

This report is submitted for:

Oregon DEQ NPDES permit compliance.

# 2014 Inflow and Infiltration Report

*Baker City Public Works*

*The Baker City Public Works Department continues to dedicate resources to reduce and eliminate Inflow and Infiltration from the City's wastewater collection system while providing excellent service to its customers and protecting the environment.*

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## Annual Summary

The Baker City Public Works Department continues to direct its efforts to reduce and, wherever possible, eliminate **inflow and infiltration** into the Baker City wastewater collection system.

All new wastewater collection lines and manholes which are installed by Baker City personnel or contractors are vacuum and pressure tested and inspected to ensure that they are properly installed and completely water tight. This prevents both surface and ground water

from entering into the system.

Our wastewater collection crews work daily to clean and video inspect lines searching for sources of **inflow and infiltration**.

In 2014 Wastewater Collection Specialists cleaned 121,384 feet of line and video-inspected 30,300 feet of line. They also cut and/or chemically treated roots in over 1,133 feet of line.

In addition, a manual push camera was pur-



chased by the City. It was used on 35 occasions, the majority of which were private laterals, looking for broken lines and possible sources of **inflow and infiltration**.

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## 2014 CIPP Wastewater Mainline Lining Project

**I** mproving  
the efficiency  
of our  
municipal  
wastewater system

Baker City's wastewater lining projects have been highly successful in eliminating infiltration into the wastewater collection system over the past several years. The CIPP liner creates a water tight barrier, keeping raw wastewater inside the pipe and groundwater out. This year's CIPP project concentrated in an area of town that has high ground water. Approximately 12 city blocks of lines were lined using this method. Of the 4,518 feet of lines which were lined, 1,287

feet were old or leaking 6" diameter terra cotta pipe. The remaining 3,231 feet was a combination of old or leaking 8" terra cotta and concrete pipe.

To accomplish a CIPP project it takes a combined effort between contract personnel and the Public Works Department. Lines are cleaned, root cut, and spot repairs performed. Lines are video inspected, live laterals are identified, and all necessary measurements are taken. The contractor then inserts the

resin impregnated liner between manholes, injects steam into the line to cure the resin. Lastly the lateral connections are cut out using a robotic cutter. This results in the line being fully operational while preventing infiltration of surrounding ground water.

Planned and Engineered Construction, Inc. (PEC) from Helena, Montana performed the work this fiscal year.



Specialized lining crew from PEC is shown here inserting the liner into an old section of terra cotta wastewater mainline on 3rd Street between Campbell and 'A' Streets.

## 2014 Standard Construction Methods

The Baker City Public Works Department continues to use effective construction and maintenance procedures to minimize and/or eliminate **Inflow and Infiltration** of water into the Baker City wastewater collection system.

Water tight rubber Fernco couplers and Romac saddle connectors are used to secure and seal connections when laterals and mainline pipe are repaired.



In this installation, both Strongback® Fernco and regular Fernco couplers were used for a repair on Madison Street in Baker City.



Romac saddle connectors used to secure new laterals to mainlines.



**E**liminating sources of Inflow and Infiltration



Ground water is close to the surface in the SE portion of Baker City. On Myrtle Street, the bolts on a Romac saddle were tightened to the specified torque to create a water tight seal against the larger mainline.



## 2014 Standard Construction Methods—Continued

While constructing new manholes over existing pipe connections, the entire pipe is encapsulated with high strength concrete to create a water tight seal.



Leaky manhole was removed from under the street.

Manhole No. D-158 was replaced in 2014. It had been a source of inflow and infiltration for many years.



New plastic pipe was used to reconnect the lines.



High strength concrete placed around the pipe creates a water tight seal for the new manhole base.



After concrete cures, the tops of the pipe are cut out and the remaining manhole components are installed.

**P**roviding improved access to clean and maintain lines.

## 2014 Miscellaneous Projects Resulting in I & I Reduction or Elimination

Baker City crews worked on several wastewater projects to seal lines and improve the collection system.



Broken and leaking lateral/mainline connection was excavated and repaired.



Poor lateral connection in high ground water area was repaired.

## 2014 Miscellaneous Projects Resulting in I & L Reduction or Elimination—Continued



A lateral, broken during installation of power pole on Auburn Avenue, was repaired.



New water tight rectangular manhole was constructed over a line on 5th Street for access and maintenance purposes.



Leaking cap on the end of a City mainline was excavated and replaced with a new properly sealing cap.

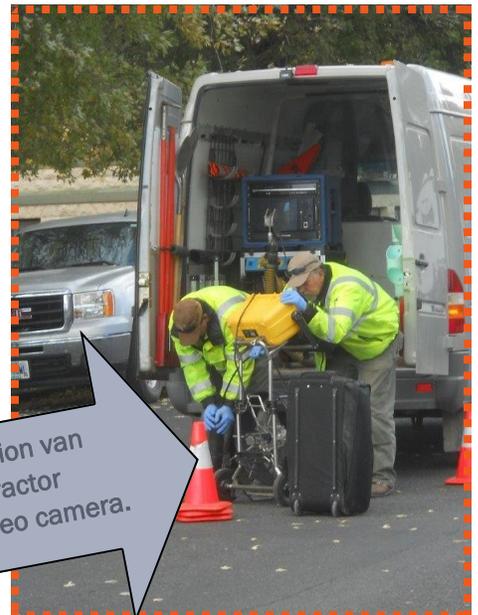


## 2014 General Maintenance, Cleaning, Video Inspection & Manhole Inspection

Baker City crews worked daily cleaning, video inspecting, and rating lines and manholes.



*Neither snow nor rain nor heat nor gloom of night stays these couriers from the swift completion of their appointed rounds...*



Video inspection van houses the tractor mounted video camera.

### 2014 General Maintenance, Cleaning, Video Inspection & Manhole Inspection—Continued



This past year, extra work was performed to inspect and rate manholes in the collection system. Each manhole is rated for defects, inflow and infiltration, and flow characteristics. The manhole depth and the size of the pipes are measured and recorded as well.

City of Baker City  
MANHOLE INSPECTION REPORT

Manhole No. 1000  
Date 7/1/14

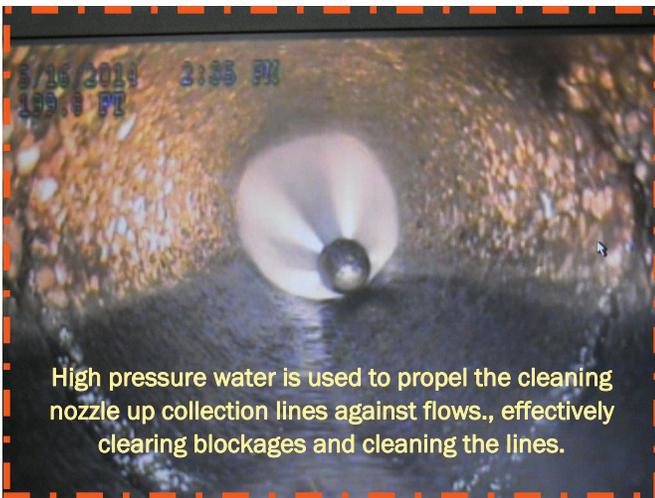
Inspector Gregory Miller  
Street Type Highway

1. Lid Condition	<u>1</u>
2. Ring & Lid	<u>1</u>
3. Inlet Pipes	<u>1</u>
4. Threat	<u>1</u>
5. Crown	<u>1</u>
6. Slope	<u>1</u>
7. Block	<u>1</u>
8. Status	<u>1</u>
9. Other	

Street or Ground Surface: \_\_\_\_\_  
 Ring & Lid: \_\_\_\_\_  
 Left Slope: \_\_\_\_\_  
 Threat: \_\_\_\_\_  
 Cast: \_\_\_\_\_  
 Inflow: \_\_\_\_\_  
 Block: \_\_\_\_\_  
 Manhole  
 Diameter of Pipe: 18"

Stub Locations & Sizes (Plan View)

City of Baker City  
Public Works Department



High pressure water is used to propel the cleaning nozzle up collection lines against flows., effectively clearing blockages and cleaning the lines.



Video inspection equipment detects root intrusion and leaky pipes. This section of pipe is located under Tracy Street.

### 2014 General Maintenance, Lateral Inspections

Baker City's Vivax vCAM CCTV inspection system continues to be very useful in identifying problems—including I & I—in laterals and mainlines. The unit is generally used several times per month to evaluate lines.



Inspection is performed to determine if additional repair work is necessary.

Public works performs inspections for local professionals working on private laterals.



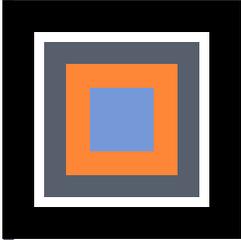
## 2015 Inflow and Infiltration Reduction Projects.

Through the use of video inspection equipment, including the Vivax system and the Cues tractor/camera unit, as well as visual inspection of manholes in the Baker City collection system, new sources of *inflow and infiltration* will be identified. Identified sources will be repaired as time and funding become available.

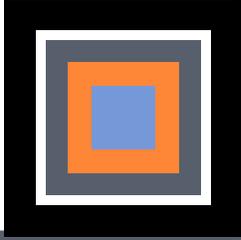
Baker City Public Works will be performing a CIPP project for 2015-2016 which will reduce I & I currently coming into the system. Lines identified for the next project include-

- 3rd Street between Baker & Madison Street
- Alley line west of 12th between 'A' & 'B'
- 4th Street between Madison & Campbell

Other lines will be identified as further inspections are completed.



*B*aker City continues to work with D.E. Q. Professionals to improve wastewater collection and treatment systems.





# Baker City Public Works

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