



March 25, 2015

Tim Wagner, Environmental Group Manager
Department of Environmental Protection
Southcentral Regional Office
909 Elmerton Ave.
Harrisburg, PA 17110

**East Hanover Township Municipal Authority, Dauphin County
2014 Ch. 94 Wasteload Management Report**

Dear Mr. Wagner:

On behalf of the East Hanover Township Municipal Authority, GHD submits two copies of the 2014 Chapter 94 Municipal Wasteload Management Report. If you have any questions concerning the information provided, please feel free to contact me.

Sincerely,
GHD

A handwritten signature in black ink that reads "Nancy Adams". The script is cursive and fluid.

Nancy Adams
Environmental Scientist

Enclosures

C: Ron Reeder, East Hanover Township, 8848 Jonestown Road, Grantville, PA 17028, w/ enclosure
Curt Cassell, East Hanover Township, 8848 Jonestown Road, Grantville, PA 17028, w/ enclosure
Lee Stinnett, Salzmann Hughes, 105 North Front Street, Suite 205, Harrisburg, PA 17101, (electronic copy via email)

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East Hanover Township Municipal Authority

Wasteload Management Report

Chapter 94 - 2014

March 18, 2015

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Introduction

The East Hanover Township Municipal Authority (EHTMA) wastewater treatment plant (WWTP) processes include mechanical screening, activated sludge via sequencing batch reactors with biological nutrient removal, ultraviolet disinfection, effluent screening and cascade post-aeration prior to discharging to Bow Creek.

The EHTMA WWTP, which operates under DEP National Pollutant Discharge Elimination System (NPDES) Permit No. PA 0247464, has a maximum monthly design wastewater flow capacity of 0.40 MGD. The treatment plant is also designed for an organic loading of 458.7 lbs BOD/day. In 2014, the facility disposed of 38.1 dry tons biosolids averaging 1.8% solids. Biosolids are disposed of at the Derry Township Municipal Authority for agricultural utilization.

1. Hydraulic Loadings

Graph 1 in Appendix A presents the hydraulic loadings from 2010-2014, the annual average of hydraulic daily loadings for 2010-2014, and the projected loadings for the next five years (2015 - 2019). The monthly hydraulic loading data for 2010 to 2014 are presented in Appendix A, Table 1. The average daily flow for 2014 is 0.186 MGD. The hydraulic loading projections for 2015 to 2019 are based on the average of ratios of the 3-month maximum average flow to annual average flow for the years 2010 through 2014. The average maximum 3-month flow to annual average flow ratio is 1.10. This ratio is multiplied by the projected annual flows for 2015 through 2019 to obtain the projected maximum 3-month average flows.

2. Organic Loadings

An August 14, 2013 Organic Loading Supplemental Information letter addressed to Aaron W. Baar of the PA DEP is included in Appendix A. This letter is a supplement to EHTMA's 2014 Ch. 94 Report and provides a detailed explanation for only using organic loading data beginning in August 2012 for the 5-year projection calculations. Organic Loading data that are greyed-out on Table 2 and Graph 2 of Appendix A represent historic data that is unrepresentative for the reasons stated in the August 14, 2013 letter.

Additionally, on January 23, 2013 the sampler tube dislodged from the grating and pulled in solids from the bottom of the channel resulting in an influent BOD sample result of 2,190 mg/L (3,543 lbs/day). This sample is not representative of typical influent BOD concentrations for this facility and is therefore discarded in the average BOD loading calculation for January 2013. This section is presented based on data from August 2012 through December 2013.

Graph 2 in Appendix A presents the monthly organic loadings from August 2012 through 2014, the annual average of organic daily loadings since August 2012, and the projected loadings for the next five years (2015 - 2019). The monthly organic loading data for August 2012 to 2014 is presented in Appendix A, Table 2. The average organic loading for 2014 is 327 lbs BOD/day. The peak organic loading projections for 2015 to 2019 are based on the Organic Loading Projection Factor. This factor is calculated by dividing the one month maximum BOD loading by the annual average BOD

loading for the August 2012 through 2014. The resulting factor of 1.15 is multiplied by the projected annual BOD loadings for 2015 through 2019.

3. Basis of Projections

In addition to the information provided in Sections 1 and 2, the hydraulic and organic projected loadings are based on flow and BOD projections and population growth estimates. The projected annual flow is determined by averaging the gallons/day/EDU values for 2010 through 2014 and multiplying this number by the projected number of EDUs for each of the next five years multiplied by the 3-month maximum ratio. The average flow is 179 gallons/day/ EDU.

The projected annual BOD loading is determined by averaging the BOD loading/day/EDU values for August 2012 through 2014 and multiplying this number by the projected number of EDUs for each of the next five years multiplied by the maximum-month ratio. The average loading used is 0.29 lbs BOD5/day/EDU.

The sewered population for the past five years and the projected population for the next five years are presented in Table 3 of Appendix A. The projected population increase for 2015 through 2019 is estimated based on proposed housing developments in the service area.

4. Overload Conditions

The EHTMA WWTP is designed for a maximum monthly flow of 0.40 MGD and an organic loading of 458.7 lbs BOD/day. The projected maximum monthly flow through 2019 is not expected to exceed 0.40 MGD. The projected 3-month maximum flow through 2019 is 0.210 MGD. The projected maximum monthly organic loading through 2019 is not expected to exceed 458.7 lbs BOD/day. The projected maximum monthly organic loading through 2019 is 359 lbs BOD/day.

5. Industrial Waste Report

At the present time, there are no large industrial dischargers within the Township that are connected to the system. All discharge from small industrial and commercial users is domestic sanitary sewage originating from schools, hotels, restaurants, office buildings, churches, automotive service stations, and grocery.

6. Collection System Construction and Connections

There were no sanitary sewer extensions in 2014.

- The Preserve at Bow Creek is a private sewer extension that has not been dedicated over to the Authority yet.

A map of the EHTMA sewer system is provided in Appendix B.

7. Sewer System Monitoring, Maintenance, and Repair

East Hanover Township personnel are responsible for monitoring and maintaining all facets of the EHTMA wastewater treatment, collection and conveyance system. In terms of pump station monitoring, pump run times are recorded on a daily basis. Township staff also perform overall pump station checks on a daily basis. In the event of a power outage, the Township owns a portable generator to supply auxiliary power to Pump Stations 1, 2, and 3 and Pump Stations 4 and 5 have a permanent onsite emergency generator. The Township Engineer is available and utilized for unusual situations and/or events on an as-needed basis.

The Township sewer system is maintained on a continual basis to ensure structural integrity and to prevent increases in inflow and infiltration. Township personnel annually inspect all wastewater facilities, including a visual inspection of all manholes once per year. Repairs are made as-needed. All repairs and routine and non-routine maintenance completed at the WWTP and in the collection system are recorded in a Monthly Operator Report presented at the monthly East Hanover Township Municipal Authority meetings.

8. Condition of Sewer System

The general condition of the sewer system is good. Problems that are found are promptly repaired. To our knowledge, conveyance capacity has not been exceeded and we do not anticipate it being exceeded in the future.

9. Sewage Pump Stations

East Hanover Township personnel maintain five pumping stations. The pump stations are in good condition. Any problems that arise are promptly addressed and corrected.

The following design capacities and daily maximum flows are for peak conditions. Present maximum daily flows for each pump station are based pump run time logs (hour readings). Pump run times are recorded daily at each station. The two-year maximum flows are calculated using the two year projected growth and the location of that growth relative to each pump station, assuming 400 gpd/EDU for peak conditions for the additional EDUs.

No. 1	Condition	good
	Design Capacity	80 gpm (115,200 gpd)
	2014 Maximum Flow	25,968 gpd
	Projected 2-Year Maximum Flow	25,968 gpd

No. 2	Condition	good
	Design Capacity	80 gpm (115,200 gpd)
	2014 Maximum Flow	15,648 gpd
	Projected 2-Year Maximum Flow	15,648 gpd
No. 3	Condition	good
	Design Capacity	605 gpm (871,200 gpd)
	2014 Maximum Flow	485,301 gpd
	Projected 2-Year Maximum Flow	485,301 gpd
No. 4	Condition	good
	Design Capacity	80 gpm (115,200 gpd)
	2014 Maximum Flow	22,080 gpd
	Projected 2-Year Maximum Flow	22,080 gpd
No. 5	Condition	good
	Design Capacity	140 gpm (201,600 gpd)
	2014 Maximum Flow	17,640 gpd
	Projected 2-Year Maximum Flow	17,640 gpd

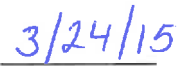
Municipal Official Acknowledgment and Approval

The East Hanover Township Municipal Authority is committed to providing adequate wastewater treatment services to the community. The objectives of this report are to manage, identify and address Sewer System needs now and in the future.

This 2014 Wasteload Management Report has been reviewed and is hereby approved for submission to the Pennsylvania Department of Environmental Protection (DEP) by:

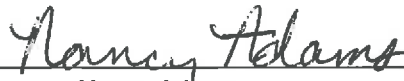


Rick A. Hoover, P.G., Chairman
East Hanover Township Municipal Authority

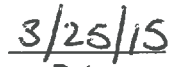


Date

Prepared by:



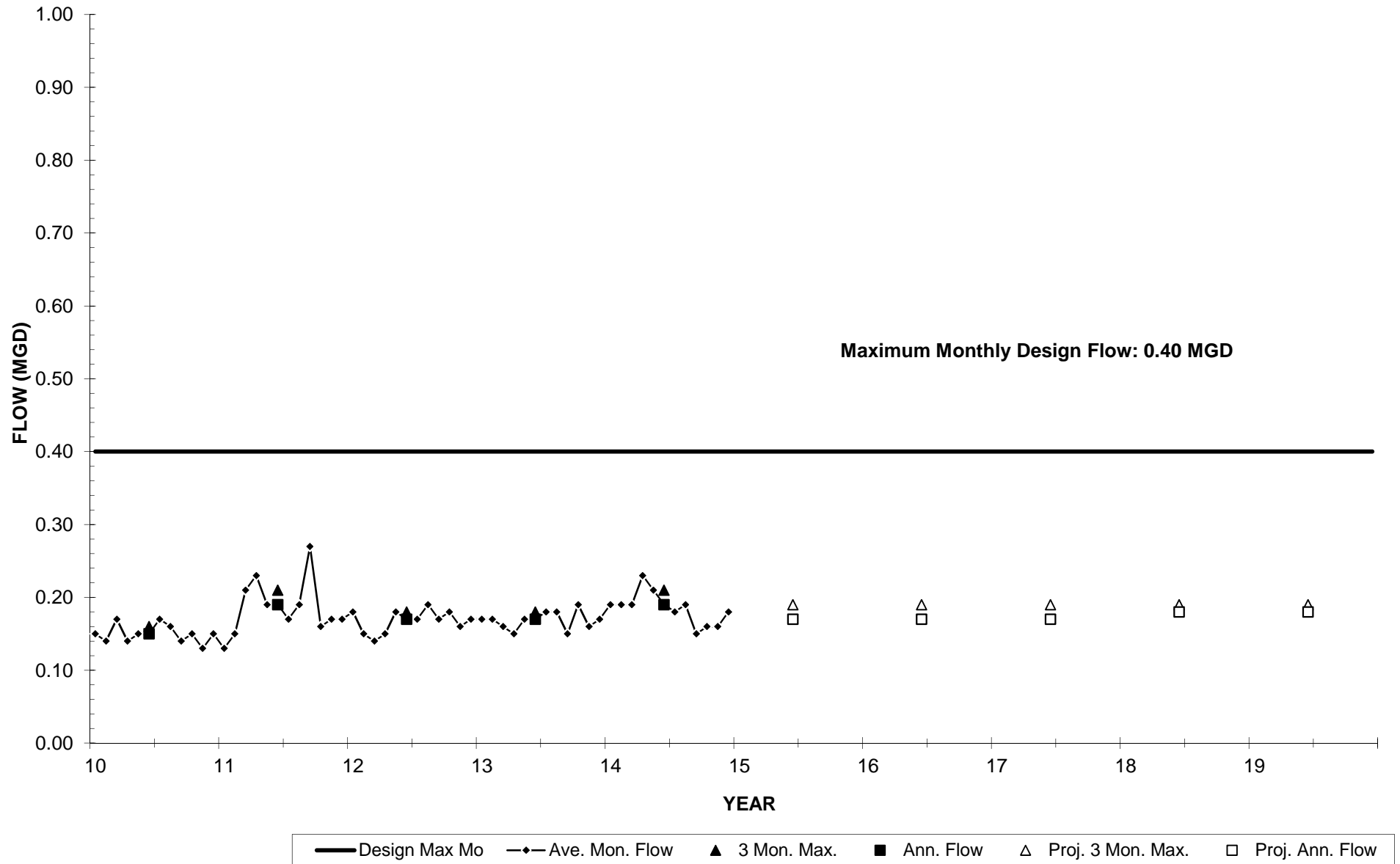
Nancy Adams
GHD



Date

Appendix A – Hydraulic and Organic Loading Data

Graph 1
EHTMA Hydraulic Loading



Graph 2
EHTMA Organic Loading

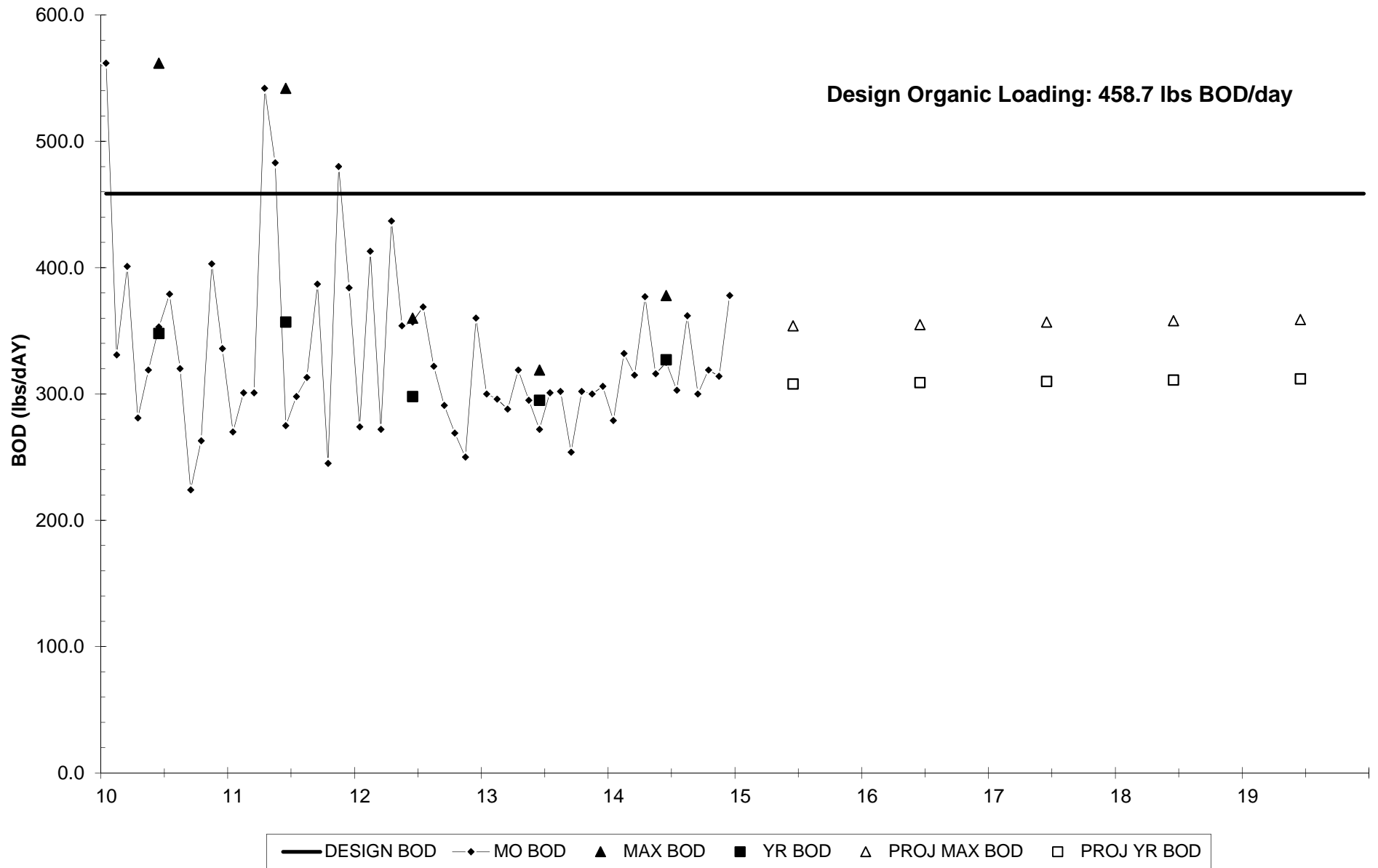


TABLE 1

**East Hanover Township Municipal Authority WWTP
FLOW TABLE**

FLows-MGD

<u>Month</u>	<u>Monthly Average Daily Flows, MGD</u>					
	2010	2011	2012	2013	2014	
January	0.145	0.133	0.176	0.171	0.190	
February	0.138	0.152	0.148	0.174	0.194	
March	0.165	0.208	0.144	0.164	0.194	
April	0.138	0.226	0.145	0.150	0.229	
May	0.146	0.189	0.177	0.165	0.214	
June	0.148	0.187	0.167	0.169	0.189	
July	0.173	0.165	0.174	0.181	0.182	
August	0.155	0.194	0.193	0.181	0.188	
September	0.138	0.274	0.170	0.151	0.152	
October	0.152	0.162	0.175	0.189	0.159	
November	0.133	0.167	0.160	0.162	0.158	5-Year
December	0.152	0.165	0.166	0.174	0.178	<u>Average</u>
Annual Average	0.149	0.185	0.166	0.169	0.186	0.171
Max. 3-Month Average	0.159	0.211	0.179	0.177	0.212	0.188
3-Mo. Max/Ave Ratio	1.07	1.14	1.08	1.05	1.14	1.10
EDU'S	844	861	982	1,038	1,083	
Flow/EDU (gpd)	177	215	169	163	172	179
Rainfall (inches)		77.3	40.7	41.6	39.8	
Remaining EDUs	[(Design Flow)/(Flow/EDU x Ratio)]-Existing EDUs=					948

FLOW PROJECTIONS

Year	Prev Flow +	(Add'l EDU's)	Incr Flow =	Proj Flow x	Proj Factor =	Proj 3 Mo Max
2015	0.171	5	0.001	0.172	1.100	0.189
2016	0.172	5	0.001	0.173	1.100	0.190
2017	0.173	5	0.001	0.174	1.100	0.191
2018	0.174	5	0.001	0.175	1.100	0.193
2019	0.175	5	0.001	0.176	1.100	0.194

Maximum Month Design Flow = 0.40

TABLE 2

**East Hanover Township Municipal Authority WWTP
BOD TABLE**

BOD LOADINGS - LBS/DAY

Month	Monthly Average Organic Loading, lbs/d ¹					
	2010	2011	2012	2013	2014	
January	562	270	274	300	279	
February	331	301	413	296	332	
March	401	301	272	288	315	
April	281	542	437	319	377	
May	319	483	354	295	316	
June	353	275	357	272	325	
July	379	298	369	301	303	
August	320	313	322	302	362	
September	224	387	291	254	300	
October	263	245	269	302	319	
November	403	480	250	300	314	
December	336	384	360	306	378	Average
Annual Average	348	357	298	295	327	307
Max. Monthly Average	562	542	360	319	378	352
Ratio	1.61	1.52	1.21	1.08	1.16	1.15
EDU's	844	861	982	1,038	1,083	
BOD lbs/EDU	0.41	0.41	0.30	0.28	0.30	0.29

Remaining EDUs $[(\text{Design BOD})/(\text{BOD/EDU} \times \text{Ratio})] - \text{Existing EDUs} = 292$

1 - See "Section 2 - Organic Loadings" of the narrative for a detailed explanation regarding greyed-values from 2010-2012 and shaded cells in 2013.

BOD PROJECTIONS

Year	Prev Load +	(Add'l EDUs)	Incr Load =	Proj Load x	Proj Factor =	Proj 1 Mo Max
2015	307	5	1	308	1.15	354
2016	308	5	1	309	1.15	355
2017	309	5	1	310	1.15	357
2018	310	5	1	311	1.15	358
2019	311	5	1	312	1.15	359

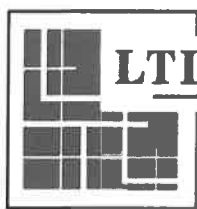
Design Load (lbs/day) = 458.7

TABLE 3

**East Hanover Township Municipal Authority WWTP
POPULATION DATA AND PROJECTIONS**

YEAR	2010	2011	2012	2013	2014*	Estimated Increase				
						2015	2016	2017	2018	2019
SEWER EDUS										
EHTMA	844	844	861	982	1,038	5	5	5	5	5
New EDUs		17	121	56	0					
TOTAL EDUS	844	861	982	1,038	1,083	5	5	5	5	5

* 2014 Total EDUs adjusted to account for correction to actual EDU count per Authority records.



LTL CONSULTANTS, LTD. • ENGINEERS & CODE OFFICIALS

PO BOX 241 • ONE TOWN CENTRE DRIVE • OLEY, PA 19547
(610) 987-9290 • FAX: (610) 987-9288

August 14, 2013

Aaron W. Baar
Department of Environmental Protection
Southcentral Regional Office
909 Elmerton Avenue
Harrisburg, PA 17110

RE: East Hanover Township 2012 Chapter 94 Report
Organic Loading Supplemental Information

Dear Mr. Baar,

On behalf of our Client, East Hanover Township Municipal Authority, we would like to thank the Department for meeting with us to discuss the wastewater treatment plant organic loading and 2012 Chapter 94 Report. As discussed during the meeting, we believe the high organic loading reported in the previous Chapter 94 reports are a result of periodic issues with the sampling protocol used and not truly representative of the actual organic loading received at the wastewater treatment plant. Please accept the following explanation of the previously reported organic loading, revised organic loading projections, and discussion of changes to the sampling setup.

2012 Organic Loading

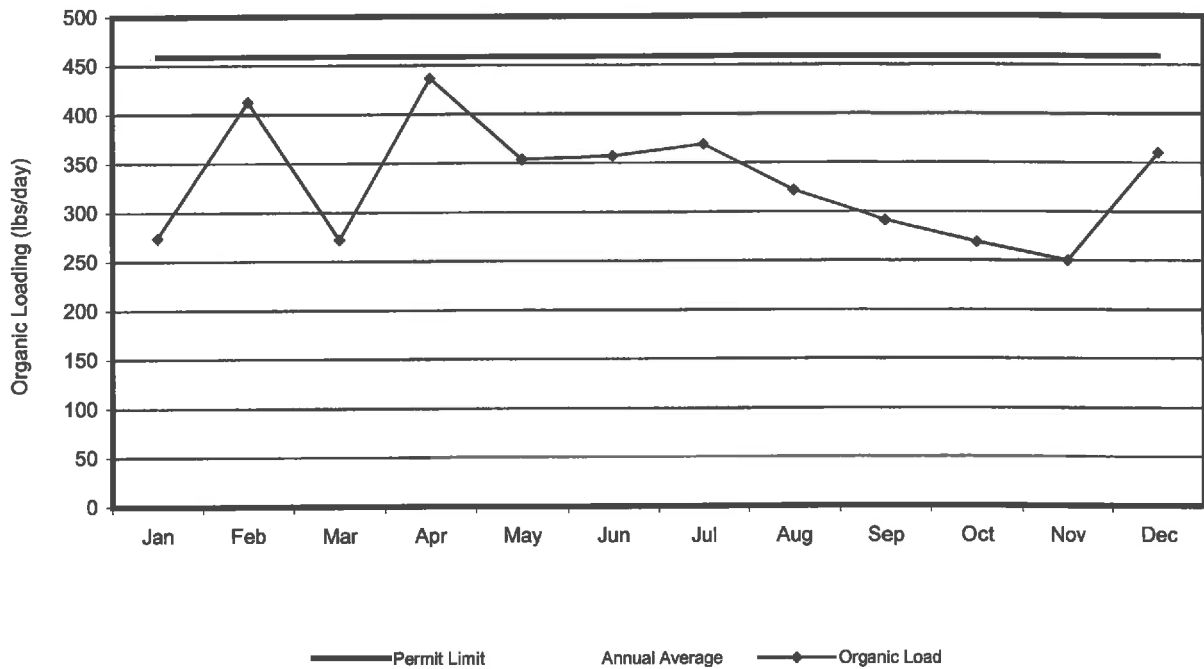
In July 2012, the Authority completed construction of the influent screening facility. Prior to the completion of this project, 8-hr composite samples were taken from the influent pump station wet well. As the water level in the wet well fluctuated, the floatable solids would occasionally be taken into the sampling port. This would result in an artificially elevated influent organic loading concentration. At no time has the wastewater treatment plant effluent exceeded the NPDES permit limits.

Following the construction of the influent screening facility, the sampler was relocated from the wet well to the channel between the screen and wet well. The sampling tube is now suspended from the grating into the flow stream. Following the sampler relocation, the organic loading between August 2012 and November 2012 ranged from 250 lbs/day to 322 lbs/day, which is well below the NPDES permit limit of 459 lbs/day. In December 2012, the reported organic loading was 489 lbs/day. This elevated organic loading was due to the sampler tube being dislodged from the grating support and taking in solids at the bottom of the channel. Please note that no other months in 2012 exceeded the organic limit. If we exclude the non-representative sample taken on December 12, 2012 (877 lbs/day), the monthly average for December is reduced to 360 lbs/day. The following table and graph show the corrected Organic Loading for 2012.

2012 Organic Loading Analysis

Month	Average Monthly (lbs/day)	Average Monthly (lbs/day) Post Screening Facility
January	274	
February	413	
March	272	
April	437	
May	354	
June	357	
July	369	
August	322	322
September	291	291
October	269	269
November	250	250
December	360	360
Average Monthly	341	298
Maximum Monthly	437	360
Maximum Monthly to Average Monthly Ratio	1.28	1.21

Organic Loading Graph 2012



5-year Projected Organic Loading

The Construction of the Screening Facilities was a significant modification to the wastewater treatment plant that removes the floatable solids that previously interfered with the sampling. Therefore, we propose using the data following the construction of the Screening Facilities for the 5-year organic loading projections. We believe this data is representative of the current and future sewage characteristics.

The average monthly organic loading from August to December of 2012 was 298 lbs/day with a maximum monthly organic loading of 360 lbs/day. This provides a maximum monthly to average monthly ratio of 1.21. This ratio was used to project the 5-year organic loading. As indicated in the following table, the 5-year projected maximum monthly organic loading is 375 lbs/day. Therefore, we do not project an organic overload in the next 5 years.

Year	EDUs	Average Monthly (lbs/day)	Maximum Monthly (lbs/day)
2012	982	298	360
2013	1020	309	374
2014	1023	310	375
2015	1023	310	375
2016	1023	310	375
2017	1023	310	375

We would also like to note that the organic loading during the first six months of 2013 is less than the projected loading shown in the table above. The average monthly concentration for the first six months was 295 lbs/day, with a maximum monthly loading of 319 lbs/day. This analysis does exclude a sample taken on January 23, 2013, which would have resulted in an organic loading of 3,543 lbs/day. Similar to the December occurrence, the sampler tube dislodged from the grating and was taking in solids from the bottom of the channel.

Sampling Protocol and Accuracy

To help prevent future sampling errors, the Authority has added additional restraints to the sampler tube that will secure the tube in the proper location. In the event there is a future sampling issue, the Authority will provide details in the monthly DMR. If and when possible, the Authority may provide additional sampling when the accuracy of a sample is in question.

Please feel free to contact me with any questions or comments.

Sincerely,



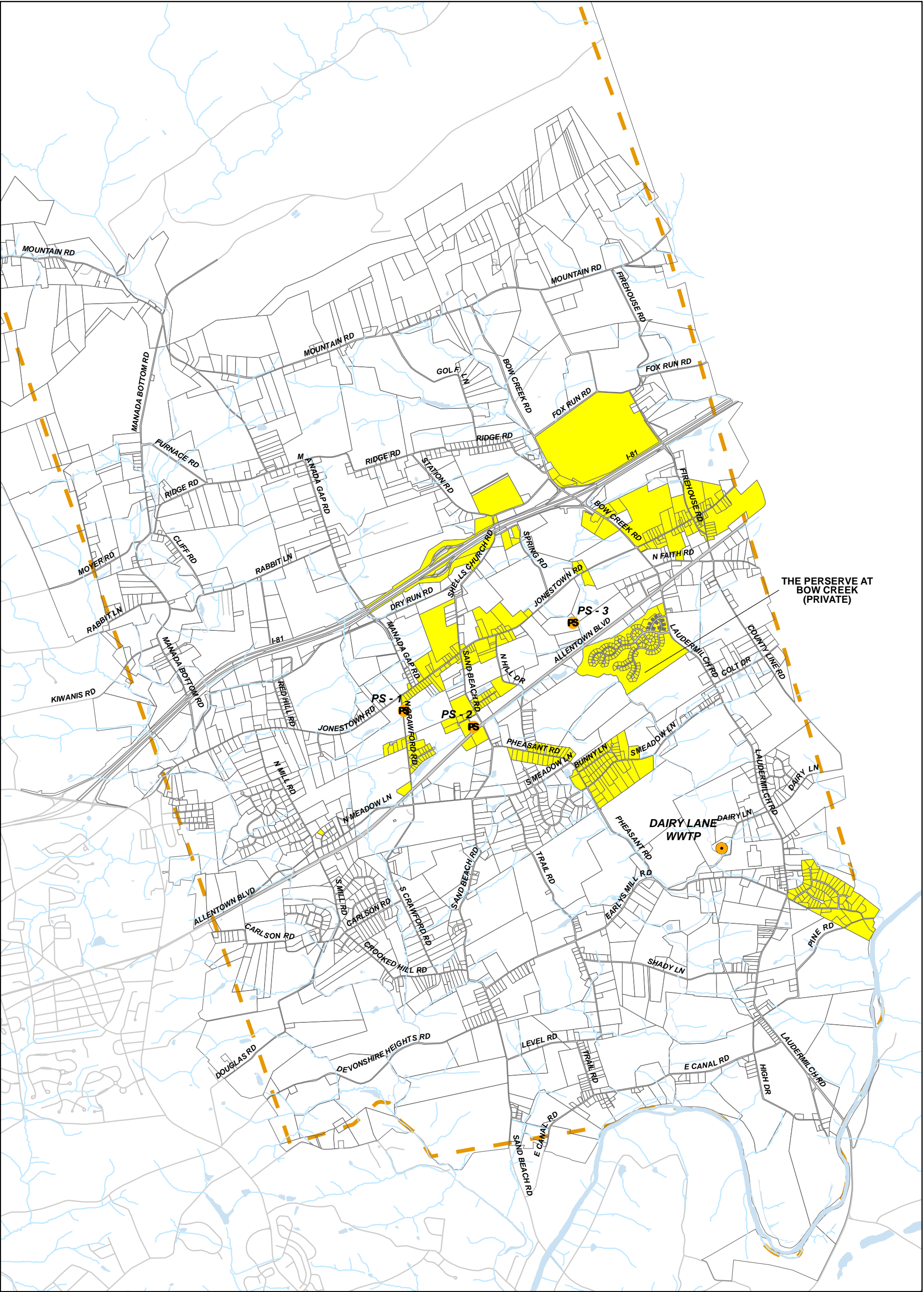
Hyon Duk Shin, P. E.

Water & Wastewater Department Manager

Cc: Ronald L. Reeder, Township Manager
Curt W. Cassell, Operator
Scott T. Wyland, Salzmans Hughes, P.C.
Lee Stinnett, Salzmans Hughes, P.C.

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Appendix B – Sewer Extension Map



LEGEND

WWTP

PUMP STATION

EXISTING SEWER SERVICE AREA

MUNICIPAL BOUNDARY

ROADS

STREAM

WATER BODY

Appendix C – Meter Calibration Report

W.G. MALDEN

P.O. BOX 196, EAST EARL, PA 17519
PHONE: (717) 768-0800 FAX: (717) 768-0802

*****SERVICE REPORT*****

CURTIS CASSEL
EAST HANOVER TOWNSHIP
8848 JONESTOWN ROAD
GRANTVILLE, PA 17028

SERVICE DATE: 12/2/2014
METER#: C8316 AA
LOCATION: WWTP EFFLUENT
SERIAL #: 0447/05 UR32547-001
MANUFACTURER: KROHNE/CHESELL
RECORDER: 392
TRANSMITTER: 1D20D
PRIMARY: 8" MAG
MAXIMUM CAPACITY: 7500 GPM
SERVICE CONTRACT: ANNUAL

WORK PERFORMED

CLEANED EQUIPMENT: X PRIMARY: X

RECORDER CALIBRATION CHECKED AT: 0, 25, 50, 75 & 100%
ERROR: 0% CORRECTED ACCURACY: $\pm 1\%$

TOTALIZER CALIBRATION CHECKED AT: OPERATING RATE
ERROR: 0% CORRECTED ACCURACY: $\pm 1\%$

TRANSMITTER CALIBRATION
VOLUMETRIC DRAWDOWN
ERROR: 0% CORRECTED ACCURACY: $\pm 1\%$

COMMENTS: PERFORMED ANNUAL CALIBRATION. LEFT EQUIPMENT OPERATING PROPERLY.

SERVICE REPRESENTATIVE: DENNIS
copies:

PERSON SEEN: CURTIS

Appendix D – Sewage Sludge Management Inventory

APPENDIX D
East Hanover Township Municipal Authority WWTP
Sewage Sludge Management Inventory

2014	Average Flow (MGD)	Average Influent BOD₅ (mg/L)	Average Effluent CBOD (mg/L)	Volume of Sludge Wasted (Gallons)¹	Average MLSS (mg/L)	Biosolids Generated (Dry Tons)	Average Total Solids (%)
January	0.190	175	3.25	90,299	2,677	2.96	1.7
February	0.194	220	3.00	66,715	2,478	4.03	2.0
March	0.194	227	3.20	76,081	2,384	3.39	1.7
April	0.229	173	3.20	79,858	2,397	5.24	1.9
May	0.214	195	3.00	80,566	2,394	3.56	1.9
June	0.189	212	3.25	82,808	2,453	0.89	1.2
July	0.182	203	3.00	102,712	2,500	5.39	2.0
August	0.188	198	3.00	90,491	2,261	3.94	2.0
September	0.152	232	3.25	71,501	2,041	2.82	1.7
October	0.159	241	3.50	43,126	2,208	2.33	1.9
November	0.158	248	3.67	53,575	2,378	2.28	1.9
December	0.178	306	4.75	52,818	2,530	1.30	1.9
Total				890,550		38.13	
Average	0.186	219	3.34		2,392		1.8
Min	0.152	173	3.00		2,041		1.2
Max	0.229	306	4.75		2,677		2.0

1 - Represents total volume of sludge wasted from SBR #1 and SBR #2.

GHD

1240 North Mountain Road

Harrisburg PA 17112

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www.ghd.com

