Old Fort at Hesperus
18683 Hwy 140
Hesperus, CO 81326

# Rehabilitation of the Old Fort Water System

January 20, 2015

History:

The Old Fort at Hesperus is a 6,278 acre property that is owned by the Colorado State Land Board (SLB) and managed for the benefit of Fort Lewis College (FLC) as the Hesperus Trust. It is located 14 miles southwest of Durango on State Highway 140. It has a long history in the region as a military fort, native American boarding school (-1910, high school (1911-1934), junior college (1927-1956) and agriculture experiment station (1915-2010) . Since 2010, Fort Lewis College has been in charge of the day to day operations and is working closely with the SLB in developing a long term Asset Management Plan.

Old Water System:

The old water system was put in place in the 1950s to serve the 400 plus student and employee population. In addition to supplying domestic water it was also used for fire protection so the system was very large. In 1983-84, fire hydrants were installed throughout the main campus converting the fire suppression system water source to the large reservoir on the North end of the property. Domestic water distribution lines to the buildings in the headquarters area were also upgraded at this time. The water source is a spring, which is considered Groundwater Under the Direct Influence of Surface Water (GWUDI). GWUDI falls under the same regulatory requirements as surface water and thus requires direct filtration and disinfection.

Fort Lewis College had Goff Engineering prepare an infrastructure assessment and report on the Old Fort at Hesperus in April, 2011. Their report concluded that while the distribution system to the buildings at the headquarters was in pretty good shape (replaced in 1983), the chlorination system was not working and filtration is now required because of the source of the water. In 2012, Russell Engineering was contracted to design an upgraded system including electrical systems.

In January, 2013, Fort Lewis College submitted a System Population Certificate to Colorado Department of Public Health and Environment (CDPHE) for their review. They responded with a letter in July, 2013 stating that our system does not serve25 or more people for more than 60 days per year. Therefore it would be a non-public system that does not require a certified operator and additional monitoring. Because we do not know all of the long term uses for the property, we ask Russell Engineering to design a system that included as many “public” water system components as possible. This would allow us to upgrade the system to a public system more easily if needed in the future.

# Pictorial Overview of Old System

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|  | This building houses pumps, pressure tank, electric controls and access to distribution pipes. The outside walls, window glazing and inside walls have tested positive for asbestos.<br><br>The south wall and window will be removed for demolition. |
|  | 1,000 gallon pressure tank sits on main floor. Installed in approximately 1952, it is unknown if the bladder is intact so it will be replaced. |
|  | A crude chlorination system was installed in 1983 but is no longer operational. |
|  | Electrical system includes non-compliant wiring and mercury switches. Most likely installed in 1950s and upgraded in 80s. |
|  | Two pumps are located in the basement. They are high flow (160 to 260 gpm), low pressure (52 psi) pumps that currently operate independently. Pumps will be retained for new project but will be rewired to run alternately. |
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Plans were completed in early 2014 and included electrical upgrades, building upgrades as well as the design of the filtrations, chlorination and pressure tank system. Fort Lewis College purchased the pressure tank, filter banks and chlorination system components in June, 2014.

A pre-bid meeting was held and the bid was released on August 7, 2014. Animas Valley Construction company was awarded the project August 28th and the contract was finalized September 17th. We held our first construction meeting on September 18th to coordinate the

project. Team members included staff from Russell Engineering, FLC Physical Plant, Old Fort, AVC and its subcontractors (Durango Electric and JT Plumbing). Fort Lewis College completed the first asbestos abatement by removing the south wall of the pumphouse building. Due to a series of submittal changes and the long lead time on some of the electrical components, the project did not begin on site until November 17th. An additional asbestos team was needed to prepare the inside of the building for equipment installation on November 22nd. The distribution system was recharged on December 2nd but building upgrades were not completed until mid-December. Additionally, Industrial Process Technology who provided us the filters and chlorination system was not available until January 8th for an on-site visit for training. The entire distribution system (approximately 7,000 gallons) was disinfected January 9-11th with all building and water outlets maintaining at least 10 ppm chlorine levels after 24 hours.

## Pictorial Overview of New System:

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|  | After removing the old pressure tank, a 528 gallon vertical pressure tank (170 gal capacity) was installed on the main floor. Based on the calculated usage (47gpm), this tank should supply existing users and can be refilled in 3 minutes by pumps. |
|  | All of the electrical systems were replaced and a new heater was installed in the building. |
|  | The lower level of the building houses two pumps. A safety railing was installed on the main floor. |

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|   | Graver Filter system installed with both a pre-filter (5MC3-30inch) and a final filter (5MC3-30-222-30inch). The filter cartridges were installed in early December. With the low turbidity in the water, they are expected to last longer than others. The filters can process 50 gpm into the pressure tank.<br><br>A public water system requires two banks of filters but due to cost constraints, only one was installed. The system was laid out so that an additional bank of filters could be installed. |
|  | A Stenner pump and 30 gallon chlorine reservoir was installed to automate chlorination. |

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|  | A Hanna Instruments Chlorine analyzer was installed to assist with monitoring.<br><br>Industrial Process Technologies provided training on both the pump and the analyzer. |
|  | Existing pumps are designed to come on when pressure drops below to 24 psi and turns off at 39 psi.<br><br>With these settings, pressure in the lowest point of the system has been over 50 psi. These values are much higher than with the previous system. |
|  | A new insulated window was installed in the south wall. Painting will be completed in the Spring, 2015. |

Funding Summary:

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| Colorado State Land Board: | $20,000 |
| Southwest Water Conservation District | $49,103 |
| Colorado Water Conservation Board (WSRA) | $25,000 |
| Fort Lewis College (cash and in-kind) | $20,000 |
| | $114,103 |

Expense Summary:

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| Engineering Fees: | $21,337.00 |
| Filters and chlorination system (including monitoring): | $20,688.44 |
| Asbestos abatement | $5,924.22 |
| Construction contract: | $49,750 |
| Demolition, building and electrical upgrades | |
| Installation of all equipment | |
| Startup supplies: | $ 476.22 |
| Surveys, Code compliance | $1,601.45 |
| FLC in-kind contribution (staff time, equipment) | $10,000.00 |
| | $109,777.43 |

If you have any questions, please contact me at 970-385-4574 or lashell_b@fortlewis.edu.

Sincerely,

Beth LaShell
Coordinator, Old Fort at Hesperus
Fort Lewis College