City of Ligonier Indiana Wastewater Treatment Plant

Current Plant Operation

- The City of Ligonier WWTP is located within a Three (3) acre compound at 305 Bridge Street.
- Plant design flow is a design flow of 1.5 MDG
- From January 1st, 2011 to September 30th, 2011 the plant treated 324,000,000 gallons for a average of 1,180,000 gallons per day
- An average flow of 1.18 mgd put that plant at 78% capacity.

Wastewater Treatment Plant History City of Ligonier, Indiana

- The first wastewater treat plant was built as a WPA (Works Project Administration) project as part of the “New Deal” of the 1930’s The current facilities still is located at the original plant site.
- The first plant consisted of a pump build, two primary clarifiers and one fixed cover Digester. All three pieces of equipment are still in operation today.

Original Pump station from the 1930's

As Seen Today

Original Pump station from the 1930's

Seen from the 1930's to 1990

Original Pump station from the 1930's

Electrical Controls form 1972 to 1990

First Plant Upgrade -1972

- The first plant upgrade took place in 1972, the plant was classified at that time by IDEM as a Class II treatment plant

- The design flow for the plant was increase to .52 mgd, a grit channel and grinder were added, along with a manually racked bar screen and two additional primary clarifiers.

First Plant Upgrade -1972

Grinder

Grit Channel(s)

First Plant Upgrade -1972

- The first biological process was also install consisting of a standard rate rock media trickling filter coupled with the plants first secondary clarifier.

First Plant Upgrade -1972

Standard Rate Trickling Filter

Rock Media

First Plant Upgrade -1972

First Secondary Clarifier to be installed

First Plant Upgrade -1972

- Chlorine was also add for disinfection, making it the first time that wastewater was disinfected since the installation of the first treatment plant.
- Also added to the plant was one floating cover digester to work in conjunction with the existing fixed cover digester.

Primary Clarifiers

Second Plant Upgrade - 1990

- The plant upgrade began in October 1990. The design flow of the plant was again increase to 1.5 mgd and again upgraded in classification to a Class III facility as it remains today.
- The standard rate trickling filter was removed and two high rate Bio-towers (Tricking Filter) were installed for ammonia removal (nitrification)

Second Plant Upgrade - 1990

Bio-towers under Construction, September 1991

Second Plant Upgrade - 1990

Completed Bio-tower

One of two Bio-Towers install for nitrification in the 1990's (no longer in service)

Second Plant Upgrade - 1990

- Also installed was a Solids Contact Process located between the Bio-towers and the Secondary Clarifiers

Second Plant Upgrade - 1990

Solids contact tank under construction (no Longer in operation)

Secondary Clarifier #2 under construction

Contact tank blowers

Bio-tower pump stations

Second Plant Upgrade - 1990

- Two new secondary clarifiers were installed, the existing secondary clarifier was then converted to a larger chlorine contact tank.
- A sulfur dioxide system was then installed for dechlorination in the old chlorine contact chamber.

Second Plant Upgrade - 1990

Installation of Secondary Clarifier #2

Second Plant Upgrade - 1990

One of two Secondary Clarifiers install in 1990

Each secondary is 50 x 15 and hold 220,000 gallon each.

Second Plant Upgrade - 1990

- During the expansion two more primaries clarifiers were added bring the total to six.

Second Plant Upgrade - 1990

Building for Chlorine & Sulfur Dioxide

Secondary Clarifier to Be converted to the Chlorine contact tank

Existing chlorine tank to become sulfur dioxide tank

Second Plant Upgrade - 1990

Arial Photo of Completed Plant (Circa 1993)

Third Plant Upgarde - 2002

- The third plant upgrade took place in 2002. At that time a 317,000 sludge hold tank was installed.
- Two (2) Grit Augers and One (1) grinder
- Two (2) more outside drying beds were added bring the total to four (4)

Third Plant Upgrade - 2002

Sludge hold tank under construction

Third Plant Upgrade - 2002

Grit / trash Auger(s) (no longer In service)

Grinder (no longer in Service)

Third Plant Upgrade - 2002

Drying beds under construction

Third Plant Upgrade - 2002

- The fixed cover digester was converted to a floating cover, giving the plant two (2) floating cover digesters

- Also added was a UV
- (Ultra Violet)disinfection system replacing the Chlorine / Sulfur dioxide systems. The UV was installed in the Chlorine contact structure.

Third Plant Upgrade - 2002

Digester cover being fabricated on site

Completed cover being set in place

Third Plant Upgrade - 2002

Completed cover as it operates today

Third Plant Upgrade - 2002

Chlorine Contact tank being converted to the UV structure

Forth Plant Upgrade - 2008

- In 2008 the most significant change since the 1972 upgrade happened, the conversion of the plants biological process from a Tricking Filter type of plant to that of an Activated Sludge Process.

Activated Sludge Process Aeration tanks

One of two aeration tanks installed in 2008

Each tank
has a capacity of
333,000 gallons

Mix Liquor
under
aeration

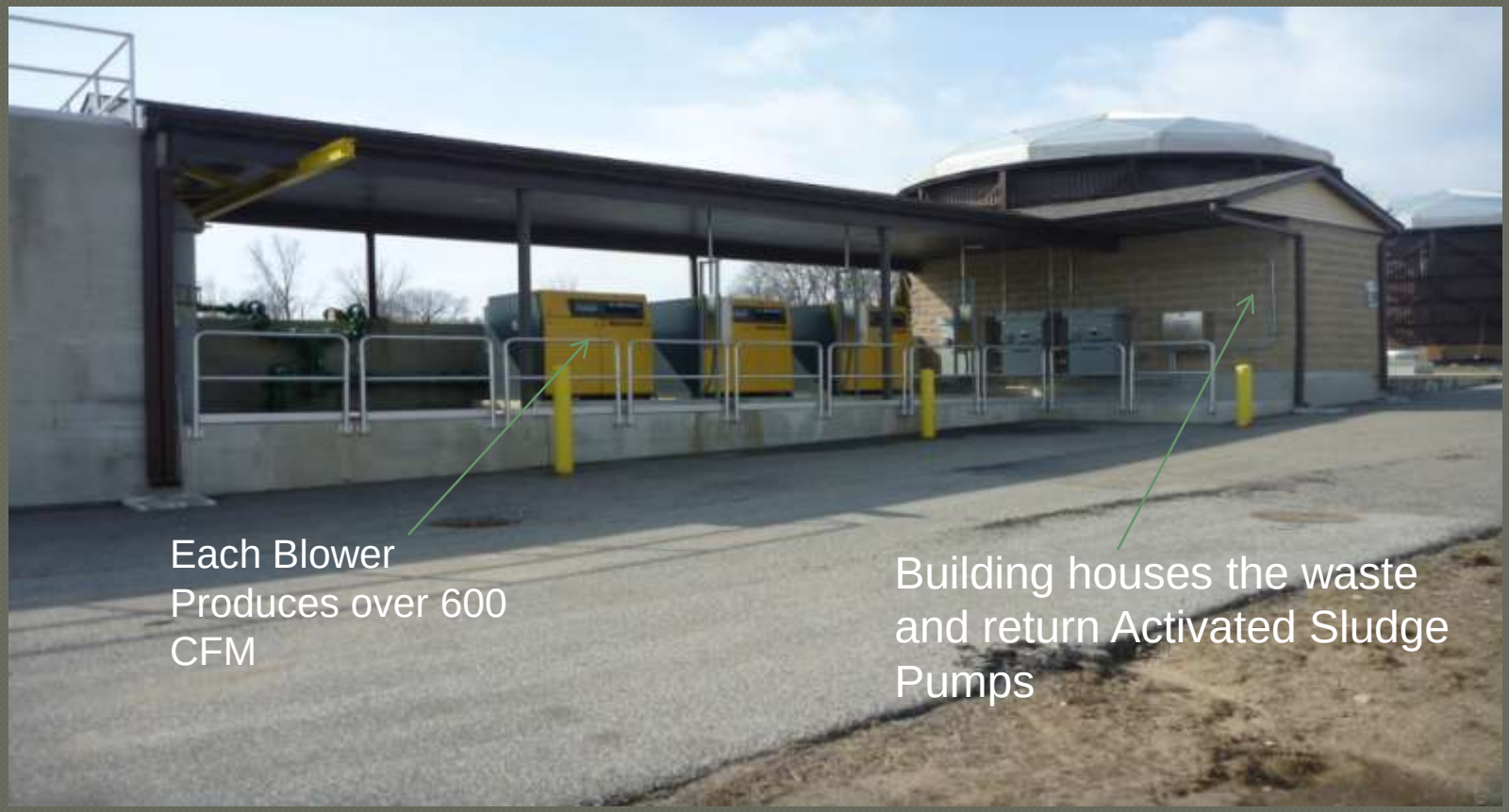
Aeration tanks

Each tank is 110 x 26 x 17 and contains over 800 ft of piping

Spare aeration tank

Aeration Blower System

Three blows for constant air feed to system



Laboratory & Testing

The lab at the WWTP performs all testing for the City's wastewater and drinking water.

The lab is a 365 day a year operation.

At a minimum the lab will perform 4,160 test per year in-house.

The lab also prepare and processes over 1040 additional test, such as metals test for outside lab work.

Solids Processing

- At the present time the WWTP processes sludge through two anaerobic floating cover digesters with a total holding capacity of 178,000 gallons
- A sludge hold tank that was installed in 2002 with a capacity of 317,000 gallons

Solids Processing

- Geo-bags are used at this time for drying sludge.
- Dried sludge is stored in a holding barn
- In October 2011 the plant applied to IDEM for a land application permit to help off set the cost of its current disposal method.

Anaerobic Digesters

Sludge Hold Tank

317,000 gallon holding capacity

Sludge Hold Tank

The tank is 50 x 18 ft deep

Top operating level of tank

Mixing: sludge is constantly recalculated By a 15 hp motor / pump

Geo-Bags

Sludge hold Barn

The barn can hold two bags of dried Sludge

Each Geo-Bags Is 60 x 45ft.

Approx. 350,000 gallons of liquid Sludge can be Processed through one bag

Geo-Bag Processing

Bags are filled to a height of seven (7) feet Approx. 150,000 gallons. On the initial filling a bag will dewater back to one foot.

With the correct mixture of Polymer, Solid / liquid separation occurs allowing for the bag to dewater with the filtrate returning back to the head of the plant for treatment

Other Structures

Lab, Office from the 1972 upgrade

Chlorine room used for 1972 to 1990

Other Structures

Lincolnway lift station, one of three Lift Stations in the City

Lift station structure from 1972 to 1990

Other Structures

Lincolnway lift station from 1990 to 2008

Lift Station being installed December, 1991

Other Structures

Garage / work shop being constructed 1991

Other Structures

Indoor sludge drying beds being constructed

These beds are now used for Indoor only after sludge is dried in the Geo-bags