**Monthly Operating Report**
**December, 2009**
**Concord Wastewater Treatment Plant**
**Operated by Woodard &Curran**

**Date:** January 12, 2010

**To:** Alan Cathcart, Concord Water & Sewer Superintendent
**cc:** Chris Whelan, Town Manager
Richard Reine, Director Concord Public Works

**From:** Michael Thompson and Staff

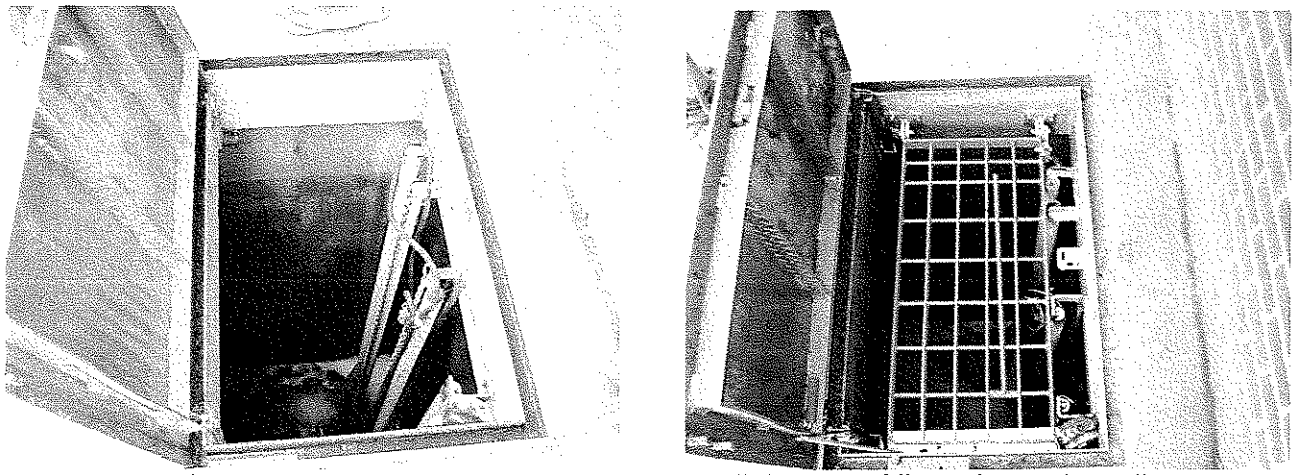
*Key Activities This Month/Capital Program*

During December all treatment processes were either operational or in ready standby. Flow through the facility in December averaged 1.096 million gallons per day (MGD) and the permit critical 12-month average flow fell slightly from November (1.05 MGD) to 1.02 MGD. The 12-month average daily flow permit limit is 1.2 MGD. This 1.02 MGD 12-month rolling average flow is the lowest since August 2008. If historical trends hold, I would expect this rolling average flow rate to start a slow creep upward to peak again in the spring of 2010.

More notable events or tasks accomplished in December include:

1) On December 17th the facility received a surprise inspection from Mass. DEP's George Kretas. In is normal for this Environmental Engineer/Inspector to show up unannounced yet he was pushing up his normal May inspection to December in anticipation of his retirement in two months. Mr Kretas sat down with Elena Proakis Ellis and Woodard & Curran's Bill Luksha and Mike Thompson to discuss facility operation and the uncertain plans at DEP to assign his replacement. George has been the CWWTF inspector and DEP primary contact for operators since mid-1998.

2) Plant staff continued to work on two projects to improve safety around open tanks. One project included the installation of a new fall protection grating at the outside tank drain wetwell (pictured below). This grating installation is part of a larger project focused not only on safety and operator access, but also targeting improvements in pump reliability and automatic operation. Additionally, plant staff began the installation of fiberglass grating and aluminum diamond plate over the CoMag reaction tanks so that maintenance personnel can safely access the four tank mixer gearboxes and chemical feed lines suspended out over these process tanks.



*Outside tank drain wetwell before and after hinged safety grating installed to prevent falls into this very deep well.*

*Maintenance Management*

Following is a brief list of a portion of maintenance items completed in December:

a) cutting and installing new fiberglass grating and aluminum diamond plate at the effluent flume and CoMag reaction tanks to improve safety around these channels/tanks.
b) installed mounting bracket for ultra-sonic sensor used to read water level in RDT filtrate sump and installed new aluminum fall protection grate just under the access hatch to this sump.
c) worked with welding service to identify and repair failed welds and section of roller band on secondary/tertiary sludge rotary drum thickener.
d) replaced failed(worn) intermediate drive shear pin on the #1 secondary clarifier rake drive.
e) injected final 55 gals of 165 totals gallons of antifreeze added to the facility's hot water heating loop.

*Environmental Compliance*

| Parameter | Monthly Avg. | Permit Limit | Notes |
|---|---|---|---|
| Flow, MGD | 1.02 MGD (12-month. Avg.) | 1.2 MGD | Dec. avg. =1.096 MGD |
| BOD5 (mg/l) | 4 mg/l | 30 mg/l | 99% average BOD removal in Dec. |
| TSS (mg/l) | 9 mg/l | 30 mg/l | 96 % average TSS removal in Dec. |
| Coliform, Geo.Mean #/100ml | 2 cfu*/100ml | 200 cfu/100ml | Daily max. of 22 cfu/100ml on Tue. 12/1 |
| Phosphorus | 0.68 mg/l | 1.0 mg/l Nov.'09 – Mar. '10 | 0.91 mg/l daily max. on Thu. 12/3 |
| Total Ammonia Nitrogen | 1.88 mg/l | Report Only | 2.21 mg/l daily max. on Thu. 12/31 |

**cfu =coliform forming unit or colony.*

During December, the Concord WWTP performed continuous two-stage total phosphorus (TP) removal using aluminum sulfate. First stage chemical TP treatment occurred in the secondary clarifiers and second stage TP treatment took place within the CoMag® advanced treatment process. The monthly average effluent TP concentration in December is 0.68 mg/l, thereby meeting the CWWTP's winter permit limit not to exceed 1.0 mg/l TP.

Additionally, during December all effluent disinfection was performed using ultra violet light.

Finally, over the week of December 6th the Concord WWTF conducted the 2009, fourth-quarter Whole Effluent Toxicity (WET) sampling event. The 48-hour LC50, a.k.a. acute toxicity test, for *Ceriodaphnia* is >100% and permit complying. The 7-day NOEC, a.k.a. chronic toxicity test, is also > 100%. Monitoring of chronic toxicity is a permit requirement; however there are currently no chronic toxicity limitations. A copy of the complete WET test report prepared by our contracted lab is enclosed for your review.

*Septage Receiving*

During December, the facility received 109,600 gallons of septage from Concord residences and businesses.

WWTP Septage Receipts in gallons

| | 2009 | 2008 | 2007 |
|---|---|---|---|
| January | 10,500 | 22,750 | 61,850 |
| February | 41,250 | 60,300 | 55,000 |
| March | 83,250 | 55,550 | 48,550 |
| April | 168,250 | 152,300 | 127,000 |
| May | 150,900 | 135,150 | 153,800 |
| June | 151,450 | 126,450 | 128,750 |
| July | 138,500 | 117,000 | 159,050 |
| August | 137,750 | 142,400 | 140,250 |
| September | 203,750 | 219,950 | 112,250 |
| October | 172,400 | 262,900 | 199,700 |
| November | 155,400 | 165,300 | 179,950 |
| December | 109,600 | 104,050 | 42,000 |
| Annual Totals: | 1,523,000 | 1,636,000 | 1,408,150 |

*Sludge Production*

During December, 117,000 gallons of liquid sludge, equivalent to 17.79 dry tons, was transported to Upper Blackstone Water Pollution Abatement District (UBWPAD) in Millbury, Massachusetts.

WWTP Sludge Production in gallons / dry tons

| | 2009 | 2008 | 2007 |
|---|---|---|---|
| January | 107,500/16.71 | 112,227/20.15 | 97,500/12.83 |
| February | 86,000/14.13 | 107,124/18.35 | 89,500/11.94 |
| March | 99,000/17.56 | 98,500/17.97 | 99,000/12.91 |
| April | 153,000/23.94 | 90,000/17.98 | 143,500/21.55 |
| May | 170,670/24.27 | 107,000/19.74 | 170,200/26.40 |
| June | 153,000/20.83 | 98,500/17.76 | 152,000/21.29 |
| July | 126,000/20.57 | 117,000/20.98 | 161,500/23.60 |
| August | 76,376/11.81 | 99,000/16.51 | 143,500/21.31 |
| September | 126,000/21.65 | 98,000/16.82 | 126,000/15.27 |
| October | 99,000/16.03 | 108,000/18.54 | 230,614/30.28 |
| November | 99,000/16.51 | 80,500/12.62 | 128,669/21.13 |
| December | 117,000/ | 126,000/18.46 | 140,555/22.69 |
| Annual Totals: | 1,412,546/214.01 | 1,241,851/215.88 | 1,682,535/241.2 |

*Alarm Activity*

This section provides the Town information on events that activate the facility's alarm response system. These events occur while the plant is unmanned and while both the plant's SCADA system and *Lexington Alarm* are monitoring the facility's alarm system. This report identifies alarm activity from the start of the calendar year to the present.

**Concord WWTP Off-Hours Alarm Log**

| Date | Time | Alarm Source | Observations/Corrective Action/Comments |
|---|---|---|---|
| 01/03/09 | 11:21 am | Intrusion | Headworks building door not properly latching following installation of new weather security strip by facility upgrade contractor. High wind rocked door – setting off alarm. Plant staff worked on weather strip to improve door latching. |
| 01/07/09 | 7:45 pm | Hi Effluent Turbidity | Recent M2 backwash cycles producing very brief jump in turbidity as forward flow resumes. Solution is to shorten time between backwash cycles until overall treatment performance improves with slight operational adjustments over coming days. |
| 02/08/09 | 10:26 am | Intrusion | High wind blew open addition door. Plant staff already on the way for normal weekend rounds, checked door and securely locked. Contractor made aware of need to rework this as well as other facility upgrade doors and locksets. |
| Various times in March | | HVAC Common alarm | Faulty operation of plant boilers-particularly boiler #2-causing a brief dip in plant hot water loop temperature. Lag or backup boiler reliably responded and automatically brought hot water loop temp back above alarm setpoint. Boiler install vendor and others continue to monitor/troubleshoot plant heating system. |
| 04/09 | NA | NA | No after hours alarms in April |
| 5/27/09 | 7-9pm | CoMag eff pH | pH meter inaccurately reading –required cleaning and calibration. Caustic pumps checked for normal operation. |
| 6/20/09 | 2 pm | CoMag low eff pH | Both caustic feed pumps to CoMag effluent had become air bound. On call operator came on site and bled air from pump and restored normal auto feed of caustic based on pH input from SCADA. |
| 07/09 | NA | NA | No after hours alarms in July. |
| 08/09 | NA | NA | No after hours alarms in August. |
| 9/3/09 | 10:00 PM | Intrusion | CoMag settling tank room – north motion sensor activated. No doors, windows, or other motion sensors activated. Police investigate – apparent false alarm. |
| 10/09 | NA | NA | No after hours alarms in October. |
| 11/15 | 5 pm | Power Failure | Brief power bump resulted in a handful of drive and panel faults. The on call operator responded on site and reset equipment without incident. |
| 12/20 | 4 am | HVAC Common Alarm | Faulty operation of plant boilers apparently resulting from a fault in the fuel oil transfer system. Responding operator rest the fuel transfer control panel without incident, cleaned the flame sensor s on both boilers, then restored system to normal automatic operation based on inside/outside air temperature. |