Management Practices pamphlet is being used as a training tool for local restaurant managers and owners.

Maintenance and Repairs

- Made repairs to aeration panels
- Installed new VFD controller for Influent pump #4
- Installed new grit classifier at flow equalization basin
- Replaced chlorine analyzer for tertiary effluent
- Installed new 2,500 gallon sodium hypochlorite storage tank
- Installed new influent and backwash air valves for tertiary filters 1 & 2
- Performed one week sludge thickening pilot project to explore alternative sludge disposal methods
- Installed new VFD for effluent pump P-10
- Repair VFD for effluent pump P-9
- Other plant maintenance and repairs were performed as required

O & M Manual

The plant's main operations and maintenance manual (O&M) was not changed during 2011; however, the plant's O&M manual library was updated to include new equipment that was placed into service over the past year. Updating the plant's O&M manual takes place on an ongoing basis. We have one O&M manual that is used for operational guidelines and minor service to plant equipment. We also catalog individual O&M's for every piece of equipment in place at the treatment plant, collection system, and lift stations.

Training

- All staff was retrained in the biannual Red Cross Adult CPR and Standard First Aid Certification Program.
- All staff participates in the plant's in-house safety/training meetings that are conducted every other Wednesday throughout the year.
- All Operations and Laboratory staff participated in several one-day training classes and seminars related to wastewater treatment, laboratory and maintenance.

Public Outreach/Education

The Scotts Valley Green Schools Program was developed in 2010 to provide environmental education to Scotts Valley students and to encourage the institution of best environmental practices at the schools following the model of the Green Business Program. The Green Schools Program was funded by the City of Scotts Valley, and

offered free to the area schools. It focused initially on the ninth grade at Scotts Valley High School, and the fifth grades at Vine Hill Elementary School and Baymonte Christian School, two grade levels in which ecology concepts are taught. All three schools welcomed the program. Since planning with the teachers did not occur until mid-year, however, the Baymonte teachers opted to enter the program next year, in 2011-2012, instead of 2010-2011. For this year, two series of presentations and three community service events were offered at Scotts Valley High School. Two series of presentations were also offered at Vine Hill Elementary, along with a Save Our Shores presentation, and the formation of an Environmental Leadership Council.

245 ninth graders at Scotts Valley High School received presentations on Oceans and Plastics Pollution by the Surfrider Foundation. Community service opportunities offered in association with it included storm drain placarding, a beach cleanup, and monitoring recycling at the Skypark July 4 Celebration. Also, as part of the presentation, the ROP Marketing class was introduced to the Clean Oceans Project, a local organization working to clean up ocean plastics, and this class completed a display board and a DVD for the organization's outreach. Later, all ninth graders participated in another 4-part program led by Green Schools staff along with other local organizations and agencies. Sections in this program focused on watersheds, groundwater conservation, maintaining groundwater quality, and solid waste and recycling.

The Vine Hill Elementary School programs consisted of two participatory events on water pollution prevention and solid waste and recycling for 97 fifth graders. 28 of the fifth graders later met to form an Environmental Leadership Council. The Green Schools Program's "Green Schools Detectives" checklist was used to determine specific ways to improve environmental practices at the school before the end of the year. A presentation by Save Our Shores, "Waste Reduction for Healthy Oceans", was also set up as part of the school's "Cultivating Kindness" assemblies for the entire school community.

Scotts Valley City Staff, in collaboration with the County of Santa Cruz and other City agencies, were successful in obtaining a grant in 2008 from the California Integrated Waste Management Board (CIWMB) in order to implement a pharmaceutical and sharps disposal program. Since that time, the Sharp Solutions for Home Medicines Program has provided a convenient and permanent system to dispose of home-generated used sharps and unwanted pharmaceuticals in the County of Santa Cruz. The County has established 33 convenient and well-publicized drop-off locations, primarily at pharmacies, throughout the region.

In 2010, the Palo Alto Medical Foundation (PAMF), previously a non-participant, established a pilot project to dispose of pharmaceuticals from its patients at its clinic in

Scotts Valley. The project was so successful that PAMF expanded pharmaceutical take-back at all 5 of its major clinics in Santa Cruz County in 2011, significantly expanding the program. Since PAMF's program is limited to its patients and it covers all costs of the program, collection data from its sites is not available.

From July 2008 through December 2011, over 51,000 pounds of sharps and pharmaceuticals have been collected and diverted from county landfills and water systems, thus reducing water pollution and public health risks. The three take-back sites in Scotts Valley alone collected 1,006 pounds of sharps and 2,027 pounds of medicines during 2011. Compared to countywide data, these figures amount to 12% and 18%, respectively, of the two medical wastes collected in a city that comprises only 4.4% of county population.

The Monterey Bay Area Green Business Program continues to thrive. Goals of the Green Business Program include promoting pollution prevention, waste minimization, and implementing best management practices that go above and beyond the regulatory standards. Since its launch in July, 2004, the program has developed the certification capability in nineteen different business sectors, including: restaurants, plumbers, office/retail facilities, hotels/hospitality services, custodial companies, beauty salons, laundromats, wineries, painters, and landscapers, property management/multi-family dwellings, schools, medical facilities, garment cleaners, vehicle service facilities, auto body shops, printers, contractors/remodelers, and pharmacies. A significant portion of the program for restaurants, hotels, and plumbers is dedicated to minimizing discharges of fats, oils, and greases (FOG) into the sanitary sewer. The program is supported by a database launched in 2010, which allows it to collect metrics on water & energy savings, and pollution & waste reduction, and assess the program's impacts. Nineteen businesses have been certified to date in Scotts Valley. These businesses have been advertised in a local paper and will be advertised again in the spring.

Electronic Waste: On Saturday, September 10, 2011, the City of Scotts Valley conducted its 9th annual e-waste collection event. The City collected over 27,000 pounds of electronics, mostly in the form of computers, monitors and television sets, from nearly 350 participants. These items are now banned from landfill disposal because of their hazardous material content of lead, mercury, and other heavy metals.

Appliance & Tire Collection: The City of Scotts Valley held its 8th annual Appliance and Tire Collection Event on Saturday, October 15. Nearly 100 participants dropped off a total of 8 water heaters, 8 washers, 4 dryers, 7 oven/stoves, 13 refrigerators, 41 misc. small appliances and 266 tires. Scrap metal from appliances was shredded, melted and

made into new metal products. Collected tires were ground into small pieces and will be recycled into rubber playground surfaces and rubber floor mats.

On an annual basis, the treatment plant staff provides a number of ongoing public outreach/education services. Some of those services include:

- Oil Recycling: As a member of the County's regional oil recycling program, the City distributes oil recycling containers to local automotive supply stores where they are distributed to residents at no cost. The 2.5 gallon used oil containers have labels containing information on proper disposal practices and can be used throughout the county in any curbside collection program as part of the integrated regional program.
- As always, plant tours are encouraged and given upon request to any person or group wishing to learn about the treatment process. Several individual and group tours were given in 2011.

NPDES PERMIT EFFLUENT VIOLATIONS 2002-2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
January	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	1*	0	0	0
September	0	0	0	0	0	0	0	0	0	0
October	0	0	0	0	0	0	0	0	0	0
November	0	0	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	0

*TCDD

TABLE 1

2011 PLANT FLOW AND RAINFALL

	Total Plant Flow Eff.+Rec.MGD Mo. Total	Effluent Daily Flow MGD Mo. Total	Effluent Inst. Max. MGD (peak)	Recycled Total Flow Million Gallons Mo. Total	Rainfall Inches (Total)
January	28.154	27.619	3.49	0.535	2.05
February	27.858	26.669	3.57	1.189	10.65
March	34.512	33.867	3.49	0.645	13.79
April	26.707	23.088	2.42	3.619	0.74
May	26.291	19.521	3.54	6.770	3.41
June	27.352	20.954	3.50	6.398	3.15
July	25.398	17.113	2.79	8.285	0.00
August	24.940	15.299	2.52	9.641	0.04
September	24.030	15.035	2.42	8.995	0.02
October	26.040	21.679	2.29	4.361	3.26
November	23.959	22.141	2.74	1.818	3.67
December	24.513	22.049	2.39	2.464	0.18
Total	319.75	265.03		54.72	40.96
Average	26.65	22.09	2.93	4.56	3.41
Maximum	34.51	33.87	3.57	9.64	13.79
Minimum	23.96	15.04	2.29	0.54	0.00

ADDWF, MGD	0.837
Eff + Recycle	

TABLE 2**2011 Influent & Effluent Suspended Solids**

	Influent mg/L	Effluent mg/L	Effluent lb/day	Percent Removal
January	256	6	46	97.5%
February	282	8	60	97.1%
March	208	5	45	97.6%
April	245	8	51	96.7%
May	264	8	38	97.0%
June	252	6	33	97.6%
July	315	6	28	98.0%
August	277	7	25	97.6%
September	258	10	39	96.0%
October	268	6	47	97.7%
November	254	6	36	97.6%
December	282	5	34	98.1%
Average	263	7	40	97.4%
Maximum	315	10	60	98.1%
Minimum	208	5	25	96.0%

TABLE 3**2011 Influent & Effluent BOD & cBOD**

	Influent BOD mg/L	Effluent BOD mg/L	Effluent BOD lb/day	BOD Percent Removal	Influent cBOD mg/L	Effluent cBOD mg/L	Effluent cBOD lb/day	cBOD Percent Removal
January	287	3	27	98.8%	211	2	19	98.9%
February	271	4	29	98.6%	225	3	24	98.6%
March	238	3	22	98.9%	173	2	17	98.8%
April	267	4	36	98.3%	191	4	30	98.0%
May	276	3	28	98.7%	203	3	23	98.6%
June	277	3	26	98.8%	202	3	23	98.5%
July	280	3	25	98.9%	240	3	22	98.9%
August	296	3	28	98.8%	234	3	25	98.7%
September	280	5	42	98.1%	227	4	30	98.4%
October	303	3	26	98.9%	223	2	19	98.9%
November	319	3	27	98.9%	251	3	22	98.9%
December	298	3	24	99.0%	251	2	18	99.1%
Average	283	4	28	98.7%	219	3	23	98.7%
Maximum	319	5	42	99.0%	251	4	30	99.1%
Minimum	238	3	22	98.1%	173	2	17	98.0%

TABLE 4**2011 Tertiary Effluent Nitrogen**

	Tertiary Ammonia mg/L as N	Tertiary Organic N mg/L as N	Tertiary Nitrate mg/L as N	Tertiary Nitrite mg/L as N	Influent Total N mg/L as N	Tertiary Nitrogen Removal Percent
January	0.28	0.4	7.7	< 0.2	69	88.3
February	0.05	0.6	5.3	< 0.1	59	90.0
March	0.33	0.4	6.5	< 0.1	51	86.4
April	0.06	0.9	8.2	< 0.1	60	84.8
May	0.07	0.6	5.8	< 0.1	50	87.2
June	0.08	0.6	6.6	< 0.1	52	86.2
July	0.05	0.9	7.4	< 0.1	52	84.0
August	0.07	0.9	5.5	< 0.1	69	90.8
September	0.08	1.3	6.2	< 0.1	78	90.4
October	0.05	0.9	5.5	< 0.1	55	88.4
November	0.13	0.7	4.7	< 0.1	66	91.8
December	0.06	0.8	6.2	< 0.1	82	91.5
Average	0.11	0.8	6.3	< 0.1	62.0	88.3
Maximum	0.33	1.3	8.2	< 0.2	82.0	91.8
Minimum	0.05	0.4	4.7	< 0.1	50.0	84.0

TABLE 5**2011 Influent & Effluent pH and Effluent Turbidity, Settleable Solids, and Oil & Grease**

	Influent pH Std Units	Effluent pH Std Units	Effluent Turbidity NTU	Effluent Settleable Solids ml/L	Effluent Oil & Grease mg/L	Effluent Oil & Grease lb/day
January	8.1	7.2	3.7	< 0.1	< 5	< 40
February	8.1	7.0	3.7	< 0.1	< 5	< 40
March	7.9	7.0	1.6	< 0.1	< 6	< 45
April	8.1	7.1	5.7	< 0.1	< 5	< 40
May	8.1	7.2	6.4	< 0.1	< 5	< 40
June	8.0	7.2	3.9	< 0.1	< 5	< 40
July	7.9	7.1	3.8	< 0.1	< 5	< 40
August	8.1	7.2	4.9	< 0.1	< 5	< 40
September	8.1	7.1	5.9	< 0.1	< 5	< 40
October	8.1	7.1	4.9	< 0.1	< 5	< 40
November	8.2	7.2	2.9	< 0.1	< 6	< 45
December	8.2	7.1	2.8	< 0.1	< 5	< 40
Average	8.1	7.1	4.2	< 0.1	< 5.1	< 41
Maximum	8.2	7.2	6.4	< 0.1	< 6.0	< 45
Minimum	7.9	7.0	1.6	< 0.1	< 4.6	< 40

TABLE 6**2011 Effluent Chlorine Residual and Bacteriological Quality**

	Chlorine Residual mg/L @Santa Cruz	Total Coliform MPN/100mL	Fecal Coliform MPN/100mL	Enterococcus MPN/100mL
January	< 0.01	1067	< 200	< 100
February	< 0.02	8625	< 1400	< 100
March	< 0.01	1120	< 200	< 100
April	< 0.01	1720	< 320	< 100
May	< 0.01	933	< 233	< 100
June	< 0.01	3720	760	< 100
July	< 0.01	6520	1160	204
August	< 0.01	2520	< 320	100
September	< 0.01	1880	720	< 100
October	< 0.01	1960	< 180	61
November	< 0.01	1520	< 490	17
December	< 0.01	1370	240	27
Geometric	< 0.01	2,109	< 402	< 79
Maximum	< 0.02	8,625	1,160	204
Minimum	< 0.01	933	< 180	< 17

TABLE 7**2011 Sludge
Wasting**

	WAS Flow MGD	WAS Percent Solids	WAS Metric Tons per month (dry wt)	Hours Pressed per/mnth	Sludge Cake % Solids	Sludge Hauled Tons/mnth (dry wt)
January	0.7141	0.86	20.9	128	15.2	29.0
February	0.6820	0.87	21.6	125	15.4	27.1
March	0.7331	1.02	27.6	138	16.1	31.0
April	0.8940	0.87	20.9	129	15.5	27.5
May	0.6783	0.89	20.4	133	15.8	26.0
June	0.6715	0.91	21.0	127	15.8	26.9
July	0.6539	0.89	21.6	118	15.7	24.3
August	0.7620	0.84	19.3	137	15.5	26.2
September	0.6274	0.84	16.8	123	15.2	21.8
October	0.6942	0.83	19.0	120	15.0	24.8
November	0.7658	0.82	19.6	129	15.5	26.2
December	0.7704	0.89	23.3	132	15.6	29.4
Total	8.647		252.0	1,536		320.2
Average	0.721	0.88	21.0	128	15.5	26.7
Maximum	0.894	1.02	27.6	138	16.1	31.0
Minimum	0.627	0.82	16.8	118	15.0	21.8

TABLE 8**2011 Plant Operating Parameters**

	Aerator lbs	Clarifier lbs	Total lbs	RAS mg/L	MLSS mg/L	Clar. SS mg/L	MCRT 7-day	F/M 7-day	SVI Ratio
January	14022	11141	25,162	9039	5574	2632.6	10.6	0.21	172
February	13280	9643	22,923	9098	5280	2278.6	9.1	0.22	174
March	13544	11543	25,087	9809	5486	2727.7	9.2	0.24	166
April	14094	8037	22,130	9637	5603	1899.2	9.3	0.21	155
May	12945	7349	20,294	9000	5147	1736.6	8.8	0.23	159
June	13104	7649	20,753	8959	5210	1807.6	9.0	0.23	152
July	12814	8124	20,937	8303	5094	1919.7	8.8	0.23	165
August	12735	7215	19,950	8432	5063	1705.1	8.7	0.20	161
September	12156	6825	18,981	8260	4833	1612.9	9.3	0.21	167
October	12095	8586	20,681	8024	4808	2029.0	9.6	0.22	189
November	12784	8975	21,759	8267	5082	2120.9	9.5	0.21	185
December	13626	10533	24,159	8579	5417	2489.2	9.7	0.18	175
Average	13,100	8,802	21,901	8,784	5,216	2,080	9.3	0.22	168
Maximum	14,094	11,543	25,162	9,809	5,603	2,728	10.6	0.24	189
Minimum	12,095	6,825	18,981	8,024	4,808	1,613	8.7	0.18	152

FIGURE 1

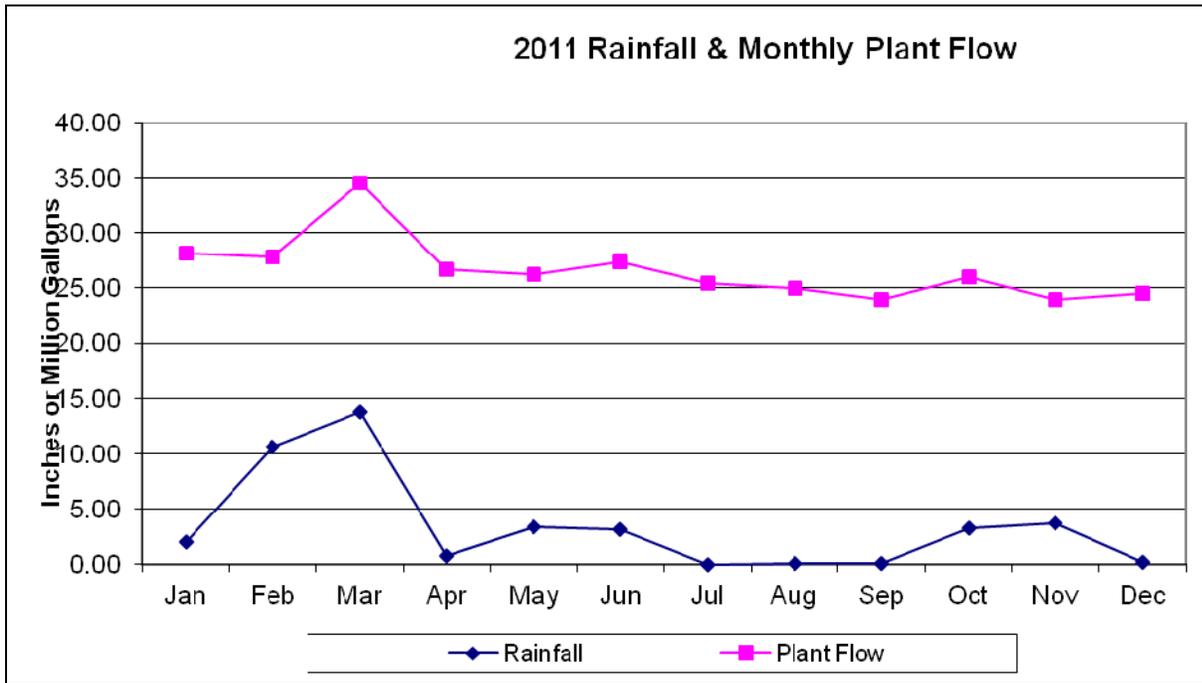


FIGURE 2

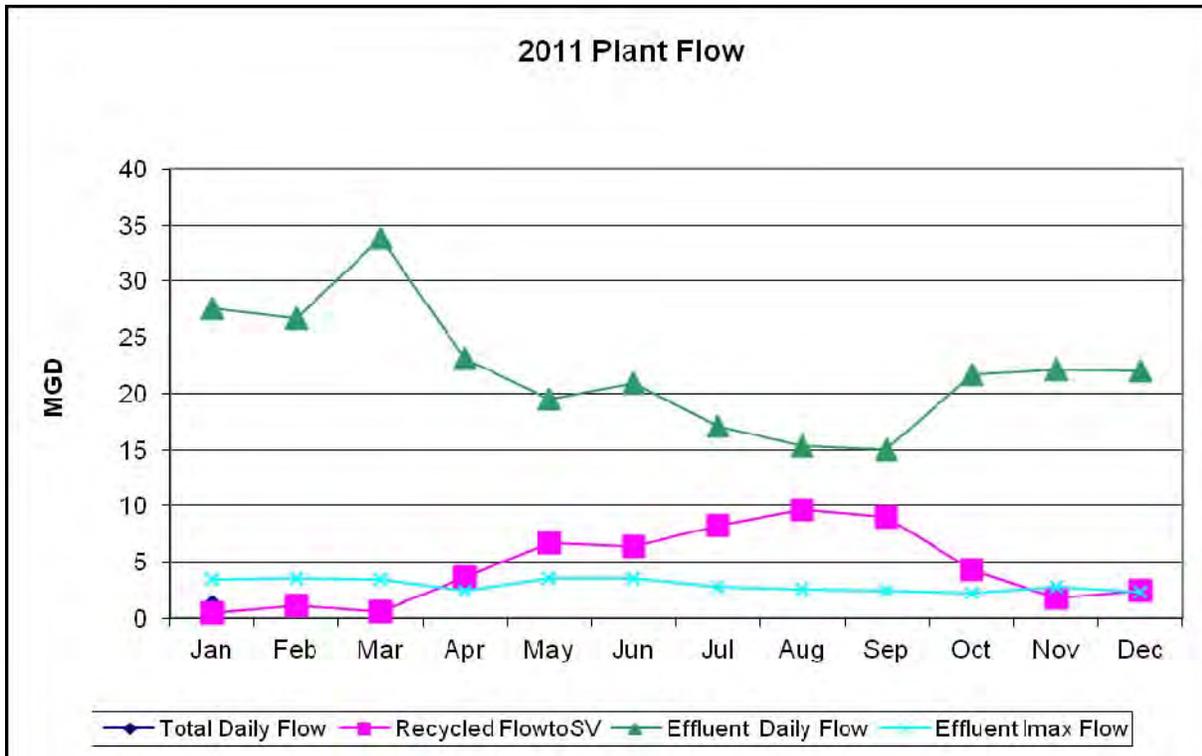


FIGURE 3

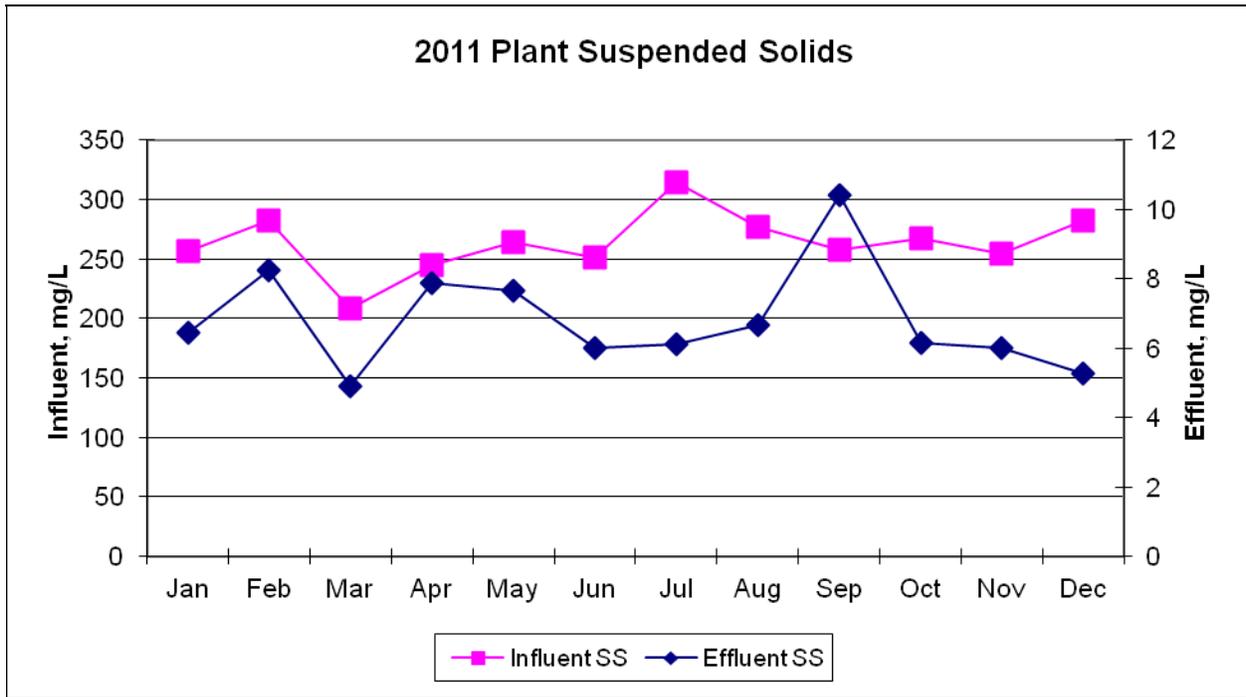


FIGURE 4

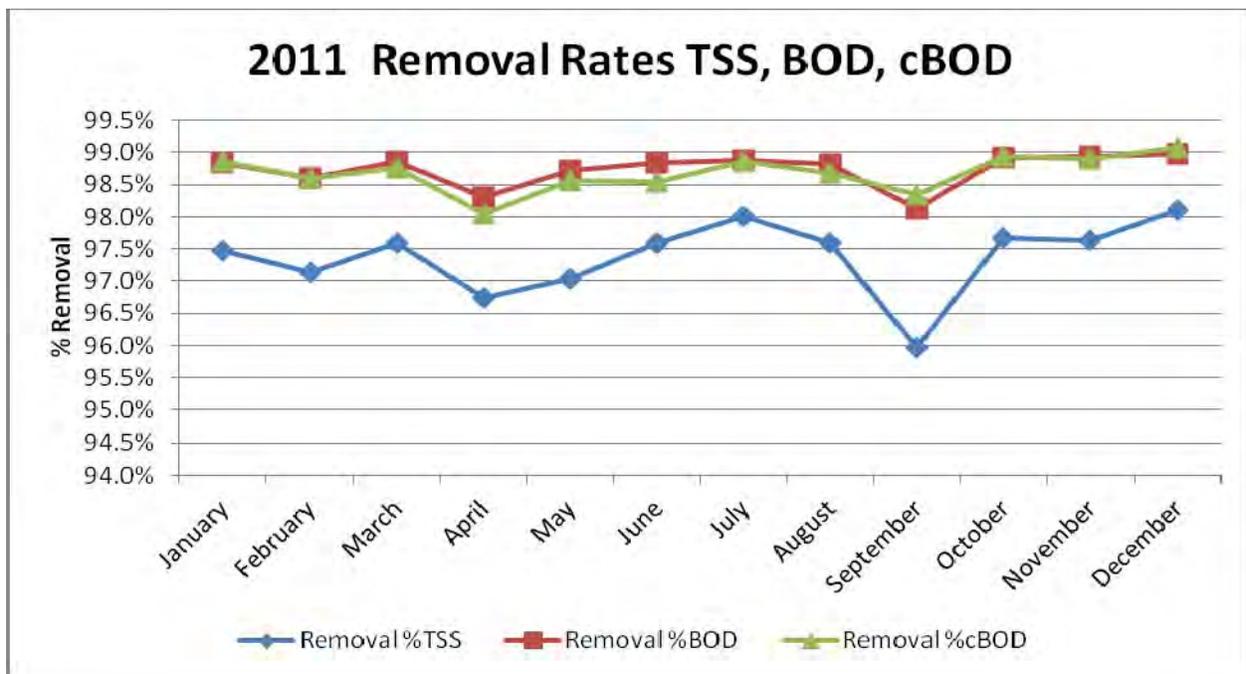


FIGURE 5

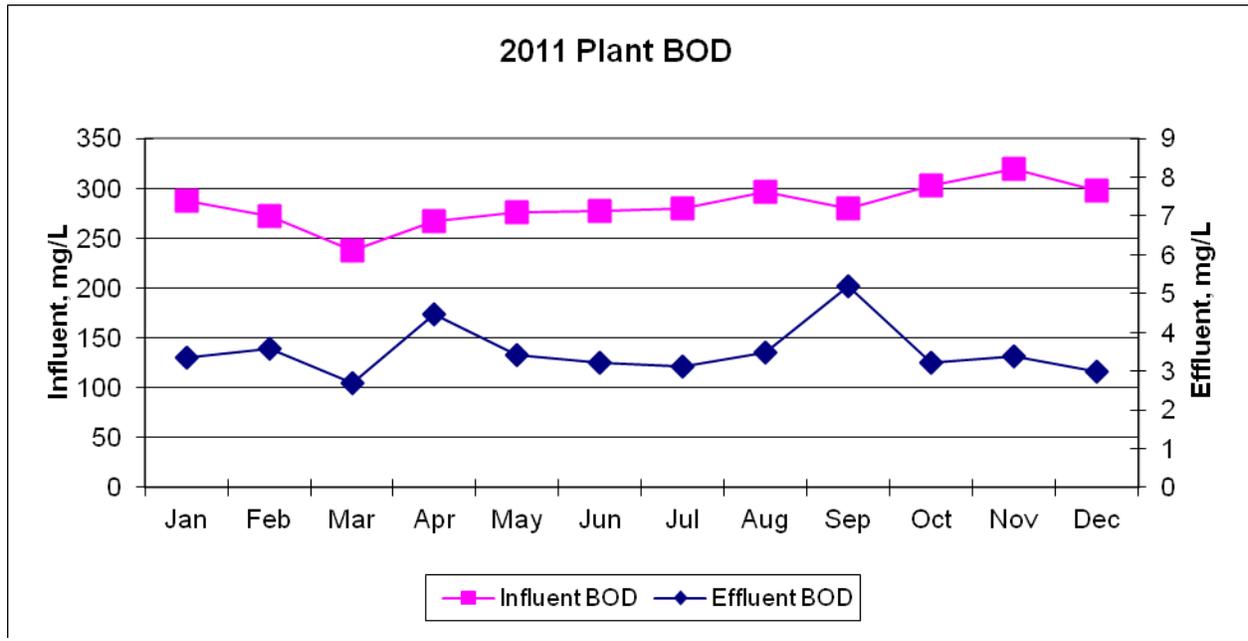


FIGURE 6

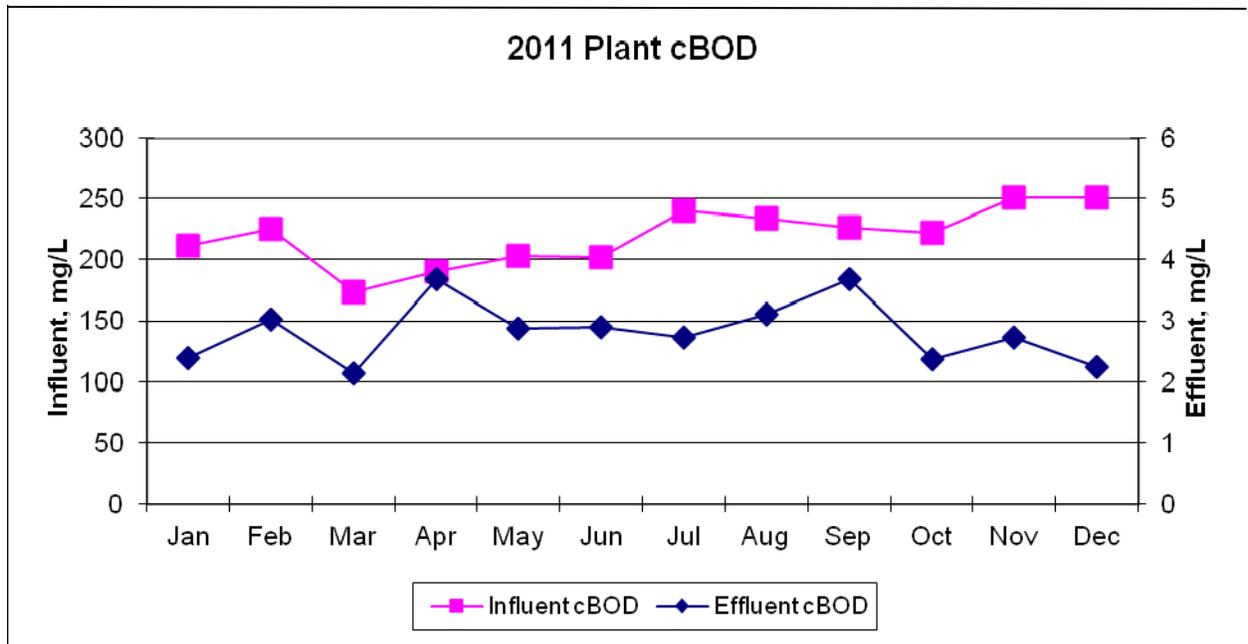


FIGURE 7

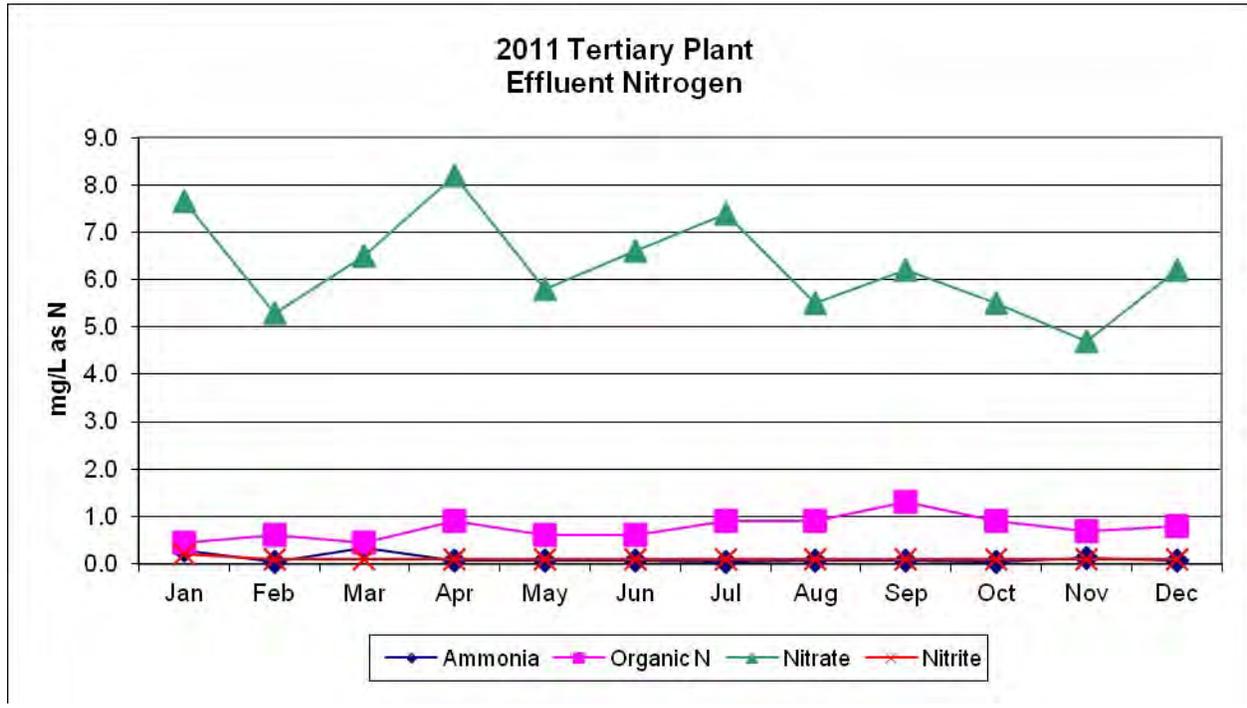


FIGURE 8

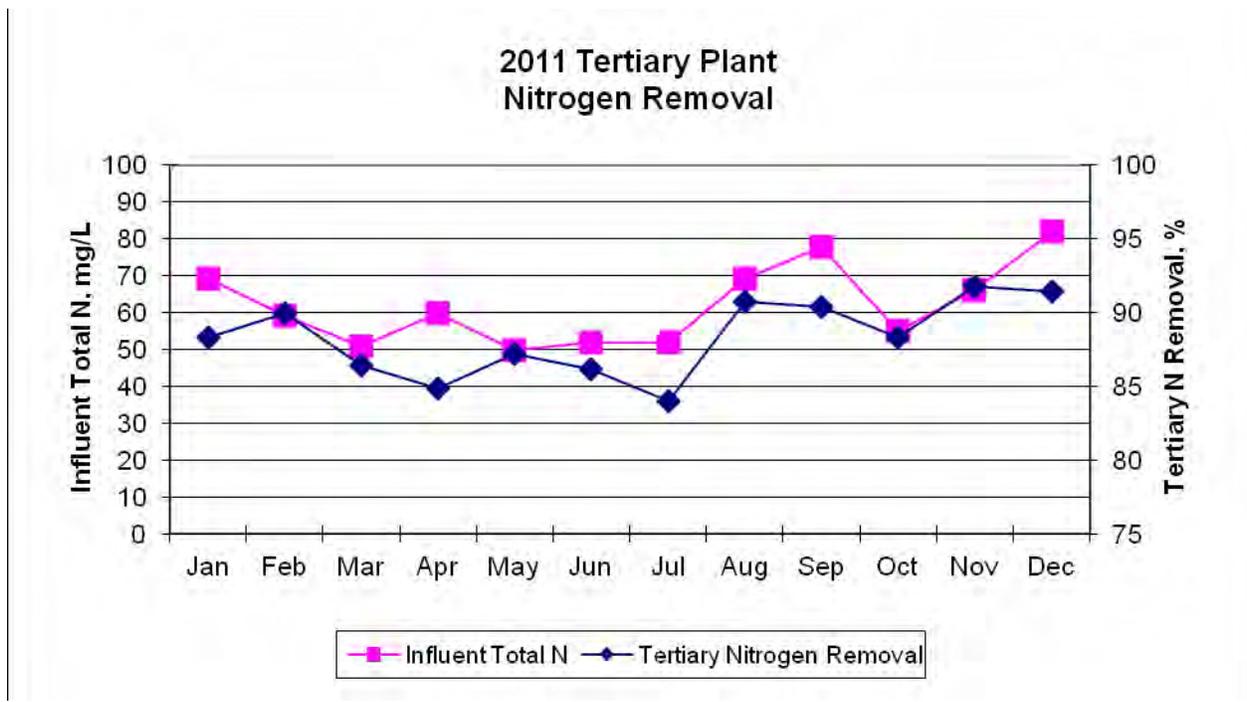


FIGURE 9

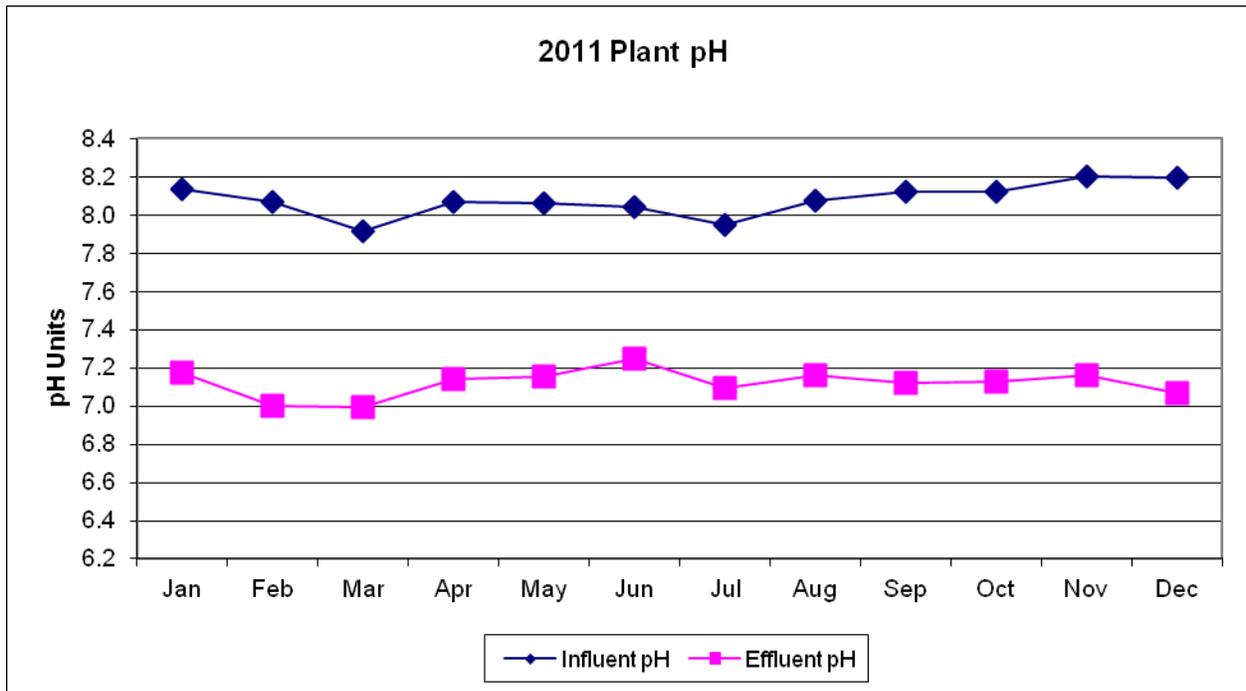


FIGURE 10

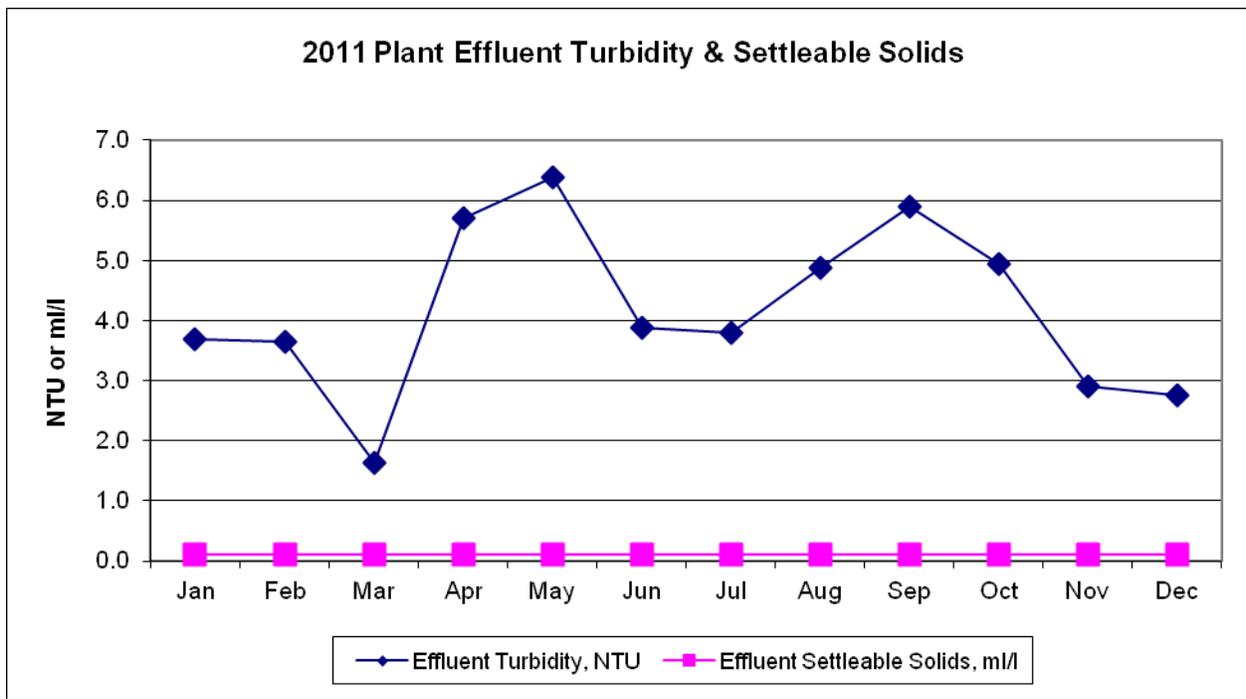


FIGURE 11

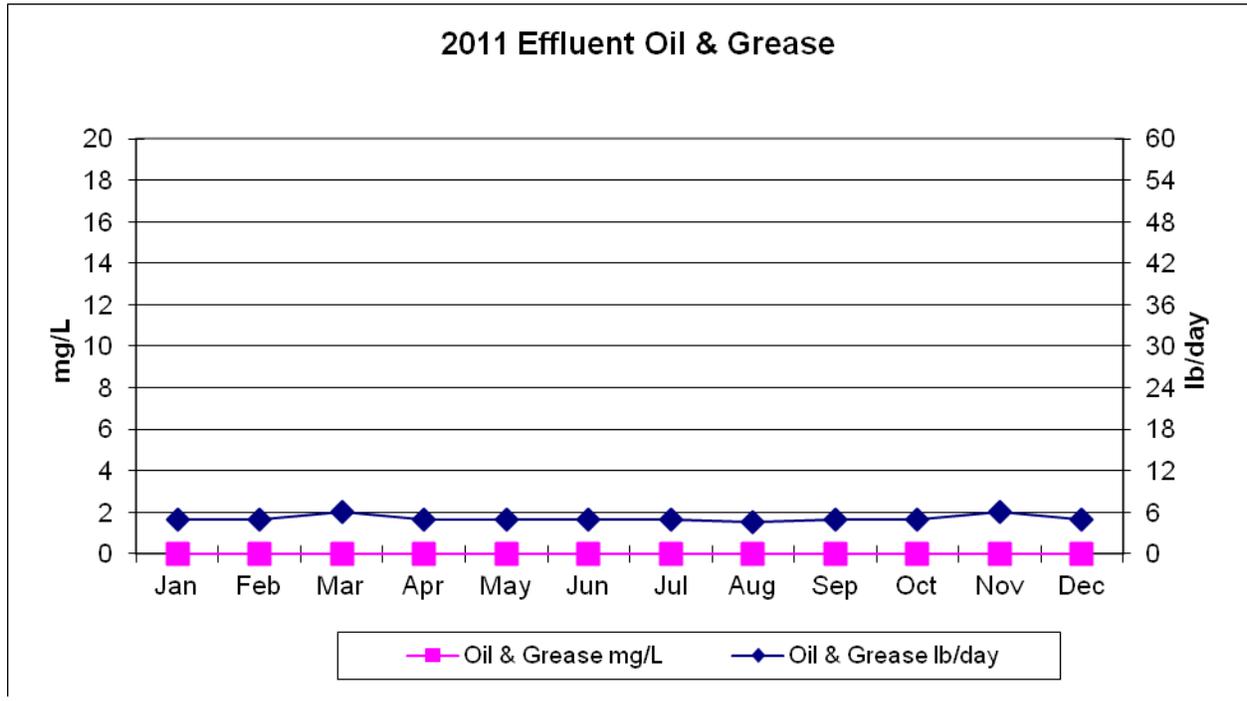


FIGURE 12

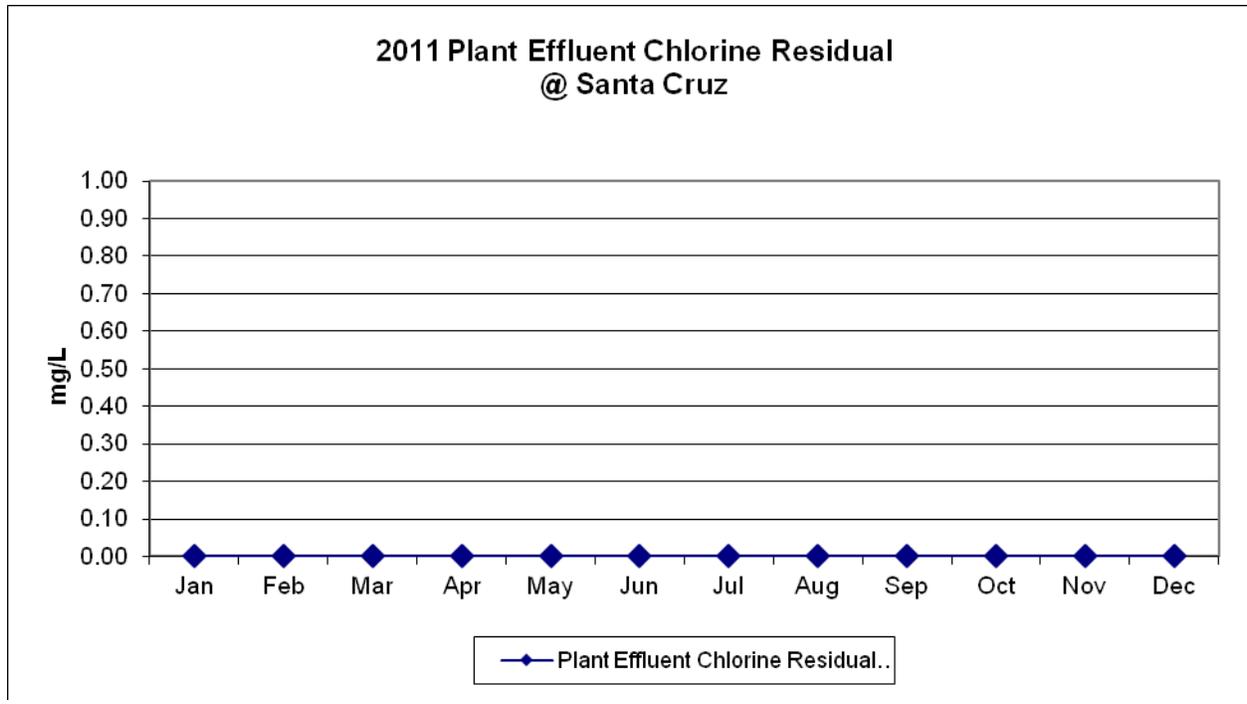


FIGURE 13

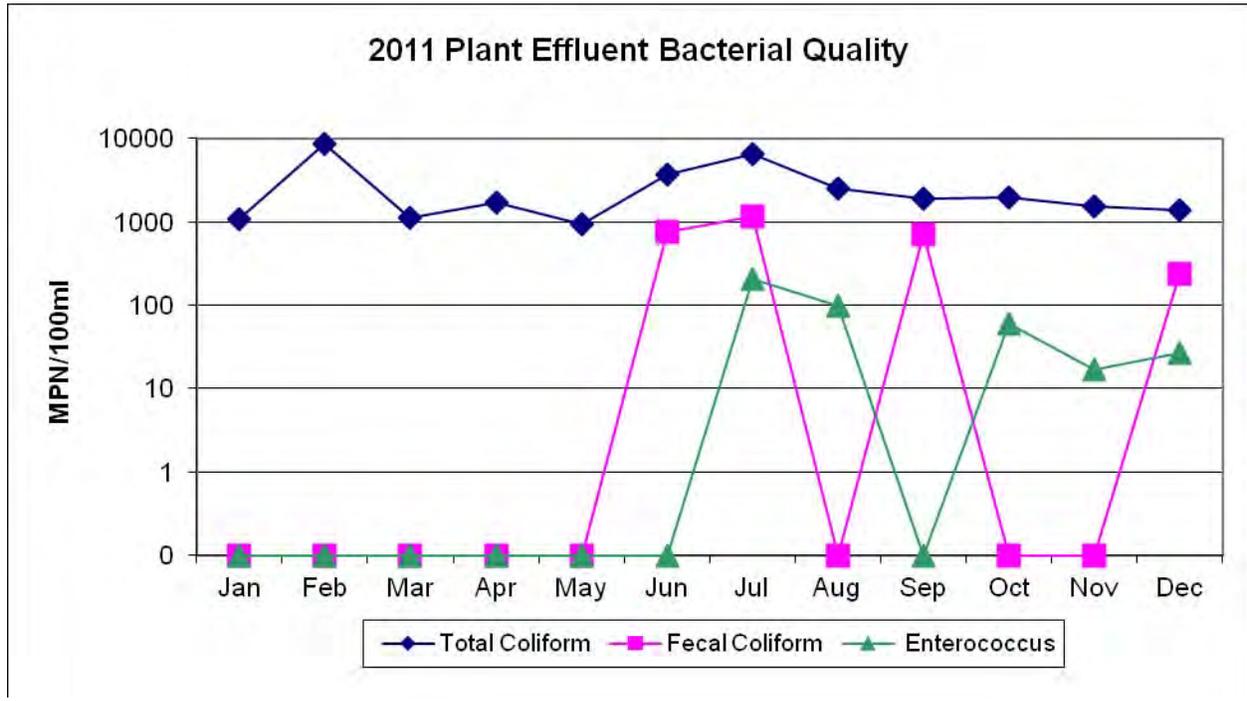


FIGURE 14

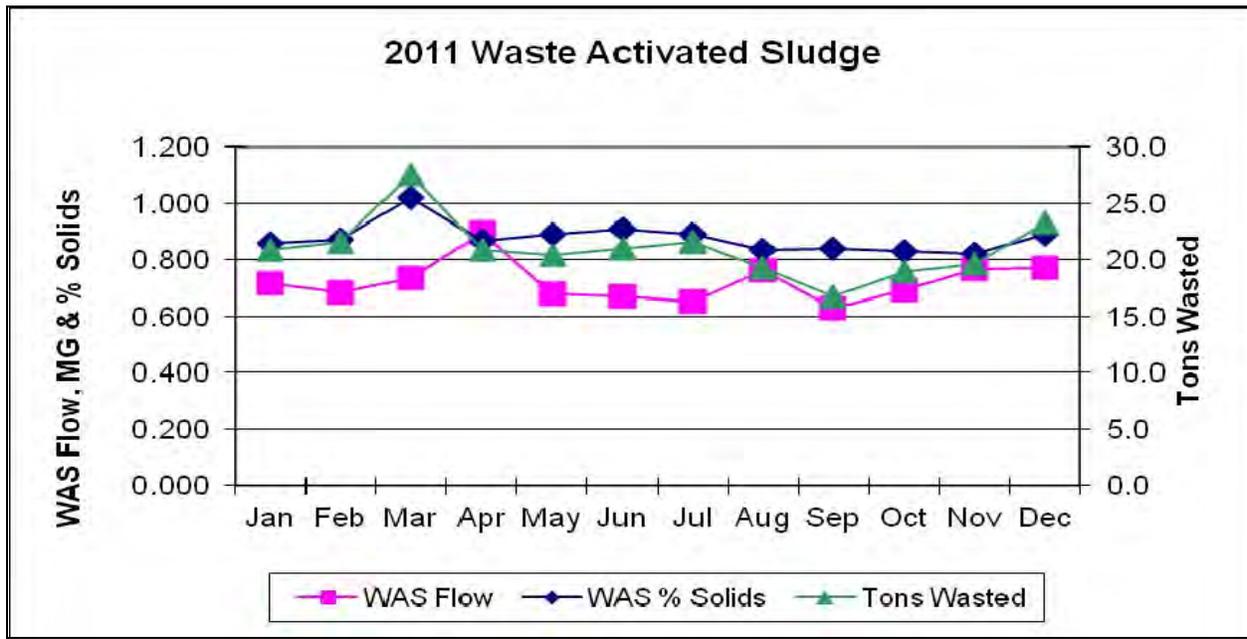


FIGURE 15

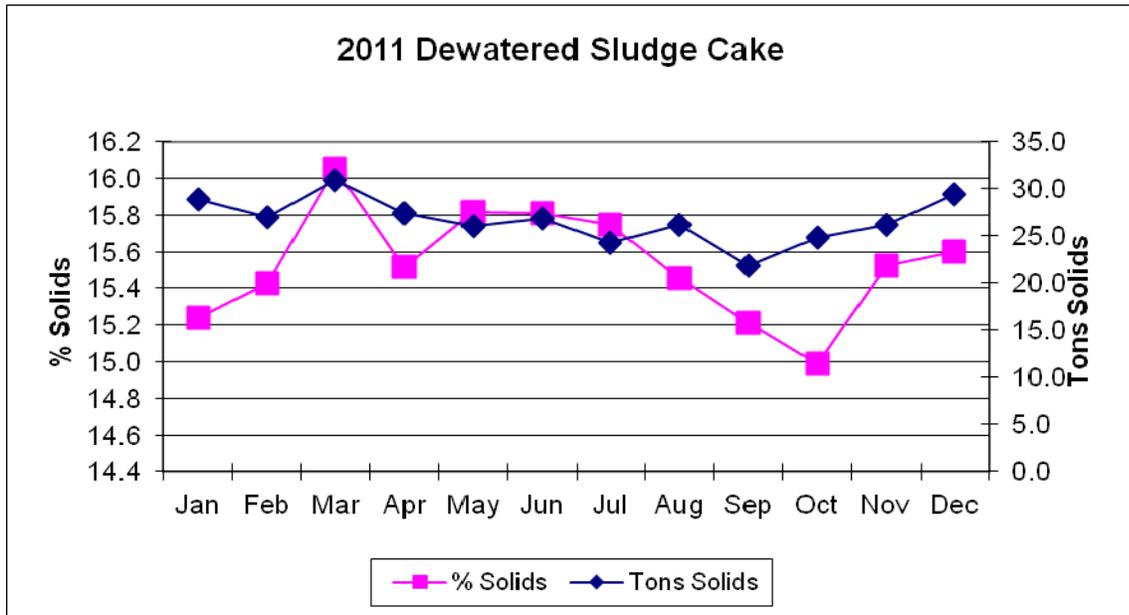


FIGURE 16

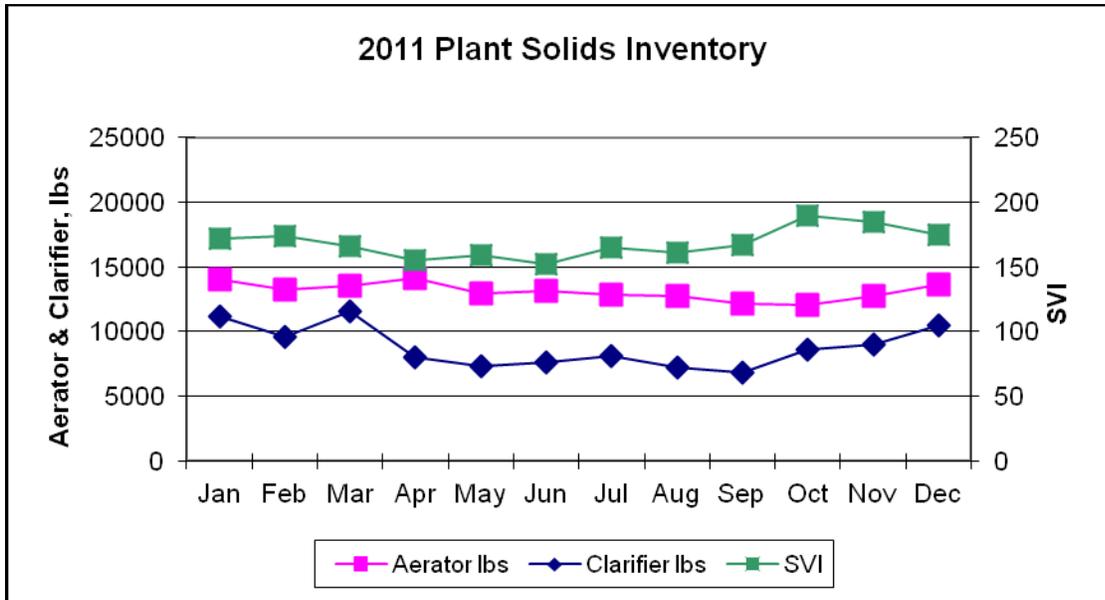


FIGURE 17

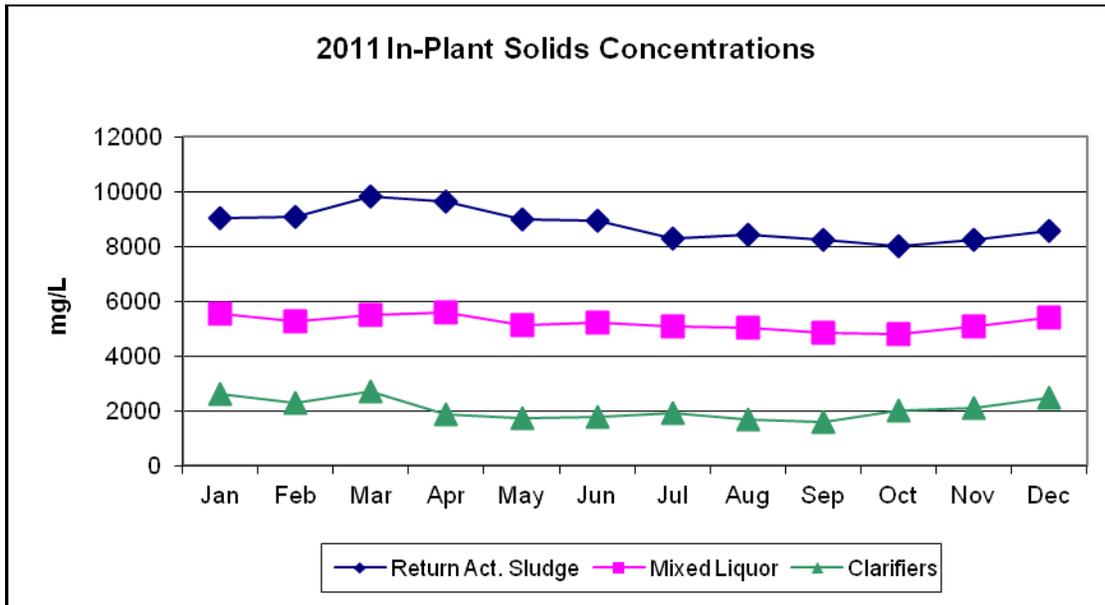


FIGURE 18

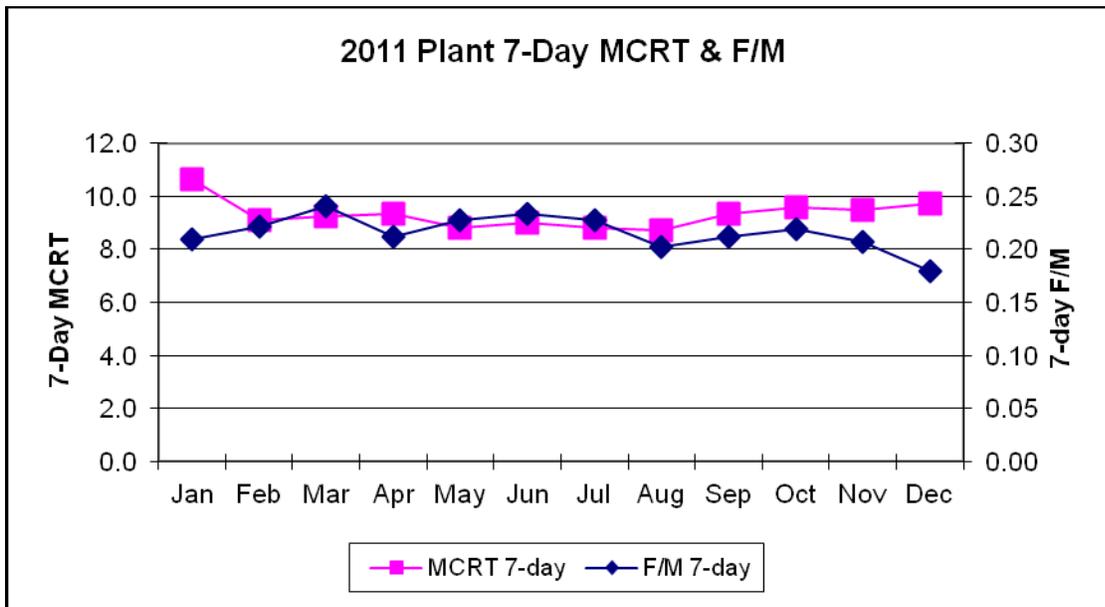


FIGURE 19

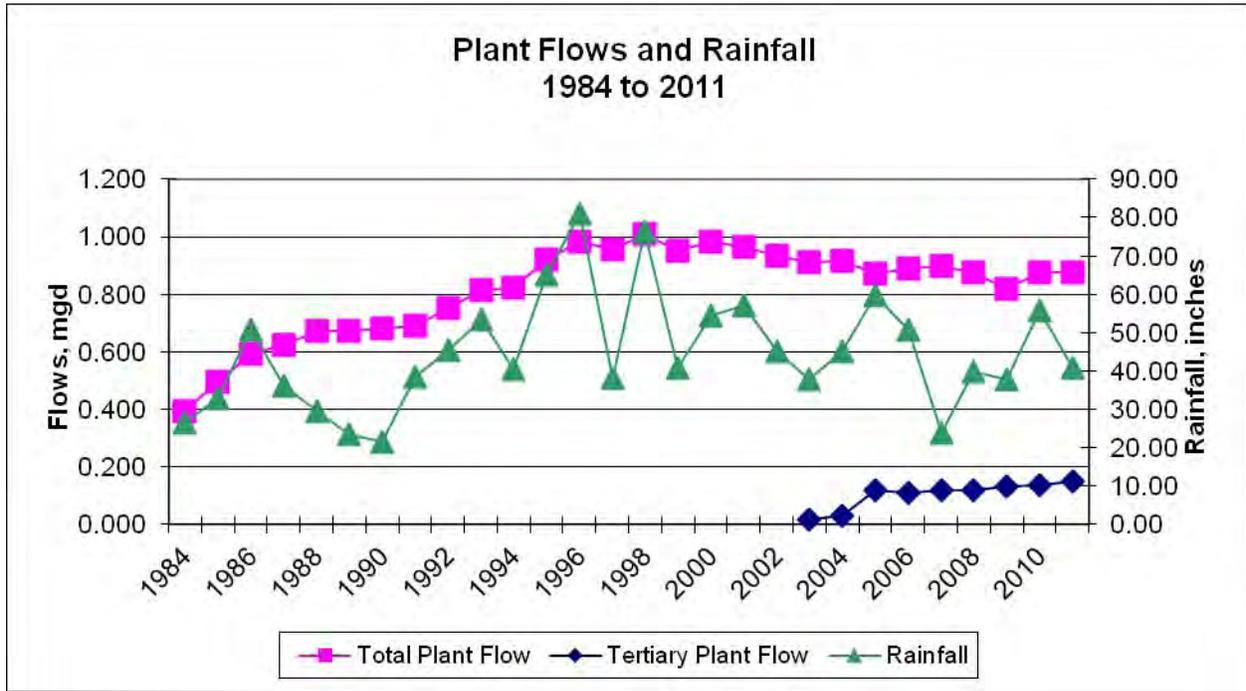


FIGURE 20

