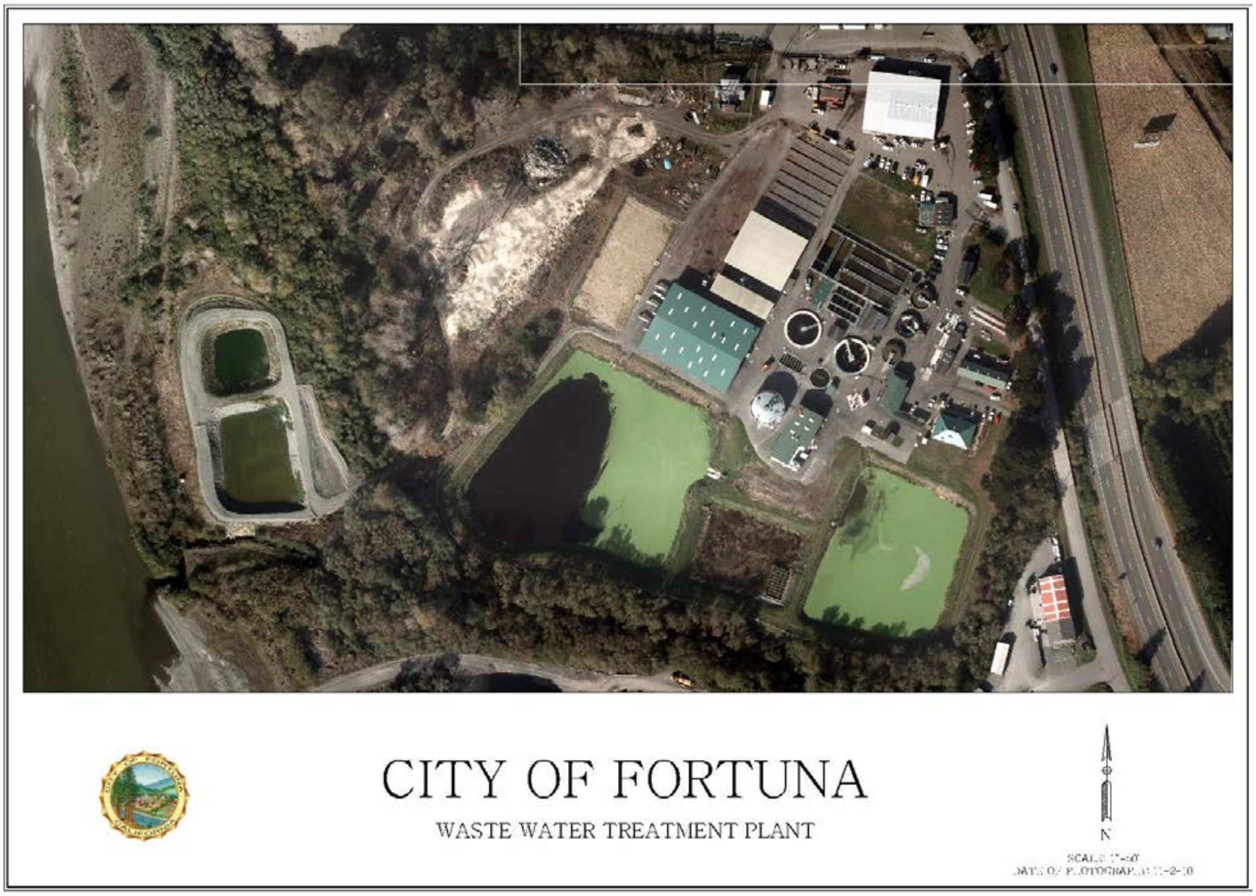
*CITY OF FORTUNA*

# TOM COOKE MEMORIAL WASTEWATER TREATMENT PLANT

*2014 ANNUAL REPORT*

January 19, 2015




1. **Introduction**

The Tom Cooke Memorial Wastewater Treatment Plant (WWTP) is operated by the City of Fortuna. The plant is located at 180 Dinsmore Drive, in Fortuna, Humboldt County, California and serves a population of approximately 12,000. Major treatment processes include screening and grit removal, primary treatment, secondary treatment, mixed liquor recycle for biological nutrient removal (BNR), sludge thickening, anaerobic digestion, electrical cogeneration, solids dewatering and composting, side stream equalization, and effluent disinfection. Treated effluent is currently discharged to the percolation ponds during dry weather, and to Strong's Creek, a tributary of the Eel River, during the wet weather season. The facility is permitted to compost biosolids to Class A Exceptional Quality standards. Numerous auxiliary systems are required for proper operation of many plant processes including: potable water, process water, HVAC, electrical power distribution, gas, chemicals, instrument air, and others.

The State Water Resources Control Board (SWRCB) classified the Tom Cooke Memorial Wastewater Treatment Plant as a Class III Secondary Treatment wastewater treatment facility. The facility currently operates under the SWRCB Order Number R1-2011-0004 issued on January 27, 2011.

This report is a summary of plant operation and performance during 2014. In addition to a discussion of effluent quality and the plant's success in meeting treatment objectives, the report contains summaries of 2014 plant operations, maintenance, chemicals, utilities, and human resources.

## 2. Summary

The plant generally operated well throughout the entire year. Together with careful control of operational processes, addition of ammonia prior to chlorination to form chloramines and aeration of the plant effluent has successfully allowed the facility to meet Disinfection Byproduct limits for discharge to Strongs Creek.

Historically, the WWTP was allowed to bypass storm flows into the oxidation ponds. Until November of 2007, the facility was permitted to discharge directly from the ponds into Strongs Creek. As such, the WWTP secondary treatment system did not have to treat the volumes that it currently treats during winter flows. Typically, peak flows through the plant prior to 2007 were 1.8 MGD. 2014 was not a typical year as far as rainfall is concerned so peak high flows were lower than previous years only reaching a maximum of 3.4 MGD.

The City is moving forward the process of looking at alternatives for treatment processes that will allow the City to comply with the anticipated regulations we will face in our 2016 NPDES permit. We are looking at several different options to fit several different combinations of treatment. The biggest challenge we face is losing the ability to discharge to the current percolation ponds after 2016. This leaves the city with very few cost effective means for discharge during the summer months without pumping across the river or south to private farmland. Initial studies show that the best option for the City is to follow through with the possibility of getting the Basin Plan amended in order to discharge to the receiving waters year-round. This will cost the City more in construction costs but will be beneficial in the long term. Currently this option has made the short list for consideration by the Regional Board and will be discussed this year.

Following is a list of effluent violations and Order Condition infractions from 2014:

- There were no violations in the month of January
- On February 5$^{th}$ and 15$^{th}$, Chlorine residual in the contact basin fell below minimum of 1.5. The chlorine dose was increased. On February 20$^{th}$ the pH fell to 6.3 due to the lack of ammonia but once the ammonia was put back online the pH increased.
- On March 8$^{th}$, the Total Maximum Chlorine Residual in the effluent was 3.2 mg/L, above the maximum of 0.02 mg/L. There were issues with the Dechlorination system that were fixed.
- There were no violations in months of April, May or June.
- On July 7$^{th}$ and 8$^{th}$ the chlorine residual fell below the 1.5 mg/L minimum in the contact basin.
- There were no violations in the month of August.
- On September 3$^{rd}$, 4$^{th}$, 8$^{th}$, 20$^{th}$ and 21$^{st}$ the chlorine residual fell below the 1.5 mg/L minimum in the contact basin. Working out the issues of switching disinfectant water from potable to process.
- On October 7$^{th}$ the CL2 Residual was below the minimum due to a plugged Ammonia ejector.
- No violations in November

- On December 19th the CL2 residual in the CCC was 1.4 mg/L and on the 22nd the pH at M-001 was 6.3 SU

## 3. OPERATIONS

### *a. Pretreatment*

In 2014 the City of Fortuna, with the assistance of Freshwater Environmental Services, continued implementing the Fats, Oils and Grease (FOG) Control Program (Element 7 of the City's draft SSMP) by conducting regular inspections of pretreatment devices at food service establishments within the City. This work was conducted under the authority of the current Fortuna Municipal Code which requires interceptors, when necessary, at food service establishments and also requires that they be regularly maintained. Inspection procedure includes an informal interview of the food service establishment's Owner or Manager regarding their existing infrastructure and kitchen practices, and an educational discussion of FOG source control. Violations are documented and proof of corrective actions is required. There were no major violations and business owners were educated on BMPs for FOG containment.

City of Fortuna utilities crews continued to inspect sanitary sewer manholes and other infrastructure for inflow and infiltration that may contribute to unnecessary volumes of waste water to be treated. Routine maintenance and video was done on the City’s collection system.

### *b. Influent Treatment and Quality*

The plant operates at an average dry weather flow of .760 Million Gallons per Day (MGD), and during wet weather can experience flows above 4.5 MGD. During high flow periods, plant influent is partially diverted to flow equalization ponds to allow the plant flow to remain at a controlled uniform rate below the plant’s current wet weather operational capacity of 3.8 MGD.

A summary of annual flow and influent parameter concentrations for the past three years is shown in Table 1.

**Table 1: Influent Parameters**

| | 2012 | 2013 | 2014 |
|---|---|---|---|
| Mean Influent Flow, MGD | **1.115** | **0.869** | **.939** |
| Total Annual Flow, MG | **400.2** | **316.5** | **343.6** |
| Mean Influent SS, mg/L | **302** | **303** | **347** |
| Mean Influent $BOD_5$, mg/L | **277** | **337** | **335** |

### *c. Preliminary Treatment*

The preliminary treatment process includes screening and grit removal as well as influent flow monitoring.

Wastewater enters the treatment facility at the head works structure, which provides a grit and screenings removal operation. There is one automatic stair-stepper type bar screen. This screening machine removes rags and large pieces of debris from the wastewater. Grit channels located downstream of the screen remove sand, gravel and similar heavy inorganic material by gravity separation. The grit channel operates at a lower velocity than standard because organics allowed to fall out of the waste stream are separated by a cyclone grit classifier and returned to the plan influent wet well. The grit and screenings are collected and hauled to a sanitary landfill site.

### d. Primary Treatment

After the grit channels, the next wastewater treatment process is primary sedimentation where the velocity of flow entering the clarifier tanks is reduced, allowing the heavier solids in the wastewater to settle to the bottom by gravity. Sludge collectors in the tanks sweep the settled sludge (primary sludge) into a sludge hopper located on the bottom of the tank, from where the sludge is pumped either to the anaerobic digester or the Gravity Belt sludge thickener. There are three circular primary clarifiers. By varying the number of units online, staff implemented a control strategy to optimize secondary treatment and provide additional carbon material to effect nutrient removal. The viability of utilizing primary sludge elutriation, rinsing carbon rich volatile acids out and back into the secondary system via the gravity belt thickener, hinges on the ability to perform this process without undue odor formation.

Table 2 contains a summary of key primary treatment effluent parameter concentrations over the previous three years.

**Table 2: Primary Treatment Effluent Parameters**

| | 2012 | 2013 | 2014 |
|---|---|---|---|
| Mean Primary Effluent TSS, mg/L | **86** | **75** | **88** |
| Mean Primary Effluent $BOD_5$, mg/L | **195** | **206.8** | **195.6** |

### e. Secondary Treatment

The secondary treatment process includes biological treatment of the waste stream as well as solids separation processes.

In the activated sludge process, effluent from the primary clarifiers flows to three parallel aeration basins where it is mixed with Return Activated Sludge (RAS) from final clarifiers and is aerated. Due to the low rainfall in 2014 only two of the basins were online for most of the year. The activated sludge is primarily comprised of micro-organisms and bacteria, which are a natural part of wastewater and are used to break down the organic solids in the wastewater. Micro-organism are monitored microscopically weekly by operations and laboratory staff to confirm number, type, and general health of the process.

A mixed liquor recycle system allows denitrification for removal of Nitrate Nitrogen from the waste stream. This process improves the secondary treatment process by returning a portion of the alkalinity removed during the nitrification process and reducing the need for caustic soda addition. At present, the process continues to require some caustic addition due to the inadequate supply of carbon which is necessary for anoxic conversion of Nitrate into Nitrogen gas. A curtain was installed at the beginning of one of the aeration basins to study the effects of a real anoxic zone at the front end of the process. Prior to this addition, air to this portion of the basin was simply shut down but residual oxygen from the later part of the aeration process leaked back in infiltrated this zone so it was difficult to obtain a true anoxic zone. Staff has not received the desired results we anticipated regarding the denitrification process but the curtain has lowered the alkalinity which in turn raised the pH therefore less is needed for the pretreatment side of the basins.

The mixed liquor from the aeration basins flows to large final clarifiers where the activated sludge is allowed to settle. A controlled quantity of this sludge is "returned" to the aeration basins as Return Activated Sludge (RAS) to repeat the treatment process, and excess quantities are removed as Waste Activated Sludge (WAS) to the WAS holding tank. There are two final clarifiers, and the number in operation is adjusted to optimize performance during varying flow conditions. Flows indicative of low rainfall has allowed the operation of only one secondary clarifier for the entire year.

A summary of key aeration basin parameters for the previous two years is shown in Table 3.

**Table 3: Secondary Treatment Process Parameters**

| | *2012* | *2013* | *2014* |
|---|---|---|---|
| Mean Mixed Liquor Suspended Solids, mg/L | **2861** | **2860** | **1464** |
| Mean F:M Ratio | **0.17** | **0.17** | **.25** |
| Mean Cell Residence Time, days | **30** | **30** | **14.1** |

### *f. Final Effluent Treatment and Quality*

Chlorine gas is combined with ammonia to form chloramines which are used to disinfect the final effluent before it is discharged. Ammonia is fed into the chlorine feed water at a carefully controlled dosage to limit the formation of Disinfection Byproducts. Aeration has been added immediately prior to discharge to further reduce Disinfection Byproducts and raise effluent pH and Dissolved Oxygen. In 2014, the plant continued to produce a high quality effluent. A summary of key final effluent parameters for 2014 is shown in Table 4. Details of the final effluent qualities are presented in graphical form in Appendix A. A summary of other key treatment parameters for 2014 is shown in Table 5.

**Table 4: Treated Wastewater Parameters 2014**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen (mg/L) | 2 | 1.2 | 0.87 | 0.63 | 0.76 | 13 | 3.4 | 3.5 | 0.44 | 6.3 | 2 | 1.6 |
| Unionized Ammonia Nitrogen (mg/L) | 0.0047 | 0.0033 | 0.0017 | 0.0014 | 0.0011 | 0.061 | 0.012 | 0.013 | 0.0019 | 0.016 | .0046 | .003 |
| Nitrate as nitrogen (mg/L) | 5.8 | 5.5 | 3.3 | 15 | 13 | 16 | 18 | 21 | 22 | 18 | 23 | 17 |
| Total Phosphate Phosphorous (mg/L) | 3.4 | 4.3 | 2.8 | 4.2 | 0.87 | 4.7 | 5.6 | 4.9 | 5.3 | 5 | 4.5 | 2.9 |
| Copper (ug/L) | 9.4 | 12 | 11 | 15 | 8.4 | 9.2 | 13 | 9.3 | 9 | 11 | 9.7 | 9.6 |
| Bromodichloromethane (ug/L) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | .61 | ND |
| Dibromochloromethane (ug/L) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Nitrate, lbs/day average | 52 | 61 | 42 | 162 | 117 | 139 | 139 | 142 | 157 | 144 | 198 | 312 |

**Table 5: Key Treatment Parameters 2014**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EFFLUENT BOD, mg/L | | | | | | | | | | | | |
| Max | 7.8 | 8.2 | 8.9 | 7.6 | 5.4 | 12.2 | 12.2 | 5.4 | 8.7 | 9.1 | 9.1 | 8.7 |
| Mean | 7.2 | 7.1 | 7 | 6.6 | 3.8 | 8.7 | 7.6 | 4.7 | 6.6 | 8 | 7.5 | 7.4 |
| Average lbs/day | 65 | 79 | 88 | 71 | 34 | 75 | 50 | 32 | 47 | 64 | 64 | 141 |

| INFLUENT BOD, mg/L | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max | 455 | 325 | 303 | 280 | 420 | 337 | 460 | 558 | 503 | 427 | 388 | 315 |
| Mean | 360 | 288 | 262 | 266 | 345 | 312 | 353 | 466 | 442 | 372 | 334 | 221 |
| Average lbs/day | 2231 | 2414 | 2572 | 2021 | 2216 | 1939 | 2126 | 2794 | 2791 | 2665 | 2515 | 3502 |

| INFLUENT TSS, mg/L | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max | 623 | 428 | 450 | 303 | 462 | 356 | 449 | 599 | 502 | 464 | 397 | 328 |
| Mean | 424 | 305 | 292 | 268 | 383 | 314 | 353 | 449 | 415 | 413 | 335 | 246 |
| Average lbs/day | 2627 | 2556 | 2866 | 2036 | 2460 | 1951 | 2126 | 2692 | 2620 | 2959 | 2523 | 5482 |

| EFFLUENT TSS, mg/L | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max | 5.1 | 6.8 | 7.7 | 12.4 | 5.3 | 21.9 | 14.6 | 4.3 | 14.1 | 14.1 | 10.3 | 33.2 |
| Mean | 4.5 | 5.5 | 6.9 | 7.5 | 3 | 12.1 | 9.7 | 2.9 | 6.9 | 6.1 | 5.6 | 14.5 |
| Average lbs/day | 41 | 61 | 87 | 81 | 27 | 105 | 64 | 19 | 49 | 49 | 48 | 266 |

| INFLUENT FLOW, MGD | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max | 0.869 | 1.513 | 2.344 | 1.554 | 0.932 | 0.85 | 0.814 | 0.847 | 1.26 | 1.602 | 1.727 | 3.416 |
| Mean | 0.743 | 1.005 | 1.177 | 0.911 | 0.77 | 0.745 | 0.722 | 0.719 | 0.757 | 0.859 | 0.903 | 1.964 |
| TOTAL | 23.019 | 28.139 | 36.501 | 27.327 | 23.872 | 22.36 | 22.74 | 22.3 | 22.719 | 26.642 | 27.091 | 60.9 |

| EFFLUENT FLOW, MGD | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max | 1.083 | 1.327 | 1.509 | 1.294 | 1.079 | 1.04 | 0.795 | 0.81 | 0.854 | 0.956 | 1.03 | 2.268 |
| Mean | 1.236 | 1.932 | 2.781 | 1.961 | 1.297 | 1.152 | 1.112 | 0.946 | 1.432 | 1.565 | 1.901 | 4.875 |
| TOTAL | 33.579 | 37.149 | 46.767 | 38.814 | 33.444 | 31.188 | 24.631 | 25.1 | 25.618 | 29.63 | 30.907 | 70.3 |

| SETTLEABLE SOLIDS, ml/L | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max | <0.1 | <0.1 | <0.1 | <0.1 | N/A | N/A | N/A | N/A | N/A | N/A | <0.1 | <0.1 |
| Mean | <0.1 | <0.1 | <0.1 | <0.1 | N/A | N/A | N/A | N/A | N/A | N/A | <0.1 | <0.1 |

| COLIFORM, MPN | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Median | 3 | 18 | 17 | 4.3 | 1.9 | 1.8 | 1.8 | 2 | 2 | 2 | <1.8 | 1.9 |
| Max | 13 | 130 | 79 | 11 | 7.8 | 70 | 33 | 4.5 | 4.5 | 4.5 | <1.8 | 4.5 |

| PH | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max pH | 7.1 | 6.9 | 6.9 | 6.8 | 6.7 | 6.9 | 6.9 | 7.2 | 7.3 | 7 | 6.9 | 6.3 |
| Min pH | 6.3 | 6.6 | 6.8 | 6.7 | 6.6 | 6.6 | 6.8 | 6.9 | 6.9 | 6.7 | 6.7 | 7.2 |

| BASIN CHLORINE RESIDUAL, mg/L | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean | 2.9 | 3.2 | 4.1 | 3.9 | 3.9 | 3.7 | 3.6 | 3.2 | 2.2 | 2.5 | 2.6 | 2.8 |
| Max | 6.9 | 5.8 | 5 | 4.4 | 4.8 | 5.2 | 5.5 | 5.8 | 3.4 | 4 | 5 | 4.5 |

| Mixed Liquor Concentration, mg/L | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean | 1853 | 1412 | 1620 | 1157 | 1403 | 1696 | 1568 | 1491 | 1385 | 1302 | 1258 | 1428 |
| Max | 2168 | 1527 | 2267 | 1289 | 1673 | 2302 | 1975 | 1737 | 1590 | 1618 | 1456 | 2182 |

| Sludge Wasted, LBS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max | 1045 | 1107 | 1,141 | 1002 | 945 | 853 | 765 | 806 | 738 | 1329 | 861 | 1437 |
| Mean | 893 | 804 | 879 | 545 | 784 | 695 | 611 | 638 | 620 | 646 | 22600 | 22159 |
| TOTAL(1000 lbs) | 27.7 | 22.5 | 27.3 | 16.4 | 24.3 | 20.8 | 19 | 19.8 | 18.6 | 20 | 21.8 | 31.8 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Sludge Digested, LBS | 38718 | 28627 | 31999 | 33947 | 42916 | 37793 | 40316 | 61589 | 64106 | 46771 | 35870 | 39198 |
| Digester % solid | 2.8 | 2.5 | 2.2 | 2.4 | 2.2 | 1.9 | 2 | 2.4 | 2.3 | 2 | 2.3 | 2.5 |
| Cogeneration, kwh | 19.75 | 0 | 0 | 17 | 91.25 | 153.75 | 103.5 | 70.5 | 60.5 | 88.5 | 98 | 37.5 |
| Mean Primary Effluent BOD, mg/L | 226 | 190 | 148 | 169 | 208 | 219 | 230 | 239 | 225 | 206 | 186 | 102 |
| Mean Primary Effluent TSS, mg/L | 76 | 77 | 69 | 103 | 86 | 102 | 95 | 88 | 102 | 113 | 80 | 65 |

### g. *Solids Handling*

The anaerobic digestion process reduces sludge volume and stabilizes the solids to form biosolids. In 2014, an average of 1937 lb/day of raw sludge from primary treatment was pumped to the anaerobic digester for treatment. Average total solids (TS) concentration of raw sludge was 2.5% and total volatile solids content was 85% of TS. Waste activated sludge (WAS) was diverted from the mixed liquor recycling line to eliminate fluctuations in digester feed rates due to variations in RAS concentrations and pumped to the anaerobic digester after processing through the gravity belt thickener. In 2014, approximately 364 lb/day of WAS was thickened and sent to the digester. In 2014, approximately 320 dry metric tons of biosolids were produced. We produced approximately 250 cubic yards of Class A Exceptional Quality compost. Biosolids are composted for 15 days at temperatures in excess of 140 degrees to destroy pathogens and are tested quarterly for metals content to ensure Exceptional Quality status and safety of the finished material. Results of tests performed in 2014 are presented in Table 6. We did meet the 40-503 standards for fecal coliform and salmonella which is what is required for Class A compost. We only tested two lots of compost which was during the 1$^{st}$ and 3$^{rd}$ quarters of 2014.

**Table 6: Biosolids Quality Monitoring 2014**

| Compost monitoring in 2014, mg/kg | 1$^{st}$ Quarter | 2nd Quarter | 3$^{rd}$ Quarter | 4th Quarter |
|---|---|---|---|---|
| Chromium (Cr) | 47 | NA | 43 | NA |
| Nickel (Ni) | 44 | NA | 45 | NA |
| Copper (Cu) | 310 | NA | 250 | NA |
| Zinc (Zn) | 580 | NA | 530 | NA |
| Arsenic (As) | 4.1 | NA | 3.4 | NA |
| Selenium (Se) | 4.4 | NA | 3.5 | NA |
| Molybdenum (Mo) | 4.6 | NA | 35.1 | NA |
| Cadmium (Cd) | 1.8 | NA | 1.4 | NA |
| Mercury (Hg) | 0.53 | NA | 0.56 | NA |
| Lead (Pb) | 49 | NA | 41 | NA |

| Compost monitoring in 2014 | 1$^{st}$ Quarter | 2nd Quarter | 3$^{rd}$ Quarter | 4th Quarter |
|---|---|---|---|---|
| Salmonella, MPN/ 1 g TS | <0.4 | NA | NA | NA |
| Fecal Coliform, MPN/ 1 g TS | 3.4 | NA | 229 | NA |

(Manure Typically has >2,400 MPN/g TS Fecal Coliforms)

## 4. MAINTENANCE

### *a. Maintenance Summary*

The WWTP performed a variety of scheduled, preventative, predictive and breakdown maintenance on a wide variety of equipment. The main goal of maintenance activities is to ensure equipment availability to meet plant process operation requirements.

The WWTP work area includes all major and auxiliary processes. Maintenance minimizes callouts, reduces overtime costs, limits potential for discharge violations due to mechanical failure, and costs associated with repairs are significantly lower than replacement costs.
In addition to routine lubrication and preventative maintenance activities, the following notable predictive maintenance was completed in 2014:

- Installed new VFD for RAS pump #3 and Clarifier #5
- Replaced aeration blower filters
- Installed new fan switch at Cogeneration facility
- Replaced skimmer arm and bottom side blades for Clarifier #5
- Replaced all 3 belts on belt filter press
- Replaced grit chain gear box.

### *b. Flow Meter Calibration Record*

Flow to the plant is measured at the head works and chlorine contact basin effluent weir. Meters are checked monthly for accuracy and functionality.

## 5. CHEMICALS AND UTILITIES

### *a. Chemicals*

Several chemicals are used for a variety of treatment processes at the plant. Major process chemicals are discussed below and include:

- Sodium Hydroxide (Nutrient Removal, pH adjustment)
- Chlorine gas (Disinfection)
- Sulfur Dioxide gas (Dechlorination)
- Ammonia Hydroxide

#### i. Sodium Hydroxide for Nutrient Removal and pH Adjustment

Sodium Hydroxide consumption to provide for the increased demand for alkalinity associated with nitrification for nutrient removal (i.e. ammonia) during 2014 was approximately 30.5 tons. Sodium Hydroxide was applied to the mixing box upstream of the aeration basins and, if necessary, prior to discharge to Strongs Creek.

#### ii. Chlorine for Disinfection

Chlorine is used for disinfection of the final effluent. In 2014, approximately 10.7 tons were consumed for this purpose.

#### iii. Sulfur Dioxide for Dechlorination

Sulfur Dioxide is used for dechlorination of the final effluent prior to discharge to Strong's Creek. In 2014, approximately 10 tons was consumed for this purpose.

#### iv. Ammonia Hydroxide

Ammonia Hydroxide is used to eliminate free, uncombined chlorine and limit Disinfection Byproduct formation.

### *b. Utilities*

#### i. Reclaimed Water

The total amount of water reclaimed from the treated effluent for use in the treatment plant averaged 71,899 gallons per day for an estimated reclaimed water usage of 26.2 million gallons in 2014. In July we switched our disinfection water from potable water to process water saving approximately 13 million gallons in potable drinking water. This was done in part as a cost saving measure but expedited due to the heavy drought conditions.

#### ii. Cogeneration

During the year, we operated the cogeneration unit for 591 hours at 86 kilowatts (kw). The City has signed on to programs to reduce power consumption on the grid during high peak times so we run the cogeneration unit more often in the summer high-peak months then in the winter.

## 6. HUMAN RESOURCES

### *a. Staffing*

In 2014, the treatment plant was able to increase its personnel to 9 employees with the addition of one full time OIT position. This increase in personnel has allowed the City of Fortuna to partner with College of the Redwoods, which is located about ten miles north of the city, to provide certified operation services for their WWTP while they search for a Grade III operator. City staff oversees their facilities as well as provides operators on a daily basis to monitor and operate the College's WWTP. Plant staffing for 2014 is shown in Table 7.

**Table 7: Plant Staffing**

| | |
|---|---|
| Chief Plant Operator | 1 |
| Shift Supervisor | 2 |
| WWTP Operator | 2 |
| Plant Maintenance Mechanic | 1 |
| Lab Director | 1 |
| OIT Full Time | 3 |

### *b. Staff Training & Development*

In addition to weekly safety meetings, the WWTP has developed an Operator Training Program that expands the abilities of the operational staff, resulting in better service to the public, and better, more efficient operation of the facility.

WWTP operating staff conducted and/or attended the following trainings:

- Asbestos Training
- Trench Safety
- Respiratory Protection
- Confined Space
- Bloodborne Pathogens
- Lifting and Carrying

### *c. Operator Certification*

The WWTP continues to have two full time Shift Supervisor positions in the organizational structure of the water and wastewater treatment facilities. This allows for operational and process changes to be made when needed, including during weekends, in accordance with SWRCB Office of Operator Certification guidelines, and provides the required two operators on duty at all times. While this demonstrates compliance with the regulations of the Office of Operator Certification, it also provides sufficient levels of staffing and improves staff safety during holidays and weekend shifts.

Table 8 summarizes the status of operator certification held by WWTP operators at the facility during 2014.

**Table 8: Wastewater Treatment Certifications**

| | |
|---|---|
| Grade IV | 1 |
| Grade III | 4 |
| Grade II | 1 |
| O.I.T. | 3 |

Additional certifications held by WWTP staff include Laboratory Analyst, Water Treatment, & Maintenance Technologist certifications. One staff member is qualified to perform Energized Electrical Work, as well.

## 7. Certification of Report

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including fine and imprisonment for withholding information regarding permit violations.

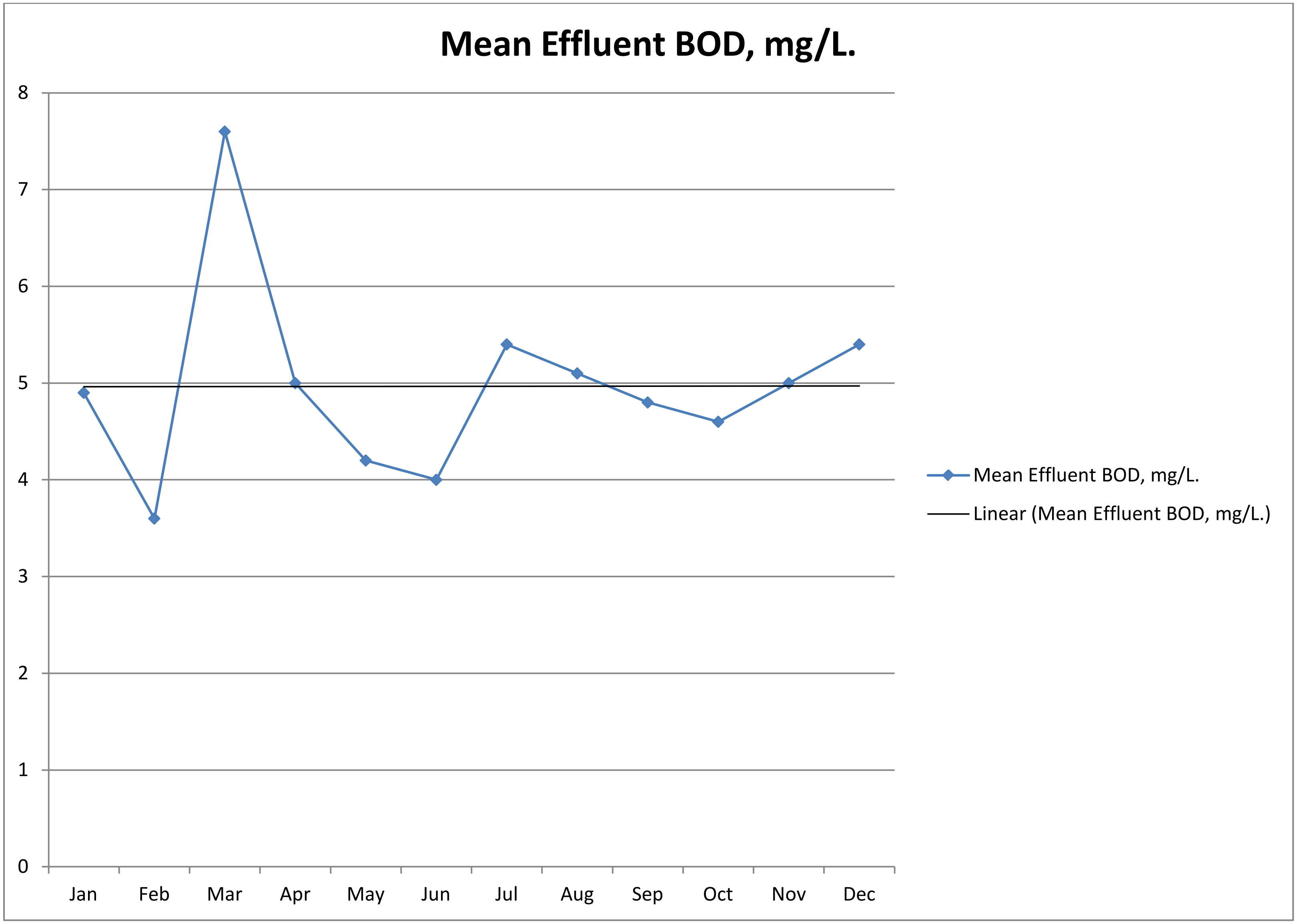
If you have any questions or need additional information, please feel free to contact me at dculbert@ci.fortuna.ca.us or (707)725-1476.

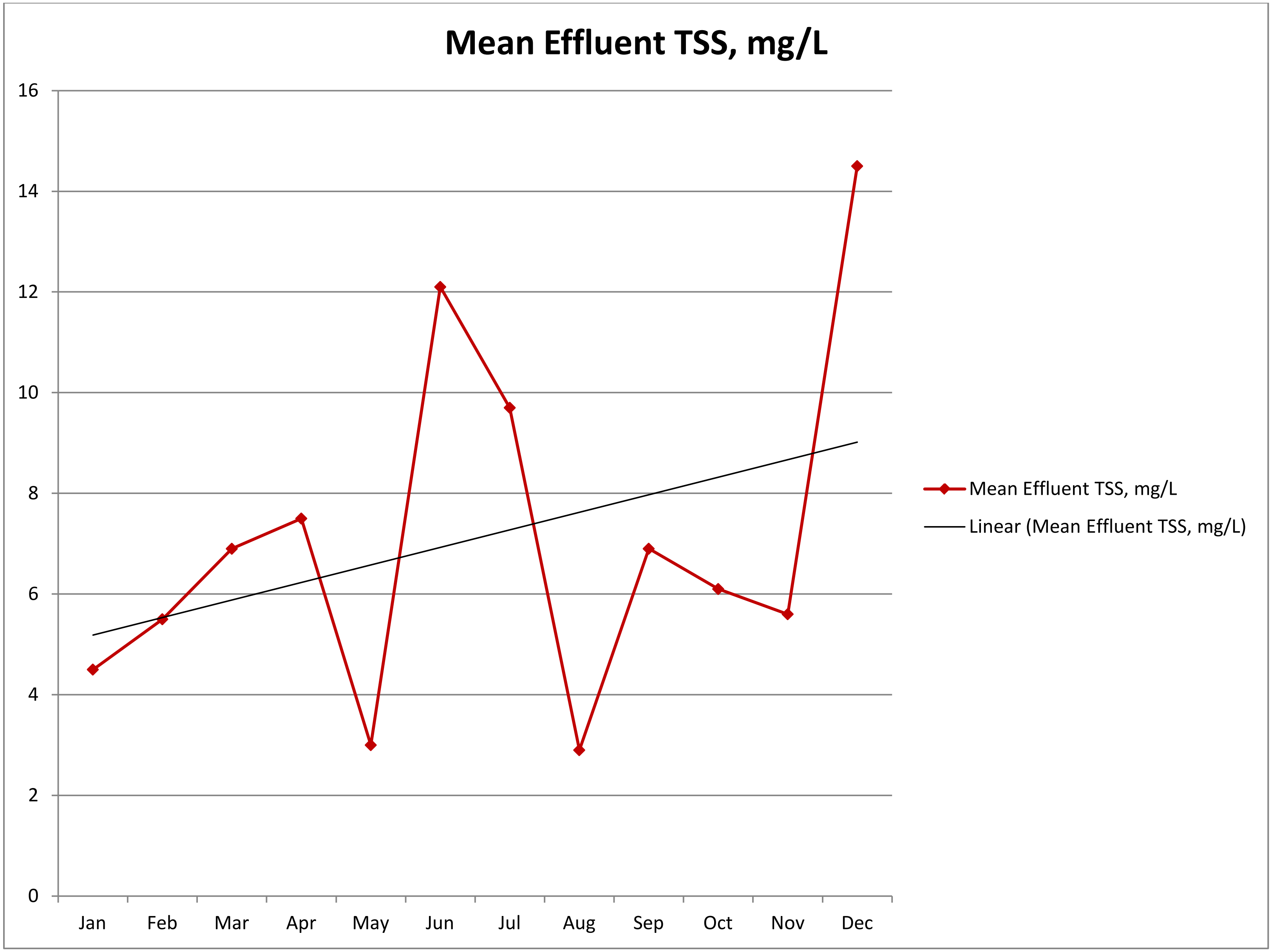
Sincerely,

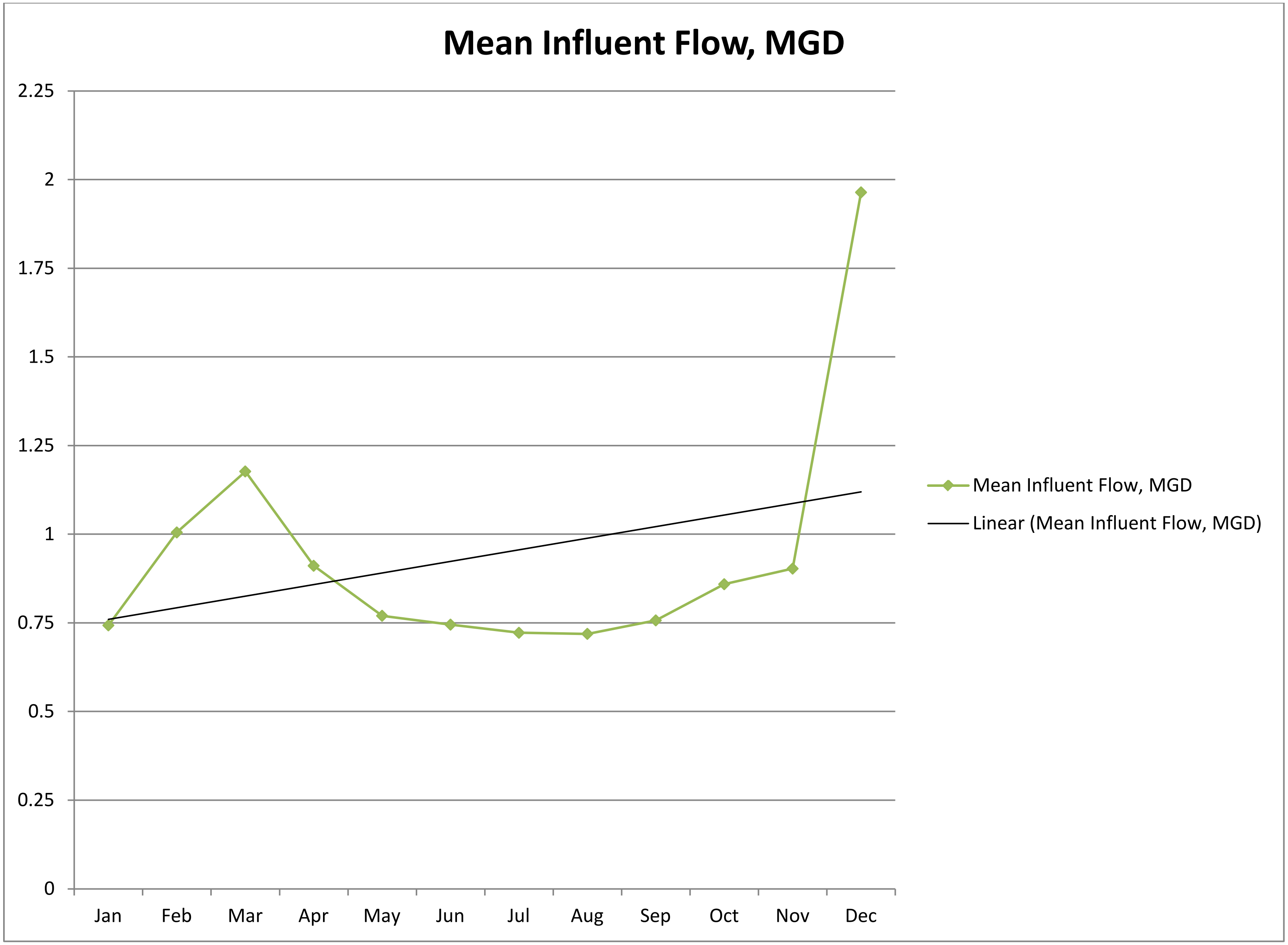
Doug Culbert, WWTPO IV-9678
Chief Plant Operator
City of Fortuna, Tom Cooke Memorial WWTP

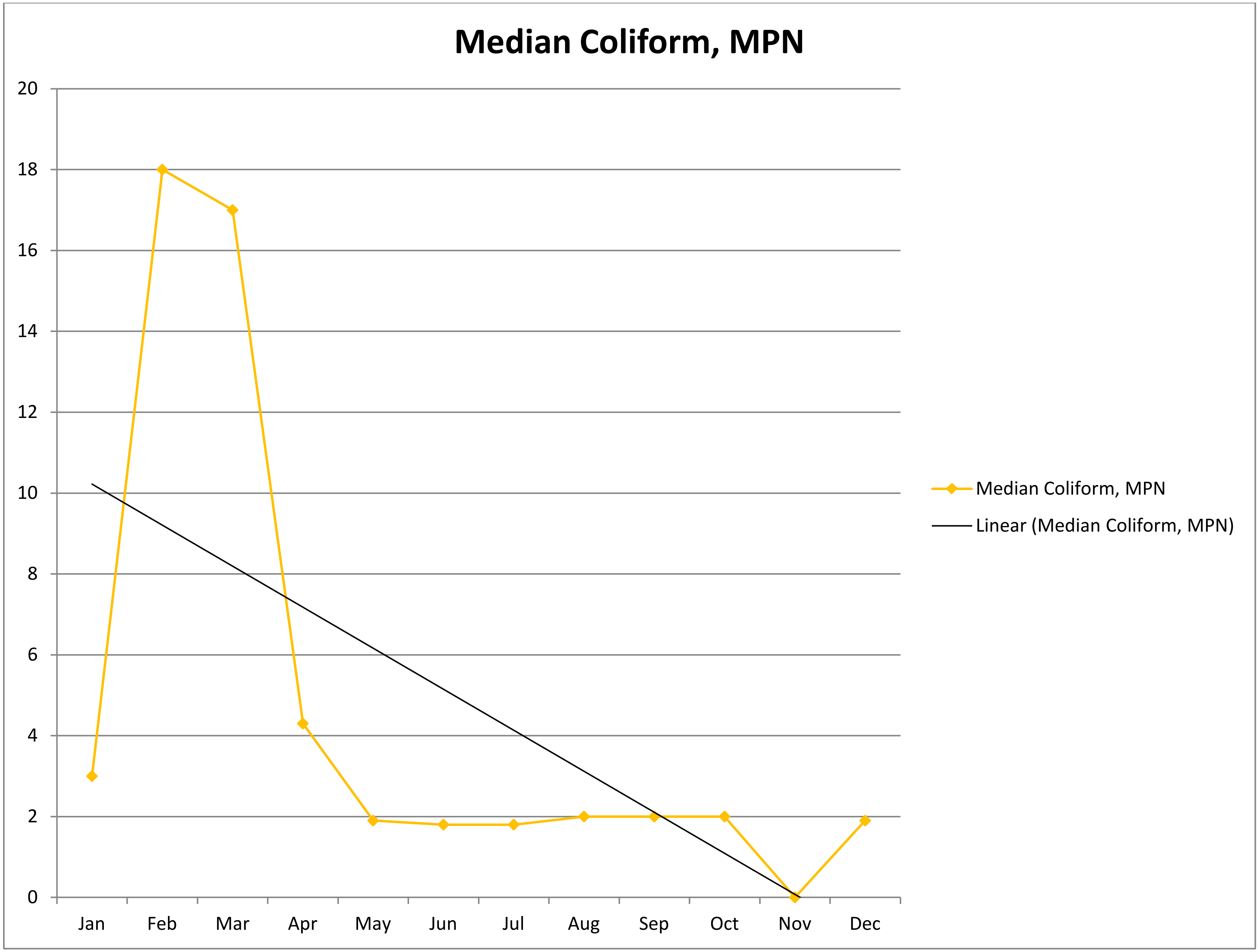
# Appendix A

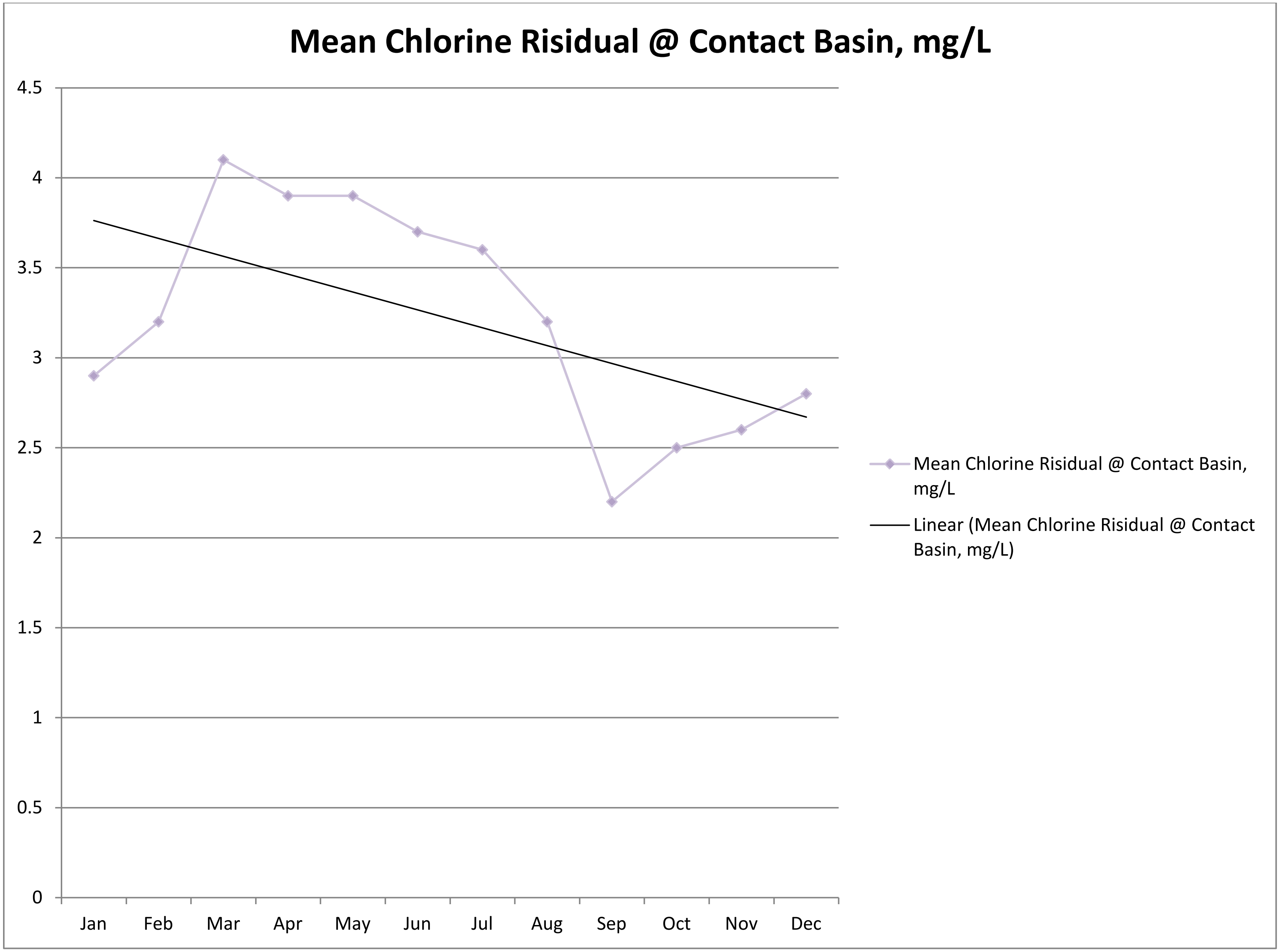
# Performance Charts

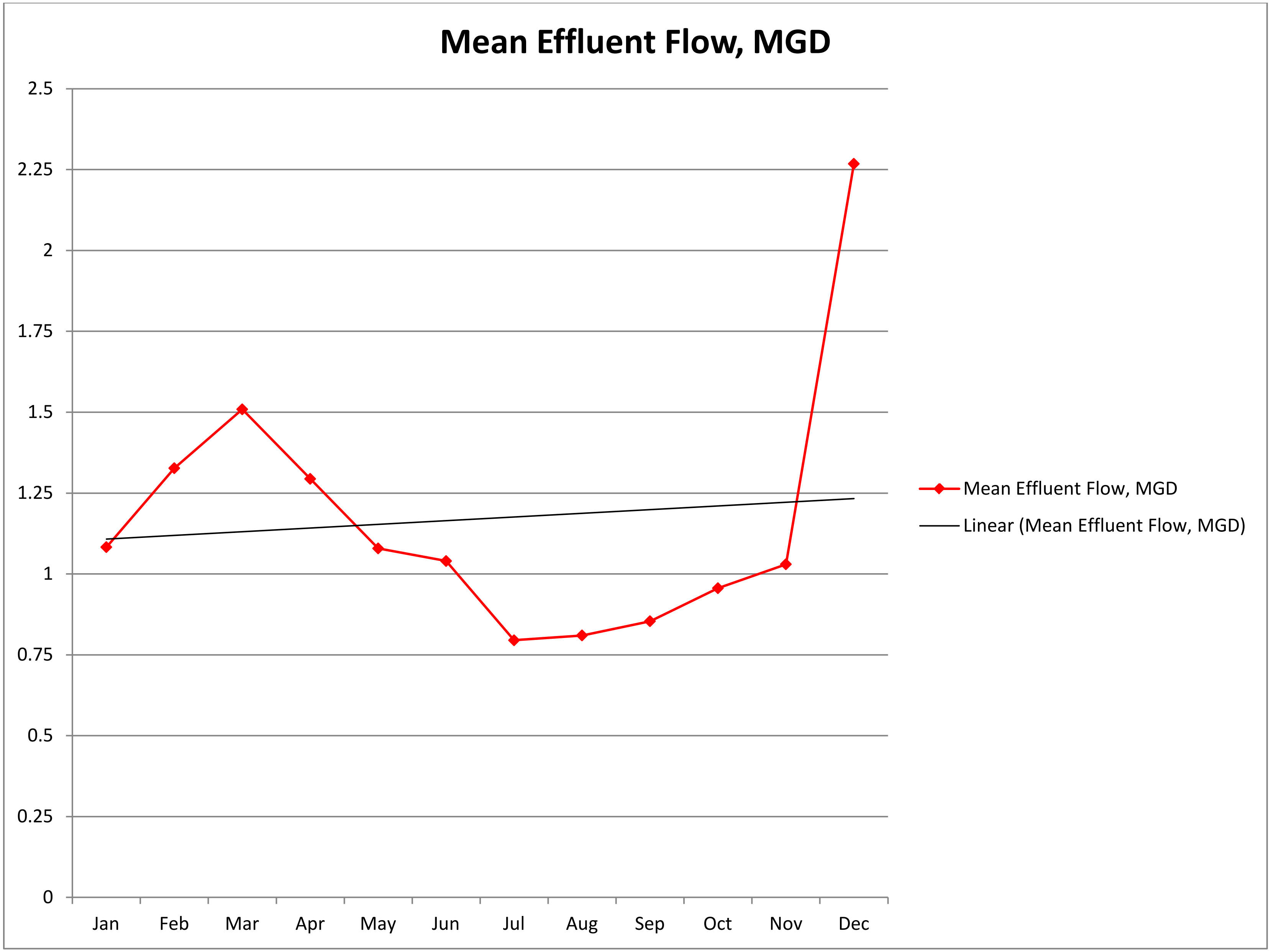

Mean Effluent BOD, mg/L.
8
7
6
5
4
3
2
1
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Mean Effluent BOD, mg/L.
Linear (Mean Effluent BOD, mg/L.)


Mean Effluent TSS, mg/L
16
14
12
10
8
6
4
2
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Mean Effluent TSS, mg/L
Linear (Mean Effluent TSS, mg/L)

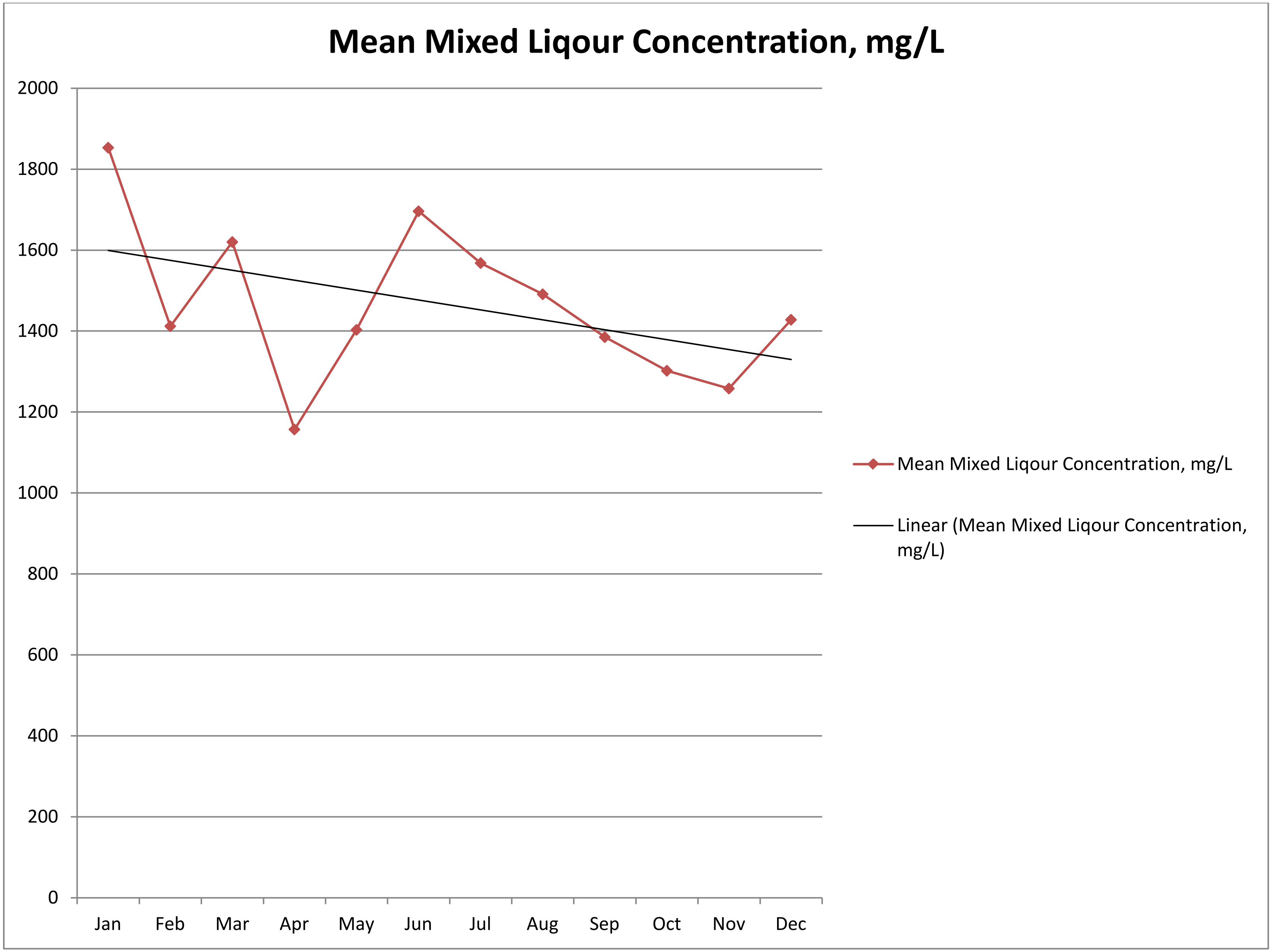

Mean Influent Flow, MGD
2.25
2
1.75
1.5
1.25
1
0.75
0.5
0.25
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Mean Influent Flow, MGD
Linear (Mean Influent Flow, MGD)

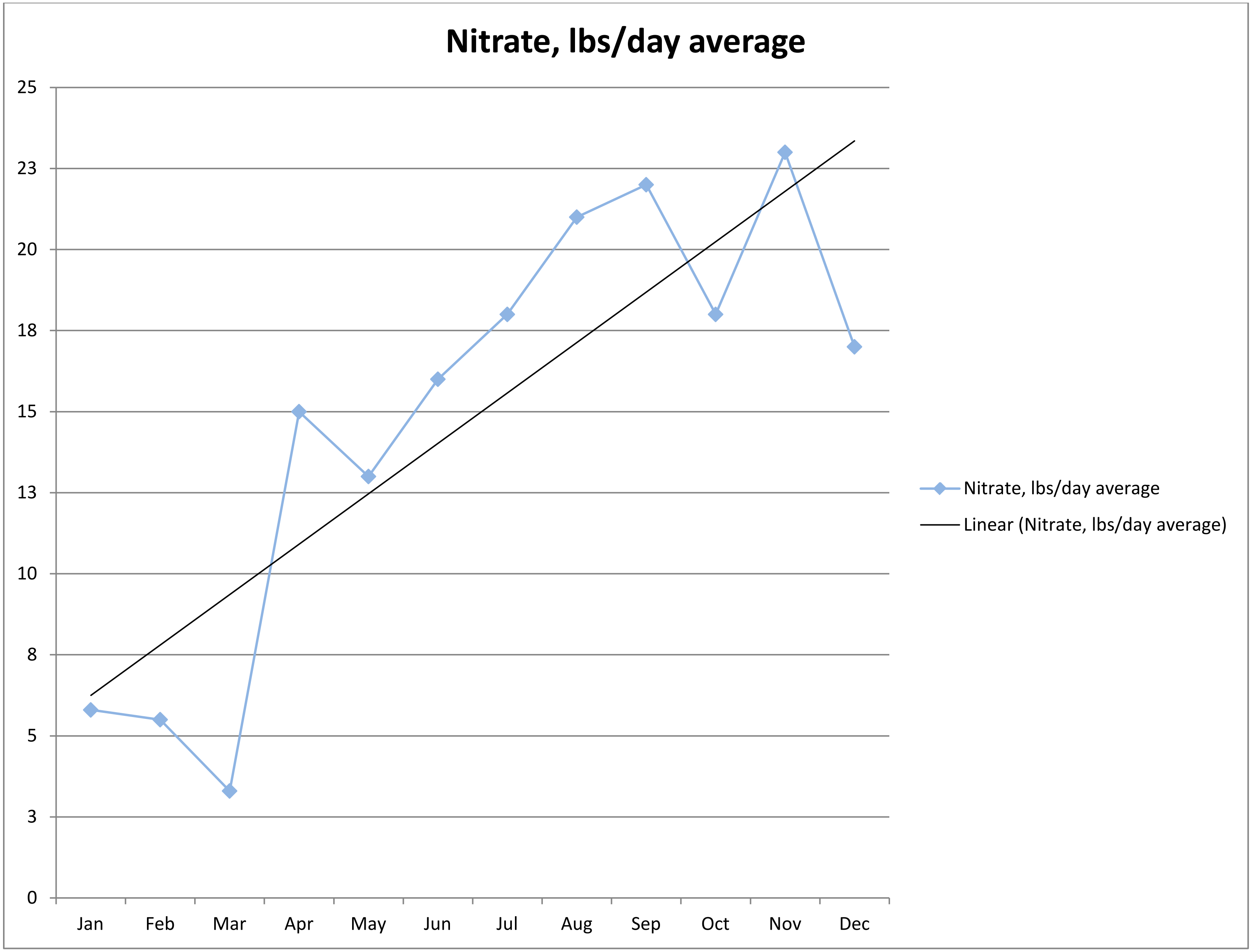

Median Coliform, MPN
20
18
16
14
12
10
8
6
4
2
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median Coliform, MPN
Linear (Median Coliform, MPN)


Mean Chlorine Risidual @ Contact Basin, mg/L
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Mean Chlorine Risidual @ Contact Basin, mg/L
Linear (Mean Chlorine Risidual @ Contact Basin, mg/L)

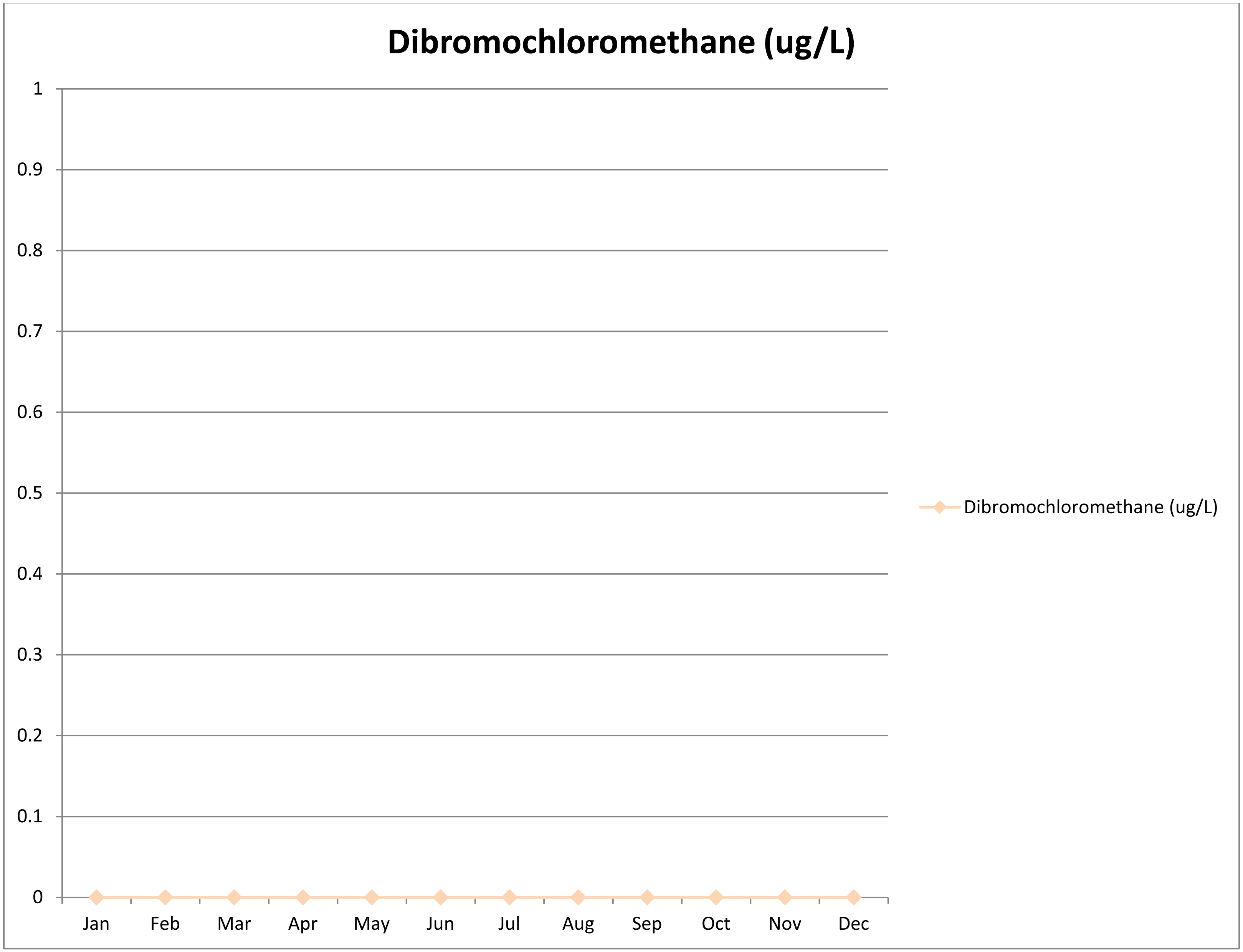

Mean Effluent Flow, MGD
2.5
2.25
2
1.75
1.5
1.25
1
0.75
0.5
0.25
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Mean Effluent Flow, MGD
Linear (Mean Effluent Flow, MGD)


Sludge Wasted, LBS
35000
30000
25000
20000
15000
10000
5000
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Sludge Wasted, LBS
Linear (Sludge Wasted, LBS)

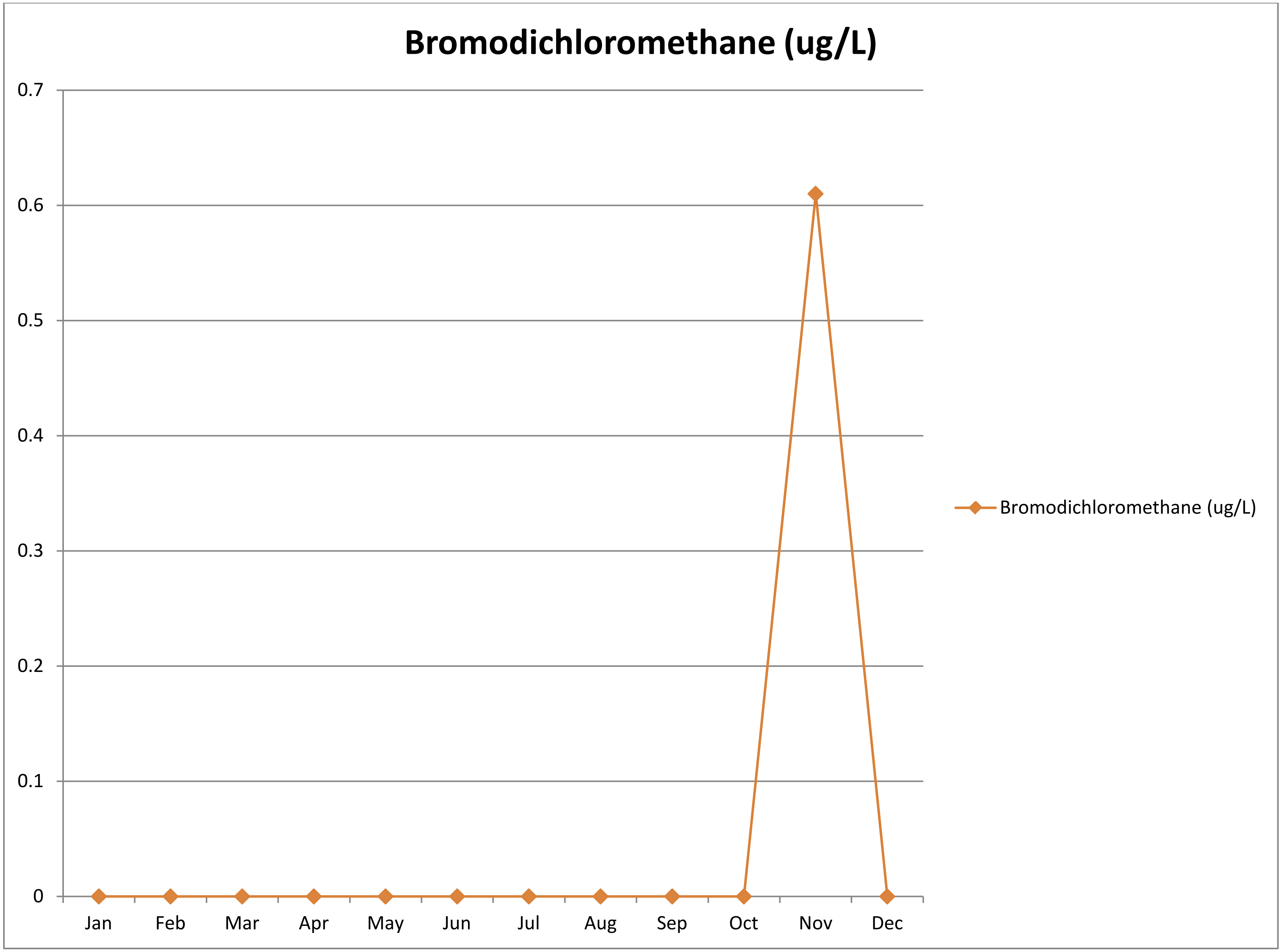

Mean Mixed Liqour Concentration, mg/L
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Mean Mixed Liqour Concentration, mg/L
Linear (Mean Mixed Liqour Concentration, mg/L)

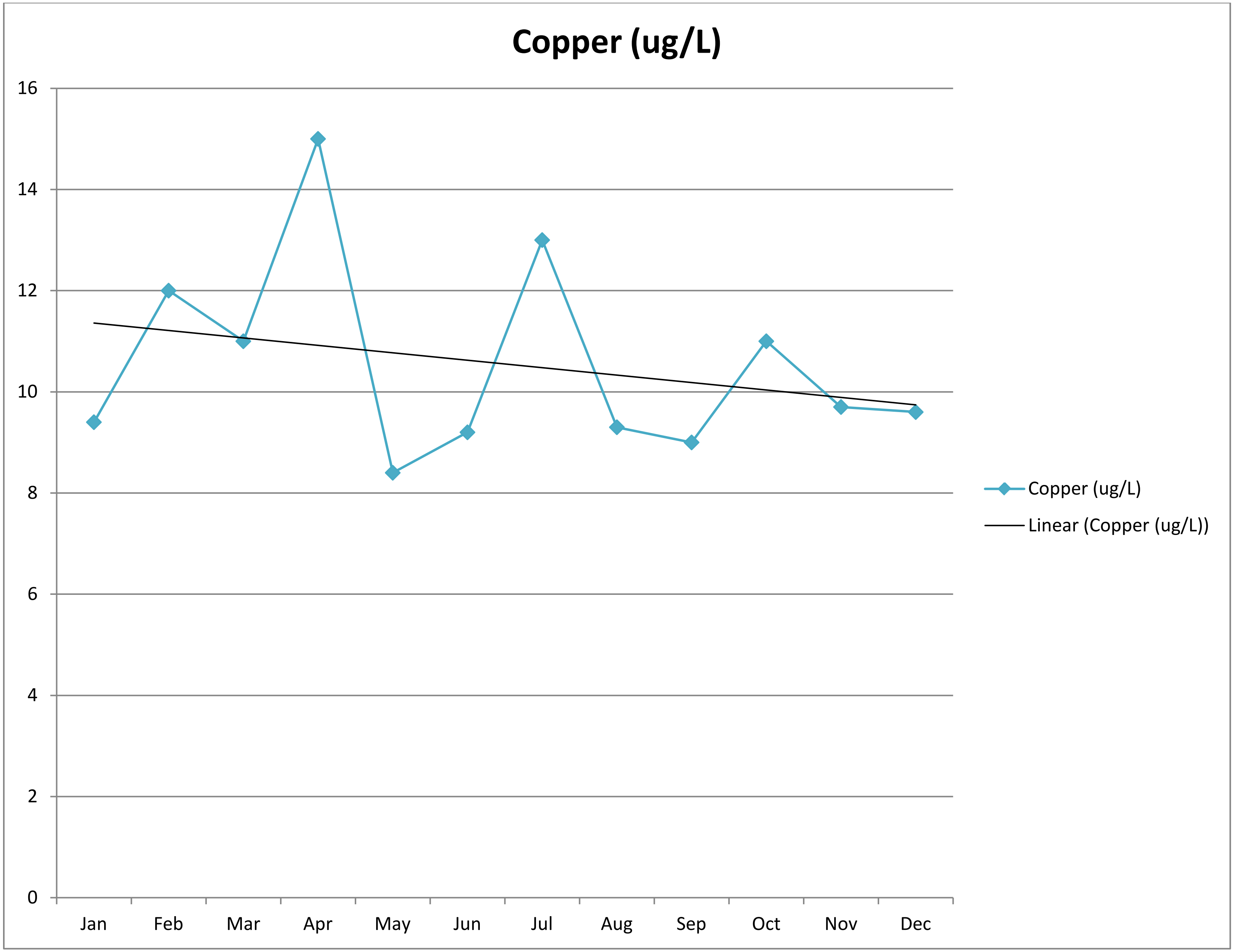


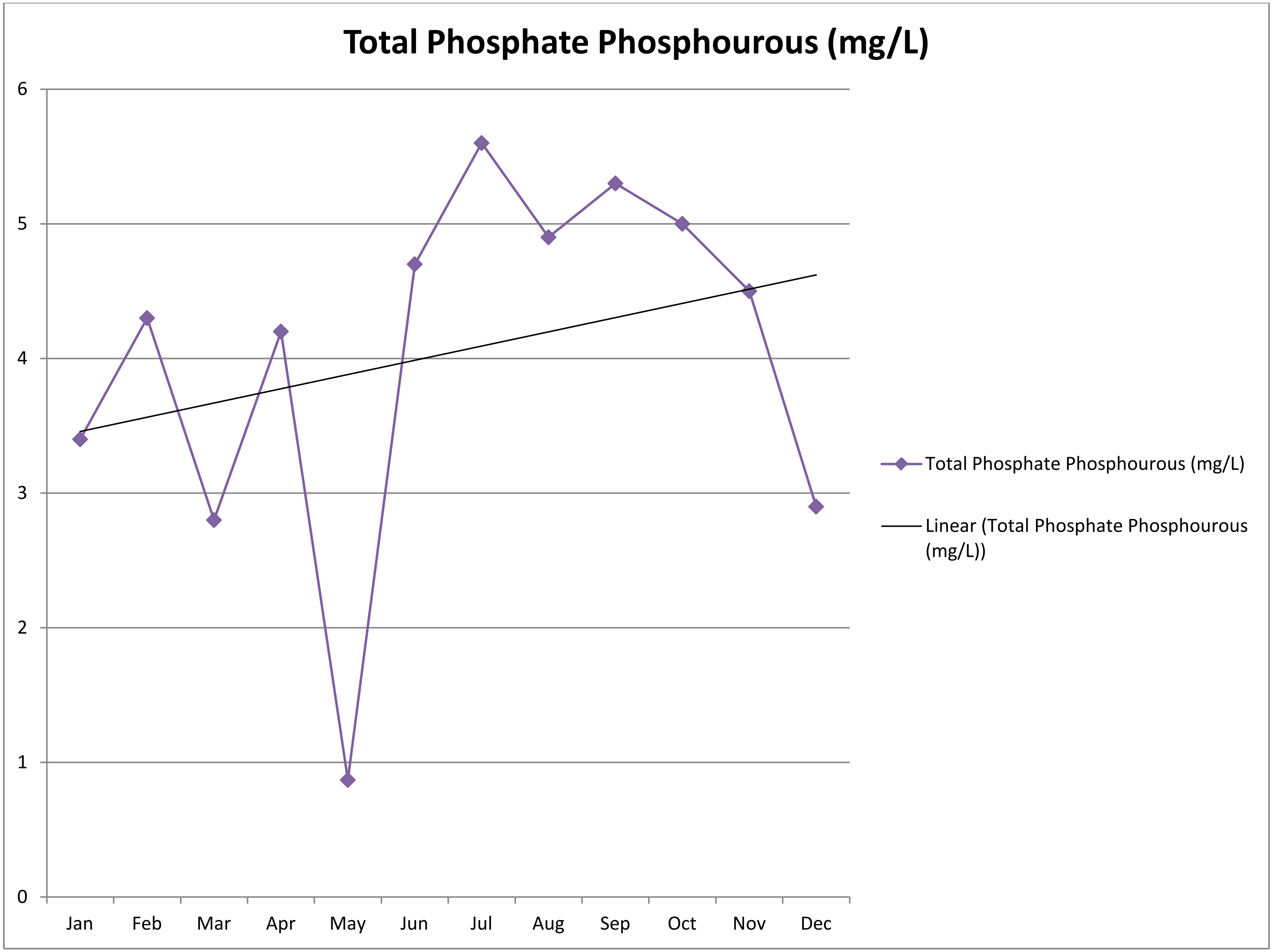
Nitrate, lbs/day average
25
23
20
18
15
13
10
8
5
3
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Nitrate, lbs/day average
Linear (Nitrate, lbs/day average)

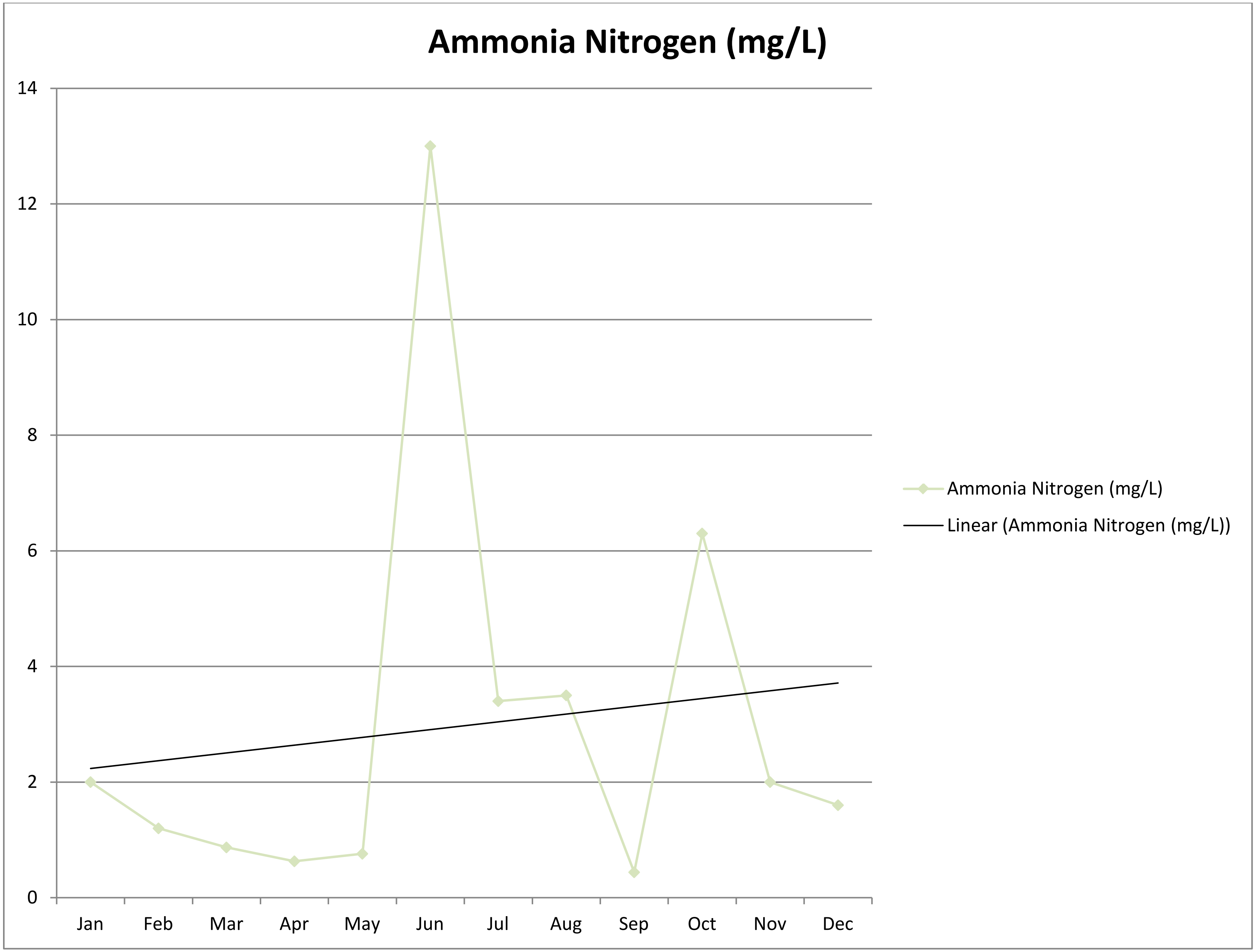


Dibromochloromethane (ug/L)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Dibromochloromethane (ug/L)


Bromodichloromethane (ug/L)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Bromodichloromethane (ug/L)


Copper (ug/L)
16
14
12
10
8
6
4
2
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Copper (ug/L)
Linear (Copper (ug/L))


Total Phosphate Phosphourous (mg/L)
6
5
4
3
2
1
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Total Phosphate Phosphourous (mg/L)
Linear (Total Phosphate Phosphourous (mg/L))


Ammonia Nitrogen (mg/L)
14
12
10
8
6
4
2
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Ammonia Nitrogen (mg/L)
Linear (Ammonia Nitrogen (mg/L))