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Proposed Groundwater Source Sass Well

Town of Crawford

Orange County

Part 3 EAF Volume 1

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Town of Crawford Groundwater Source
Sass Well

1.0 PROJECT INFORMATION

Location: Blackhawk Road, Pine Bush
Town of Crawford
Orange County, New York

Lead Agency: Town of Crawford Town Board

Project Sponsor: Town of Crawford
121 Route 302
Pine Bush, NY 12566
(845) 744-2020

Supervisor: Charles Carnes

Councilpersons: Michael Menendez
William Mons
James Licardi
Daniel Flanick

Contact Person: Charles Carnes

Project Professional Consultants

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Engineer	Bipin Gandhi, PE	PO Box 38, Route 207 Goshen, NY 10924 845-294-5404
Surveyor	William Norton, LS Mercurio, Norton and Tarolli, PC	45 Main Street Pine Bush, NY 12566 845-744-3620
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2.0 EXECUTIVE SUMMARY

2.1 Summary of the Proposed Action

This Part 3 EAF was prepared for the Town of Crawford Town Board, applicant and Lead Agency for the proposed project. The Town of Crawford Pine Bush Water District has been experiencing severe water supply difficulties for several years. During summer months or dry periods the District has been unable to provide its residents with an adequate water supply without restricting usage during the summer months.

The Water District's source of supply includes the following facilities:

- Main well
- Blackhawk well
- Kelly well
- Finneran Lane well
- Dewitt Well (pending)

The lack of an adequate water supply in the Pine Bush Water District has been closely monitored by the Town Board and the Orange County Department of Health (District well production figures and District usage figures are available for review at Town Hall). Therefore, the Town of Crawford has been actively searching for additional water resources within the Town boundaries. The Water District has evaluated several sites as potential groundwater sources of supply. Of the sites evaluated for potential, several sites were selected for testing programs which ranged from exploratory soils boring to test well installation and pump testing.

Beginning in 2003, the District embarked on an accelerated search for an additional source through site identification, investigation and development. The initiative is directed towards the procuring a groundwater source, given the land cost and regulatory requirements for new surface water sources. The District has tested three sites for potential groundwater resources since January 2003. The subject site, known as the Sass well, located on Blackhawk Road, is the third source to show significant potential groundwater resources. The first was the Finneran Lane well, which was initially used by the Water District as an emergency source, and subsequently permitted through the NYSDEC Public Water Supply Application and Orange County Health Department review processes. The second source, known as the Dewitt well, is currently under review. The site plan contained in the appendix of this document shows the location of the Sass site, located adjacent to the hamlet of Pine Bush in the Town of Crawford. The proposed project will encompass approximately 0.2 acres of this parcel. Water from the site will be treated at the well head and transmitted to the District's distribution system via the proposed water transmission line, which will traverse the site towards the Right of Way (ROW) of Blackhawk Road.

2.2 Description of Project Development

Prior to proposing the use of the Sass well as a source of public water supply, a comprehensive testing and evaluation program was performed for the proposed resource. Beginning in 2006, on site investigations at the site have included the following elements:

- 1) Review of existing conditions and mapping, including aerial photography.
- 2) A Soil Boring Program incorporating the review data collected during installation of nine soil borings on the subject site. The boreholes were converted to monitoring wells through the installation of a 2' screening casing and grout seal to bedrock. The testing program was composed of the following elements:
 - ◆ Drilling Observation/Data Collection
 - ◆ Date Reduction
 - ◆ Data Analysis
 - ◆ Report and recommendation to proceed with test production well.
- 3) Based on the results of the boring program it was determined that the semi-confined unconsolidated glacial material had adequate thickness and was extensive enough to possibly support a high capacity (greater than 350 gallons per minute) production well. An eight (8) inch diameter test production well was installed adjacent to boring SB-9, (reference attached site plan). This site was selected due to the vertical thickness of sand and gravel observed in the test boring samples at boring locations SB-1 and SB-9. The well was installed on September 11, 2006. The well was completed by Kendrick Drilling of Chester, New York using air rotary methods to a depth of 63.0 feet. The screen depth and length were determined based on the boring logs for locations SB-1 and SB-9. The screen slot size was based on grain size analysis of soil samples from test boring location SB-9. Appendix B of the Aquifer Test and Well Assessment Summary by GWI, contains the grain size analysis reports. A total screen length of 40 feet was designed with varying slot sizes with 10 feet of eight inch, wire wound, 0.10 inch slot, stainless steel screen from 23 to 33 feet below land surface, 5 feet of 0.30 inch slot stainless steel screen from 33 to 38 feet, 15 feet of 0.80 inch slot stainless steel screen from 38 to 53 feet and 10 feet of 0.20 inch slot stainless steel screen from 53 to 63 feet below land surface. Approximately 26 feet of eight (8) inch steel riser pipe completed the installation to above land surface. The well was developed for approximately 8 hours using an air surge block method. Appendix C of the Aquifer Test and Well Assessment Summary by GWI, presents the New York State Department of Environmental Conservation well completion report (NYSDEC well number 07791).
- 4) The pump test protocol was initiated by conducting a 8-hour step drawdown test on October 4, 2006. The step drawdown test was used to determine well efficiency and set a target range for the long term (4 day) pump test. During the step drawdown test, aquifer drawdown was recorded by pressure transducers in the monitoring wells noted above.

Pre-test aquifer water levels were recorded in the interim between the step drawdown test and the long term (4 day) aquifer test, initiated on December 4, 2006. In order to assure elevation accuracy from the monitoring well data, all wells were surveyed and tied to the same datum. Additionally, a staff gauge was installed in the pond on site in order to evaluate the potential for induced recharge from the surface water body.

Aquifer testing was conducted on the test production well from December 4-8, 2006 for a four day period. The withdrawal volume for the test over the pumping period averaged 410.55 gpm. Water levels were monitored in the test production well (pumping well), observations wells SB-1, SB-2, SB-3, SB-5, SB-6, SB-7, SB-8, home owner wells HOW-1 and HOW-2, the municipal supply well known as the Black Hawk Road well and surface water stilling well SG-1 with calibrated pressure transducers. Water level monitoring was conducted approximately five (5) days prior to the aquifer test, during pumping and over five days of aquifer test recovery. Precipitation for the aquifer test period was obtained from data collected at the Pine Bush Sewer District Sewer Plant, Pine Bush New York. Hydrographs of the water level change for the pumping well and each of the monitoring wells, the home owner wells, and the stilling well staff gauge for the entire aquifer test period are presented in the Aquifer Test and Well Assessment Summary by GWI. The water level change recorded in the pumping well for the last six (6) hours of withdrawal was less than 0.3 feet.

The discharge water from the aquifer test was piped approximately 300 feet from the test production well and into a surface water drainage channel for discharge away from the site. No precipitation events were recorded during the aquifer test.

A review of the water level hydrographs indicates that prior to the withdrawal portion of the aquifer test there is no evident trend for recharge (rising water levels) or discharge (falling water levels) in the immediate vicinity of the test well site. Hydrographs also indicate that all observation wells monitored except the surface water stilling well, SG-1, and the Black Hawk Road municipal supply well show some drawdown effect during pumping. The maximum drawdown observed in the pumping well was approximately 19.5 feet and the least water level change was observed at observation well SB-8 with less than approximately 3.0 feet of drawdown at the end of pumping. Analysis of well test data indicates that the potential long term safe yield of the well is approximately 425 gpm. Considering uptime/downtime for maintenance, equipment calibration, testing and well cycling, the project sponsor proposes to permit the well at a rate of 330 gpm, or 475,200 gpd.

Comparison of precipitation events recorded prior to pumping and during recovery indicates that none of the observation wells show a direct response in water levels due to recharge through precipitation. This suggests that the aquifer is confined to semi-confined as shown based on the water level data shown on the hydrogeologic cross sections.

In order to establish a well head protection zone within the area of the pumping well the local direction of groundwater flow was determined over four time periods. In

general, the direction of groundwater flow in each case returned to that before the pumping portion of the aquifer test with flow from the west toward the east and discharging toward the unnamed drainage to the east of the property site.

Prior to testing the proposed production well, the pond overflow, upgradient from the well, was extended 170 feet to the east and downgradient from the production well. In order to determine the potential for induced recharge to the pumping well from the adjacent surface water pond to the west, the groundwater temperature was monitored at the pumping well and at observation wells SB-3, and SB-6 and surface water temperature was monitored at surface water stilling well SG-1. In addition the water quality parameters of temperature, specific conductance, dissolved oxygen, pH, and turbidity were also measured in a flow through cell with discharge water from the pumping well. These data indicate that the pond is hydraulically separated from the groundwater flow system.

The production test well was also sampled for testing during the 4 day pump test. Groundwater samples were collected for micro-particulate analysis (MPA) and a full Subpart 5 NYSDOH (Public Health Law, Section 225 Public Water Systems Subpart 5-1 dated January 6, 1993) analysis at the 72 hour mark during the aquifer test and analytical data including analysis for pesticides; herbicides (EPA Methods 504.1, 508, 515.1, 525.2, 531.1, 547, 548, 549); NYS Part 5 Groups 1 (including the asbestos method 1980), II and III inorganics; radiological parameters of gross alpha, gross beta, and total radium and radon; nitrates, nitrites, lead, copper, silver, dioxin, and volatile organics including MTBE (EPA method 502.2). Analyses were performed by Severn Trent Laboratories (NYSDOH 10142).

Laboratory results are included in the Appendix of this document. Results indicate that the production test well meets prevailing NYS standards with the exception of Manganese at 650 micrograms per liter (reference Appendix). The levels recorded in the testing are manageable through conventional water treatment methods, including the addition of amendments. These criteria exceedences were determined by the project engineer not to be limiting with respect to development of the well as a municipal source of supply.

This document examines the potential impacts associate with the proposed project including:

- ◆ The development of a municipal well for purposes of supplying water to the residents of the Pine Bush Water District;
- ◆ Construction of an 8' water transmission line;
- ◆ Construction of an access road to the well area;
- ◆ Construction of a small structure to house well monitoring and water treatment equipment.

2.2.1 Required Approvals

It is anticipated that the approval of the source as a permanent source of supply will require the following agency permits/approvals at a minimum:

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|---|---------------------------|
| ◆ Town of Crawford Board | Funding Approval |
| ◆ Orange County Department of Health | Water Supply Improvements |
| ◆ New York State Department of Environmental Conservation | Water Supply Application |
| ◆ New York State Department of Health | Water Supply Improvements |

2.2.2 List of Involved Agencies

- ◆ Town of Crawford Town Board
- ◆ Orange County Department of Health
- ◆ New York State Department of Environmental Conservation
- ◆ New York State Department of Health

2.2.3 List of Interested Agencies

- ◆ New York State Office of Parks, Recreation, and Historic Preservation

2.2.4 Summary of Potential Impacts

The following text summarizes the potential impacts as a result of this action.

- ◆ Soils/Geology/Topography
 - ◆ Disturbance of the soils present on the property and erosion of soil through wind action, water transport and other natural processes
 - ◆ Excavation of a trench for the installation of a water transmission line.
- ◆ Surface and Groundwater Resources
 - ◆ Potential erosion of soils and sedimentation.
 - ◆ Potential drawdown of existing wells within the vicinity of proposed municipal ground water supply wells.
- ◆ Air Resources
 - ◆ Installation of the proposed water transmission line will have an impact on air quality via emissions from construction equipment.
 - ◆ Dust generated by construction activities.
- ◆ Noise

- ◆ Impacts to existing noise levels at the site would occur as a result of the installation and construction of the well, transmission line and structures.
- ◆ Vegetation
 - ◆ Removal of the existing vegetation for the construction of the treatment facilities, transmission line, etc..
- ◆ Visual Resources
 - ◆ A potential change in the view of the project area.
- ◆ Land Use
 - ◆ The primary impact as a result of this project would be the conversion of vacant land to a municipal water supply.
 - ◆ Impacts to landowners within the proposed well head recharge zone are expected to be minimal. Measures would include the establishment of best management practices and other wellhead protection measures recommended for Zone I-IV protection under NYSDOH Watershed Rules and Regulations program.