



**Biosolids Management Program
Performance/Management Review Report
*Annual Report to the Board 2015***

***Waco Metropolitan Area Regional
Sewerage System (WMARSS)***



BACKGROUND

The Waco Metropolitan Area Regional Sewerage System (WMARSS) treatment plant in Waco, Texas has been in operation for over 42 years. WMARSS provides wastewater treatment to seven owner cities: Bellmead, Hewitt, Lacy Lakeview, Lorena, Robinson, Waco and Woodway. The facility uses conventional, single stage, nitrifying, activated sludge treatment to meet state treatment requirements for its effluent. Two valuable end products result from these treatment processes: highly treated effluent for reuse and beneficial bio-solids.

Biosolids Manufacturing

Biosolids are either pelletized, using a heat drying process, or lagoon-stabilized, and then land applied. Either method results in beneficial reuse and landfill for emergency disposal (not a beneficial reuse).

The sludge Dryer/Pelletizer has been in operation since 1996, and has continually produced Class A biosolids. In this process, anaerobically digested sludge is dewatered and then heat dried to 92% dry. The result is a bio-solid "pellet" that physically resembles commercial fertilizer. These pellets are land applied using the same equipment utilized in the commercial fertilizer industry. The lagoons receive Class B, anaerobically digested sludge. After further stabilization in the lagoons, the biosolids meet Class AB requirements and can be land applied.

The distribution/transportation of biosolids products is accomplished through the combined efforts of WMARSS personnel, contractors, and/or customers. WMARSS personnel are responsible for producing and loading the Class A, pelletized product. The customer is responsible for hauling the dried material from the treatment plant to their site for land application or further processing (commercial fertilizer companies will purchase the pellets to create their own branded fertilizer products). WMARSS personnel are also responsible for producing the Class AB sludge from the stabilization lagoons. The contractor is then responsible for hauling and land applying the wet sludge at the customer's site.

Biosolids Regulatory Compliance

Sludge Table Dry Weight basis	8/21/2014	10/22/2012	12/19/2014	2/25/2015	4/23/2015	6/25/2015	Average sample mg/kg	Max value	Table-1 MAX Limit mg/kg
Arsenic	9	18	12.3	8.3	9.2	7.9	9.11	13.10	75
Cadmium	0.83	1.5	1.2	1.1	1.1	0.93	1.31	1.56	85
Chromium	24.5	30.6	30	28.4	32.1	69.3	46.71	57.10	3000
Copper	172	287	269	284	318	227	259.5	318	4300
Lead	14.7	23	22.3	27.4	31.8	23.9	23.85	31.8	840
Mercury	011	0.12	0.14	0.25	0.2	025	0.18	0.25	57
Molybdenum	8.7	15.4	10.9	11.4	11.9	7.6	11	15.4	75
Nickel	7.2	11	10.1	11.8	10.8	11.9	14.86	15.4	420
Selenium	2.9	4.9	3.3	3.4	3.9	3	3.57	11.8	100
Zinc	316	456	447	471	1390	361	573.5	1390	7500
MPN	8	2	<2	<2	<3	98	86	98	<1000

Biosolids Production

Year	Total metric Distributed	Dry tons	Pellets Class A, tons	Lagoon storage Class AB, tons	Landfill Class B, tons	% Beneficial reuse
2015	5761		4663	33	1064	82%
2014	4570		3062	811	697	85%
2013	4452		2819	1633	0	100%
2012	4757		3653	1105	0	100%
2010	5201		4209	917	75	99%
2009	5468		4102	1366	0	100%

WMARSS modifies its biosolids program as needed in response to factors such as new state regulations, new or improved best management practices, and changing customer demands. New Class AB sludge regulation effect the sludge lagoon product, the lagoon product was historically Class A before the new rule came into effect. The proposed New Digesters will produce a Class A product.

Biosolids Products

	Pellets Class A, tons	Lagoon cleaning Class AB, tons (Contract)	Landfill Class B, tons	Lagoon to Belt press Class AB, tons	Proposed New Digesters Class A, tons
Product material Wet or Dry	Dry 10% moisture	Wet 80% moisture	Wet 80% moisture	Wet 80% moisture	Wet 80% moisture
Fertilizer Value per Product ton	\$76.13	\$7.60	N/A	\$12.69	\$12.69
Production Cost per Dry ton	\$176.00	\$59.79 includes trucking	\$352.00 includes trucking	\$76.05 includes trucking	\$76.05 includes trucking
Treatment time per Dry ton	1 hours	180 days	11 hours	180 days	11 hours
Unit capacity of plant sludge production	90%	50%	100%	50%	50%
Improvements to increase unit capacity		50% Clean 2 lagoons		50% Dewatering and Cake Storage, clean 2 lagoons-mixing	100% Dewatering and Cake Storage

WMARSS hauling cost per market demand	Customer cost because pellets nutrient value per ton	Included in Contract	\$16 per wet ton/ \$368 per truck	\$8 per wet ton/ \$184 per truck	\$8 per wet ton/ \$184 per truck
Annual cost per 100% production	\$1,056,000	\$358,740	\$2,112,000	\$456,300	\$456,300
Truck loads per year @ 100%	240	3878	2080	2080	2080

The Biosolids Management Program establishes the goals and objectives for the NBP annually. The Manual is available online to City of Waco employees and by request to all other parties. The WMARSS website (www.wmarss.com) provides information about the facility and the NBP.

Goals and Objectives 2015

Below are the 2015 Goals and Objectives and a summary of the outcomes. The focus for this year's goals and objective is to improve the dependability of some problematic equipment within the bio-solids value chain. Also to provide an additional avenue to the dryer for beneficial bio-solids use equal to or reduced to current per ton of hauling and landfill cost disposal. The cost comparisons will be outlined in the bio-solids annual report.

Goal 1 - Increase the plants beneficial bio-solids processing capacity. Reduce the current practice of hauling sludge to the landfill when the dryer is not keeping up with sludge production.

Objective 1.1 Have a contractor clean out #3 Bio-solids lagoon and land apply full amount of bio-solids in lagoon #3 (30 million gallons) to three adjacent land owners that have a total of 1000 acres.

- Progress Tracking; 10/09/15 Bid package has been developed and engineering is viewing specs. 12/04/15 bid package approved by legal

Objective 1.2 - Land apply lagoon bio-solids from lagoon #3 to non-adjacent land 1000 wet tons per to provide an additional avenue of beneficial bio-solid outlet.

- Progress Tracking; Tal Elliot has picking up lagoon sludge 50 wet tons 12/16/15

Objective 1.3 - Irrigate 300,000 gallons of lagoon sludge to land adjacent to the plant current no lagoon sludge is bring applied to adjacent land a third avenue of beneficial bio-solid outlet.

- Progress Tracking;

Goal 2 - Reduce the tons of pellets loaded using the loader to a week.

Objective 2.1 - Design a auger in pellet storage building to bring 50 tons a week of pellets back to the above ground silo.

- Progress Tracking; Project has been designed and currently in the budget process.

Goal 3 - Reduce the number of hand entered trip tickets in the computer, an average of 400 per month.

Objective 4.1 - Install a septic and industrial receiving station scanner that automatically electronically records the trip ticket information reducing the number of hand entered to 50 tickets..

- Progress Tracking; 10/09/15, developing spec for the scanners for the receiving stations.

Goal 4 - Reduce the times in a day the septic station auger clogs with rag to once a week, currently clogs an average of 1 time a day.

Objective 4.1 - Install grinder for septic receiving station to reduce the size of the rag debris because the larger rags clogs the auger.

- Progress Tracking; 12/16/15, Currently Bidding out a grinder for the septic receiving station.

Goal 5 - Reduce Dryer downtime related to holes in air duct system to once a year, the pre-separator and poly-cyclones in the air duct have been the units causing the resent shut downs.

Objective 5.1 - Replace dryer pre-separator and poly-cyclones

- Progress Tracking; Contacts sign with vender to replace the unit

Objective 5.2 - Replace Dryer effluent air duct 90

- Progress Tracking; Contacts sign with vender to replace the unit, new 90 delivered, construction starts Jan 2016

Goal 6 - Develop a consistent market with the public interest parties for lagoon cake bio-solids product. We have a current interest of one individual for 25 wet tons a day.

Objective 6.1 – Communicate with local farmers and existing pellets customers to use 75 wet tons of day.

- Progress Tracking; Tal Elliot wants 25 wet tons a day.

Goal 7 - Install replacement gen set #1, currently generator 1 is out of service and beyond repair.

- Progress Tracking; P.O has been issued to selected contractor and pre-construction meeting is June 23, 2015 to install the new Jenbacher generator, 12/16/15 installation is 90% complete

Annual Reports

The NBP and the Biosolids Management Program Manual outline the required portions of the annual report, which includes: (element15) ***Bio-solids Management Program Performance Report***.

- a. Summaries monitoring data and other measurements that demonstrate the performance of WMARSS BMP relative to established goals, objectives and legal requirements.**

The pellets product tests results all passed the Class A requirements.

Attached (WMARSS incident corrective action tracking report). Incorporating new TCEQ class AB sludge requirements for Lagoon sludge.

- b. Summary of relevant contractor activities.**

The bio-solids contractor delivered 4505 wet tons of class B cake to the landfill for the year of 2014 and 7,093 wet tons for 2015.

c. Summary of performance relative to other voluntary adopted requirements, if any.

The waste to energy program processed an average of 1-million gallons a month of high strength organics and FOG from local industries. Generator #1 600kw unit installation is in progress. Using 16,000 cubic feet per hour (9.6mmbtu/hr) of methane gas produced from the anaerobic digesters @ \$3.00 per mmbtu this is a \$183,168 saving in natural gas cost. The new unit will increase the electrical savings from \$332,880 to \$416,100 annually.

	Natural Gas (MMBTU) (Cost)	Digester Gas (MMBTU) (Savings)	Electrical Production (Savings)
Dryer	18,974	81,913	0
Gensets	52,560	0	3,504,000
Totals	\$ 214,602	\$245,738	\$ 332,880

d. Progress towards achieving biosolids goals and objectives.

The 2015 Goals and Objectives status report is listed above.

e. Summary of internal audit results.

The summary for 2014 internal audit is attached but was performed in 2015 we plan on doing two internal audits in 2016.

No major nonconformance

f. Summary of the third party audit results.

The summary of the 2015 third party audit is attached

Three major nonconformances.

The NBP and the Biosolids Management Program Manual outline the required portions of the annual report, which includes: (element17) ***Management Review Report.***

g. Review monitoring data and other measurements that demonstrate the performance of WMARSS BMP relative to established goals, objectives and legal requirements.

Recommendations:

h. Review Progress towards achieving biosolids goals and objectives.

Recommendations:

i. Review of internal audit results.

Recommendations:

j. Review of the third party audit results.

Recommendations:

k. Review of performance relative to each of the 17 elements of the BMP.

Recommendations:

l. Review documentation of findings, evaluations, and follow up actions.

Recommendations:

m. Review the need for changes in existing policy or the adoption of new policy to support the BMP and biosolids related activities.


Recommendations:

The NBP requires annual reviews of Goals, Standard Operating Procedures, and system/process audits, both internal audits annually and third-party audits. This report documents the annual Program Performance Report and will contain the needed policy changes Utilizing the WMARSS audit corrective action sheet and summary sheet as an attachment, from the meeting between the Biosolids team and Program Manager (Management Review)

Respectfully Submitted, Biosolids Management Program Performance Report.


Michael Jupe
WMARSS Program Administrator

After the meeting with the Biosolids Team, (The Management Review) with Recommendations.


David Kerr
Program Manager
City of Waco

After WMARSS Board Meeting


Lisa Tyer
Utility Director

City of Waco