Closure Plan for Hard Chrome Plating Line

West Falls Machine Company
East Aurora, New York

November 2016
Revised July 2017

0067-016-001

Prepared For:

West Falls Machine Company, Inc.

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CLOSURE PLAN
for
HARD CHROME PLATING LINE

WEST FALLS MACHINE COMPANY
EAST AURORA, NEW YORK

November 2016
Revised July 2017

0067-016-001

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Table of Contents

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Table of Contents

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

1.1 Background

West Falls Machine Company, Inc. (West Falls Machine) operates a specialty parts manufacturing facility at 11692 East Main Street (also referred to as Big Tree Road) in East Aurora, New York (refer to Figure 1). The property is comprised of an approximately 7,000 square foot industrial/manufacturing building and offices located on a 2.8-acre parcel (see Figure 2). The facility is primarily engaged in the specialized fabrication of mechanical drive components through machining, welding, cutting, and grinding operations. In conjunction with these services West Falls Machine operates a hard chrome plating (aka. non-decorative chromium electroplating) line. The hard chrome plating step is a finishing operation used to provide a protective surface on drive shafts and other custom machined components as may be requested by some clients.

Hard chrome plating is chromium plating that has been applied as a fairly heavy coating (usually measured in thousandths of an inch) for wear resistance, lubricity, oil retention, and other 'wear' purposes. This electroplating method is referred to as 'hard chrome' because it is thick enough that a hardness measurement can be performed on it. West Falls Machine Company intends to permanently shut down the hard chrome plating operation for business reasons. Other manufacturing operations are not expected to be affected by the shutdown.

1.2 Environmental History

Green Environmental Specialists, Inc. performed a Phase II Site investigation on the property in June 1998 (Ref. 1) in response to an alleged report of disposal of metal-bearing wastewater to the Site septic system. The Phase II investigation involved the collection of groundwater samples from 20 temporary monitoring well locations across the northern portion of the property in the vicinity of the facility's leach field for analysis of total chromium. With the exception of one groundwater sampling location (SB-12), chromium was not detected at any of the monitoring locations.

The hard chrome plating line as well as the associated evaporator system used to treat rinse waters and collected groundwater are currently governed by an Order on

Consent (No. B9-0542-98-10) issued by the New York State Department of Environmental Conservation (NYSDEC) on November 22, 2002, which requires adherence to Operation and Maintenance (O&M) Plans for both the plating line and the evaporator system (Refs. 6 and 7).

In December 2002, Benchmark Environmental Engineering & Science, PLLC (Benchmark) was retained by West Falls Machine Co., Inc. to assist with the compliance activities identified in the Order on Consent. Benchmark prepared a Supplemental Site Investigation (SSI) Work Plan (Ref. 2) and performed the investigation work in February and March 2003. The results of the SSI are presented in the March 2003 letter report (Ref. 3). Unfiltered groundwater samples from two temporary wells detected chromium above GWQS; however, a filtered sample contained chromium at a concentration well below its GWQS indicating that groundwater has not been impacted by the low-level localized chromium detected in the soil within the leach field borings. At the request of NYSDEC, additional groundwater samples were collected and analyzed for total chromium. As presented in an addendum to the letter report (Ref. 4), chromium was detected in both unfiltered samples at concentrations above the GWQS. The second addendum (Ref. 5) issued to NYSDEC provided filtered and unfiltered analytical data to demonstrate that elevated levels of total chromium in groundwater is associated with the suspended solids within the sample.

2.0 PLATING LINE CLOSURE PLAN

2.1 Plating System Description

West Falls Machine Company employs two process tanks that contain chromic acid and are equipped with rectifiers for use in the hard chromium plating system. The large plating tank (Tank 1) was designed to be the primary plating tank and is used to electroplate drive shafts and custom machined components. The small plating tank (Tank 2) is used for smaller parts in conjunction with the operation of Tank 1. In general, parts are masked as required with aluminum foil or vinyl tape materials and submersed for plating in Tanks 1 or 2. The chromic acid solution in Tank 1 is typically maintained in the range of 32 to 36 ounces of hexavalent chromium per gallon as determined by daily colorimetric chemical testing of the plating solution. Figure 3 is a process schematic of the plating system and illustrates the function and integration of the equipment.

Both plating tanks are located within the confines of a subgrade pit with a bottom depth approximately 7 feet below plant floor level. The pit is constructed of a concrete floor and epoxy coated cement blocks filled with concrete and covered by an open grate. The pit is lined with secondary containment steel plating to a height of approximately 2.5 feet above the floor level. Below the cement blocks is a 6- to 8-inch thick drain tile layer underlain by stone aggregate. The plating room is surrounded by a perimeter drain system that discharges to a sump (deemed the "plating area floor sump"). A separate shallow sump is present inside the pit (i.e., the "pit sump") and is used to periodically remove infiltration water that migrates into the void space between the steel liner and the concrete floor. Figure 4 presents the plan view and cross-section of the plating room.

Following completion of plating, parts are suspended over the plating tank to allow for gravity drainage and rinsing with clean water to remove plating bath residual from the parts. All rinse water from this operation drains back into Tank 1. After parts have been rinsed, they are suspended over a 55-gallon drum for removal of masking and further rinsing, if necessary. Rinse water from this manual operation is collected in the drum and transferred back into Tank 1. Residual solids from this step are transferred manually into the sludge holding tank. A detailed description of Tank 1 (plating) and Tank 2 (plating solution recovery) follows:

- **Tank 1 (Large Chrome Plating Tank):** A 975-gallon (working capacity) Koroseal-lined carbon steel chromic acid plating tank (4 feet wide x 5 feet long x 7 feet deep) is

installed within a 1,620-gallon secondary containment system. Installation of this tank was completed on November 10, 2002. In December 2002, a non-resettable amp-hour meter was installed on the 7,500-amp rectifier associated with this tank. The tank is ventilated by two opposed slotted hoods that run the length of the tank on each side (slotted length is 58 9/16 inches) and connect into the main exhaust manifold directly below the 24-inch diameter primary suction line to the exhaust fan.

- **Tank 2 (Small Chrome Plating Tank):** A 315-gallon (working capacity) PVC-lined carbon steel chromic acid plating tank (3 feet wide x 4 feet long x 4 feet deep) is installed within the same 1,620-gallon secondary containment system with Tank 1. Installation of this tank was completed in December 1997. In December 2002, a non-resettable amp-hour meter was installed on the 2,000-amp rectifier associated with this tank. The tank is ventilated by two opposed slotted hoods that run the length of the tank on each side (slotted length is 47 inches) and combine to form a 16-inch branch that ties into the 24-inch main exhaust manifold directly below the mist eliminator in the suction line to the exhaust fan.

The exhaust fan for the tank ventilation system is equipped with a 5-hp motor and rated at 7,500 cfm. The fan is located outside on the roof adjacent to the plating area. An in-line mist eliminator constructed of PVC internals is employed as an add-on control device and was installed into the reconfigured ventilation system just above the convergence of the two branches that draw exhausted air from the tank hoods. A Magnehelic pressure gauge was installed in December 2002. When plating operations began in February 2003, a fume suppressant (Cancel ST-45 manufactured by Plating Resources, Inc.) was added to Tank 1 to maintain a surface tension on the plating and recovery tanks of 45 dynes/cm or less in accordance with 40CFR63.343(c)(5)(ii).

2.2 Evaporator System Description

The primary function of the evaporator system is to evaporate excess water from the groundwater collection sources. The key components are:

- **Atmospheric Evaporator:** The atmospheric evaporator is used to concentrate groundwater pumped from the plating area floor sump and other groundwater extraction sources. The concentrated water is filtered and returned to the plating tanks. Approximately 50 to 70 gallons per day (gpd) of water are evaporated from this system. The tank contents are heated to 80°F to enhance the evaporation rate. The exhaust rate from the evaporator blower is 3,300 cubic feet per minute (cfm).
- **Tank 3 (Evaporator Holding Tank):** This tank has a working capacity of 275 gallons and receives approximately 50 gpd of groundwater from the plating area floor sump

and other sources (see Figure 3). The contents of the holding tank are circulated through the evaporator, and concentrated solution is pumped periodically by portable pump to Tanks 4 or 5 for filtering and reused as makeup water.

- **Tank 4 (Standby Holding Tank):** This polyethylene tank has a working capacity of 250 gallons and is located in a secondary containment dike. The tank is used for storage of the same materials as Tank 5.
- **Tank 5 (Sludge Holding Tank):** This polyethylene tank has a working capacity of 250 gallons and is located in a secondary containment dike. The tank is used for storage and filtering of concentrated groundwater from Tank 3 and flushings from the mist eliminator and porous pot filters. Sludge is pumped out of the tank and into the filter press in a batch operation to concentrate the solids. Filtrate is returned to Tanks 1 and 2 or Tanks 4 and 5 if there is insufficient capacity in Tanks 1 and 2.
- **Filter Press:** A recessed chamber, plate, and frame filter press is used to concentrate solid residuals from the plating operation. The filter is fed in a batch processing mode from Tank 4 or 5 by a dual diaphragm sludge pump. The filter cake generated during a press cycle typically exceeds 50 percent solids concentration. Pressed solids are transferred manually into a 55-gallon drum for storage and ultimate disposal. Filtrate generated during the press cycle is returned to either Tank 1, 2, 4, or 5, or the sludge holding tank.
- **Plating Area Floor Sump:** The floor sump is located on the main floor level in the Plating Area and is approximately 18 inches in diameter and 15 feet deep. The sump is equipped with a manually operated submersible style sump pump that is rated at approximately 3.5 gallons per minute (gpm). Daily, groundwater that collects in the sump is pumped out of the sump for use as makeup water in the evaporator or in the plating tanks.

2.3 Shut-down of Plating Line

Upon approval of this Closure Plan, West Falls Machine Co. will begin decommissioning of its hard chrome plating line. The handling and disposition of raw materials and wastes include:

- **Unused Chromic Acid**: No containers of unused chromic acid remain on-site; all supplies were depleted in anticipation of decommissioning.
- **Chromic Acid Solution**: The chromic acid solution in Tanks 1 and 2 is typically maintained in the range of 32 to 36 ounces of hexavalent chromium per gallon. Currently, an estimated 650 gallons of this solution remain in Tank 1 and 315 gallons in Tank 2. Both tanks will remain heated and be allowed to evaporate to the point that the remaining quantity of concentrated acid is reduced to approximately 50% or less than the current volume, at which point it will be transferred to temporary storage

(either in Tanks 4 or 5, after cleaning, or NYSDOT-approved compatible drums) and maintained on-site within secondary containment. The containers will be labeled appropriately as to content, health hazard and date of generation. If possible, this material (which will be considered a Commercial Chemical Product under RCRA) will be transferred to another plating company for reuse by a licensed hauler within nine months of generation. Otherwise, the material will be sent off-site to a Verified Recycler within one year of generation. NYSDEC Chemical Bulk Storage regulations will apply to bulk chromic acid storage of 2,200 pounds or more following 90 days of containerization; West Falls Machine Company would, among other requirements, need to perform daily visual inspections of the chromic acid stored within secondary containment.

- **Rinse Water**: All rinse water from parts decommissioning (see below) will be directed to plating tank 2 for continued evaporation as long as Tank 2 remains operational.
- **Sludge**: Remaining contents in Tanks 3, 4, and 5 and any sludge generated from cleaning will be processed through the filter press. Sludge will be disposed at a permitted TSDF as a RCRA-listed (F006) hazardous waste filter press cake.

2.4 Equipment Decommissioning

Equipment associated with the hard chrome plating line includes:

- Tanks (5)
- Secondary containment steel plating
- Piping
- Pumps
- Exhaust hoods, fans, and roof-top ventilation system
- Filter press
- Evaporator
- Mist eliminator

West Falls Machine Company will use its staff to decontaminate tank materials, racking, and other parts that came in contact with the plating solution and plating solution exhaust. The order of operations will be such that the evaporator and Tank 3 will be the final units to be decommissioned, allowing ground water to continue to be pumped for evaporation until the point of facilities decommissioning (see below), and thereby minimizing dewatering during subgrade work. To decontaminate, the hard surfaces contacting chromium solutions or vapors will be drained to Tank 2 and any residual sludge will be collected and containerized for disposal with filter press sludge. The equipment will then be double rinsed followed by air

drying. Rinsate will be directed to Tank 2. Tank 2 contents will continue to be concentrated to the extent practicable, after which they will be containerized for reuse or recycling as described above. Rinse waters from cleaning of Tank 2 as well as the evaporator system will be either combined with the containerized chromic acid product or drummed for disposal at a TSDF with the sludge materials. Following cleaning, the equipment will be handled in the following manner:

- Tanks will be rendered unusable (size reduced).
- Metal components will be segregated and salvaged as scrap.
- Non-metal components will be disposed as solid waste.
- Functional mechanical and electrical equipment will be sold or temporarily kept on-site for resale to another plating firm.
- Any parts that cannot be adequately cleaned or transferred to another plating facility for reuse will be disposed as hazardous waste (e.g., filter cloths).

2.5 Facilities Decommissioning

Facilities to be decommissioned include the concrete tank pit floor, walls, plating area floor sump, pit sump, and secondary containment steel plating. Following equipment removal, the steel floor plate above the secondary containment pit will be removed for salvage as will the steel stairs, railings and steel plate liner that covers the pit floor and walls. A qualified demolition/environmental services firm will be retained to aid in removal of the remaining subgrade secondary containment system, including the block, concrete, sumps and drain tile materials. Benchmark will observe and document the work, and perform analytical testing of the various materials as needed to determine disposal requirements. Figure 4 presents a cross-section of the hard chrome plating room.

Block and concrete not in contact with the water table or exhibiting signs of impact will be sent to a permitted concrete recycling facility; remaining materials will be tested for leachable chromium via TCLP methodology and disposed appropriately. Soils, aggregate, and drain tile beneath the floor will be removed to the point they exhibit a clean visual soil surface, with the removed material similarly tested for leachable chromium and other parameters as required by the disposal facility (expected to be a permitted solid waste landfill) and disposed appropriately. The plating area floor sump and pump will be removed as well and rinsed prior

to disposal as sanitary waste. The scraped sidewalls and base will be tested to document post-excavation conditions as detailed in Section 3.2.

Work will be performed during dry weather months to minimize the extent of dewatering that may be required. Nevertheless, a baker tank with a bag filter and liquid phase activated carbon treatment system will be present to manage excavation water. Excavation water will be treated through activated carbon; recycled back to the tank until analytical testing demonstrates that it meets groundwater quality standards for total and hexavalent chromium and pH; and discharged on-site.

3.0 ENVIRONMENTAL SAMPLING PLAN AND SITE RESTORATION

3.1 Survey

Upon removal of the floor, concrete block walls, and perimeter drain system, the subgrade chrome tank pit will be surveyed (i.e., approximate boundaries as determined by GPS and average depth as manually measured) and the information will be transferred to a Site map.

3.2 Confirmatory Soil Sampling

Benchmark will collect confirmatory samples within the newly exposed subgrade chrome tank pit at a frequency of approximately 1 per 30 linear feet of sidewall and 1 per 900 square feet of exposed base in accordance with DER-10 Section 5.4(b)5. Therefore, a minimum of four sidewall samples and one bottom sample will be collected. Additional samples will be collected from the base of the tank pit beneath the plating area floor sump; pit sump; and between the pit sump and perimeter drain system as shown on Figure 4. Post-excavation confirmatory samples will be submitted to the laboratory on a 48-hour turn-around time for analysis of total and hexavalent chromium via USEPA Methods 6010C and 7196A with an equivalent Category B deliverables package to facilitate data evaluation by a third-party validation expert.

Prior to receipt of confirmatory analytical data, the subgrade chrome tank pit will be blocked with reflective barricades and yellow flagging.

3.3 Temporary Dewatering and Treatment

Water removed from the subgrade area and surface water run-in will be treated on-site prior to discharge to grade. In general, removed water will be stored/settled in a portable 20,000-gallon storage tank and, if deemed necessary, pumped through a bag or cartridge filter prior to treatment using activated carbon. Following completion of the work, settled solids remaining in the tank and spent filter bags will be disposed off-site. Spent GAC will be characterized (TCLP metals testing) and either regenerated off-site or disposed at a permitted disposal facility in accordance with applicable federal and state regulations. The storage tank will be decontaminated via pressure washing.

3.4 Removal of Impacted Soil

If any confirmatory samples exceed the NYSDEC Part 375 protection of groundwater soil cleanup objective (PGWSCO) for hexavalent chromium (19 ppm), the impacted soil will be excavated and transported off-site for disposal at a commercial solid waste landfill. Lateral and vertical excavation will continue until impacted soil/fill is removed; Part 375 PGWSCOs are met; excavation has reached physical barriers (physical barriers may include underground utilities, subgrade piping, and/or concrete structures such as building foundations that are not planned for removal); or it is deemed infeasible for safety reasons.

Impacted soil will be direct-loaded into dump trucks or dump trailers, covered, and transported by a licensed hauler to the disposal facility.

3.5 Backfill and Site Restoration

Following testing and confirmation that no significant impacts remain and with NYSDEC concurrence, a two-part blend of Hydrogen Release Compound (HRC®) Primer and Chemical Reducing Solution (CRS®) manufactured by Regenesis will be placed in the excavation to reduce hexavalent chromium to trivalent chromium and promote removal from the groundwater via precipitation. Based on the expected size of the excavation area, saturated thickness, and a conservative estimate of expected residual chromium concentrations, Regenesis recommends application of 400 pounds of CRS® and 120 pounds of HRC® Primer. These amendments will be added directly to the bottom of the excavation and field blended with the excavation equipment. The excavation will then be backfilled with 2 feet of washed stone bedding, compacted with the excavator/backhoe bucket, and covered by a geotextile fabric.

A 5-foot length of slotted 4-inch PVC pipe (well screen) will be installed within the washed stone and will transition to a 4-inch PVC riser that will extend to the finished floor elevation. The riser will be sealed with a J-plug or threaded cap and protected via a steel road box with a cover. The PVC pipe will serve as a groundwater monitoring point and potential groundwater extraction location.

Following installation of the well, the remainder of the pit will be backfilled with approved structural backfill material from a licensed commercial quarry or flowable fill. Stone backfill material, if used, will be placed into the excavation and compacted with the excavator/backhoe bucket in 1- to 2-foot lifts to minimize settling. Backfill will be completed

to match the elevation of the base of surrounding concrete flooring to facilitate patching and reuse of the area at a later date.

3.6 Groundwater Monitoring

Groundwater samples will be collected from the 4-inch well installed within the washed stone bedding of the former hard chrome plating pit on a monthly basis for up to six months and semi-annually thereafter if the data suggest a need for continued monitoring. Prior to collecting the samples, a minimum of 10 well volumes will be removed via temporary pumping. Purge water will be filtered through activated carbon and re-introduced to the well during the same event after the groundwater samples are collected. The groundwater samples will be analyzed for trivalent and hexavalent chromium via USEPA SW-846 Methodology. If samples exhibit elevated turbidity (>50 NTU), samples will be submitted for both total and soluble (filtered) analysis.

4.0 GROUNDWATER PUMPING AND TREATING OPERATIONS

During construction of the subgrade chrome tank pit, the pit was surrounded by gravel and a collection drain that empties into the floor sump. The facility currently pumps groundwater from the plating area floor sump on a daily basis for production makeup and to mitigate buildup of hydrostatic pressure in the floor pit area. This pumping operation has also served to remove low levels of chromium in the groundwater beneath the plating line.

As discussed below, supplemental pumping was initiated in 2013 from a second location beneath the plating floor to further remove any residual chromium trapped within the aggregate materials. This is effected via a small diameter well that extends into the aggregate materials and is shrouded by a welded steel casing that extends above the secondary containment skirting in the pit.

4.1 Groundwater Testing

To track the gross concentration of chromium in the groundwater from the plating area floor sump, a sample is collected weekly and tested on-site using a colorimetric procedure. In order to achieve a higher degree of analytical precision and track concentrations for comparison against New York State Groundwater Quality Standards/Guidance Values (GWQS/GVs) per 6NYCRR Part 703. West Falls Machine Company currently collects one sump sample per year for analysis of total chromium by a NYSDOH-certified laboratory using SW856 Method 6010B. Table 1 summarizes the annual groundwater results that have been generated by the laboratory over the past 2 years. Samples collected from the supplemental pumping well discussed in Section 4.2.1 are also presented on Table 1. Plating area floor sump sample results have indicated concentrations within an order of magnitude of the GWQSs over the past 2 years. Groundwater concentrations from the supplemental pumping well have fallen below GWQSs since August 2014.

4.2 2013 Groundwater Investigation

In anticipation of business ownership transfer, West Falls Machine Company requested that Benchmark perform a limited Site groundwater investigation. Beginning in October 2013, Benchmark performed the investigation primarily focused on the evaluation of shallow groundwater relative to potential impact from hard chrome plating operations. Thirteen 1-inch temporary monitoring wells (TMWs) were installed to 12 feet below ground surface

(fbgs). Shallow groundwater was generally encountered at 8 fbgs. PID scans of the fill (0-6 feet) and native soils (6-12 feet) were non-detect with no recognized visual or olfactory impacts. Groundwater samples were collected using low flow purging/sampling procedures and submitted for analysis of trivalent and hexavalent chromium via USEPA SW-846 Methodology. At temporary well locations TMW-8 through TMW-13, additional samples were collected for USEPA Target Compound List (TCL) volatile organic compound (VOC) and TCL base-neutral semi-volatile organic compound (SVOC) analyses. Following the groundwater sampling, Benchmark personnel removed the temporary wells and backfilled the well borings with sand and bentonite clay. Figure 5 show the sampling locations.

In addition to the temporary wells, West Falls Machine Company requested sampling of the plating area floor sump (which discharges to the on-site hard chrome plating rinse water treatment system) as well as the area below the subgrade secondary containment pit in the plating area (i.e., beneath the steel decking secondary containment system and underlying concrete floor). Accordingly, Benchmark collected a grab sample from the groundwater in the floor sump for trivalent and hexavalent chromium analyses. The area beneath the plating line secondary containment pit was accessed by cutting a small area of the steel floor decking and coring through the concrete floor. No field indications of impact were encountered. Nevertheless, both a soil sample (from the underlying cuttings) and a grab sample from the pore water encountered in the boring were collected and analyzed for total and hexavalent chromium (see Table 2). The concrete was patched and the floor decking was repaired following the sampling work.

4.2.1 Groundwater Results

Tables 2 and 3 summarize the groundwater analytical results and provide a comparison to NYSDEC GWQS/GVs. As indicated, trivalent and hexavalent chromium were reported as non-detect (ND) or well below GWQSs at all TMW locations with the exception of a slightly elevated concentration of hexavalent chromium (0.075 mg/L) as compared to the GWQS of 0.05 mg/L at TMW-5, immediately downgradient of the plating area. Samples collected for VOC and SVOC analyses from temporary wells TMW-8 through TMW-13 were all reported as ND or well below GWQSs.

As indicated on Table 2, low level concentrations of trivalent and hexavalent chromium above GWQSs were detected in the samples collected from the plating area floor sump and

pore water sample below the plating tank secondary containment pit; however, the concentrations were generally within an order of magnitude of the GWQS. Nevertheless, West Falls Machine Company requested that Benchmark assist in addressing the pore water concentrations beneath the secondary containment pit. This was accomplished by driving a small, 1-inch diameter slotted PVC pipe into the aggregate beneath the floor pit concrete. The PVC pipe and a steel casing, which was welded to the floor plating, were extended above the steel secondary containment plating. Suction tubing connected from the well to a low volume peristaltic pump was run into Tank 3 and allowed to operate continuously at a rate of approximately 0.25 gpm. Table 1 summarizes the groundwater analytical results for the water collected from the supplemental pumping well and the plating area floor sump in 2014 and 2015.

4.2.2 Soil Results

Table 4 presents the soil analytical results with a comparison to NYSDEC Part 375 SCOs. As indicated, chromium and hexavalent chromium concentrations were below CSCOs and PGWSCOs for the soil sample collected beneath the plating line secondary containment pit.

4.2.3 Conclusions

Groundwater samples collected across the Site were generally non-detect for the parameters analyzed with the exemption of isolated concentrations of trivalent and hexavalent chromium slightly above GWQSs near the plating operations in former temporary well TMW-5. In addition, the soil sample collected beneath the plating line secondary containment pit was below CSCOs. These environmental conditions are considered *de minimis* in nature with minimal site impact.

4.3 Termination of Groundwater Pumping Operations

Neither the Order on Consent nor the O&M Plans currently specify plating line closeout requirements. The groundwater pumping operations are currently performed for the joint purpose of dewatering the subgrade chrome tank pit and removing impacted groundwater from the prior chromic acid release.

Termination of groundwater pumping and treatment is supported by the consistent and significant drop in the concentration of chromium in groundwater observed to date as discussed in Section 4.2 and summarized on Tables 1 through 4. However, additional groundwater data from the well to be installed within the former hard chrome plating pit will provide up to 6 months of additional chromium data.

If chromium concentrations in the groundwater of the new well are not reduced to concentrations below or near the GWQS of 0.05 mg/L within the 6-month sampling timeframe discussed, West Falls Machine Company will notify NYSDEC that additional actions will be taken (e.g., additional groundwater in-situ treatment, installation of a pump-and-treat system, or other applicable actions) and submit a Work Plan describing the proposed remedial action. If a pump-and-treat system is proposed, the system would be sized in accordance with the amount of water previously being pumped by the plating area floor sump. Upon installation, the groundwater would be sampled quarterly the first year and, if the results are consistent, a reduced sampling frequency would be proposed to NYSDEC for approval.

The point at which the groundwater has been adequately remediated will be based on achievement of one or more of the conditions listed below consistent with the NYSDEC's current Site Management Plan template. In all instances, samples exhibiting elevated turbidity (>50 NTU) will be filtered as discussed in Section 3.6 and soluble concentrations will be employed in evaluation of the data:

- Concentrations of total and hexavalent chromium reach levels that are consistently below the groundwater quality standard of 0.05 mg/L;
- Concentrations become asymptotic to a low level over an extended period of time as accepted by the NYSDEC; or
- NYSDEC determines that the groundwater extraction and treatment system has reached the limit of its effectiveness. This assessment may be based on groundwater data collected from the new monitoring well and historic data from wells located throughout the Site. West Falls Machine Company will submit a letter report to NYSDEC demonstrating that this has occurred. NYSDEC will review the report and either agree or disagree with the assessment.

5.0 REPORTING

A brief Closeout Letter Report will be prepared to summarize the work completed including results of confirmatory soil sampling; the mass of soil excavated (if any) per scale receipts from the off-site disposal facility; manifests for solid and liquid wastes shipped off-site; a description of equipment and materials shipped off-site for recycling; purchaser(s) of useable equipment; a drawing showing excavated soil and confirmatory soil sampling locations; a description of any problems encountered, deviations from this Plan, and associated corrective measures taken; and other pertinent information necessary to document that the Site activities were carried out in accordance with this Closure Plan. The Closeout Letter Report will be submitted to NYSDEC. Groundwater monitoring results from the newly installed well will be summarized and provided to NYSDEC is tabular form.

6.0 TERMINATION OF ORDER AND PERMIT

6.1 Termination of Order

Upon NYSDEC approval of the Closeout Letter Report and concurrence that groundwater monitoring and remediation operations can cease as discussed in Section 5, the Order on Consent will be terminated by NYSDEC.

6.2 Air State Facility Permit

Following termination of the plating and evaporator system processes, West Falls Machine Company intends to surrender its Air State Facility Permit (ID 9-1466-00047/00003) since the Facility's only two emission units are associated with these processes. Upon completion of the plating line closure activities, West Falls Machine Company will submit a letter to NYSDEC describing the fate of the permitted equipment and requesting the permit be surrendered.

7.0 REFERENCES

1. Green Environmental Specialists, Inc. performed a Phase II Site investigation on the property in June 1998
2. Benchmark Environmental Engineering & Science, PLLC. *Supplemental Site Investigation (SSI) Work Plan, West Falls Machine Co., Inc., East Aurora, NY*. December 2002.
3. Benchmark Environmental Engineering & Science, PLLC. *West Falls Machine – Supplemental Site Investigation Report.* March 18, 2003.
4. Benchmark Environmental Engineering & Science, PLLC. *West Falls Machine – Addendum to March 18, 2003 Supplemental Site Investigation Report.* March 25, 2003.
5. Benchmark Environmental Engineering & Science, PLLC. *West Falls Machine – Addendum 2 to March 18, 2003 Supplemental Site Investigation Report*. April 30, 2003.
6. Benchmark Environmental Engineering & Science, PLLC. *West Falls Machine Company Plating System Operation & Maintenance Plan*. January 2003; revised November 2015.
7. Benchmark Environmental Engineering & Science, PLLC. *West Falls Machine Company Evaporator Operation & Maintenance Plan*. June 2003; revised November 2015.
8. New York State Department of Environmental Conservation. *West Falls Machine Company, Order on Consent, File #B9-0542-98-10*. November 22, 2002.

TABLES

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1

SUMMARY OF 2014/2015 GROUNDWATER ANALYTICAL RESULTS

West Falls Machine Co., Inc.
11692 Big Tree Road, East Aurora, New York

Parameter	NYSDEC Class "GA" GWQS [1]	Plating Area Floor Sump		Supplemental Pumping Well [2]			
		December 2014	December 2015	March 2014	August 2014	November 2014	December 2015
Chromium (mg/L)	0.05	**0.23**	**0.2**	**0.13**	0.0097	0.0059	0.0049
Hexavalent Chromium (mg/L)	0.05	**0.19**	**0.18**	0.035	ND	ND	ND

Notes:

1. Class "GA" Groundwater Quality Standards/Guidance Values (mg/L), 6NYCRR Part 700-705, revised June 1998.
2. Below secondary containment pit floor.

Definitions:

ND = Not Detected

BOLD Exceeds GWQS/GV

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TABLE 2

SUMMARY OF 2013 GROUNDWATER ANALYTICAL RESULTS

West Falls Machine Co., Inc.
11692 Big Tree Road, East Aurora, New York

Parameter	NYSDEC Class "GA" GWQS [1]	Below Plating Tank Area[2]	Plating Area Floor Sump
		September 2013	October 2013
Chromium (mg/L)	0.05	**0.78**	**0.35**
Hexavalent Chromium (mg/L)	0.05	**0.45**	**0.36**

Notes:

1. Class "GA" Groundwater Quality Standards/Guidance Values (GWQS/GVs) in mg/L.
2. Pore water sample.

Definitions:

BOLD	Exceeds GWQS/GV

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 3

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS FROM TEMPORARY WELLS

West Falls Machine Co., Inc.
11692 Big Tree Road, East Aurora, New York

Parameter [1]	NYSDEC Class "GA" GWQS [2]	October 4, 2013							December 5, 2013					
		TMW-1	TMW-2	TMW-3	TMW-4	TMW-5	TMW-6	TMW-7	TMW-8	TMW-9	TMW-10	TMW-11	TMW-12	TMW-13
Inorganic Compounds (ug/L)														
Chromium (trivalent) [3]	**50**	5.3	ND	ND	5.8	44	22	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium [3]	**50**	ND	ND	ND	ND	**75**	24	ND	ND	ND	ND	ND	ND	ND
TCL VOCs (ug/L)														
VOCs	**--**	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND
TCL SVOCs (ug/L)														
Acetone	**50**	NA	NA	NA	NA	NA	NA	NA	ND	ND	3.4 J	ND	8.2 J	ND
Di-n-butyl phthalate	**50**	NA	NA	NA	NA	NA	NA	NA	0.47 J	0.43 J	0.38 J	0.29 J	0.38 J	0.26 J
Diethyl phthalate	**50**	NA	NA	NA	NA	NA	NA	NA	0.27 J	ND	0.25 J	ND	0.20 J	ND
Phenanthrene	**50**	NA	NA	NA	NA	NA	NA	NA	ND	ND	0.52 J	ND	ND	ND

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Class "GA" Groundwater Quality Standards/Guidance Values (ug/L), 6NYCRR Part 700-705, revised June 1998.
3. Sample field filtered due to turbidity >50 NTU.

Definitions:

TMW= Temporary Monitoring Well
ND = Not Detected
NA = Not Analyzed
"--" No GWQS/GV
BOLD Exceeds GWQS/GV

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4

SUMMARY OF 2013 SOIL ANALYTICAL DATA

West Falls Machine Co., Inc.
11692 Big Tree Road, East Aurora, New York

Parameter [1]	Commercial SCO[1]	Protection of Groundwater SCO[2]	Below Secondary Containment Pit
Trivalent Chromium (mg/kg)	**1,500**	**-**	199
Hexavalent Chromium (mg/kg)	**400**	**19**	8.8

Notes:

1. Commercial Soil Cleanup Objectives (CSCOs) per 6NYCRR Part 375-6
2. Soil concentration deemed protective of leaching to groundwater per 6NYCRR Part 375-6

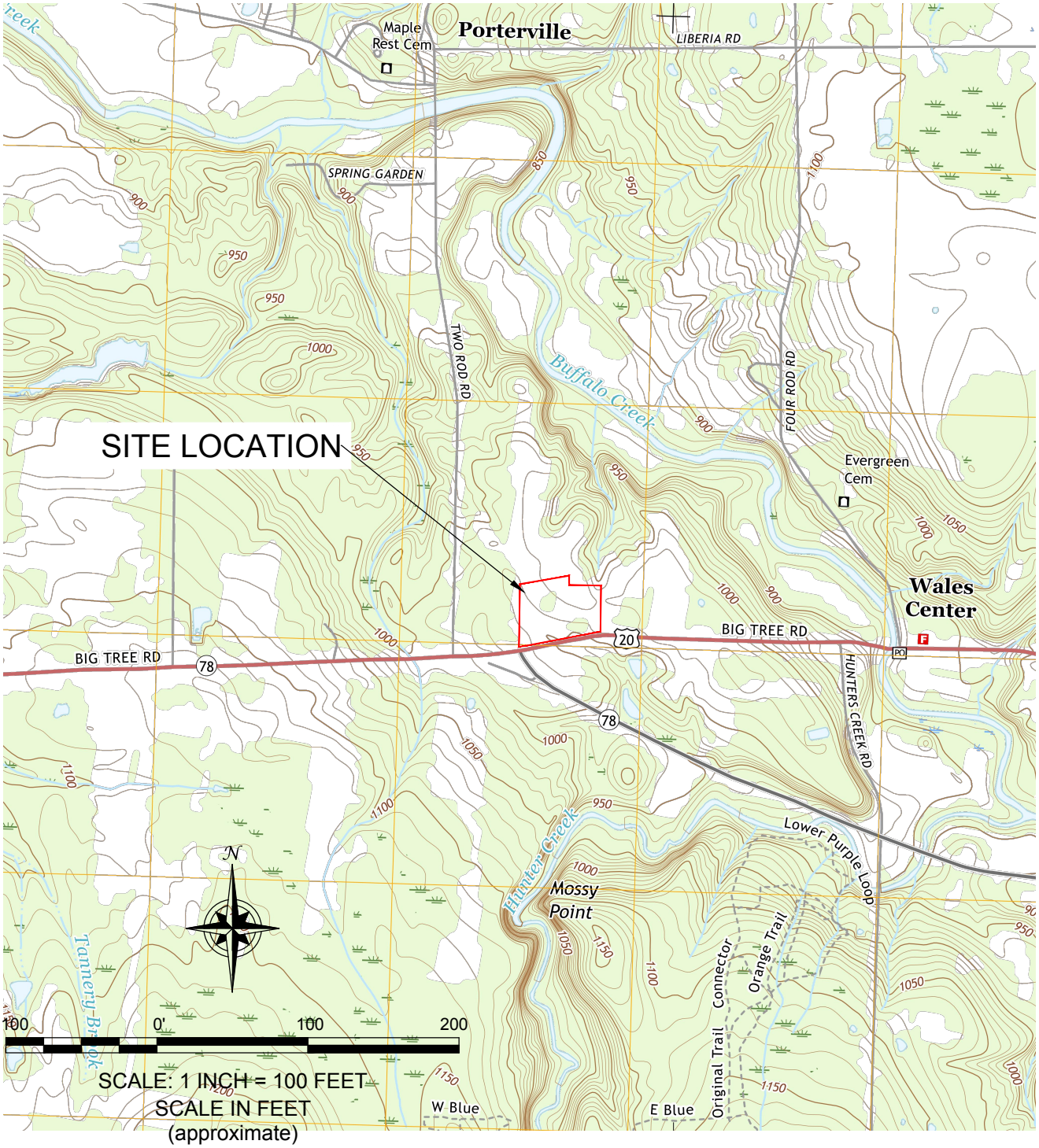
Definitions:

BOLD	Exceeds PGW SCO
BOLD	Exceeds CSCO

FIGURES

F:\CAD\Benchmark\West Falls Machine Co\Figure 1; Site Location.dwg

FIGURE 1



BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

PROJECT NO.: 0067-016-001

DATE: OCTOBER 2016

DRAFTED BY: RFL

SITE LOCATION AND VICINITY MAP

CLOSURE PLAN FOR HARD CHROME PLATING LINE

11692 BIG TREE ROAD
EAST AURORA, NEW YORK

PREPARED FOR

WEST FALLS MACHINE CO.,INC.

F:\CAD\Benchmark\West Falls Machine Co\Figure 2; Site Plan (Aerial).dwg

DATE: OCTOBER 2016
DRAFTED BY: RFL

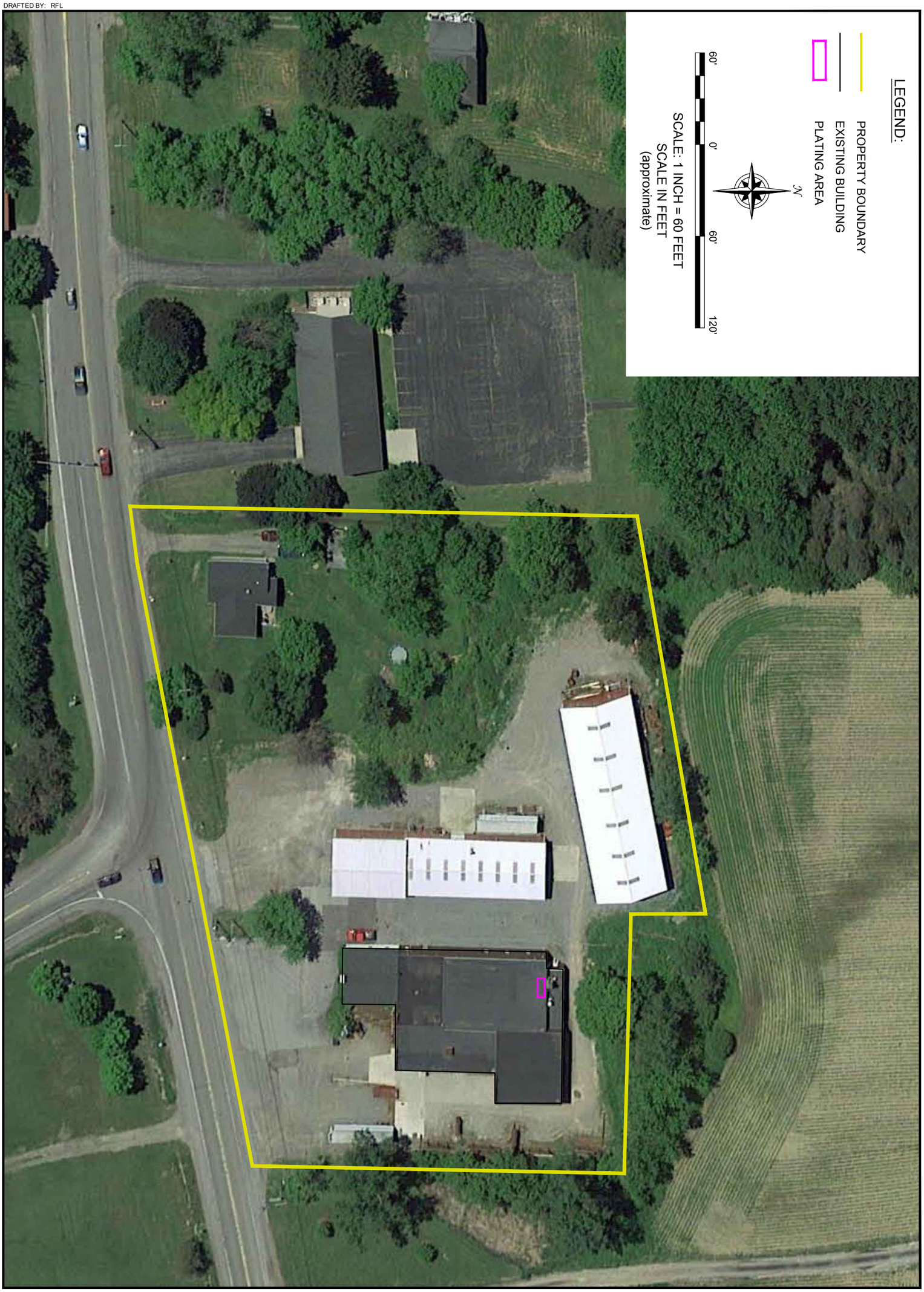


FIGURE 2

SITE PLAN (AERIAL)

CLOSURE PLAN FOR HARD CHROME PLATING LINE

11692 BIG TREE ROAD

EAST AURORA, NEW YORK

PREPARED FOR

WEST FALLS MACHINE CO., INC.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

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SUITE 300
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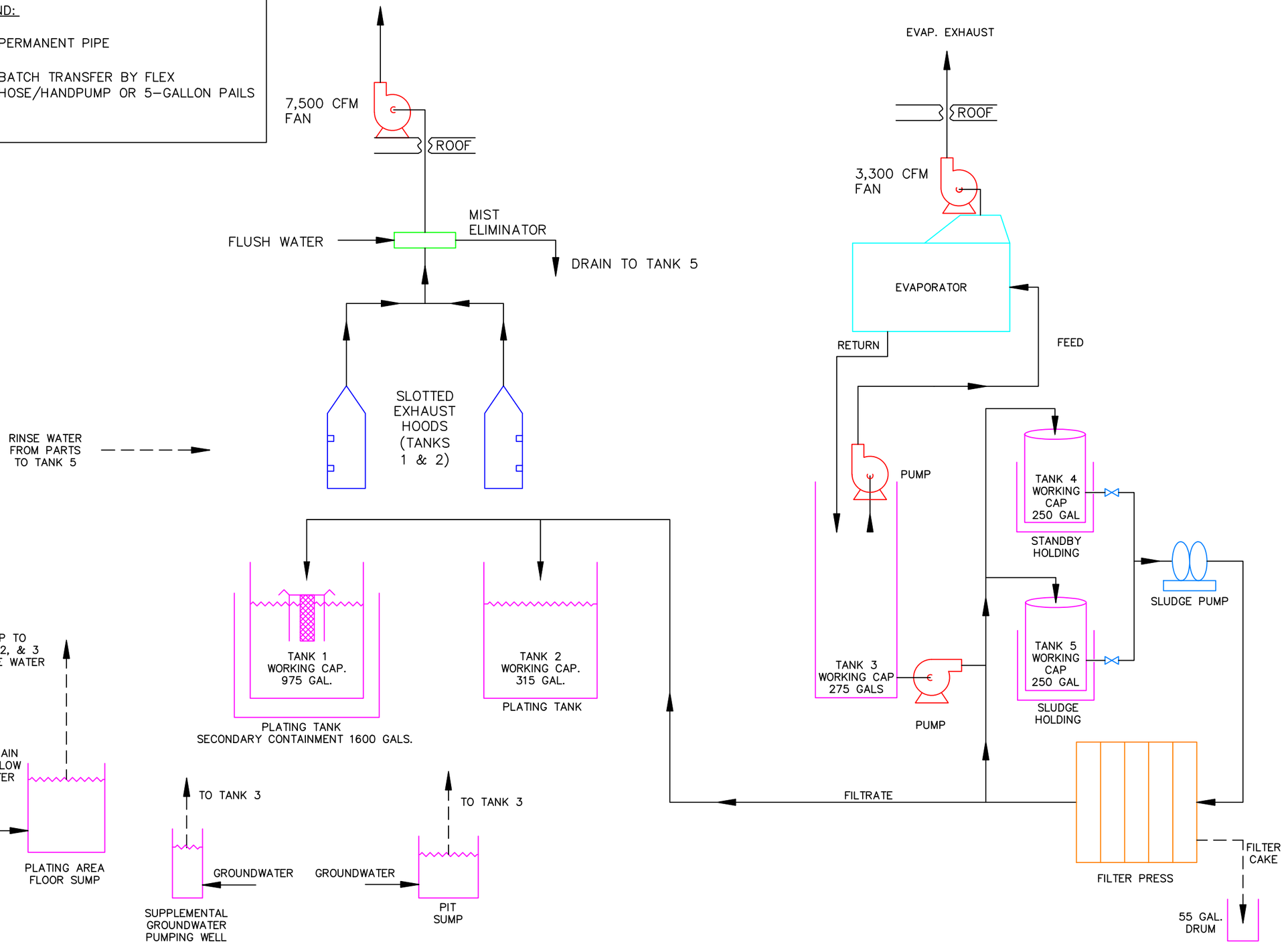
JOB NO.: 0067-016-001

LEGEND:

PERMANENT PIPE

BATCH TRANSFER BY FLEX HOSE/HANDPUMP OR 5-GALLON PAILS



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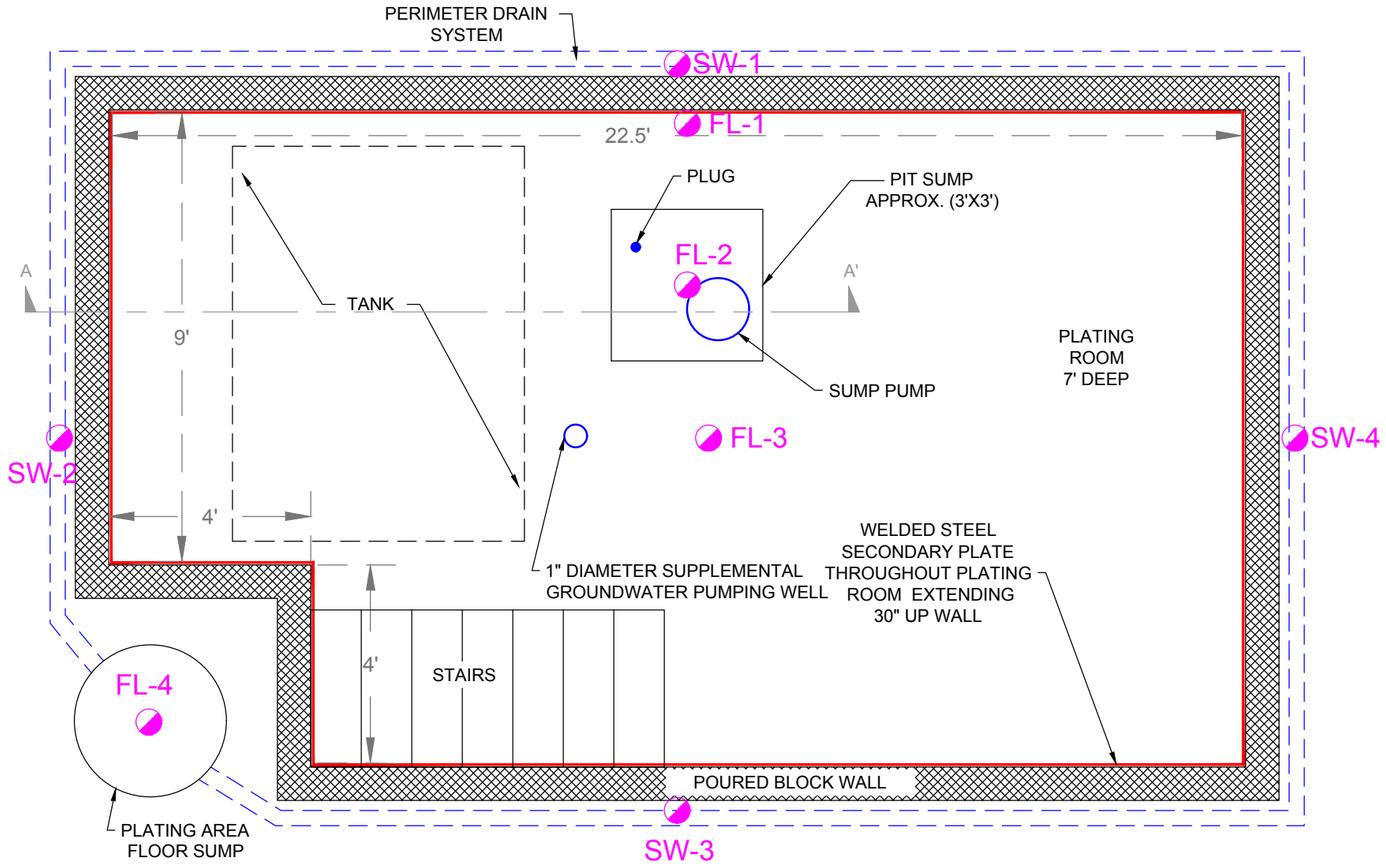
PLATING SYSTEM PROCESS SCHEMATIC

CLOSURE PLAN FOR HARD CHROME PLATING LINE
11692 BIG TREE ROAD
EAST AURORA, NEW YORK

PREPARED FOR
WEST FALLS MACHINE CO., INC.

FIGURE 3

F:\CAD\Benchmark\West Falls Machine Co\Plating Room Closure Work Plan\Figure 4; Plan and Xsxn Plating Rm.dwg



PLAN VIEW PLATING ROOM

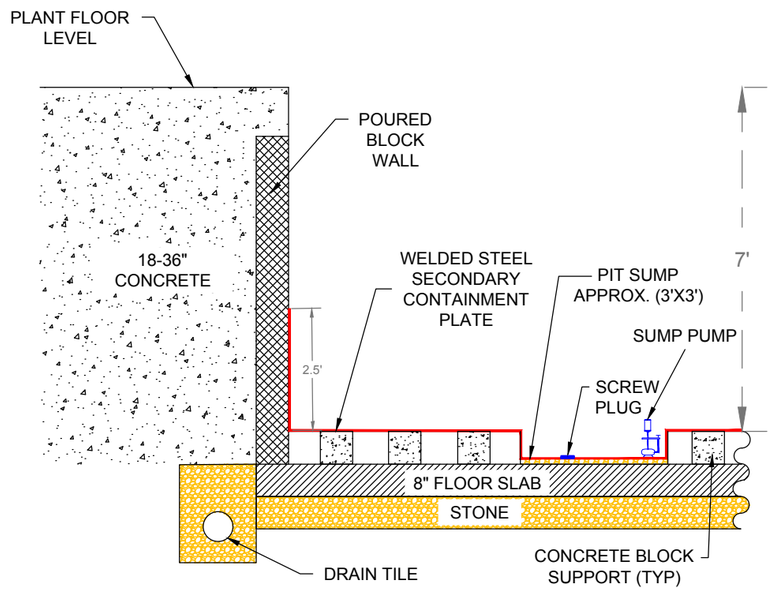
NTS

LEGEND:

FL-1	CONFIRMATORY FLOOR SOIL SAMPLE
SW-3	CONFIRMATORY SIDEWALL SAMPLE

CROSS-SECTION (A-A')

NTS



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PLAN AND CROSS-SECTION OF PLATING ROOM

CLOSURE PLAN FOR HARD CHROME PLATING LINE
11692 BIG TREE ROAD
EAST AURORA, NEW YORK

PREPARED FOR
WEST FALLS MACHINE CO., INC.

FIGURE 4

F:\CAD\BenchmarkWest Falls Machine Co\Figure 5; 2013 GW Sampling Locations.dwg

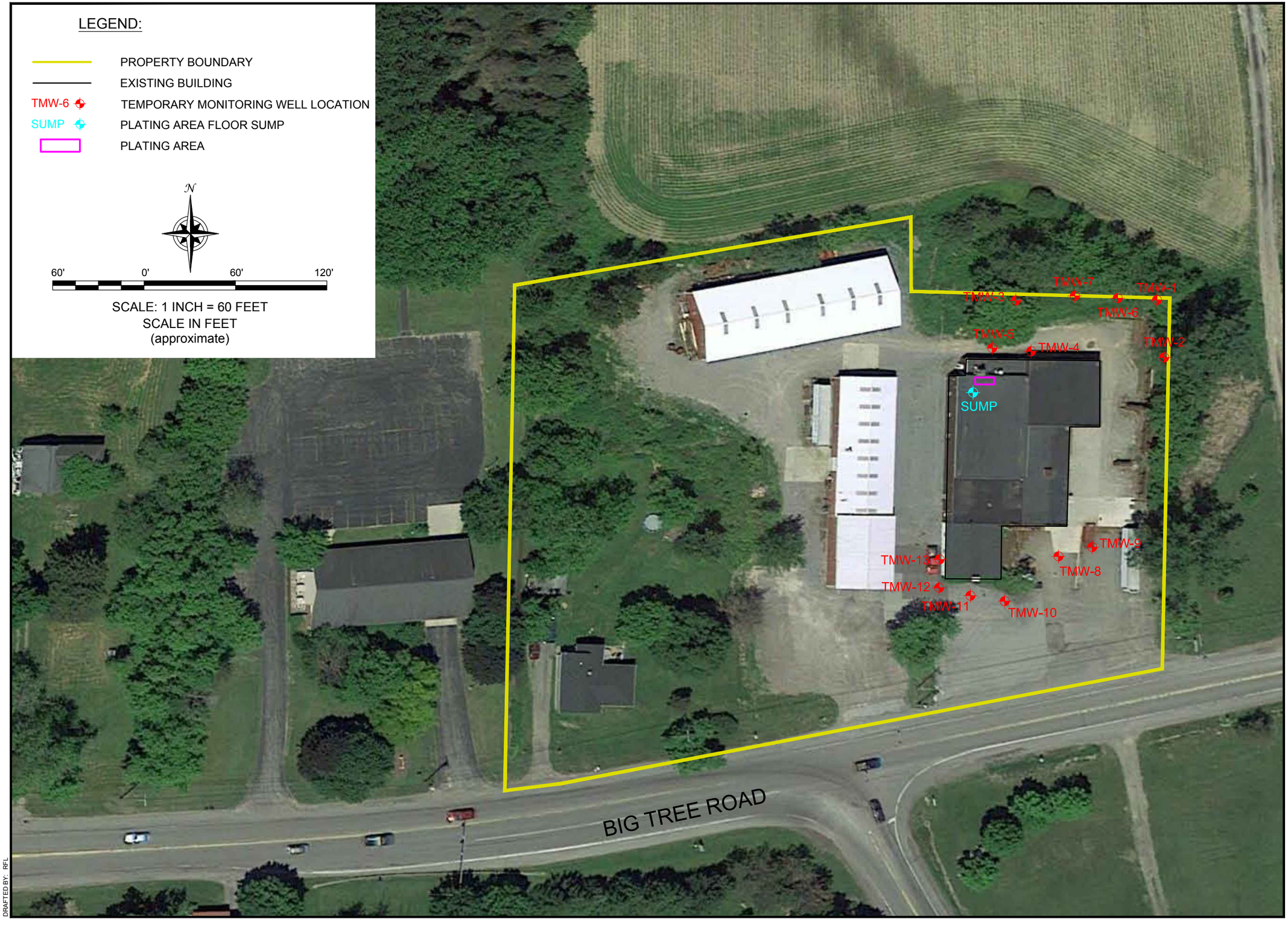
LEGEND:

- PROPERTY BOUNDARY
- EXISTING BUILDING
- TMW-6 — TEMPORARY MONITORING WELL LOCATION
- SUMP — PLATING AREA FLOOR SUMP
- PLATING AREA

N

60' 0' 60' 120'

SCALE: 1 INCH = 60 FEET
SCALE IN FEET
(approximate)



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2013 GROUNDWATER SAMPLING LOCATIONS

CLOSURE PLAN FOR HARD CHROME PLATING LINE
11692 BIG TREE ROAD
EAST AURORA, NEW YORK

PREPARED FOR
WEST FALLS MACHINE CO., INC.

FIGURE 5