APPENDIX O

TDCS OPERATION, MAINTENANCE AND MONITORING

Contents of Appendix O

SUMMARY OF TDCS OM&M – MAY 2009 TO DECEMBER 2010

TDCS OM&M began in May 2009 and the activities and events up to December 2010 are described herein. During TDCS Construction Contract Phases 1, 2 and 3 (August 2007 to May 2009) there was daily access to the shaft and tunnels via the TDCS General Contractor (MO-JV) cranes and personnel cages. On May 15, 2009, the final inspection of the underground work was completed, and the TDCS was turned over to the Owner. At this time GeoTrans Inc. assumed responsibility for OM&M of the TDCS. The original design includes permanent access to the TDCS via an elevator and stairwell as part of the Phase 4 Construction. However, until the permanent access is installed, access is by cranes and personnel cages. The TDCS is a Permit-Required Confined Space and provisions for emergency rescue are also needed.

This section includes the TDCS events and activities since May 15, 2009, covering: the repairs to temporary pumps; and; the normal OM&M. Refer to Table TDCS OM&M Log for a chronology of TDCS Entries and related activities and events.

Periodic Inspection of TDCS Facility

Periodic inspections are conducted of the TDCS to confirm the existing condition and short term stability so that workers can safely access the TDCS for OM&M activities. The inspections are primarily visual and include the access shaft, tunnels, utility support brackets and hangers, ventilation ducting, electrical panels and cables, and piping for compressed air supply, fresh water supply and sump pump discharge piping. The tunnel roof integrity inspections are physical inspections that involve sounding the tunnel roof and the controlled removal if potential loose rocks by scaling with long pry bars. The inspections of the TDCS have been performed by qualified engineers, engineering geologist and electricians. The inspections are conducted prior to the entry of workers into the TDCS with the focus and purpose of identifying and eliminating conditions that present immediate hazards to workers. Since May 2009, the results of the inspections have shown that the overall condition of the TDCS facilities appears to be good however, there are items that warrant future attention. These include features of the TDCS that were installed for the purpose of construction and were not designed for a long term service life and include shotcrete lining in the shaft, electrical panels in the bell-out, utility lines, support brackets and hangers. The Phase 4 improvements to the TDCS should include provisions that address these temporary items.

TDCS Access and Temporary Pump Repairs (May 2009 to November 2009)

Planning for post-construction OM&M began in December 2008 and arrangements with the TDCS Access Contractor and the Confined Space Rescue Team were in-place before May 15, 2009. Following the completion of Construction Phase 3 - Drain Wells and Piezometers and during the demobilization of the TDCS General Contractor, the TDCS Access Contractor began mobilizing equipment including backup generator, personnel cages, cranes, decontamination trailer and tool and supply trailer. The requirements for TDCS Entry include having a primary crane and a backup crane each with operators, personnel cages and an on-call Confined Space Rescue Team which is provided through a subcontract with the Glens Falls Fire Department. The TDCS site included site utilities left in-place by the general contractor and the temporary TDCS dewatering piping and pretreatment system including two – 18,000 gallon weir Tanks. Refer to Figure 3-1 TDCS Site Plan May 2009.

TDCS Pump System May 2009

The pump system left in place by the general contractor was the same system used during the general construction of Phases 1, 2 and 3 and included two Stancor 30 horsepower (hp) submersible pumps in the TDCS Sump with one pump running continuously and the backup pump on float switch. Both pumps were powered from the electrical panels at the bottom of the shaft in the TDCS bell-out. During construction, the general contractor also had two pumps in reserve and would rotate and refurbish pumps, as required. Prior to closure of the TDCS, the Owner supplied and the general contractor installed at the invert of the bell-out a new float-controlled ABS 35 hp submersible pump powered directly from the electrical panel at the top of the TDCS shaft. The TDCS water was piped to the top of the shaft and directly into the North wier Tank (the South Tank was in standby) and into the John Street utility tunnel where it connected to the process water pipeline to the North Basin and the Water Treatment Plant (WTP).

TDCS Alarms and Auto-Dialer

TDCS dewatering system included a high water alarm and electrical protection system. These systems were activated and functioned properly during a final inspection test conducted on May 15, 2009. The high water alarm included a flashing red light and horn located on the project sign near the south west corner of John and Allen Streets. The high water alarm was a

float switch located in the TDCS sump set 5 feet above the bottom of the sump. The electrical protection system included a shunt trip panel switch that would de-energize the power to the TDCS bell-out panels when activated by a float switch located about one foot above the bell-out floor level and one foot below bottom of electrical panels. As part of the improvements to the existing system, an auto-dialer and dedicated Verizon landline were added on June 22, 2009. The auto-dialer was set to call key personnel for the following conditions: power outage, Pump 2 running, Pump 3 (ABS) running, and low battery on auto-dialer.

TDCS Pump Repairs

On June 5, 2009, the first pump failure was noticed when the TDCS flow meter registered zero flow. It was confirmed that the backup pump was running on float control and the general contractor was notified of a warranty issue with the dewatering pumps. The general contractor sent two spare pumps to the TDCS site and the Access Contractor sent the two pumps to a pump repair shop for inspection and testing. On June 18, 2009, the pump shop confirmed that only one pump was usable and the other pump needed bearings. On June 19, 2009, the TDCS entered to replace Pump 1. Pump 1 was set to run continuously with Pump 2 in the sump in backup on float control and Pump 3 (out-of-the sump) on the bell-out floor in backup on float control.

The TDCS pumping system operated without problem for six weeks until the second pump failure, which occurred the evening of August 2, 2009. The auto-dialer notified the operators when Pump 2 was running (on float control) which was confirmed the next morning. An entry into the TDCS was done on August 4, 2009 to replace Pump 1 (Stancor) with a recently rebuilt pump (Stancor). Upon energizing the rebuilt pump, the circuit breaker tripped offline. The circuit breaker was replaced with a new unit and still tripped when the pump was energized. It was determined that the internal starter on the pump was bad. Pump 3 (ABS submersible) was then installed in the TDCS sump as the primary pump but its control circuit fuse failed during initial start because the control wire size was too small for the 200 plus foot distance. Pump 2 was left running continuously until August 7, 2009 when the ABS pump control circuit was fixed with larger control wire. Pump 1 (ABS 35hp) was in-service on primary float control with Pump 2 (Stancor 30hp) in-service on secondary float control.

The pump discharge hoses for the TDCS failed three times: September 7, September 20, and October 15, 2010. The failed hoses were the original hoses used during construction. The pump system continued to pump uninterrupted to the North wier Tank until September 7, 2009 when the primary pump hose split open and the secondary pump came on. The TDCS Access Contractor made an entry on September 8, 2009 and the split section of hose repaired and the primary pump was returned to service on float control. On September 20, 2009, the primary hose failed again due to an abrasion hole developed because of the movement when the pump started and the secondary pump began pumping. On September 21, 2009, the TDCS was entered to repair the primary hose and return the primary pump to service on float control. On October 15, 2009, during the sump deck installation, the primary hose developed a split and was repaired. From that point on, the TDCS pump system continued to pump uninterrupted to the north wier tank until the permanent pumps were in service on November 19, 2009.

Level Transmitters Failures and Circuit Redesign

The vertical turbine pump control panel was designed with an automatic switch to sense a failure of one of the two level transmitters (LVT) installed in the TDCS Sump. On November 20, 2009, the automatic switch did not work as designed and the number one LVT was directly wired to the pump controller with the number two LVT as an in-place spare. The LVT switching system was redesigned as a manual system and the automatic switch replaced with a manual switch during the February 2010 TDCS entry. At the time of the switch replacement, the number one level transmitter (LVT) failed and the number two LVT was connected directly to the pump controller in place of LVT number one. The following week the two LVTs were replaced with more robust units and the manual switch was wired. The level transmitter system has functioned without problems since March 2010.

TDCS OM&M (DECEMBER 2009 TO DECEMBER 2010)

The OM&M of the TDCS began after the installation and commissioning of the permanent pumps in the TDCS in November 2009. Included herein is a discussion and summary of the OM&M activities for the period from December 2009 through December 2010.

Operation and Maintenance Summary

A brief summary of TDCS operation and maintenance is included herein. Operation activities included normal TDCS operation and response to power outages and heavy rainfall runoff events. Maintenance activities included TDCS Entries for maintenance, inspections, and pump repairs in February, March, April and September 2010. TDCS OM&M Entry Procedures have been revised for each entry since May 2009 with the goal of continuous improvement. Maintenance included establishing equipment spares for TDCS pumping system and Utility Tunnel Roof Spall repairs and underpinning.

Normal Operation Activities

Current operation includes pumping mode of the Duplex Pump System with Vertical Turbine pumps alternating every 24 hours with a submersible pump, P-3, as a backup on float control. The discharge is directed through piping and valves to the North Basin where it is combined with other site groundwater and surface water and pumped to the on-site WTP. The following daily TDCS operation checks are made flow meter readings, pump trend data including motor amperage, run time, sump level, et cetera). The pump system trending files plot the following information: tunnel sump level, tunnel pump station flow, tunnel pump station flow total, motor current for each vertical turbine pump, motor speed for each vertical turbine pump, and when the ABS pump is running.

TDCS Entry February 23, 2010, to March 3, 2010

The first TDCS entry following the permanent pump installation was from February 23 to March 3, 2010, and involved pump system maintenance inspection, replacement of failed sump level transducers, inspection of the shaft and tunnels, tunnel roof integrity testing and scaling, drain well monitoring, replacement of 277 volt tunnel lighting with 120 volt lighting, and installation of multilevel piezometer, PZ-202, in probe hole PH-2.

Pump Failure March 13, 2010, to April 15, 2010

Vertical turbine pump, P-2, failed to start on March 13, 2010, due to motor overheating likely caused by short cycling of the pump. The thermal overload protection circuit performed as designed and prevented severe motor overheating. Pump P-1 also failed to start due to a tripped circuit breaker in the control circuit. The backup submersible pump, P-3, functioned as

designed, started up successfully and maintained the pumping rate from the TDCS Sump. The pump supplier provided technical support to investigate the control panel and make "work-around" changes in the programming of the pump variable frequency drive. Both P-1 and P-2 were back in service on March 15, 2010, however P-2 was still experiencing auto-shutdowns due to thermal overloads. On March 23, 2010, the level transducer, LVT-1 failed and the backup transducer, LVT-2, was connected. The troubleshooting investigation showed that the circuit board for the controller for P-2 was not the cause of the problem and that the most likely cause was a problem with the pump P-2 drive motor.

Further investigations on March 26, 2010, included inspection of the control panel and testing of the pump motor wiring from the electrical shed. Electricians performed megger tests on the P-2 motor power feed circuit and the results showed acceptable readings, indicating that the motor windings were in good shape. The electricians found a disconnected ground for the shield wire of the signal cable of LVT-1 and once the ground was connected LVT-1 functioned properly. However, the P-2 pump motor would not start and a TDCS Entry was needed.

The TDCS Entry was made on March 26, 2010, to inspect the drive motor for P-2 and during the entry additional tasks were accomplished including greasing the drive motor for pump P-1 and collecting water samples from the TDCS Sump. Inspection of the P-2 motor revealed that it could not be rotated by hand. The motor shaft was disconnected from the pump drive coupling and could be rotated partially until it bound up and would not rotate either direction. The motor was removed from the pump, decontaminated and sent to a motor repair shop on April 1, 2010, for disassembly and rebuild. Inspection of the motor in the shop showed that the bearings were full of grease and showed no abnormal wear or problems. There were no defects in any of the motor components found during the motor disassembly. The motor was reassembled with new bearings and bench tested successfully.

TDCS Entry on April 15, 2010, was made to reinstall the rebuilt drive motor on pump P-2 and perform a test of pump P-2. The pump was tested at various speeds and the associated pressures at the pump gage and flow measurements taken indicated that the pump was functioning within its design range. A simulated pump failure test was conducted using the emergency stop switches. The emergency stop switches in the bell-out were pushed for both pumps and each pump would successfully start up when the other pump was de-energized.

When both pumps P-1 and P-2 were de-energized, the backup submersible pump, P-3, successfully started. The TDCS pumping system functioned without problems from April 15, 2010, to November 30, 2010.

TDCS Entry for OM&M September 13 to 17, 2010

The second TDCS Entry for pump maintenance was from September 13 to 17, 2010, and included Health and Safety survey, engineering inspections by GeoTrans and Brierley Associates, pump maintenance, tunnel roof integrity testing and scaling, convergence point monitoring, tunnel gutter cleaning maintenance, groundwater monitoring, evacuation drill by Geo Trans, piezometer system maintenance, electrical system inspection and a confined space rescue drill by the Glens Falls Fire Department. Refer to the TDCS Entry Report which contains a detailed summary of activities, recommendations and various reports of related activities.

Power Outages

The 200 kw backup diesel generator Located at the TDCS has sufficient capacity to keep the TDCS pumping ventilation systems running. The generator is connected via two circuits to manual transfer switches. Since May 2009 there have been two power outages. On August 12, 2009, the power was out for about 45 minutes and due to the short duration the generator was not started. On August 11, 2010, the power was out for about three hours and the generator was started and power transferred to keep the TDCS pumping system running. The pump controller power was disconnected during both transfer switch actions (i.e. from grid to generator and back to grid power) to avoid voltage spikes associated with the transfer switching.

Heavy Rainfall and Runoff Event September-October 2010

There was a heavy rainfall event from September 30 to October 1, 2010. The TDCS weather station rain gage recorded a total of 5.08 inches over the two days (1.93 inches on September 30 and 3.15 inches on October 1). The event resulted in high runoff flows over the entire Site. Flow from the TDCS was up to 300 gpm and all three TDCS pumps were running. The North Basin was nearly full therefore, at 07:30 on October 1, 2010, the discharge from the TDCS which normally flows to North Basin, was diverted to the 80,000 gallon modular tank in Building 2. The modular tanks are constructed of a thin galvanized sheet steel wall with a

reinforced membrane liner supported by steel framework. The modular tanks do not have protective secondary containment and are intended for use only in emergency situations.

An inspection was made after the rainfall event showed evidence that the heavy rainfall event resulted in high surface runoff that may have entered the top of the TDCS Shaft and directly contributed to the high TDCS pump flows. There was clear evidence that significant runoff entered the TDCS Site from along Lower Allen Street and especially at the TDCS entrance driveway at the south end of the site adjacent to the GL&V driveway. The runoff may also have exited the TDCS Site and entered the GL&V property along the south property line. Additionally, leakage from the combined sewer overflow outfall near the boat launch may have overflowed the stop logs at the entrance to the tailrace tunnel and entered into the drain to the TDCS and thus contributed to the high TDCS flows.

TDCS Equipment Spares

TDCS equipment spares that have been purchased and are stored at the GE Hudson Falls WTP include:

- One drive motor for TDCS Vertical Turbine pump;
- One mechanical seal for Vertical Turbine pump; and
- Two Instrumentation Northwest 30 PSIA PS98i submersible level transmitters with 40 feet of jacketed cable

Utility Tunnel Roof Spall

The utility tunnel, that is under the intersection of Sumpter, John, and Lower Allen Streets, provides for the electrical and water supply to the TDCS site and for the TDCS discharge piping to the WTP. The utility tunnel is 12.5 feet wide by 300 feet long and runs from Building 1 to a bulkhead near the north property line of TDCS Site (the Former Buildings 8, 9, 10 lot) with an 80 foot long (stub tunnel) section that intersects near the midpoint and runs northwest. It is cast-in-place concrete with a reinforced concrete beam and slab roof constructed using the cut and cover tunnel method. The tunnel is about four to five feet below street grade. A small section of roof (12.5 ft long by 5.5 ft wide bay) beneath Sumpter Street was found to have severely corroded reinforcing steel that caused the lower concrete cover to spall two to three inches and fall to the tunnel floor. The tunnel is used daily by site maintenance personnel and

carries a number of site collection system pipelines including the process water from the TDCS. The spalled section of roof was a safety hazard and the failure could cause damage to the pipeline. An engineered structural repair was installed at the roof spall area. An engineering assessment of the remaining tunnels (Stub Tunnel and Building 7 to Building 1 piping tunnel) has also been completed with several other areas noted with structural problems. Of specific concern is the structurally deficient roof support beam near the bulkhead end of the utility tunnel near the TDCS site where the failure would result in damage and possible breakage of the main pipeline carrying contaminated water from the TDCS to the WTP.

MONITORING

A summary of the TDCS monitoring is included herein and includes residential air monitoring during TDCS Entries (when the ventilation system is operating), weather monitoring including temperature and lightning, work space air monitoring in the TDCS during entries, personnel monitoring during the September 2010 TDCS Entry, drain well monitoring for flow rate and contaminant concentrations, DNAPL sump monitoring for accumulation of PCB oil, and TDCS effluent monitoring.

Residential Air Monitoring

Residential air monitoring is performed during each planned TDCS Entry. The air monitoring is performed at Res 1 and Res 2 locations for each 24 hour period worked in the TDCS shaft.

Weather Monitoring

The weather conditions at the TDCS are needed for the residential air monitoring and for safety (lightning). The TDCS weather station was installed on the electrical shed next to the TDCS shaft on September 3, 2010. Daily climatic data since September 24, 2010, are recorded.

TDCS Entry – Air Monitoring

TDCS Entry – Air Monitoring is conducted for each entry into the TDCS. Prior to entry into the TDCS a four gas recording meter is lowered down the shaft to test the air. Oxygen, carbon monoxide, hydrogen sulfide and VOC concentrations are measure and recorded. In

addition whenever personnel are in the TDCS the air quality is continuously monitored. There have been no OSHA PELs or NIOSH RELs have been exceeded during TDCS entries.

Personal Monitoring – Sept 2010

Personnel air monitoring was conducted in the TDCS during the September 2010 entry. Personnel monitoring included: PCB and VOC sampling, respirable dust/crystalline silica, vinyl chloride, and bulk rock dust analysis. The personnel air monitoring indicated that no OSHA PELs or NIOSH RELs were exceeded during the September 2010 TDCS entry. Refer to Appendix H for a report of the personal monitoring sampling, testing and results.

Drain Well Monitoring

The twenty (20) drain wells were monitored for flow every two to four months from May 2009 to February 2010 and approximately every 6 months thereafter. The flow from each drain well was measured using a container of known volume and a watch. Water samples were collected from the drain wells for PCB and VOC analyses in February and September 2010.

DNAPL Sump Inspections

Visual inspections of the DNAPL sump have been performed to determine if DNAPL is accumulating in the sump and to evaluate the method to collect any accumulated DNAPL. Only small quantities of DNAPL have been noted to accumulate at scattered locations on the invert of the TDCS sump. Refer to Section 4 for discussion of Sampling, Testing and results.

TDCS Process Water (Effluent) Sampling Port

A sample port was installed in the pipe that carries the TDCS water to the WTP. The port is located in the utility tunnel beneath John Street and was installed the week of May 17, 2010. Samples for PCB and VOC analyses have been collected monthly starting in May 2010.

Table: TDCS Operation, Maintenance & Monitoring Log

Entry Day #	Date	Purpose
	5/15/2009	Final Inspection of TDCS Phase 3 Construction - last day of MO-JV Responsibility, GeoTrans takes over responsibility for TDCS OM&M.
	5/15/2009	MO-JV installed Owner submersible backup pump (ABS) on bell-out invert at El 24. Pumps in TDCS includes submersibles: P1-Stancor (30hp) in sump running continuous, P2-Stancor (30hp) in sump on float control, P3-ABS (35hp) on bell-out invert on float control. All pumps connected to piping to North Frac Tank
	5/15/2009	Glens Falls Fire Department contract in-place for Confined Space Rescue Team
	5/19/2009	MO-JV disconnected backup generator (800 kw)
	5/19/2009	Alpine connects Standby Generator (200 kw) rental from Milton Cat
	5/21/2009	MO-JV installed permanent TDCS Shaft Cover
		TDCS Flow ~73 gpm
	5/28/2009	Alpine mobilizes job trailer and personnel cages (2 - 5 man and 1 - 2 man) to TDCS Site
	5/22/2009	MO-JV demobilized from TDCS Site
	5/29/2009	Alpine mobilizes Grove RT650E Crane to TDCS Site
	5/30/2009	Alpine mobilizes Lima 400T Lattice Boom Crane (40 ton) to TDCS Site
	6/4/2009	GeoTrans installs data storage module (CFM-100) in Geokon data logger
	6/5/2009	PUMP FAILURE of temporary Pump P1 (Stancor-30hp). Pump P2 (Stancor-30hp) functioning on float control, Reported pump failure as a warranty claim to Construction Manager & GE. MO-JV notified of warranty claim and provided two additional Stancor 30hp pumps.
	6/9/2009	Alpine mobilizes Decon Trailer on Rental
	6/10/2009	Pre-Entry Mtg for pump repair/replacement
	6/15/2009	Begin permanent pump design based on existing TDCS flows.
1	6/19/2009	EMERGENCY OM&M: Replace temporary TDCS pump, P-1 (Stancor-30hp) with spare provided by MO-JV
	6/22/2009	Alpine installs autodialer (via Verizon landline) for TDCS Alarms that include callout for: power outage; pump P2 On; high water and; low battery (on auto dialer).
	7/16/2009	Emerick orders two vertical turbine pumps per proposal 7-14-09
	7/17/2009	Alpine disconnects South Frac Tank and reconfigures piping to North Frac Tank, Precision Industrial cleans sediment from South Frac Tank and empties into roll-off bin where GeoTrans adds cement to stabilize for offsite disposal.
	7/27/2009	Rain-For Rent moves South Frac Tank from TDCS to North Basin for decontamination.
	7/27/2009	Alpine begin permanent TDCS piping to tie-in at bulkhead in Utility tunnel at Allen St.
2	7/30/2009	OM&M Drill Entry: Glens Falls Fire Department - familiarization and rescue drill and GT measures flow rates from TDCS drainwells.
	8/2/2009	PUMP FAILURE of temporary Pump P1 (Stancor-30hp). Pump P2 (Stancor-30hp) functioning on float control.
3	8/4/2009	EMERGENCY OM&M: Replace temporary pump, P-1, with rebuilt pump provided by MO-JV - that failed immediately. Moved ABS pump from bell-out invert to P-1 position in sump, problems with control circuit for new P1, keep P2 on manual - run continuous three days.
4	8/7/2009	EMERGENCY OM&M: Replace float switch control cables for new P-1, ABS pump, and reset float switches for P-2. P1 and P2 on float control working properly
	8/12/2009	POWER OUTAGE at TDCS 45 minutes (backup generator not started) no problems found after power returned
	8/20/2009	South Frac Tank decontamination complete, tank off rental

Table: TDCS Operation, Maintenance & Monitoring Log

Entry Day #	Date	Purpose
	8/20/2009	Standby generator 200kw off rental and purchased from Milton Cat
	8/20/2009	ABS pump P1 (35hp) off rental and purchased from Pump Services & Supply
	8/21/2009	NYSDEC requested Residential Air Monitoring for planned TDCS Entries
	8/26/2009	Vertical Turbine Pumps Control Panel ordered from Emerick
5	8/28/2009	Phase 4: Verify key dimensions of sump walls for sump deck steel fabrication. Residential Air Monitoring at Res 1 and Res 2
	8/31/2009	Rain-For-Rent removes South Frac Tank from Hudson Falls
	9/7/2009	Autodialer callout alarm that P2 is running
6	9/8/2009	EMERGENCY OM&M: TDCS pump P-1 has split in discharge hose - repaired hose
	9/8/2009	Order Steel for Pump support frame and sump deck
	9/15/2009	Order electrical shed
	9/18/2009	Order safety hand rail for shaft cover hatch opening (9'x12') and man ladder for sump
7	9/21/2009	EMERGENCY OM&M: TDCS pump P-1 has abraded hole in discharge hose - replaced l
	9/23/2009	Begin construction of Electrical Shed
	9/25/2009	Alpine begin construction of TDCS Electrical Shed (8x14) at Shaft Collar
	10/5/2009	Fiber Optic Bid walk through: Alpine, Hour, Comali with Geotrans and A. Bossard
	10/8/2009	Electrical Shed Completed
	10/12/2009	Delivery: Vertical Turbine Pumps and Galvanized Steel Sump Frame and Deck
	10/13/2009	Safety Hand rail for shaft cover hatch opening (9'x12') installed complete
8	10/14/2009	Phase 4: Prep for new pipe at shaft collar. Residential Air Monitoring
	10/14/2009	Drainwells off at 0930
9	10/15/2009	Phase 4: Remove temporary sump cover, begin new sump deck, fix split discharge hose for P1. Residential Air Monitoring
	10/15/2009	Drainwells on at 1500
10	10/19/2009	Phase 4: Install new pipe at shaft collar, disconnect North Frac Tank, cutover to new pipe, sump deck Residential Air Monitoring
	10/19/2009	Drainwell off at 1000
11	10/20/2009	Phase 4: Installation of new galvanized steel sump deck and pump support frame. Residential Air Monitoring
	10/20/2009	Drainwells on at 1530
12	10/21/2009	Phase 4: Installation of new sump deck and piping at abandon HF-303 casing to gutter drain. Residential Air Monitoring
13	10/22/2009	Phase 4: New sump deck installation complete. Residential Air Monitoring
	10/26/2009	Precision Industrial cleans sediment from North Frac Tank and empties into roll-off bin where GeoTrans adds cement to stabilize for offsite disposal
	10/26/2009	Delivery: Ethernet Panel Boxes - damage found after reciept
	10/27/2009	Delivery: Vertical Turbine Pump Control Panel
	10/28/2009	Rain-For-Rent moves North Frac Tank from TDCS to North Basin for decontamination
14	10/29/2009	Phase 4: Electrical wiring (power / control) for new TDCS vertical turbine pumps. Pre-Installation Conference for Vertical Turbine Pumps. Residential Air Monitoring
15	10/30/2009	Phase 4: Install pump frame, electrical wiring for new pumps. Residential Air Monitoring
16	11/2/2009	Phase 4: Install & level two vertical turbine pump bases, electrical boxes. Sample and flow test of Drain Wells in TDCS. Residential Air Monitoring

Table: TDCS Operation, Maintenance & Monitoring Log

Entry Day #	Date	Purpose
17	11/3/2009	Phase 4: Install, Emerick begin assemble two new vertical turbine pumps and discovers there are missing parts for seal - assembly on hold for parts delivery. Residential Air Monitoring
	11/3/2009	Geotrans conducts Hydrogeologic Inspection
18	11/4/2009	Phase 4: Install chemical resistant discharge hoses, level transducers, electrical boxes. Residential Air Monitoring
	11/9/2009	Phase 4: Comalli begin Fiber Optic cable installation from TDCS to Bldg 12 to WTP
	11/16/2009	Phase 4: Fiber Optic cable install complete
19	11/17/2009	Phase 4: Install new steel support bracket, 6" valve for steel header discharge pipe. Residential Air Monitoring
	11/17/2009	Drainwells off at 0900
20	11/18/2009	Phase 4: Emerick with completes assembly of two new vertical turbine pumps, Alpine completes discharge hose anchoring and sump cleaning. Residential Air Monitoring
	11/18/2009	Drainwells on at 1500
21	11/19/2009	Phase 4: FIRST RUN of Vertical Turbine Pumps. Emerick & Tectra Tech perform testing and start-up of new vertical turbine pumps. Residential Air Monitoring
22	11/20/2009	Phase 4: VT PUMPS RUNNING. Final inspection of new vertical turbine pump system, Emerick attempting debugging pump controller for dual LVT. Vertical Turbine Pumps 1 and 2 set to hold ~4 feet of water depth in sump an to alternate every 24 hours. Pump 3 (ABS Submersible) is backup pump on float control. Residential Air Monitoring
	12/8/2009	Phase 4: Emerick / Clinton Controls (panel designer) debugging LVT error
	12/10/2009	Phase 4: Emerick debugging LVT error
	12/14/2009	North Frac Tank decontamination complete, tank off rental
	12/15/2009	Rain-For-Rent removes North Frac Tank from Hudson Falls
	2/5/2010	Phase Three Hydraulic Monitoring Status Report issued and sent to NYSDEC included recommendations for additional Phase Three Actions.
	2/12/2010	NYSDEC gives verbal ok to install multi level vibrating wire piezometer PZ-202 in existing probe hole PH-2
	2/18/2010	Tailrace Tunnel lift station shut off (at 1430 hours)and piping reconfigured so that all water drains by gravity to TDCS via abandoned casing for HF-303
23	2/23/2010	OM&M: Emerick pump lubrication and refitting VT Pump Control Panel with manual switch for LVT, also found LVT-1 had failed during the day - system running on LVT-2, drainwell testing and sampling, tunnel rock scaling. Residential Air Monitoring
24	2/24/2010	OM&M: tunnel rock scaling (1/2 day due to snow storm). Residential Air Monitoring
25	3/1/2010	Phase 4: Install Multi Level VW PZ-202 in PH-2; OM&M: tunnel rock scaling. Residential Air Monitoring, Hour Electric replaces tunnel lighting 277v with 120v system.
26	3/2/2010	Phase 4: Install Multi Level VW PZ-202 in PH-2; OM&M: tunnel rock scaling. Emerick replacing LVT -1 and LVT-2. Residential Air Monitoring
27	3/3/2010	Phase 4: Install Multi Level VW PZ-202 in PH-2; OM&M: tunnel rock scaling. Residential Air Monitoring
	3/4/2010	PZ-202 FIRST AUTOMATED READINGS sent to Geokon Data Logger in Electrical shed
	3/13/2010	PUMP FAILURE of Vertical Turbine Pump P2 and P1. Backup pump P3 (ABS submersible) running on float control.

Table: TDCS Operation, Maintenance & Monitoring Log

Entry Day #	Date	Purpose
	3/15/2010	Emerick investigating PUMP FAILURE. P2 was short cycling and tripped off due to over temperature and P1 did not start due to tripped breaker in control panel. Emerick reset P1 circuit breaker, and reprogrammed P1 and P2 to alternate every hour.
	3/18/2010	Emerick investigating PUMP FAILURE. P2 over temperature, P1 and P2 alternating every hour.
	3/22/2010	PUMP FAILURE of P2. Emerick replaced circuit board but P2 failed to start normally. Switched power lead to P2 with leads from controller for P1 - no change - conclusion is that motor should be inspected.
	3/23/2010	Level Transducer Failure. LVT-1 failed, switch to LVT-2
28	3/26/2010	EMERGENCY OM&M: Emerick Repair TDCS vertical turbine pump VTP-2 - motor failure locked up does not turn by hand- remove for repair. Performed greasing of P1 motor and reprogrammed P1 to run as single pump until P2 is repaired. Electrician found disconnected shield wire ground as cause of failure of LVT-1. Residential Air Monitoring
28	3/26/2010	GeoTrans collects samples of TDCS Sump water for full suite of tests.
	4/1/2010	P2 motor taken to Emerick repair shop, Northeast Electric Motors, where motor was found to be bound up but no cause for the binding could be determined during disassembly. All parts of the motor appeared normal and the motor was reassembled with new bearings, greased and tested successfully.
29	4/15/2010	EMERGENCY OM&M: Emerick Repair P2, install rebuilt drive motor and test run pump and reprogram P1 and P2 to alternate every 24 hours. Residential Air Monitoring
	5/17/2010	GT installed sampling port in TDCS process water line to water treatment plant and began collecting monthly samples for testing.
	8/11/2010	POWER OUTAGE at TDCS approximately 3 hours, the backup generator was started and manually switched over andprovided power until grid power was restored.
30	9/13/2010	OM&M: Emerick vertical turbine pump maintenance and lubrication and Alpine in Tunnel 1 roof integrity inspection and scaling. Residential Air Monitoring
31	9/14/2010	OM&M: Tunnel 1, 2 and 3 roof integrity inspection and scaling, Convergence readings. Residential Air Monitoring
32	9/15/2010	OM&M: Tunnel 2 roof insp/scaling, Convergence rdgs, Replace MUX2, Brierley Inspection of shaft and tunnels. Residential Air Monitoring
33	9/16/2010	OM&M: debris removal, drainwell test/sample, DNAPL Sump Collect, Hydrogeologic Inspection. Residential Air Monitoring
34	9/17/2010	OM&M: Glens Falls Fire Department - familiarization and rescue drill - Tunnel 3. Residential Air Monitoring
	9/29/2010	Heavy Rainfall about 2 inches
	10/1/2010	Heavy Rainfall about 3 inches, TDCS flowrate up to 300 gpm with both vertical turbine pumps and ABS submersible backup pump. TDCS discharge flow was diverted temporarily to the emergency Mod-U tank in Building 2. The Village of Hudson Falls combined sewer overflow leaks into the Tailrace Tunnel and the drain to the TDCS through former casing for HF-303 was blocked with debris and water backed up in tailrace tunnel.

GeoTrans, Inc.

TDCS ENTRY REPORT

GE Hudson Falls Plant Site
Tunnel Drain Collection System

ENTRY DATES: 13, 14, 15, 16 and 17 September 2010

Purpose of Entry: **Normal Operation, Maintenance and Monitoring of dewatering pumps, drain wells and piezometers. Health and Safety Survey by GeoTrans.**

Summary

1. This represents a summary of the five days of the TDCS Entry in September 2010. The previous entry was in April 2010. This accumulated number of entry days are 34 since the end of TDCS Phase 3 Construction in May 2009 – refer to Attachment 1 - TDCS Entry Log
2. Health and Safety
    a. Entry into the TDCS Shaft and Tunnel is considered a Permit Required Confined Space Entry as indicated in GeoTrans Health and Safety Plan. GeoTrans issued the permit for this entry and maintains the original permit on site.
    b. Industrial Hygiene Survey - GeoTrans Corporate Health and Safety Officer was on site for three days (September 13, 14 &15) to conduct an health and safety survey. Refer to Attachment 2 – Industrial Hygiene Survey.
        i. Personnel Air Sampling for VOC, PCB, Respirable Dust / Crystalline Silica
            1. VOC **– Non-Detect**
            2. PCB Aroclor 1242 – 0.032 mg/m3 is **well below** OSHA PEL of 1.0 mg/m3
            3. Respirable Dust – 0.237 mg/m3 is **less than** OSHA PEL of 5 mg/m3
            4. Crystalline Silica – 0.023 mg/m3 is **well below** OSHA PEL of 0.60 – 0.86 mg/m3
        ii. TDCS ventilation return air sampling for Vinyl Chloride by Draeger was **non-detect** (detectable limit of 0.3 ppm)
        iii. TDCS ventilation system survey showed adequate ventilation for shaft and more than adequate ventilation for tunnels. Required Minimum: air volume 200 cfm per worker and; air flow velocity of 30 ft/min.
            1. Shaft – 43 ft/min calculated based on calculated air volume in Tunnel 1
            2. Tunnel 1 Sta 2+00 – 205 ft/min
            3. Tunnel 2 Sta 1+50 – 120 ft/min
            4. Tunnel 3 Sta 2+00 – 108 ft/min
        iv. TDCS noise survey showed higher than 85 dB levels in Bell-out area and in tunnels during shoveling for debris cleanup
    c. Lightning Detection System and procedures were in place for this TDCS Entry – refer to Attachment 3 -Lightning Hazard Procedures. The TDCS was safely evacuated on 9-13-10 in time to avoid an approaching lightning storm.
    d. Safety Incident during tunnel scaling on 9-14-10 (GeoTrans ID: 2010-17) Alpine scaling crew member was hit on left forefinger with small piece of falling rock. First aid required at local clinic – no lost time.

e. GeoTrans performed evacuation drill on Wednesday 9-16-10 to determine the time required to evacuate the tunnels and shaft under emergency conditions. The time required was 11 minutes. As a result of this drill workers were required to take two air packs (instead of one) into TDCS with one air pack left in Bell-out area at bottom of shaft. The second air pack is needed to provide additional duration of air during emergency evacuations. Refer to Attachment 4 Summary of Evacuation Drill.

3. Residential Air Quality Monitoring – GeoTrans installed Air sampling equipment (PUF Samplers) at Residential 1 and Residential 2 monitoring locations and collected daily (24 hour) samples for each of the five days of TDCS Entry. Results are reported in regular weekly report to GE.

4. Engineering Inspections
    a. Shaft and Bell-Out Inspection
        i. GeoTrans Competent Person performed visual inspection of shaft prior to workers entry
            1. Shotcrete looked in good condition with no apparent areas of deterioration.
            2. Steel brackets and threaded anchors that support the ventilation duct and the utility piping and electrical cables appear in good condition although all steel has surface corrosion no major loss of steel cross section is obvious.
            3. Shotcrete in shaft is covered with a slimy coating in wet areas below groundwater table.
            4. Calcite deposits are noted in numerous areas – some are very well established and hard – firmly affixed to shaft wall.
        ii. Brierley Associates performed visual inspection of shaft

    b. Tunnel Inspection
        i. GeoTrans Competent Person performed inspection of tunnels during the Tunnel Roof Integrity Testing and Scaling
            1. No rockfall debris was noted on tunnel floor prior to the Tunnel Roof Integrity Testing.
            2. Tunnel Roof Integrity Testing (sounding and removal of loose rock by scaling) was performed in the full length of Tunnels 1, 2 and 3 with pry bars (10 feet long). An aggressive and high degree of effort was required for the majority of loose rock removal. Those loose areas that could not be removed were painted for future inspection.
                a. Tunnel 1 scaled in 4 hours 10 minutes (66 feet per hour)
                b. Tunnel 2 scaled in 3 hours 23 minutes (74 feet per hour)
                c. Tunnel 3 scaled in 3 hours 55 minutes (79 feet per hour)
                d. Total time spent scaling all tunnels was 11 hours 28 minutes which was less than time spent scaling tunnels 1 and 2 in Feb/Mar 2010 during last entry.
            3. Work Rooms - Shotcrete in all three rooms was inspected and appears in good condition.

ii. GeoTrans performed convergence monitoring at the 12 existing convergence stations in the bell-out, tunnels and work rooms. The measurements showed that the excavation walls and roofs have remained stable since the previous measurements taken in May 2009. Refer to Attachment 5 – Convergence Monitoring Data September 2010.
iii. Brierley Associates performed visual inspection of tunnels and work rooms

c. Reports
i. Refer to Attachment 6 - GeoTrans TDCS Inspection Report
ii. Refer to Attachment 7 - Brierley TDCS Shaft/Tunnel Inspection Report

5. TDCS Pump System Maintenance by Emerick and GeoTrans
a. Preventative maintenance and inspection of Lift Station Pump System including two Vertical Turbine Pump and one submersible backup pump in TDCS Shaft Sump. Refer to Attachment 8 – Vertical Turbine Pump Maintenance Log and Lubrication Interval.
i. Vertical Turbine Pump 1 was lubricated at 3598 hours (previous lube at 1387 hours on 3-26-10
ii. Vertical Turbine Pump 2 was lubricated at 1824 hours (previous lube at re-build – zero hours on 4-15-10)
b. Refer to Attachment 9 - Emerick Associates Maintenance Inspection Report
c. Maintenance Inspection of discharge hoses and piping – no leaks noted.

6. Tunnel Maintenance - Debris Removal – Waste Management
a. Loose Rock removal from tunnel roof resulted in a quantity that filled 6 drums (55 gallon) which were emptied into the Haz Waste roll-off container in the WTP (Building 4B) and shipped off site for proper disposal.
b. Tunnel Gutters in Tunnels 1, 2 and 3 were cleaned to remove rock debris and biologic growth. Mineralization buildup in the right side gutter in Tunnel 3 was chipped out and removed.
c. Wet debris removed from the tunnel gutters resulted in a quantity that amounted to about ¼ of a drum (55 gallon) which remained in the drum and was shipped off site for proper disposal.
d. Tunnel invert and gutters were washed down with potable water prior to the GFFD Rescue Drill.

7. Groundwater Monitoring and Collection
a. Drain well flow measurements were taken for all drain wells, refer to Attachment 10 - Drainwell Summary.
b. Samples were collected for PCB and VOC testing - refer to Attachment 11 – Drainwell Sample Chain of Custody
c. DNAPL was collected from probe hole PH-1, 700 ml DNAPL had accumulated. Refer to weekly report to GE dated 10-01-10.
d. Hydrogeologic inspection of TDCS was performed.
e. Set up diaphragm pump in DNAPL Sump and collected 55 gallons of water. This drum was moved to water treatment plant for two weeks allowing DNAPL to settle-out – no measureable DNAPL was found after two weeks.

8. Piezometer PZ-202 Data Acquisition System Troubleshooting
    a. Vibrating Wire Piezometer sensors for PZ-202 were manually checked at the terminal block in the MUX-2 box in work room 1-1, refer to Attachment 12 – Piezometer Field Data 9-15-10. Readings compared well with readings just prior to the beginning of problem data and appeared to be valid therefore indicating that the MUX-2 was the cause of the invalid readings. Multiplexer, MUX-2, in Workroom 1-1 was replaced with new MUX and the readings were back to normal.
    b. New downloaded readings from new MUX-2 showed valid readings.

9. Electrical System Inspection was conducted by Alpine Construction and Hour Electric. Refer to Attachment 13 - Electrical Inspection
    a. Cabinets in TDCS are rated NEMA 3R ("raintight") but due to the amount of constant water and humidity the enclosure should be NEMA 4 ("watertight").
    b. Transformer is rated for outside use
    c. Panel board in bell-out is wet and corroding, 480 circuit breaker was replaced and water found in distribution panels during summer of 2009, 120v receptacles around bell-out were found to have corrosion
    d. Panel board in work room 1-1 is dry and in good condition

10. Decontamination
    a. Personnel Decontamination was improved using a hasty temporary decontamination pad of plywood and poly sheets at the mancage unloading area.
    b. Equipment Decontamination included the Geokon MUX-2 and GK-404 which were cleaned and wipe test results (non-detect) confirmed decontamination was complete, refer to Attachment 14 – Geokon Equipment Wipe Test Report.

11. Glens Falls Fire Department (GFFD)
    a. Provided Technical Rescue Team on Standby during the hours of each day of TDCS Entry.
    b. Performed a confined space rescue drill on Friday 17 September 2010 - GeoTrans reported a man down, bleeding and unconscious after being hit in head by large rock during tunnel roof scaling. GeoTrans called GFFD at 09:07am, Rescue Team arrived at 09:20am, Team entered TDCS at 09:46am, Team out of TDCS with victim at 10:11am and victim was completely decontaminated and ready for transport to ambulance by 10:15am. Total time 1 hour, 8 minutes from call to ambulance ready.
    c. Conducted post drill debriefing with all hands immediately following the drill
    d. GFFD prepared a report of the Rescue Drill, refer to Attachment 15 – Glens Falls Fire Department - Confined Space Rescue Drill Report.

12. Tunnel Access Contactor – Alpine Construction, LLC, provided two cranes and two closed man-cages and one open work basket for access with two crane operators, one top man/Confined Space Attendant, one bottom man, two Laborers (for tunnel scaling) and one Superintendent/Confined Space Attendant. Alpine removed the entire TDCS Shaft cover at the beginning of the first day (to allow for shaft inspection) and replaced it at the end of the day. For days 2 through 5 the smaller shaft hatch was removed and replaced at the end of each day of entry. Alpine turned the TDCS ventilation fan on at the beginning and off at the end of each

TDCS entry day. Upon first entry of each day and during the entire entry Alpine monitored the air quality in the Alpine work areas. Alpine provided radio communications for TDCS activities.

13. TDCS Entry Debriefing - conducted on Friday 17 September 2010 – refer to Recommendations Section

Recommendations Future Work In TDCS

These recommendations include items from TDCS Debrief Meeting.

1. The approximate schedule for the next TDCS Entry for OM&M will be when pump runtime hours have increased a target amount of about 2190 hours. Refer to TDCS Pump Maintenance Log and Calculation for VT Pump Lubrication Interval (Attachment 8). Assuming the pumps continue to run normally and alternate equally and regularly then, the target date for pump lubrication would be in approximately 6 months, mid-March 2011, when the pumps reach the target runtime hours noted below.
    a. Next Lube for Pump 1 – Target Hours: at **5788** hours (3598 hours plus 2190 hours)
    b. Next Lube for Pump 2 – Target Hours: at **4014** hours (1824 hours plus 2190 hours)

2. Health and Safety
    a. Conduct RefresherTraining for GeoTrans personnel – at least one-week prior to entry, on General Construction Operations
    b. Conduct Pre-Entry Briefing with all parties including:
        i. Conduct training for Entry Attendants for starting of TDCS Generator
        ii. Conduct Refresher training for personnel decontamination procedures
        iii. Conduct Refresher training for tunnel scaling: JSA, two DVD's (MSHA and NIOSH), and scaling tips from MSHA, refer to Attachment 6 – GeoTrans TDCS Inspection Report
    c. Conduct Daily morning Tailgate Meetings with all hands to review planned activities and schedule
    d. Revise HASP with results of Industrial Hygiene Survey (refer to Attachment 2)
        i. Add personnel air sampling data
        ii. Add confined space entry air monitoring data for TDCS entries since May 2009
        iii. Add hearing protection for personnel in bell-out (>85 db)
        iv. Add hearing protection for shoveling debris – scraping is >85 db)
        v. Lightning Safety Procedures
        vi. Add TDCS ventilation evaluation data
    e. JSA – Job Safety Analysis
        i. Revise Tunnel Scaling JSA as required based on results of H&S sampling include ½ face respirators with P100 cartidges are required for scaling and intrusive operations (Refer to Attachment 2).
        ii. Prepare JSA for TDCS Sump Entry - (tri-pod , air check, etc)
    f. Air monitoring equipment for Tunnels should be on-site one week prior and be charged up and programmed to save data (via self-contained data logger) of actual readings during pre-ventilation monitoring
    g. Escape Air Packs – each worker have one ten minute pack in work area within 25 feet and a second air pack at the TDCS Bell-Out for use during emergency evacuation while waiting for personnel cages to lift all workers out of shaft. As an alternative to a second air pack at the bell-out, consider having escape air cart with sufficient air volume and breathing tube connections for workers waiting in Bell-out for emergency evacuation.
    h. Perform Personnel Sampling for Next TDCS Entry to include Respirable Dust / Crystalline Silica per Attachment 2.

i. Decontamination Facility Reconfiguration
    i. Obtain and setup enclosed container (CONEX) with everything needed to perform complete deconning of personnel and tools. Need PPE waste bin in decon area
    ii. Locate Decon so that both cranes can reach
    iii. Eliminate existing decontamination trailer
j. Fall Protection around the TDCS Shaft
    i. Evaluate for compliance during activities when the full shaft cover is off.
    ii. Remove reinforcing steel hoop from inside of security fence around shaft cover so that it cannot be used for fall protection anchorage
k. Communications
    i. Mine Phones - replace all (five – which includes one spare unit) and consider adding three additional mine phones at locations for better coverage
    ii. Radio communications – consider a radio repeater in workroom 1-1 that would allow communication through entire tunnel system
l. Cranes
    i. Reposition cranes and decon area so that both cranes can swing to decon area
    ii. Remove weeds growing on upper bank if crane operators cannot see load
m. Lightning Safety - Alpine monitor lightning activity for crane operation safety
n. Temperature Monitoring - TDCS Ventilation and therefore TDCS Entry cannot occur when ambient air temperature reaches 85°F

3. Residential Air Monitoring – prepare summary table for all TDCS entries since May 2009

4. Shaft and Tunnels Inspection
    a. Perform initial visual inspection of shaft and tunnels by competent person prior to any work in tunnels.
    b. Perform Tunnel Roof Integrity Testing with scaling crew(s) by visual inspection, sounding and removal (scaling) of loose rock that poses potential hazard.
        i. Refer to recommended procedures contained in Attachment 6 – GeoTrans TDCS Inspection Report.
        ii. Try adding a thick rubber (i.e. vehicle tire or conveyor belt material) hand protector to scaling bars to deflect falling rocks and prevent hand and arm injuries.
    c. Perform detailed inspection of all TDCS Systems and prepare Inspection Report
        i. Dewatering System – items not inspected during regular pump maintenance: piping in shaft
        ii. Ventilation System – switches, soft start, motors, fans, ducting and duct ties (get recommendations from manufacturer) topside inspection could be done at anytime
        iii. Electrical System – from power drop in High Voltage Yard to all cabinets and panels on site. Topside inspection could be done at anytime.
        iv. Utility Brackets/Support System in Shaft/Bell-Out: prepare sketch of shaft showing all utility brackets depth measured from collar, include location of drain hoses
        v. Utility Hanger/Supports is Tunnels - #9 tie-wire is used to hang ventilation duct, 6 inch steel compressed airline and 2 inch steel domestic waterline

vi. Shaft Cover Paint System – inspect all surfaces especially including underside and plan for touchup painting at future date.

5. TDCS Ventilation System
    a. Evaluate ventilation system performance and take air flow measurements annually and similar to evaluation performed on 9-15-10 and contained in Attachment 2. Include two additional measurements at the top of the shaft 1.) with shaft cover off 2.) with shaft cover on and hatch (9x12) removed.

6. Sump Inspection
    a. Check DNAPL Sump for accumulated DNAPL and if needed pump out into 55 Gallon drum
    b. Inspect for and consider cleaning the accumulated debris in the TDCS Sump

7. Glens Falls Fire Department Technical Rescue Team perform rescue drill in September 2011

8. Electrical Work
    a. Remove or de-energize selected electrical circuits – (to be determined).

9. Equipment to Purchase
    a. Additional air packs or central air supply cart
    b. Refill all air packs at GFFD prior to TDCS entry
    c. Drum clamp to rig drums for crane pick
    d. Fabricate and install a more robust and permanent canopy cover over the Vertical Turbine pumps – pop-up folding canopies have collapsed due to accumulation of water
    e. Prior to next entry replace nylon web / ratchet ties holding 36 inch diameter duct near shaft collar – consider corrosion resistant system – i.e. stainless steel cable/turnbuckle
    f. Add a decontamination facility (conex box) that is fitted for decontamination activities and is within reach of both cranes
    g. Five new mine phones
    h. Radio repeater for workroom 1-1 (Alpine)

10. Prepare SOP for TDCS Entry for normal OM&M work

DAILY SUMMARY OF ACTIVITIES

For Each Day:

Tunnel Access Contactor – Alpine Construction, LLC, provided two cranes and two closed man-cages and one open work basket for access with two crane operators, one top man/Confined Space Attendant, one bottom man, two Laborers (for tunnel scaling) and one Superintendent/Confined Space Attendant. Alpine removed the entire TDCS Shaft cover at the beginning of the first day (to allow for shaft inspection) and replaced it at the end of the day. For days 2 through 5 the smaller shaft hatch was removed and replaced at the end of each day of entry. Alpine turned the TDCS ventilation fan on at the beginning and off at the end of each TDCS entry day. Alpine provided radio communications for TDCS activities. Alpine performed Lightning Storm Detection and coordination with GeoTrans Entry Supervisor.

Confined Space Rescue Team – Glens Falls Fire Department provided 4-man Technical Rescue Team on-call at the fire house in Glens Falls for each day of TDCS Entry.

Day 1: Monday 13 September 2010

Alpine performed the following activities:

- Provided two man sounding and scaling crew for Tunnel 1 Roof Integrity Testing
- Lightning Detection in coordination with GeoTrans Entry Supervisor – Lightning Detector indicated lightning hazard approaching close and at 1450 hours the tunnel was evacuated and work stopped until 9-14-10. After the storm passed the shaft cover was replaced over the shaft.

Emerick performed the following activities:

- Maintenance and inspection of TDCS vertical turbine pumps in the TDCS Shaft Bell-Out with GeoTrans.

GeoTrans performed the following activities:

- Industrial Hygiene Survey including personnel monitoring
- TDCS shaft Visual engineering inspection, by competent person,
- Competent person Supervised Tunnel Roof Integrity Testing performed by Alpine crew for the sounding and controlled removal of loose rock by scaling in Tunnel 1 from the Bell-out to station 1+40.
- Observed/assisted Emerick's Pump Technician during pump maintenance activities
- Air quality monitoring in the tunnels during inspection and scaling activities. All readings were good with Air at 20.9% and zero for the remaining four gases.
- Inspected pump discharge hoses for leaks – none
- Test run Pump #3 (ABS – submersible) on manual control
- Replaced Mine Phone in bell-out with working unit from electrical shed and placed new unit in electrical shed and had good two-way communication with the topside mine phone in Electrical Shed – the unit in Tunnel 1 near the Shaft Bell-Out.
- Found portable canopy with black plastic had collapsed over VT Pumps. Removed old canopy and installed a replacement portable frame & canopy.

Day 2: Tuesday 14 September 2010

Alpine performed the following activities:

- Tunnel roof sounding and loose rock removal in Tunnel 2 as noted below
- Incident at about 1500 hours – Alpine worker had a small piece of rock slide down scaling bar and hit and cutting his left forefinger. He was treated at off-site clinic with wound cleanup and band-aid and released. No lost time.

GeoTrans performed the following activities:

- Industrial Hygiene Survey including personnel monitoring
- Competent Individual Supervised Tunnel Roof Integrity Testing performed by Alpine and GeoTrans crews for the sounding and controlled removal of loose rock by scaling in: Tunnel 1 station 1+40 to end at 3+15; Tunnel 2 station 0+15 to 1+95 and; Tunnel 3 station 0+15 to end at 3+25.
- Re-establish lighting through entire tunnel system using 110v light strings (100 feet)
- Inspect for DNAPL from PH-1 – 700 ml DNAPL collected – leave open to collect in reservoir and water to overflow out open vent hole in top cap of reservoir.

Day 3: Wednesday 15 September 2010

Alpine performed the following activities:

- Tunnel roof sounding and loose rock removal in Tunnel 2 Sta 1+95 to 2+65 and cleanup of rock debris into 55 gallon drums.

Hour Electric performed the following activities:

- Performed visual inspection of electrical system in TDCS bell-out and tunnels.
- Assisted GeoTrans with troubleshooting problems with piezometer data acquisition system. Replaced MUX-2 with new MUX provided by Geokon. Made terminal connections of orange cable to MUX-2 in workroom 1-1.
- Installed a 240v pigtail from panel in electrical shed to allow connection of GeoTrans air compressor for pump used to collect fluid from DNAPL Sump.

GeoTrans performed the following activities:

- Industrial Hygiene Survey including personnel monitoring, vinyl chloride testing (Draeger), ventilation survey and noise survey.
- Competent Individual Supervised Tunnel Roof Integrity Testing performed by Alpine and crew for the sounding and controlled removal of loose rock by scaling in Tunnel 2 station 1+95 to end at 2+65. All tunnels completed and safe for worker occupancy.
- Collected data and test readings for vibrating wire piezometers during troubleshooting and replacement of MUX-2 multiplexer
- Collected Tunnel Convergence measurements
- Cleanup of rock debris into 55 gallon drums.
- Performed evacuation drill to determine duration of time required to evacuate all workers from TDCS – 11 minutes

Day 4: Thursday 16 September 2010

Alpine performed the following activities:

- Assisted with cleanup of rock debris into 55 gallon drums and removal of drums from TDCS

GeoTrans performed the following activities:

- Measured flow from all Drain Wells
- Collect PCB and VOC samples from Drain wells
- Collect DNAPL from PH-1, 700 milli-liters
- Set up diaphragm pump in DNAPL Sump and collected 55 gallons of water and moved drum to Water Treatment Plant.
- Removal of mineralization build-up in tunnel gutters
- Cleanup of rock debris into 55 gallon drums
- Wash down of tunnel invert

Day 5: Friday 17 September 2010

Alpine performed the following activities:

- Assisted with final cleanup

GeoTrans performed the following activities:

- Completed Wash down of Tunnel Invert
- Winterized water line into TDCS (shutoff and drained)
- Participated in Confined Space Rescue Drill by GFFD

Glens Falls Fire Department Technical Rescue Team performed:

- Confined Space Rescue Drill
    - 09:07 - Called by GeoTrans Entry Supervisor who reported a man down, bleeding and unconscious after being hit in head by large rock during tunnel roof scaling.
    - 09:20 - Arrived at TDCS Site
    - 09:46 - Entered TDCS
    - 10:11 – Exited TDCS with rescue victim
    - 10:15 – Completed decontamination of rescue victim
- Debrief Meeting after rescue drill

TDCS Entry Report – September 2010
List of Attachments

Attachment 1 – TDCS Entry Log

Attachment 2 – Industrial Hygiene Survey

Attachment 3 – Lightning Hazard Procedures

Attachment 4 – Summary of Evacuation Drill

Attachment 5 – Convergence Monitoring Data September 2010

Attachment 6 – GeoTrans TDCS Inspection Report

Attachment 7 – Brierley Associates TDCS Inspection Report

Attachment 8 – Vertical Turbine Pump Maintenance Log and Lubrication Interval

Attachment 9 – Emerick Associates Maintenance Inspection Report

Attachment 10 – Drainwell Summary

Attachment 11 – Drainwell Sample Chain of Custody

Attachment 12 – Piezometer Field Data 9-15-10

Attachment 13 – Electrical Inspection Report

Attachment 14 – Geokon Equipment Wipe Test Report

Attachment 15 – Glens Falls Fire Department Confined Space Rescue Drill Report

TDCS Entry Report – September 2010

Attachment 1
TDCS Entry Log

GeoTrans, Inc.

TDCS Entry Log

General Electric Hudson Falls Plant Site
Tunnel Drain Collection System - TDCS

TDCS Entry		
Number	**Date**	**Purpose**
NA	5/15/2009	Final Inspection of TDCS Phase 3 Construction - last day of MO-JV Responsibility
1	6/19/2009	OM&M: Replace temporary TDCS pump, P-1 with spare provided by MO-JV
2	7/30/2009	OM&M: Glens Falls Fire Department - familiarization and rescue drill
3	8/4/2009	OM&M: Replace temp. pump, P-1 with spare provided by MO-JV - failed, use ABS
4	8/7/2009	OM&M: Check New P-1, ABS pump continuous pumping, install float switches for P-2
5	8/28/2009	OM&M: Verify as-built dimensions of sump walls for sump deck steel fabrication
6	9/8/2009	OM&M: Repair TDCS pump P-1 hose
7	9/21/2009	OM&M: Repair TDCS pump P-1 hose
8	10/14/2009	Phase 4: Prep for new pipe at shaft collar
9	10/15/2009	Phase 4: Remove temporary sump deck
10	10/19/2009	Phase 4: Install new pipe at shaft collar, disconnect N.Frac Tank, cutover to new pipe
11	10/20/2009	Phase 4: Begin installation of new galvanized steel sump deck and pump support frame
12	10/21/2009	Phase 4: Install new sump deck and piping from abandon HF-303 casing to gutter drain
13	10/22/2009	Phase 4: New sump deck installation complete
14	10/29/2009	Phase 4: Electrical wiring for new TDCS vertical turbine pumps
15	10/30/2009	Phase 4: Install pump frame, electrical wiring for new pumps
16	11/2/2009	Phase 4: Install & level two vertical turbine pump bases, electrical boxes
17	11/3/2009	Phase 4: Install, assemble two new vertical turbine pumps
18	11/4/2009	Phase 4: Install chemical resistant discharge hoses, level transducers, electrical boxes
19	11/17/2009	Phase 4: Install new steel support bracket, 6" valve for steel header discharge pipe
20	11/18/2009	Phase 4: Final assembly of two new vertical turbine pumps, hose anchoring
21	11/19/2009	Phase 4: Testing and start-up of new vertical turbine pumps
22	11/20/2009	Phase 4: Final inspection of new vertical turbine pump system
23	2/23/2010	OM&M: pump lubrication, drainwell testing and sampling, tunnel rock scaling
24	2/24/2010	OM&M: tunnel rock scaling (1/2 day due to snow storm)
25	3/1/2010	Phase 4: Install Multi Level VW PZ-202 in PH-2; OM&M: tunnel rock scaling
26	3/2/2010	Phase 4: Install Multi Level VW PZ-202 in PH-2; OM&M: tunnel rock scaling
27	3/3/2010	Phase 4: Install Multi Level VW PZ-202 in PH-2; OM&M: tunnel rock scaling
28	3/26/2010	OM&M: Repair TDCS vertical turbine pump VTP-2 - motor failure - remove for repair
29	4/15/2010	OM&M: Repair VTP-2, install rebuilt drive motor and test pump
30	9/13/2010	OM&M: Pump lubrication and Tunnel 1 roof integrity inspection and scaling
31	9/14/2010	OM&M: Tunnel 1, 2 and 3 roof integrity inspection and scaling, Convergence readings
32	9/15/2010	OM&M: Tunnel 2 roof insp/scaling, Convergence rdgs, Replace MUX2, Brierley Inspects
33	9/16/2010	OM&M: debris removal, drainwell test/sample, DNAPL Sump Collect, Hydrogeo inspect
34	9/17/2010	OM&M: Glens Falls Fire Department - familiarization and rescue drill - Tunnel 3

TDCS Entry Report – September 2010

Attachment 2
Industrial Hygiene Survey

GeoTrans, Inc.

MEMO

DATE: October 22, 2010; Updated December 9, 2010

TO: Jay Bridge/Fletcher Baltz

FROM: Michelle Gillie, Corporate Health & Safety Director

SUBJECT: Summary of Health & Safety Survey Activities Conducted September 13-15, 2010 at GE Hudson Falls Site

At your request, I visited the GE Hudson Falls Site on September 13-15, 2010 during planned tunnel scaling tasks and other operations & maintenance activities of the tunnel drainage and collection system (TDCS). The industrial hygiene survey included personal sampling of workers to assess exposure concentrations to PCBs, various volatile organic compounds (VOCs), respirable dust and crystalline silica in addition to a ventilation survey inside the tunnels. Noise measurements were also collected in the tunnel and the WTP. Preliminary personal sampling results for the chemical hazards were provided upon receipt from the laboratory and forwarded to all impacted site personnel and the subcontractor Alpine Construction in accordance with OSHA and corporate requirements. The survey findings and recommendations, where appropriate are provided below.

AIR SAMPLING

Findings

GeoTrans, Inc.'s Certified Industrial Hygienist, Michelle Gillie, who also serves as the corporate health and safety director, conducted personal sampling for various target analytes during scaling tasks performed by GeoTrans and Alpine Construction personnel on September 14 and 15, 2010. Sampling was performed to evaluate worker exposure concentrations to respirable dust (defined as particles with aerodynamic diameters at or below 10 microns), crystalline silica, various volatile organic compounds (VOCs), and PCBs. The target VOCs were 1,1-dichloroethane, 1,2- dichloroethane, cis- and trans-1,2- dichloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethylene, benzene, n-hexane, 1,2,4-trichlorobenzene and vinyl chloride. Methylene chloride was requested but there was insufficient material to analyze for it (different method than the other VOCs).

Personal sampling was conducted for the full shift or the full duration of the task in accordance with applicable OSHA and NIOSH sampling and analytical methods. Personnel donned the required PPE including TyChem whole body suits, hard hat, face shield, hearing protection, safety glasses (optional under face shield), safety boots, rubber overboots, and leather gloves over nitrile gloves in accordance with the Job Safety Analysis. The personal sampling filters and sorbent tubes (collection media) were placed in the breathing zone of the workers outside the face shield and clothing and attached to sampling pumps clipped to the worker's belt.

Pre- and post-calibrations of the pump flow rates were performed with a calibrated precision rotameter. The collected air samples were submitted to EMSL Analytical, Inc. in Westmont, NJ, which is accredited by the American Industrial Hygiene Association for industrial hygiene analyses. The EMSL laboratory reports and chain-of-custody forms are attached.

Personal air samples on three employees showed no detected VOCs including vinyl chloride during the scaling task. This finding confirms the real-time Draeger Chip Measuring System vinyl chloride results obtained in all tunnels (none detected – limit of detection of 0.3 ppm).

PCB sampling on two Alpine workers showed variable results for the 4-5 hours duration of the task. One worker showed a PCB /Aroclor 1242 result of 0.032 mg/m^3 which is an order of magnitude higher than the results for the second employee (0.0091 mg/m^3). Both results are well below the OSHA Permissible Exposure Limit (legal limit) for Aroclor 1242 of 1.0 mg/m^3. However, the results do exceed the NIOSH recommended exposure limit of 0.001 mg/m^3 due to carcinogenic risk (very conservative). The field blank was none detected for PCBs. No other Aroclor isomer was detected in the personal air samples.

One of two personal samples collected on 9/14 and 9/15 had a respirable dust concentration of 0.237 mg/m^3 and a respirable crystalline silica concentration of 0.023 mg/m^3. The OSHA Permissible Exposure Limit for respirable dust without toxic constituents (classified as Particulates Not Otherwise Classified) is 5 mg/m^3; however, this PEL does not apply to this task since the dust on the filter showed a quartz content of 9.6%. This finding is similar to the bulk results of 14.5% quartz from a composite sample of rock and dust from tunnels 2 and 3. This was an 8-hour sample. The formula for calculation of the OSHA PEL for respirable dust containing crystalline silica is as follows: PEL in $mg/m^3 = 10/ \%SiO_2 + 2$. Based on the silica contents reported, the calculated OSHA Permissible Exposure Limit for respirable crystalline silica would vary from 0.60 mg/m^3 to 0.86 mg/m^3 (the higher the quartz content, the lower the PEL). Thus, the 8-hour exposure concentration of the Alpine employee of 0.023 mg/m^3 is well below the calculated OSHA PEL for the specific rock dust.

However, the 2010 recommended threshold limit value (TLV) for respirable crystalline silica is 0.025 mg/m^3 which is set to protect against pulmonary fibrosis and lung cancer. Industrial hygienists refer to the TLV value as it is more protective of worker health and is derived from current toxicological data and industrial experience. Thus, the personal sampling data are just slightly under the TLV value. The four-hour sample on the second day showed no dust/silica exposure.

Recommendations

The air sampling data should be incorporated into the 2010 project Health and Safety Plan (HASP) under Section 3.6 Air Monitoring Results. Additional personal sampling for respirable dust and crystalline silica should be conducted during the next scaling task and any other intrusive operation with potential exposure to rock dust. The Job Safety Analysis for scaling must be revised to address new project requirements for air sampling and respiratory protection against crystalline silica. Half-face air purifying respirators equipped with P100 cartridges will be required for scaling work or any other intrusive work with the potential for exposure to crystalline silica, regardless of the task duration or frequency.

Additionally, confined space entry air monitoring data should be summarized and incorporated into the project HASP. Confined space air monitoring in the TDCS since June 2009 (29 days of entries) has not shown any unacceptable levels for oxygen, explosive vapors/gases, hydrogen-sulfide, carbon-dioxide or VOCs.

VENTILATION SURVEY

Findings

The TDCS volume is calculated to be 221,184 cubic feet. The air flow in the tunnel provided by one (of the two) 150-HP ventilation fans (including losses) is calculated to be 20,000 cubic feet of air per minute (CFM), resulting in one air change in the entire tunnel system every 11 minutes. OSHA requires that mechanical ventilation provide each underground worker at least 200 cfm of fresh air. Thus, the current mechanical system is expected to be more than sufficient for the planned tunnel entry teams of up to five workers. Based on the output of one fan, the estimated air velocity at the hatch opening (9-ft by 12-ft, located at the center of the steel plate shaft cover) is 186 feet per minute (fpm) and for the full 25-ft diameter shaft the air velocity is 40 fpm. OSHA also requires that the linear velocity of air flow in the tunnel, shafts and all underground working areas must be at least 30 feet per minute (fpm). The ventilation system is turned on at least 30 minutes before initial entry into the tunnel.

Actual measurements of air flow and volume were obtained as part of tunnel entry operations during the site visit. The table below summarizes the ventilation data including location, duct/tunnel face area (in square feet), air velocity measurements (in feet per minute or fpm) and air volume calculations (in cubic feet of air per minute or CFM).

GE Hudson Falls, NY TDCS Scaling Operation
Ventilation Survey[1]
September 15, 2010

Location	Area (ft^2)	Velocity Readings (fpm)	Air Volume (cfm)	Notes
Tunnel 1	10' H x 11' W = 110 – 6 (circular top correction) = **104**	**Average = 205** 150,229,235,229 174,227,235,230 207,246,211,160 194,251,158,153	21,320	Midway @ 2+00 57.7°F and 71.8% relative humidity @ 11:10 AM
Tunnel 2	10' H x 12'W = 120 -6 = **114**	**Average = 120** 140,121,116,76 136,136,109,121 163,101,90,162 124,112,96,123	13,680	Midway @ 1+50 61.9°F and 54.9% relative humidity @ 10:20 AM
Tunnel 2 air supply duct	2.64 (22" diameter)	**Average = 4571** 4600, 4550, 4600, 4660, 4660, 4550, 4500	12,068	supply
Tunnel 3	10' H x 11' W = 110 – 6 (circular top correction) = **104**	**Average = 108** 118, 116, 128, 116 124,117, 123,84 112,122,104,75 101,103,103,81	11,232	Midway @ 2+00 60.4°F and 58.3% relative humidity @ 10:45 AM
Tunnel 3 air supply duct	2.64 (22" diameter)	**Average = 4763** 4635,4370,5010 4835,5475,4190 4645, 5010, 4700	12,574	Air supply at workroom 3-1
Main room (at junction of tunnels 1-3)	Not measured	Tunnel 1 face -148 Tunnel 2 face- 146 Tunnel 3 face -132	Not calculated	60.3°F and 59.8% relative humidity

Notes:
1- Ventilation measurements collected by GeoTrans on 9/15/2010 with a calibrated TSI 8386 Velocicalc Plus velometer.

The ventilation data show that the average face velocities inside the tunnel cross-sections vary from 108 fpm in tunnel 3 to 205 fpm in tunnel 1; these values exceed the OSHA minimum requirement of 30 fpm. The calculated air volumes moving through the tunnels vary from 11,232 CFM in tunnel 3 to 21,320CFM in tunnel 1. Tunnel 1 receives air flow from tunnels 2 and 3, thus it is reasonable that the air flow and volume in tunnel 1 is approximately double that of each remote tunnel segment. The measured air volume of 21,320 CFM in tunnel 1 slightly exceeds the tunnel design specification of 20,000 CFM.

The air supply ducts at the end of tunnels 2 and 3 provide over 4500 fpm air flow.

Ambient temperatures inside the tunnel varied from 57°F to 62°F; these temperatures are slightly below the recommended comfortable temperature range of 68°F to 76°F. However, since work is conducted in Level C chemical protective clothing (TyChem), the cooler temperatures are not a problem. The relative humidity measurements varied from 54% to 72%, which are within or slightly above the desired indoor air range of 30 to 70% (40-60% ideal). The use of TyChem clothing prevents cooling by evaporation of sweat.

Recommendations

The tunnel ventilation system performance should be evaluated annually, as a minimum. Should confined space entry air monitoring or personal air sampling reveal the presence or development of an atmospheric hazard, the ventilation system should also be re-assessed at that time. The findings should be incorporated into the project HASP.

Site workers need to ensure they are pre-hydrated before they enter the tunnel and take breaks as needed if heavy manual labor causes excessive sweating.

NOISE SURVEY

Findings

Background noise levels inside the tunnels during operation of the ventilation system varied from 74 decibels (dBA) in tunnel 3 to 79-80 dBA in tunnel 1. During removal of fallen rock from scaling tasks with a metal shovel and dropping the debris into drums, the sharp annoying sounds were found to exceed 90 dBA. One of two workers performing this task was not wearing hearing protection. Other workers in the vicinity were not wearing hearing protection. I advised that they obtain hearing protection and wear it and to use a plastic shovel or put a rubber blade on the metal shovel to minimize the screeching sound of metal on rock during shoveling. Hearing protection was delivered to the tunnel upon my recommendation. Sound levels at the bottom of the shaft (bell-out area) varied from 80 dBA to 84 dBA with occasional peaks at 89 dBA to 93 dBA from tunnel 1 noise sources.

Recommendations

All tunnel workers should carry hearing protection which is required by Tetra Tech to be worn when noise levels exceed 85 dBA. A rule of thumb is that if you have to raise your voice to be heard at 3 feet away, then hearing protection should be worn. This is true for both continuous noise (e.g., ventilation system) and impact noise (e.g., use of scaling bar, shoveling rock). Alternate tools or tool design which will produce less noise, as noted above, should be considered.

From:	Gillie, Michelle
To:	Baltz, Fletcher; Dodge, Kevin; O"Brien, Chip; Tallon, Chris; Leerkes, Jessica; LaPoint, Sam; Lougen, Jenn
Cc:	Bridge, Jay
Subject:	Personal PCB Sampling Results from Scaling Task
Date:	Wednesday, September 29, 2010 11:53:14 AM
Attachments:	011004777.pdf

All-
Please find attached the PCB results for the two Alpine workers doing scaling on 9/14/10 and 9/15/10. The samples represent about 4-5 hours of work. Note that sample on Charles Doty is 0.032 mg/m3 which is an order of magnitude higher than the results for Jason Bennett (0.0091 mg/m3). Both results are well below the OSHA Permissible Exposure Limit (legal limit) for Aroclor 1242 of 1.0 mg/m3. However, the results do exceed the NIOSH recommended exposure limit of 0.001 mg/m3 due to carcinogenic risk (very conservative). I cannot explain the difference in exposure data since I did not observe the workers at the time. The field blank was ND.

Feel free to contact me if you have any questions. I am awaiting the results for the VOCs, vinyl chloride, respirable dust and crystalline silica.
Fletcher- please provide a copy of these results to Alpine within 5 business days and cc me.
Thanks,
Michelle

SAFETY IS A WAY OF LIFE!

Michelle F. Gillie, M.S., CIH, CPEA | Corporate Health & Safety Director
Main: 610.337.7660 x 105 | Fax: 610.337.7659 | Mobile: 610.348.7197

michelle.gillie@tetratech.com | mgillie@geotransinc.com

GeoTrans, Inc., a Tetra Tech Company
234 Mall Blvd. Suite 260| King of Prussia, PA 19406 | www.tetratech.com

EMSL Analytical, Inc.

http://www.emsl.com

3 Cooper St.
Westmont, NJ 08108
Phone: (856) 858-4800
Fax: (856) 858-4571

Attn: **Michelle Gillie**
GeoTrans, Inc.
234 Mall Boulevard
Suite 260
King of Prussia, PA 19406
Phone: (610) 337-7660
Fax: (610) 337-7659

9/28/2010

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 9/17/2010. The results are tabulated on the attached data pages for the following client designated project:

117-2204189.01

The reference number for these samples is EMSL Order #011004777. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 858-4800.

Reviewed and Approved By:

Julie Smith - Laboratory Director or other approved signatory

ACCREDITED LABORATORY AIHA Environmental Lead & Industrial Hygiene See aihaldap.org for details

Accreditation #100194

EMSL Analytical, Inc.
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4571 Email: jsmith@emsl.com

Attn: **Michelle Gillie**
GeoTrans, Inc.
234 Mall Boulevard
Suite 260
King of Prussia, PA 19406

Fax: (610) 337-7659 Phone (610) 337-7660
Project: **117-2204189.01**

Customer ID: GEOT21
Customer PO: 86060037
Received: 09/17/10 10:00 AM
EMSL Order: 011004777

Analytical Results

Client Sample Description GEO-TDCS-7
Charles Doty - Scaling
Collected: 9/14/2010 *Lab ID:* 0001

Method	*Parameter*	*Concentration*	*Reporting Limit*	*Units*	*Analysis Date*	*Analyst*
5503 Modified	Aroclor-1016	ND	0.0035	mg/m³	9/27/2010	ehernandez
5503 Modified	Aroclor-1221	ND	0.0035	mg/m³	9/27/2010	ehernandez
5503 Modified	Aroclor-1232	ND	0.0035	mg/m³	9/27/2010	ehernandez
5503 Modified	Aroclor-1242	0.032	0.0035	mg/m³	9/27/2010	ehernandez
5503 Modified	Aroclor-1248	ND	0.0035	mg/m³	9/27/2010	ehernandez
5503 Modified	Aroclor-1254	ND	0.0035	mg/m³	9/27/2010	ehernandez
5503 Modified	Aroclor-1260	ND	0.0035	mg/m³	9/27/2010	ehernandez
5503 Modified	Aroclor-1262	ND	0.0035	mg/m³	9/27/2010	ehernandez
5503 Modified	Aroclor-1268	ND	0.0035	mg/m³	9/27/2010	ehernandez

Client Sample Description GEO-TDCS-9
Jason Bennett - Scaling
Collected: 9/15/2010 *Lab ID:* 0002

Method	*Parameter*	*Concentration*	*Reporting Limit*	*Units*	*Analysis Date*	*Analyst*
5503 Modified	Aroclor-1016	ND	0.00094	mg/m³	9/23/2010	ehernandez
5503 Modified	Aroclor-1221	ND	0.00094	mg/m³	9/23/2010	ehernandez
5503 Modified	Aroclor-1232	ND	0.00094	mg/m³	9/23/2010	ehernandez
5503 Modified	Aroclor-1242	0.0091	0.00094	mg/m³	9/23/2010	ehernandez
5503 Modified	Aroclor-1248	ND	0.00094	mg/m³	9/23/2010	ehernandez
5503 Modified	Aroclor-1254	ND	0.00094	mg/m³	9/23/2010	ehernandez
5503 Modified	Aroclor-1260	ND	0.00094	mg/m³	9/23/2010	ehernandez
5503 Modified	Aroclor-1262	ND	0.00094	mg/m³	9/23/2010	ehernandez
5503 Modified	Aroclor-1268	ND	0.00094	mg/m³	9/23/2010	ehernandez

Client Sample Description GEO-TDCS-12
Field Blank
Collected: *Lab ID:* 0003

Method	*Parameter*	*Concentration*	*Reporting Limit*	*Units*	*Analysis Date*	*Analyst*
5503 Modified	Aroclor-1016	ND	0.000050	mg/tube	9/23/2010	ehernandez
5503 Modified	Aroclor-1221	ND	0.000050	mg/tube	9/23/2010	ehernandez
5503 Modified	Aroclor-1232	ND	0.000050	mg/tube	9/23/2010	ehernandez
5503 Modified	Aroclor-1242	ND	0.000050	mg/tube	9/23/2010	ehernandez
5503 Modified	Aroclor-1248	ND	0.000050	mg/tube	9/23/2010	ehernandez
5503 Modified	Aroclor-1254	ND	0.000050	mg/tube	9/23/2010	ehernandez
5503 Modified	Aroclor-1260	ND	0.000050	mg/tube	9/23/2010	ehernandez

EMSL Analytical, Inc.
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4571 Email: jsmith@emsl.com

Attn: **Michelle Gillie**
GeoTrans, Inc.
234 Mall Boulevard
Suite 260
King of Prussia, PA 19406

Fax: (610) 337-7659 Phone (610) 337-7660
Project: **117-2204189.01**

Customer ID: GEOT21
Customer PO: 86060037
Received: 09/17/10 10:00 AM
EMSL Order: 011004777

Analytical Results

Client Sample Description GEO-TDCS-12
Field Blank

Collected:

Lab ID: *0003*

Method	*Parameter*	*Concentration*	*Reporting Limit*	*Units*	*Analysis Date*	*Analyst*
5503 Modified	Aroclor-1262	ND	0.000050	mg/tube	9/23/2010	ehernandez
5503 Modified	Aroclor-1268	ND	0.000050	mg/tube	9/23/2010	ehernandez

Definitions:
ND - indicates that the analyte was not detected at the reporting limit

EMSL ANALYTICAL, INC.

Industrial Hygiene Chain of Custody

EMSL Order Number *(Lab Use Only)*:

011004777

Corporate -
Westmont/Cinnaminson, NJ
200 Route 130 North
Cinnaminson, NJ 08077
PHONE: 1-800-220-3675
FAX: (856) 786-5974

Report To Contact Name: Michelle Gillie	**Bill To Company:** GeoTrans, Inc.	**Sampled By (Signature):** Michelle Gillie
Company Name: GeoTrans, Inc.	**Attention To:** Michelle Gillie	**Number of Samples in Shipment:** 3
Address 1: 234 Mall Blvd, Suite 260	**Address 1:** 234 Mall Blvd, Suite 260	**Date of Shipment:** 9-16-10
Address 2: King of Prussia, PA 19406	**Address 2:** King of Prussia, PA 19406	**U.S. State where Samples Collected:** NY
Phone : 610-337-7660 **Fax :** 610-337-7659	**Phone :** 610-337-7660 **Fax :** 610-337-7659	**Purchase Order:** 86060037
Email Results To: mgillie@geotransinc.com	**Project Name:** 117-2204189.01	

Turnaround Time – Please Check: Please Note Standard TAT is 2 Week.

2 Week	1 Week	4 Day	3 Day	2 Day	1 Day	Other (Call Lab)
☒	☐	☐	☐	☐	☐	☐

Media Type: Florisil / GFF
Manufacturer/Part #: SKC
Lot #: 226-39

Sample ID	Media	Analyte / Method	Volume	Sample Date/Time	Location	Comments
1 GEO-TDCS-7	GFF/Florisil	NIOSH 5503 / PCBs	56.4 L	9/14/10	Charles Doty	Scaling
2 GEO-TDCS-9	"	"	53.0 L	9/15/10	Jason Bennett	Scaling
3 GEO-TDCS-12	"	"	—		Field Blank	

Note: Most NIOSH and OSHA methods require field blanks. It is the IH field sampler's responsibility to submit the proper number of field blanks and duplicates.

Released By	Date	Received By	Date
Michelle Gillie	9/16/10	9/17/10 10:00AM	RECEIVED SEP 16

Comments/Special Instructions:

09-16-2010 12:2

Baltz, Fletcher

From: Gillie, Michelle
Sent: Wednesday, September 29, 2010 3:35 PM
To: Baltz, Fletcher; Tallon, Chris; Dodge, Kevin; LaPoint, Sam; Leerkes, Jessica; Lougen, Jenn; O'Brien, Chip
Cc: Bridge, Jay
Subject: Bulk Rock Dust Analysis
Attachments: 041021481-bulk.pdf

All-
Please find attached the lab results for the composite rock/dust sample from tunnels 2 and 3 that show the rock contains 14.5% alpha-quartz (silicon dioxide) and no measurable cristobalite or tridymite (other crystalline silica species). I will provide further data analysis upon receipt of the personal air samples.
Feel free to contact me with any questions.
Fletcher-please forward this report to Alpine as well within 5 days.
Thanks,
Michelle

SAFETY IS A WAY OF LIFE!

Michelle F. Gillie, M.S., CIH, CPEA | **Corporate Health & Safety Director**
Main: 610.337.7660 x 105 | Fax: 610.337.7659 | Mobile: 610.348.7197

michelle.gillie@tetratech.com | mgillie@geotransinc.com

GeoTrans, Inc., a Tetra Tech Company
234 Mall Blvd. Suite 260| King of Prussia, PA 19406 | www.tetratech.com

EMSL Analytical, Inc.
200 Route 130 N., Cinnaminson, NJ 08077

Order ID:041021481

Attn:	Michelle Gillie GeoTrans, Inc. 234 Mall Boulevard, Suite 260 King of Prussia, PA 19406	Customer ID: Customer PO: Date Received:	GEOT21 86060037 9/16/10 8:36 PM
Fax:	email	EMSL Order:	041021481
Project:	117-2204189.01	EMSL Project ID:	
Report Date:	9/29/10	Date Analyzed:	9/29/10

Silica, Crystalline Analysis of Bulk Material Performed X-Ray Diffraction (XRD) Method NADCA 1999 & Modified NIOSH Method 7500, Issue 3, 1/15/98

Sample ID	Location	% α-Quartz	% Cristobalite	%Tridymite
GEO-TDCS-15 041021481-0004	BULK DUST	14.5	<0.8	<0.8

Notes:

1. Reporting limit for Quartz = 0.2%
2. Reporting limit for Cristobalite and Tridymite = 0.8%

Disclaimer: All samples received in acceptable condition unless otherwise noted. "<" means less than the stated value. The lowest reportable value is equivalent to the Analytical Sensitivity that is calculated from the lowest reproducible amount of specific mineral detectable by the instrument.

Jian Hu
Analyst

Stephen Siegel, CIH- Lab Manager
Or other approved signatory

AIHA Accredited - Laboratory ID #100194

From:	Gillie, Michelle
To:	Baltz, Fletcher; Dodge, Kevin; Tallon, Chris; LaPoint, Sam; Leerkes, Jessica; Lougen, Jenn; O"Brien, Chip
Cc:	Bridge, Jay; Faust, Charlie
Subject:	Personal Respirable Dust/Crystalline Silica Results
Date:	Thursday, September 30, 2010 12:05:22 PM
Attachments:	041021481C.pdf 041021481_COC.pdf

All-

Please find attached the lab results for the above analytes that show that one of two personal samples collected on 9/14 and 9/15 had a respirable dust concentration of 0.237 mg/m3 and a respirable crystalline silica concentration of 0.023 mg/m3. The dust on the filter showed a quartz content of 9.6% which is similar to the bulk results of 14.5% quartz provided yesterday. This was an 8-hour sample. Based on the silica contents reported, the calculated OSHA Permissible Exposure Limit for respirable crystalline silica would vary from 0.60 mg/m3 to 0.86 mg/m3 (the higher the quartz content, the lower the PEL). Thus, the 8-hour exposure concentration of the Alpine employee of 0.023 mg/m3 is well below the calculated OSHA PEL.

However, the 2010 recommended threshold limit value (TLV) for respirable crystalline silica is 0.025 mg/m3 which is set to protect against pulmonary fibrosis and lung cancer. Industrial hygienists- including me -prefer to use the TLV value as it is more protective of worker health and is derived from current toxicological data and industrial experience. Thus, the personal sampling data are just slightly under the TLV value.

You should be aware that dust is generally visible to the unaided human eye at concentrations above 2 mg/m3 depending on the particle size. This means that you cannot see crystalline silica/dust levels that may be hazardous to your health. This is why we need to evaluate personnel exposures with sampling and provide respiratory protection and other PPE to prevent exposure in the interim. Certainly with toxic agents such as crystalline silica, proper respiratory protection should always be worn to reduce the exposure to zero or as low as possible.

The four-hour sample on the second day showed no dust/silica exposure which I cannot explain but it is a suspect result.

I would like to perform personal and area sampling on subsequent scaling or other intrusive tasks conducted in the tunnel to obtain additional data on respirable dust/crystalline silica exposure.

This data does not provide direct information on potential crystalline silica exposures on other tasks performed by GEO personnel in the tunnel such as hammer drilling, drain well drilling observations, mapping or while drilling/mucking tasks were performed by MERCO. I will review the MERCO PM10 data from the tunnel and make some reasonable inferences about crystalline silica content in the tunnel.

Feel free to contact me at any time with any questions. I will be coming to visit you all in the next few weeks to review these findings, detail our H&S requirements and expectations, share lessons learned, and answer any of your questions. I am out Oct 6-15 so this may occur in late October.

Thank you all for your input and cooperation.

Fletcher- please forward this data to Alpine.

Thanks,
Michelle

SAFETY IS A WAY OF LIFE!

Michelle F. Gillie, M.S., CIH, CPEA | Corporate Health & Safety Director
Main: 610.337.7660 x 105 | Fax: 610.337.7659 | Mobile: 610.348.7197

michelle.gillie@tetratech.com | mgillie@geotransinc.com

GeoTrans, Inc., a Tetra Tech Company
234 Mall Blvd. Suite 260| King of Prussia, PA 19406 | www.tetratech.com

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Phone: (856) 858-4800 Fax: (856) 786-5974 Web: http://www.emsl.com Email:westmontasblab@EMSL.com

Attn: Michelle Gillie
GeoTrans, Inc.
234 Mall Boulevard
Suite 260
King of Prussia, PA 19406
Phone: 610-337-7660
Fax: 610-337-7659

Proj: 117-2204189.01

Customer ID: GEOT21
Customer PO: 86060037
Date Received: 9/16/2010 8:36:00PM
EMSL Order ID: 041021481
EMSL Project ID:
Date Analyzed: 9/26/2010

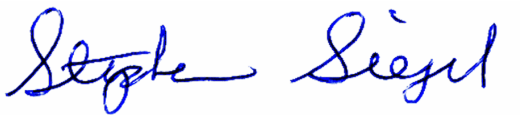
Test Report: Silica, Crystalline Analysis of Air Samples Performed by X-Ray Diffraction Via NIOSH Method 7500 (Modified), Issue 4, 3/15/2003

Sample ID	Collected Date	Location	Volume (L)	Respirable Dust (mg)	Respirable Dust (mg/m³)	Silica	Analytical Sensitivty (mg/m³)	Weight (mg)	Conc. (mg/m³)	% Silica
GEO-TDS-1	9/14/10	FIELD BLANK	N/A	<0.050	N/A	α-Quartz	N/A	<0.005	N/A	N/A
041021481-0001						Cristobalite	N/A	<0.020	N/A	N/A
						Tridymite	N/A	<0.020	N/A	N/A
Comment: Field Blank										
GEO-TDS-2	9/14/10	JASON BENNETT	1012.6	0.240	0.237	α-Quartz	0.005	0.023	0.023	9.6
041021481-0002						Cristobalite	0.020	<0.020	<0.020	N/A
						Tridymite	0.020	<0.020	<0.020	N/A
GEO-TDS-3	9/15/10	JASON BENNETT	583	<0.050	<0.086	α-Quartz	0.009	<0.005	<0.009	N/A
041021481-0003						Cristobalite	0.034	<0.020	<0.034	N/A
						Tridymite	0.034	<0.020	<0.034	N/A

Field Blank submitted with sample set. Results are not blank corrected.

Initial report from: 09/27/2010 12:38:59

Analyst(s)
Frank Craig



Samples analyzed by EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson NJ
AIHA-LAP, LLC--IHLAP Lab 100194

Stephen Siegel, CIH, Laboratory Manager
or other Approved Signatory

The laboratory can only verify the concentration of silica on the filter and not the final concentration due to data obtained by non-laboratory personnel. This report only relate to the samples submitted. The laboratory can only verify the concentration of silica on the filter and not the final concentration due to data obtained by non-Laboratory Personnel. "<" means less than the stated value. The lowest reportable value is equivalent to the Analytical Sensitivity that is calculated from the lowest reproducible amount of specific mineral detectable by the instrument. Samples received in good condition unless otherwise noted.

A bulk dust sample sample was submitted for this project.

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Phone: (856) 858-4800 Fax: (856) 786-5974 Web: http://www.emsl.com Email:westmontasblab@EMSL.com

Attn: Michelle Gillie
GeoTrans, Inc.
234 Mall Boulevard
Suite 260
King of Prussia, PA 19406
Phone: 610-337-7660
Fax: 610-337-7659

Proj: 117-2204189.01

Customer ID: GEOT21
Customer PO: 86060037
Date Received: 9/16/2010 8:36:00PM
EMSL Order ID: 041021481
EMSL Project ID:
Date Analyzed: 9/26/2010

Test Report: Silica, Crystalline Analysis of Air Samples Performed by X-Ray Diffraction Via NIOSH Method 7500 (Modified), Issue 4, 3/15/2003

QC Batch ID: 04Q100927-006

	Collected Date	Location	Volume (L)	Respirable Dust (mg)	Respirable Dust (mg/m³)	Silica	Analytical Sensitivty (mg/m³)	Weight (mg)	Conc. (mg/m³)	% Silica
Method Blank				N/A	N/A	α-Quartz	N/A	N/A	N/A	N/A
						Cristobalite	N/A	N/A	N/A	N/A
						Tridymite	N/A	N/A	N/A	N/A

Reference Standards	Analytical Sensitivity (mg/m³)	Weight (mg)	Conc. (mg/m³)	% Silica
α-Quartz (0.250 mg)	N/A		N/A	N/A
α-Quartz (0.005 mg)	N/A		N/A	N/A
Cristobalite (0.020 mg)	N/A		N/A	N/A

Initial report from: 09/27/2010 12:38:59

Analyst(s)
Frank Craig

Samples analyzed by EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson NJ
AIHA-LAP, LLC--IHLAP Lab 100194

Stephen Siegel, CIH, Laboratory Manager
or other Approved Signatory

The laboratory can only verify the concentration of silica on the filter and not the final concentration due to data obtained by non-laboratory personnel. This report only relate to the samples submitted. The laboratory can only verify the concentration of silica on the filter and not the final concentration due to data obtained by non-Laboratory Personnel. "<" means less than the stated value. The lowest reportable value is equivalent to the Analytical Sensitivity that is calculated from the lowest reproducible amount of specific mineral detectable by the instrument. Samples received in good condition unless otherwise noted.

A bulk dust sample sample was submitted for this project.

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Industrial Hygiene Chain of Custody

EMSL Order Number *(Lab Use Only):* 041021481

Corporate -
Westmont/Cinnaminson, NJ
200 Route 130 North
Cinnaminson, NJ 08077
PHONE: 1-800-220-3675
FAX: (856) 786-5974

Report To Contact Name: Michelle Gillie	**Bill To Company:** GeoTrans, Inc.	**Sampled By (Signature):** Michelle Gillie
Company Name: GeoTrans, Inc.	**Attention To:** Michelle Gillie	**Number of Samples in Shipment:** 3 + 1 = 4
Address 1: 234 Mall Blvd, Suite 260	**Address 1:** 234 Mall Blvd, Suite 260	**Date of Shipment:** 9/16/10
Address 2: King of Prussia, PA 19406	**Address 2:** King of Prussia, PA 19406	**U.S. State where Samples Collected:** NY
Phone : 610-337-7660 **Fax :** 610-337-7659	**Phone :** 610-337-7660 **Fax :** 610-337-7659	**Purchase Order:** 86060037
Email Results To: mgillie@geotransinc.com	**Project Name:** 117-2204189.01	

Turnaround Time – Please Check: Please Note Standard TAT is 2 Week.							Media Type: PVC 37mm 5µm
2 Week	1 Week	4 Day	3 Day	2 Day	1 Day	Other (Call Lab)	Manufacturer/Part #: Zefon
☒	☐	☐	☐	☐	☐	☐	Lot #:

Sample ID	Media	Analyte / Method	Volume	Sample Date/Time	Location	Comments
GEO-TDCS-1	PVC 37mm 5µm	Respirable dust – NIOSH 0600 + Crystalline silica – all species NIOSH 7500	—	9/14/10	Field Blank	send # 185735
GEO-TDCS-2	"	"	1012.6L	9/14/10	Jason Bennett	Scaling; # 185745
GEO-TDCS-8	"	"	583.0L	9/15/10	Jason Bennett	Scaling; # 185743
GEO-TDCS-15	Bulk dust	Crystalline silica – all species XRD	—	9/15/10	—	

Note: Most NIOSH and OSHA methods require field blanks. It is the IH field sampler's responsibility to submit the proper number of field blanks and duplicates.

Released By	Date	Received By	Date
Michelle Gillie	9/16/10		RECEIVED SEP 16 2010

Comments/Special Instructions:

RECEIVED
CINNAMINSON, N.J.
10 SEP 16 PM 8:36

09-16-2010 12:29

Controlled Document – Industrial Hygiene COC – IH-1.0 – 11/23/2009

041021481

From:	Gillie, Michelle
To:	Baltz, Fletcher; Dodge, Kevin; O"Brien, Chip; Leerkes, Jessica; Lougen, Jenn; Tallon, Chris; Colling, Gerard; Sullivan, James; LaPoint, Sam
Cc:	Bridge, Jay; Lapoint, Edward (GE, Corporate)
Subject:	Personal Vinyl Chloride Results
Date:	Thursday, September 30, 2010 3:28:27 PM
Attachments:	281001443 Geotrans(VC only).pdf

All-

Good news! See attached lab report and chain-of-custody. All personal samples from 9/14 and 9/15 were non detect for vinyl chloride. This confirms the real-time Draeger Chip Measuring System results I obtained in all tunnels.

Fletcher- please forward to Alpine.

Thanks, Michelle

SAFETY IS A WAY OF LIFE!

Michelle F. Gillie, M.S., CIH, CPEA | Corporate Health & Safety Director
Main: 610.337.7660 x 105 | Fax: 610.337.7659 | Mobile: 610.348.7197

michelle.gillie@tetratech.com | mgillie@geotransinc.com

GeoTrans, Inc., a Tetra Tech Company
234 Mall Blvd. Suite 260| King of Prussia, PA 19406 | www.tetratech.com

EMSL Analytical, Inc. 200 Route 130 North, Cinnaminson, NJ 08077

Order ID: 281001443

Attn:	Michelle Gillie GeoTrans, Inc. 234 Mall Boulvard Suite 260 King of Prussia, PA 19406	Customer ID: Customer PO: Date Received:	GEOT21 863060037 09/16/10 8:40 PM
Fax:	610-337-7659	EMSL Order:	281001443
Project:	117-2204189.01	EMSL Project ID:	
Report Date:	09/29/10	Date Analyzed:	09/27/10

Test Report – Vinyl chloride Analysis by GC/FID of Solid Sorbent Tubes via Mod. NIOSH 1007, Issue 2, 8/15/94

Sample ID	Location	Sampling Volume (liters)	Sample Weight (mg)	Sample Conc. (mg/m^3)	Sample Conc. (PPM)	Reporting Limit (mg/m^3)
GEO-TDCS-5 281001443-0005	Myron Bennett	40.9	<0.010	<0.24	<0.096	0.24
GEO-TDCS-6 281001443-0006	Kevin Dodge	12.5	<0.010	<0.80	<0.31	0.80
GEO-TDCS-11 281001443-0007	Myron Bennett	26.3	<0.010	<0.38	<0.15	0.38
GEO-TDCS-13 281001443-0008	Field Blank	0.0	<0.010	N/A	N/A	N/A
Desorption Blank		0.00	<0.010	N/A	N/A	N/A

Notes:

1. Samples were received in acceptable condition unless otherwise noted.
2. These results relate only to the samples tested.
3. Sample results are blank corrected.
4. Discernable field blank(s) not submitted with samples.

Alexis Willey
Analyst

Scott VanEtten, CIH- Lab Manager
Or other approved signatory

281001443

Industrial Hygiene Chain of Custody

EMSL Order Number *(Lab Use Only):*

EMSL ANALYTICAL, INC.
Corporate -
Westmont/Cinnaminson, NJ
200 Route 130 North
Cinnaminson, NJ 08077
PHONE: 1-800-220-3675
FAX: (856) 786-5974

Report To Contact Name: Michelle Gillie	**Bill To Company:** GeoTrans, Inc.	**Sampled By (Signature):** Michelle Gillie
Company Name: GeoTrans, Inc.	**Attention To:** Michelle Gillie	**Number of Samples in Shipment:** 4
Address 1: 234 Mall Blvd, Suite 260	**Address 1:** 234 Mall Blvd, Suite 260	**Date of Shipment:** 9-16-10
Address 2: King of Prussia, PA 19406	**Address 2:** King of Prussia, PA 19406	**U.S. State where Samples Collected:** NY
Phone : 610-337-7660 **Fax :** 610-337-7659	**Phone :** 610-337-7660 **Fax :** 610-337-7659	**Purchase Order:** 86060037
Email Results To: mgillie@geotransinc.com	**Project Name:** 117-2204189.01	

Turnaround Time – Please Check: Please Note Standard TAT is 2 Week.

2 Week	1 Week	4 Day	3 Day	2 Day	1 Day	Other (Call Lab)
☒	☐	☐	☐	☐	☐	☐

Media Type: Charcoal tube
Manufacturer/Part #: SKC 226-01
Lot #:

Sample ID	Media	Analyte / Method	Volume	Sample Date/Time	Location	Comments
CEO-(TDCS-5A	charcoal x2	Vinyl chloride/	40.9 L	9/14/10	Myron Bennett	Front tube
-5B	↓	NIOSH 1007 and	"		"	Back tube
(-6A		Methylene chloride	12.5 L	9/14/10	Kevin Dodge	Front tube
(-6B		NIOSH 1005	"		"	Back tube
(-11A			26.3 L	9/15/10	Myron Bennett	Front tube
(-11B			"		"	Back tube
(-13A			—	9/15/10	Field Blank	Front tube
(-13B	↓		—		"	Back tube

Note: Most NIOSH and OSHA methods require field blanks. It is the IH field sampler's responsibility to submit the proper number of field blanks and duplicates.

Released By	Date	Received By	Date
Michelle Gillie	9/16/10		RECEIVED
			SEP 16 2010

Comments/Special Instructions:

09-15-2010 12:21

From:	Gillie, Michelle
To:	Baltz, Fletcher; Dodge, Kevin; O"Brien, Chip; Lougen, Jenn; Leerkes, Jessica; LaPoint, Sam; Tallon, Chris; Colling, Gerard; Sullivan, James
Cc:	Bridge, Jay
Subject:	Personal VOC Sampling Results
Date:	Monday, October 04, 2010 12:34:32 PM
Attachments:	281001443 GeoTrans.pdf

All-

More good news! Please see attached the personal sampling results for the target VOCs during the scaling task conducted on 9/14 and 9/15. All target VOCs are ND – this includes benzene, TCE, TCB, and the other chlorinated hydrocarbons.

Methylene chloride was requested but there was insufficient material to analyze for MC (different method than the other VOCs).

Let me know if you have any questions.

Thanks,

Michelle Gillie

SAFETY IS A WAY OF LIFE!

Michelle F. Gillie, M.S., CIH, CPEA | Corporate Health & Safety Director
Main: 610.337.7660 x 105 | Fax: 610.337.7659 | Mobile: 610.348.7197

michelle.gillie@tetratech.com | mgillie@geotransinc.com

GeoTrans, Inc., a Tetra Tech Company
234 Mall Blvd. Suite 260| King of Prussia, PA 19406 | www.tetratech.com

EMSL Analytical, Inc. 200 Route 130 North, Cinnaminson, NJ 08077

Order ID: 281001443

Attn:	Michelle Gillie GeoTrans, Inc. 234 Mall Boulvard, Suite 260 King of Prussia, PA 19406	Customer ID: Customer PO: Date Received:	GEOT21 863060037 09/16/10 8:40 PM
Fax:	610-337-7659	EMSL Order:	281001443
Project:	117-2204189.01	EMSL Project ID:	
Report Date:	10/04/10	Date Analyzed:	09/29-10/01/10

Test Report – Volatile Organic Compounds Analysis by GC/FID of Solid Sorbent Tubes via Various NIOSH Methods

Sample ID	Identification	Component	Volume (L)	Report Limit (ug)	Report Limit (ppm)	Sample Amount (ug)	Sample Amount (ppm)
GEO-TDCS-3 281001443-0001	Myron Bennett	1,1-Dichloroethane	86.3	12	0.034	ND	ND
GEO-TDCS-3	Myron Bennett	1,2-Dichloroethane	86.3	12	0.034	ND	ND
GEO-TDCS-3	Myron Bennett	cis 1,2 Dichloroethylene	86.3	13	0.038	ND	ND
GEO-TDCS-3	Myron Bennett	trans 1,2 Dichloroethylene	86.3	13	0.038	ND	ND
GEO-TDCS-3	Myron Bennett	1,1,1 Trichloroethane	86.3	13	0.028	ND	ND
GEO-TDCS-3	Myron Bennett	1,1,2 Trichloroethane	86.3	14	0.030	ND	ND
GEO-TDCS-3	Myron Bennett	Trichloroethylene	86.3	15	0.032	ND	ND
GEO-TDCS-3	Myron Bennett	Benzene	86.3	8.7	0.032	ND	ND
GEO-TDCS-3	Myron Bennett	n-Hexane	86.3	6.6	0.022	ND	ND
GEO-TDCS-3	Myron Bennett	1,2,4 Trichlorobenzene	86.3	15	0.023	ND	ND
GEO-TDCS-4 281001443-0002	Kevin Dodge	1,1-Dichloroethane	26.2	12	0.11	ND	ND
GEO-TDCS-4	Kevin Dodge	1,2-Dichloroethane	26.2	12	0.11	ND	ND
GEO-TDCS-4	Kevin Dodge	cis 1,2 Dichloroethylene	26.2	13	0.13	ND	ND
GEO-TDCS-4	Kevin Dodge	trans 1,2 Dichloroethylene	26.2	13	0.13	ND	ND
GEO-TDCS-4	Kevin Dodge	1,1,1 Trichloroethane	26.2	13	0.091	ND	ND
GEO-TDCS-4	Kevin Dodge	1,1,2 Trichloroethane	26.2	14	0.098	ND	ND
GEO-TDCS-4	Kevin Dodge	Trichloroethylene	26.2	15	0.11	ND	ND
GEO-TDCS-4	Kevin Dodge	Benzene	26.2	8.7	0.10	ND	ND
GEO-TDCS-4	Kevin Dodge	n-Hexane	26.2	6.6	0.071	ND	ND
GEO-TDCS-4	Kevin Dodge	1,2,4 Trichlorobenzene	26.2	15	0.077	ND	ND

Notes:
1. Samples were received in acceptable condition unless otherwise noted.
2. These results relate only to the samples tested.
3. Sample results are not blank corrected unless otherwise noted.
4. Discernable field blank(s) submitted with samples.

Alexis Willey
Analyst

Scott VanEtten, CIH- Lab Manager
Or other approved signatory

EMSL Analytical, Inc. 200 Route 130 North, Cinnaminson, NJ 08077

Order ID: 281001443

Attn:	Michelle Gillie GeoTrans, Inc. 234 Mall Boulvard, Suite 260 King of Prussia, PA 19406	Customer ID: Customer PO: Date Received:	GEOT21 863060037 09/16/10 8:40 PM
Fax:	610-337-7659	EMSL Order:	281001443
Project:	117-2204189.01	EMSL Project ID:	
Report Date:	10/04/10	Date Analyzed:	09/29-10/01/10

Test Report – Volatile Organic Compounds Analysis by GC/FID of Solid Sorbent Tubes via Various NIOSH Methods

Sample ID	Identification	Component	Volume (L)	Report Limit (ug)	Report Limit (ppm)	Sample Amount (ug)	Sample Amount (ppm)
GEO-TDCS-10 281001443-0003	Myron Bennett	1,1-Dichloroethane	52.6	12	0.056	ND	ND
GEO-TDCS-10	Myron Bennett	1,2-Dichloroethane	52.6	12	0.056	ND	ND
GEO-TDCS-10	Myron Bennett	cis 1,2 Dichloroethylene	52.6	13	0.062	ND	ND
GEO-TDCS-10	Myron Bennett	trans 1,2 Dichloroethylene	52.6	13	0.062	ND	ND
GEO-TDCS-10	Myron Bennett	1,1,1 Trichloroethane	52.6	13	0.045	ND	ND
GEO-TDCS-10	Myron Bennett	1,1,2 Trichloroethane	52.6	14	0.049	ND	ND
GEO-TDCS-10	Myron Bennett	Trichloroethylene	52.6	15	0.053	ND	ND
GEO-TDCS-10	Myron Bennett	Benzene	52.6	8.7	0.052	ND	ND
GEO-TDCS-10	Myron Bennett	n-Hexane	52.6	6.6	0.036	ND	ND
GEO-TDCS-10	Myron Bennett	1,2,4 Trichlorobenzene	52.6	15	0.038	ND	ND
GEO-TDCS-14 281001443-0004	Blank	1,1-Dichloroethane	0.0	12	N/A	ND	N/A
GEO-TDCS-14	Blank	1,2-Dichloroethane	0.0	12	N/A	ND	N/A
GEO-TDCS-14	Blank	cis 1,2 Dichloroethylene	0.0	13	N/A	ND	N/A
GEO-TDCS-14	Blank	trans 1,2 Dichloroethylene	0.0	13	N/A	ND	N/A
GEO-TDCS-14	Blank	1,1,1 Trichloroethane	0.0	13	N/A	ND	N/A
GEO-TDCS-14	Blank	1,1,2 Trichloroethane	0.0	14	N/A	ND	N/A
GEO-TDCS-14	Blank	Trichloroethylene	0.0	15	N/A	ND	N/A
GEO-TDCS-14	Blank	Benzene	0.0	8.7	N/A	ND	N/A
GEO-TDCS-14	Blank	n-Hexane	0.0	6.6	N/A	ND	N/A
GEO-TDCS-14	Blank	1,2,4 Trichlorobenzene	0.0	15	N/A	ND	N/A

Notes:
1. Samples were received in acceptable condition unless otherwise noted.
2. These results relate only to the samples tested.
3. Sample results are not blank corrected unless otherwise noted.
4. Discernable field blank(s) submitted with samples.

Alexis Willey
Analyst

Scott VanEtten, CIH- Lab Manager
Or other approved signatory

EMSL Analytical, Inc. 200 Route 130 North, Cinnaminson, NJ 08077

Order ID: 281001443

Attn:	Michelle Gillie GeoTrans, Inc. 234 Mall Boulvard, Suite 260 King of Prussia, PA 19406	Customer ID: Customer PO: Date Received:	GEOT21 863060037 09/16/10 8:40 PM
Fax:	610-337-7659	EMSL Order:	281001443
Project:	117-2204189.01	EMSL Project ID:	
Report Date:	10/04/10	Date Analyzed:	09/29-10/01/10

Test Report – Volatile Organic Compounds Analysis by GC/FID of Solid Sorbent Tubes via Various NIOSH Methods

Sample ID	Identification	Component	Volume (L)	Report Limit (ug)	Report Limit (ppm)	Sample Amount (ug)	Sample Amount (ppm)
Desportion Blank		1,1-Dichloroethane	0.0	12	N/A	ND	N/A
		1,2-Dichloroethane	0.0	12	N/A	ND	N/A
		cis 1,2 Dichloroethylene	0.0	13	N/A	ND	N/A
		trans 1,2 Dichloroethylene	0.0	13	N/A	ND	N/A
		1,1,1 Trichloroethane	0.0	13	N/A	ND	N/A
		1,1,2 Trichloroethane	0.0	14	N/A	ND	N/A
		Trichloroethylene	0.0	15	N/A	ND	N/A
		Benzene	0.0	8.7	N/A	ND	N/A
		n-Hexane	0.0	6.6	N/A	ND	N/A
		1,2,4 Trichlorobenzene	0.0	15	N/A	ND	N/A

Notes:
1. Samples were received in acceptable condition unless otherwise noted.
2. These results relate only to the samples tested.
3. Sample results are not blank corrected unless otherwise noted.
4. Discernable field blank(s) submitted with samples.

Alexis Willey
Analyst

Scott VanEtten, CIH- Lab Manager
Or other approved signatory

EMSL Analytical, Inc. 200 Route 130 North, Cinnaminson, NJ 08077

Order ID: 281001443

Attn:	Michelle Gillie GeoTrans, Inc. 234 Mall Boulvard Suite 260 King of Prussia, PA 19406	Customer ID: Customer PO: Date Received:	GEOT21 863060037 09/16/10 8:40 PM
Fax:	610-337-7659	EMSL Order:	281001443
Project:	117-2204189.01	EMSL Project ID:	
Report Date:	09/29/10	Date Analyzed:	09/27/10

Test Report – Vinyl chloride Analysis by GC/FID of Solid Sorbent Tubes via Mod. NIOSH 1007, Issue 2, 8/15/94

Sample ID	Location	Sampling Volume (liters)	Sample Weight (mg)	Sample Conc. (mg/m^3)	Sample Conc. (PPM)	Reporting Limit (mg/m^3)
GEO-TDCS-5 281001443-0005	Myron Bennett	40.9	<0.010	<0.24	<0.096	0.24
GEO-TDCS-6 281001443-0006	Kevin Dodge	12.5	<0.010	<0.80	<0.31	0.80
GEO-TDCS-11 281001443-0007	Myron Bennett	26.3	<0.010	<0.38	<0.15	0.38
GEO-TDCS-13 281001443-0008	Field Blank	0.0	<0.010	N/A	N/A	N/A
Desorption Blank		0.00	<0.010	N/A	N/A	N/A

Notes:

1. Samples were received in acceptable condition unless otherwise noted.
2. These results relate only to the samples tested.
3. Sample results are blank corrected.
4. Discernable field blank(s) not submitted with samples.

Alexis Willey
Analyst

Scott VanEtten, CIH- Lab Manager
Or other approved signatory

281001443

Industrial Hygiene Chain of Custody

EMSL Order Number *(Lab Use Only):*

EMSL ANALYTICAL, INC.
Corporate -
Westmont/Cinnaminson, NJ
200 Route 130 North
Cinnaminson, NJ 08077
PHONE: 1-800-220-3675
FAX: (856) 786-5974

Report To Contact Name: Michelle Gillie	**Bill To Company:** GeoTrans, Inc.	**Sampled By (Signature):** Michelle Gillie
Company Name: GeoTrans, Inc.	**Attention To:** Michelle Gillie	**Number of Samples in Shipment:** 4
Address 1: 234 Mall Blvd, Suite 260	**Address 1:** 234 Mall Blvd, Suite 260	**Date of Shipment:** 9-16-10
Address 2: King of Prussia, PA 19406	**Address 2:** King of Prussia, PA 19406	**U.S. State where Samples Collected:** NY
Phone : 610-337-7660 **Fax :** 610-337-7659	**Phone :** 610-337-7660 **Fax :** 610-337-7659	**Purchase Order:** 86060037
Email Results To: mgillie@geotransinc.com	**Project Name:** 117-2204189.01	

Turnaround Time – Please Check: Please Note Standard TAT is 2 Week.							Media Type: Charcoal tube
2 Week	1 Week	4 Day	3 Day	2 Day	1 Day	Other (Call Lab)	Manufacturer/Part #: SKC 226-01
☒	☐	☐	☐	☐	☐	☐	Lot #:

Sample ID	Media	Analyte / Method	Volume	Sample Date/Time	Location	Comments
CEO-(TDCS-5A	charcoalx2	Vinyl chloride/	40.9 L	9/14/10	Myron Bennett	Front tube
-5B	|	NIOSH 1007 and	"		"	Back tube
(-6A	|	Methylene chloride	12.5 L	9/14/10	Kevin Dodge	Front tube
(-6B	|	NIOSH 1005	"		"	Back tube
(-11A	|		26.3 L	9/15/10	Myron Bennett	Front tube
(-11B	|		"		"	Back tube
(-13A	|		—	9/15/10	Field Blank	Front tube
(-13B	↓		—		"	Back tube

Note: Most NIOSH and OSHA methods require field blanks. It is the IH field sampler's responsibility to submit the proper number of field blanks and duplicates.

Released By	Date	Received By	Date
Michelle Gillie	9/16/10		RECEIVED
			SEP 16 2010

Comments/Special Instructions:

09-15-2010 12:20

281001443

EMSL ANALYTICAL, INC.

Industrial Hygiene Chain of Custody

EMSL Order Number *(Lab Use Only):*

Corporate
Westmont/Cinnaminson, NJ
200 Route 130 North
Cinnaminson, NJ 08077
PHONE: 1-800-220-3675
FAX: (856) 786-5974

Report To Contact Name: Michelle Gillie	**Bill To Company:** GeoTrans, Inc.	**Sampled By (Signature):** Michelle Gillie
Company Name: GeoTrans, Inc.	**Attention To:** Michelle Gillie	**Number of Samples in Shipment:** 4
Address 1: 234 Mall Blvd, Suite 260	**Address 1:** 234 Mall Blvd, Suite 260	**Date of Shipment:** 9-16-10
Address 2: King of Prussia, PA 19406	**Address 2:** King of Prussia, PA 19406	**U.S. State where Samples Collected:** NY
Phone : 610-337-7660 **Fax :** 610-337-7659	**Phone :** 610-337-7660 **Fax :** 610-337-7659	**Purchase Order:** 86060037
Email Results To: mgillie@geotransinc.com	**Project Name:** 117-2204189.01	

Turnaround Time – Please Check: Please Note Standard TAT is 2 Week.

2 Week	1 Week	4 Day	3 Day	2 Day	1 Day	Other (Call Lab)
☒	☐	☐	☐	☐	☐	☐

Media Type: charcoal
Manufacturer/Part #: SKC 226-01
Lot #:

	Sample ID	Media	Analyte / Method	Volume	Sample Date/Time	Location	Comments
AED	TDCS-3	charcoal	NIOSH 1003, 1500	86.8L	9/14/10	Myron Bennett	Scaling
AED	TDCS-4	↓	1501 OSHA CSI	26.2L	9/14/10	Kevin Dodge	Pump repair
AED	TDCS-10	↓	- see list below	52.6L	9/15/10	Myron Bennett	Scaling
AED	TDCS-14	↓	+ attached table	—	—	—	—
			from Vince Dolessio				

Note: Most NIOSH and OSHA methods require field blanks. It is the IH field sampler's responsibility to submit the proper number of field blanks and duplicates.

Released By	Date	Received By	Date
Michelle Gillie	9-16-10		SEP 16 2010
			RECEIVED

Comments/Special Instructions:

Requested Analytes:

NIOSH 1003 - cis-1,2-DCE, trans,1,2-DCE; 1,1-DCA; 1,2-DCA; 1,1,1-TCA; 1,1,2-TCA; TCE,

NIOSH 1500 - n-hexane; NIOSH 1501 - benzene OSHA CSI - 1,2,4-TCB

9-16-10 12:12

28100143

SCHEDULE A – PUMP EQUIPMENT AND ACCESSORIES

PLEASE REVIEW PUMP LOANER TERMS AND CONDITIONS BEFORE USE

EMSL Analytical, Inc., Pump Loans and Rentals, 200 Route 130 N, Cinnaminson, NJ 08077

Phone 800-220-3675 Fax 856-786-0327

(Check pump flowrate in the field for differences due to temperature and humidity)

Company: Geo Trans, Inc. Order Date: 9/9/10

Customer #: GEOT21 Sent: 9/10/10

Contact: Michelle Gille Expected Return Date: 9/15/10

Phone #: Actual Return Date:

Order #: 8160160037 Order Complete:

PUMPS:

Item #	EMSL #	Method	Analyte(s)	Media	Calibrated Flow Rate (LPM)	Recommended Volume (L)	Date Sent	Date Returned
1	1571	NIOSH 5503	PCB's	Florisil Tube	0.2	1-50	9/10/10	
2	139	↓	↓	↓	↓	↓		
3	1555	NIOSH 7500	Silica	PW, PVC, 37MM, 5UM	2.5	400-1000		
4	1516	↓	↓	↓	↓	↓		
5	1642	NIOSH 1003	cis-1,2-dichloroethylene	Charcoal Sorb. Tube	0.2	3		
6	1521	↓	trans-1,2-dichloroethylene	↓	0.2	3		
7	1504	↓	1,2-dichloroethane	↓	0.2	10		
8	1569	OSHA CSI	1,2,4-trichlorobenzene	Charcoal Sorb. Tube	0.2	3	↓	
9								
10								

RECEIVED 10 SEP 16 PM 8:36

ACCESSORIES:

Low Flow	Cassette Holder	Tube Protectors	Tubing	Cyclone	Cyclone Adaptors	PM-10 impactor	Instructions	Batteries	Charger	#
6	2		8	2	1		1		8	Sent
										Returned

ROTAMETERS:

Item #	Rotameter No.	Date Calibrated	Calibration Due	Rotameter Reading (LPM)	Primary Standard (LPM)		Sent	Returned
1	202L	8/24/10	2/24/11	0.2	0.2		9/10/10	
2	225H	4/29/10	10/29/10	2.5	2.4		↓	

TUBE CRACKER SENT ☑ RETURNED ☐

SCREWDRIVER SENT ☑ RETURNED ☐

PUMP CASE # 1662 SENT ☑ RETURNED ☐

1663 SENT ☑ RETURNED ☐

ITC (C)

Compound	Method	Media	flow lpm	vol L	Price	Badge?
cis-1,2-dichloroethylene	NIOSH 1003	CSC	0.01-0.2	3	46	n
trans 1,2-	NIOSH 1003	CSC	0.01-0.2	3	31*	n
1,1-dichloroethane	NIOSH 1003	CSC	0.01-0.2	10	31*	y
1,2-dichloroethane	NIOSH 1003	CSC	0.01-0.2	10	31*	n
1,1,1-trichloroethane	NIOSH 1003	CSC	0.01-0.2	3	31*	y
1,1,2-trichloroethane	NIOSH 1003	CSC	0.01-0.2	10	31*	y
trichloroethylene	NIOSH 1003	CSC	0.01-0.2	3	31*	y
tetrachloroethylene	NIOSH 1003	CSC	0.01-0.2	3	31*	y
1,2,4-trichlorobenzene	OSHA CSI	CSC	0.01-0.2	3	31*	n
vinyl chloride	NIOSH 1007	2X CSC	0.05	0.7 - 5	83	y
methylene chloride	NIOSH 1005	2X CSC	0.01-0.2	0.2 - 2.5	83	y
benzene	NIOSH 1501	CSC	0.01-0.2	30	46	y
n-hexane	NIOSH 1500	CSC	0.01-0.2	10	46	y
*Discount only good if sampled together						

tube only

not best on badge

2100 HS

TDCS Entry Report – September 2010

Attachment 3
Lightning Hazard Procedures

Draft TDCS Lightning Safety procedures:

For this entry (September 2010) into the TDCS we will utilized the following procedures:

1. The TDCS Entry Supervisor will monitor the weather forecast every 2 hours during the TDCS Entry and continuously if there is a storm threat in the region. Will use on-line weather services that shows Doppler radar. A watch means conditions are favorable for severe weather to develop and a warning means that severe weather has been reported in an area and proper precautions are required.
2. Alpine construction will have on-site and will continuously monitor the lightning detector model LD-250 by BOLTEK. Alpine will estimate the possible approach and distance of lightning strikes and will notify TDCS Entry Supervisor when lightning is estimated to be between 60 minutes and 30 minutes away from the TDCS site.
3. TDCS Entry Supervisor will evaluate the lightning estimated time of arrival provided by Alpine along with the Doppler weather radar images and determine if and when evacuation of the TDCS should begin. At this time a **minimum time of 30 minutes** is considered an ample amount of time to get notice to evacuate to the TDCS Entrants, give entrants time to make their way to the TDCS Shaft, time for the crane to lift all entrants out of the shaft and retract/laydown crane booms and; time for all entrants and topside workers to reach a designated safe area.
4. The designated safe shelters are the Alpine trailer, personal vehicles (not convertible/soft-tops), GE Building 12 or other hard topped shelters.
5. Workers are to remain in designated safe shelter until notified by TDCS Entry Supervisor.
6. TDCS Entry Supervisor shall evaluate the lightning strike information from Alpine and the Doppler radar and determine when lightning is at least 30 minutes away (may also wait until 30 minutes after the last heard lightning strike)

NOTE: the above minimum time of 30 minutes is based on an estimated time frame to accomplish an orderly evacuation from the TDCS to a designated safe shelter.

Evacuation Drill will be conducted to determine the time required to evacuate the TDCS with all TDCS Entrants and topside workers meeting in GE Building 12. The drill will begin with the personnel cage at the top and Entrants at the furthest distance from the Shaft (i.e. Tunnel 3 Workroom 3-1).

TDCS Entry Report – September 2010

Attachment 4
Summary of Evacuation Drill

9/16/10 TDCS EVACACUATION DRILL

Objective: Evacuate 6 people from the TDCS using two separate cranes

Drill timeline:

11:39 Start drill , basket leaves ground (crane 1).

11:41 Basket at bottom of shaft

11:46 First (4) people out of basket (out of TDCS)

11:48 Second crane sends down basket (leaves ground)

11:50 Last (2) men out of TDCS, drill completed

Evacuation duration 11:39-11:50

S**tarting point (location of workers within the TDCS when evacuation drill began):**

Personnel	**Location**
Kevin Dodge	Tunnel 2, work room 2 at end of tunnel.
Sam Lapoint	Tunnel 1, approx. 200 ft from shaft.
(4) Alpine employees	Near Bellout

TDCS Entry Report – September 2010

Attachment 5
Convergence Monitoring Data September 2010

GE TDCS Project **Shaft Bell-Out**

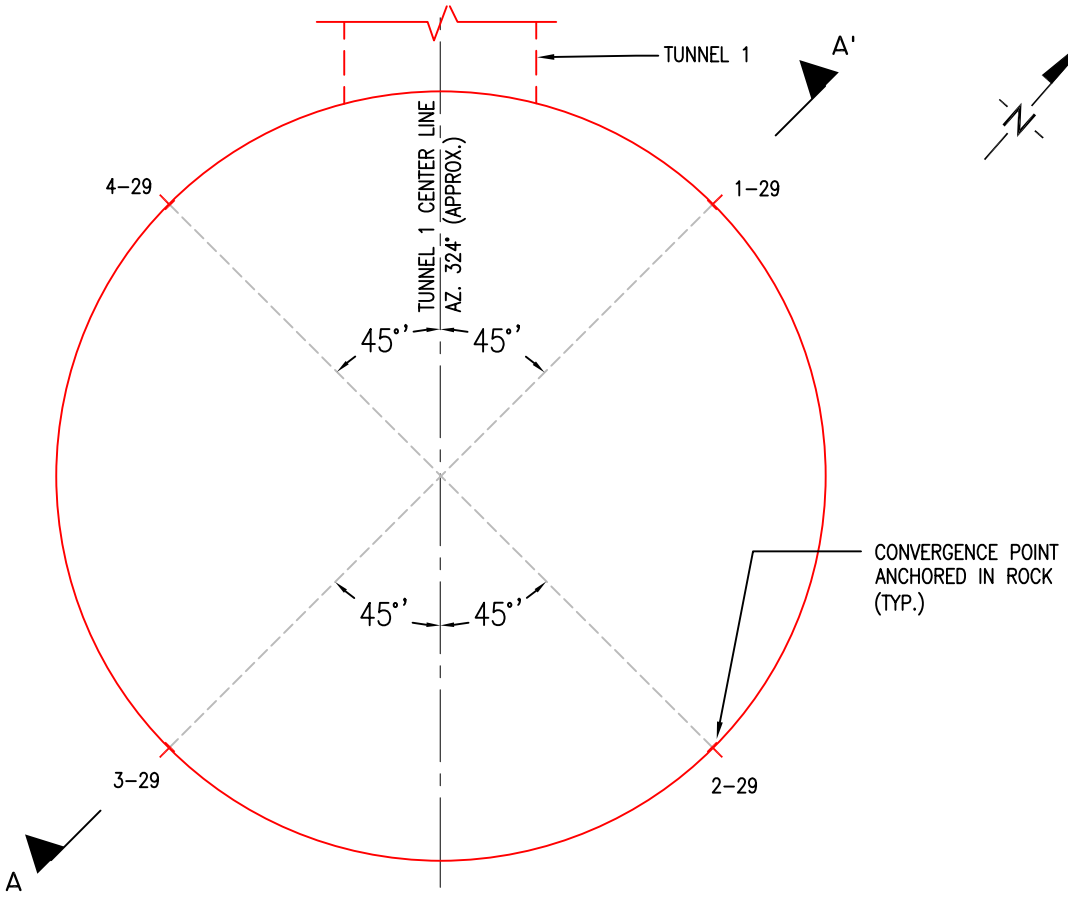
Summary of Convergence Point Monitoring **Report Date: 9/13/2010**

Convergence Points were installed in the Bell-Out of the TDCS Service Shaft by Merco/Obayashi Joint Venture on Friday 21 March 2008.
Points were installed in the walls at two elevations (El 29, El 41), and four locations approximately 90° apart (+/- 45° and +/- 135° from the tunnel centerline)
Convergence points in the bell-out are steel plates 5"x5"x1/4" with a 3/4" diameter threaded rod anchored with epoxy resin grout 8"in rock
Readings are taken with a Leica A6 laser distance meter reading from the points at El 29 diagonally across the bell-out to points at El 29 and El 41
Initial readings were taken on Friday 21 March 2008 and the mean average of the first three readings rounded to the nearest 0.01 foot is the initial mean reading.
The threshold value is 0.5 inches (0.04 ft) and the limit value is 1.0 inches (0.08 ft).
Deviation is determined by subtracting mean reading from initial mean reading, therefore positive deviation indicates convergence.

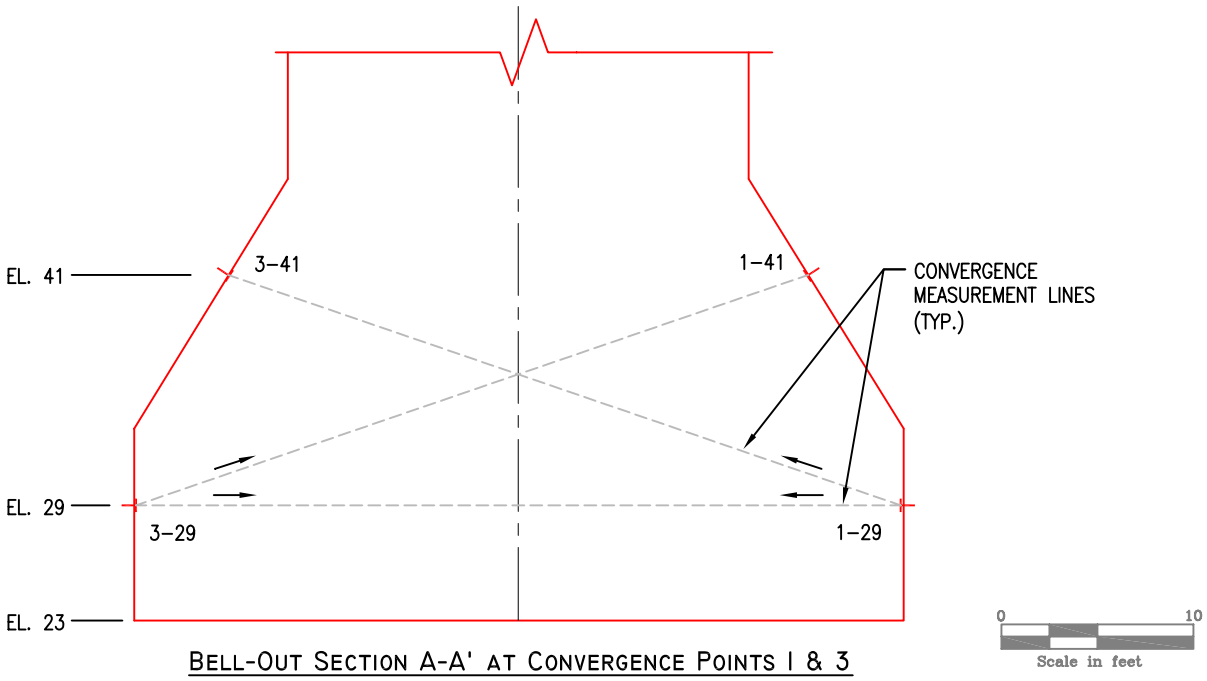
Measurement		Initial Mean Reading	Taken by: SL		Date: 5/5/09 Time: 0928 hrs			Taken by: GC		Date: 9/14/10 Time: 0840 hrs		
From	To	3/21/2008	Reading	Reading	Reading	Mean Reading	Deviation	Reading	Reading	Reading	Mean Reading	Deviation
Point ID	Point ID	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)
1-29	3-29	42.65	42.63	42.64	42.64	42.64	0.01	42.62	42.61	42.61	42.61	0.04
1-29	3-41	40.48	40.5	40.49	40.48	40.49	0	40.48	40.48	40.49	40.48	0.00
2-29	4-29	42.22	42.19	42.19	42.17	42.18	0.04	42.20	42.19	42.19	42.19	0.03
2-29	4-41	39.76	39.74	39.78	39.77	39.76	0.00	39.74	39.73	39.73	39.73	0
3-29	1-29	42.66	42.63	42.63	42.6	42.62	0.04	42.63	42.62	42.64	42.63	0.03
3-29	1-41	39.27	39.27	39.28	39.29	39.28	-0.01	39.26	39.26	39.27	39.26	0.01
4-29	2-29	42.21	42.19	42.20	42.19	42.19	0.02	42.18	42.20	42.21	42.20	0.01
4-29	2-41	40.55	40.54	40.54	40.54	40.54	0.01	40.54	40.54	40.54	40.54	0.01

4-1-08: Point 4-29 slightly loose - MO-JV notified verbally and will pack epoxy around collar. Readings not affected. - JFB 4-1-08
4-2-08: Only checked reading taken for Point 4-29 after repair -- no change noted. - JFB 4-2-08
NR=No reading, measurement line is obstructed by shed roof (installed 5-12-08) over electrical panels. - JFB 5-29-08
6-18-08: Shed roof over electrical pond was raised up on 6-17-08 and no longer is an obstruction. - JFB 6-18-08
7-1-08: Begin weekly readings.
1-5-09: Tunnel work complete, begin Monthly readings.

No deviations exceeded the Threshold Value of 0.04 ft from the first reading on 3-22-08 to the most recent reading on 9/14/10.



BELL-OUT PLAN AT ELEV. 23' - WORK SLAB



BELL-OUT SECTION A-A' AT CONVERGENCE POINTS 1 & 3

TITLE:	Bell-Out Convergence Points Tunnel Drain Collection System		
LOCATION:	Hudson Falls, New York		
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED	JFB	FIGURE:
	DRAFTED	RMK	3-1
	FILE		
	DATE	May 2008	

GE TDCS Project
Summary of Convergence Monitoring - Tunnel 1 Station 0+67

Report Date: 9/14/2010

NOTES

1. Convergence Points were installed in Tunnel 1 at Station 0+67 by GeoTrans on Tuesday 22 April 2008.
2. Four Points were installed: Two in the left and right ribs about 2 feet below the Springline and; Two in the crown about 2 feet either side of centerline.
3. Convergence points in Tunnel 1 are steel plates 5"x5"x1/4" with a 3/4" diameter threaded rod anchored with two part quick setting acrylic grout 6" to 8" into rock.
4. Readings are taken with a Leica A6 laser distance meter reading from the two points in the ribs across to points at the opposite rib and at the crown
5. Initial readings were taken on Tuesday 22 April 2008 and the mean average of the first twenty-four readings rounded to the nearest millimeter is the initial mean reading.
6. The threshold value is 0.25 inches (6 mm) and the limit value is 0.75 inches (19 mm), notify Tunnel Design Engineer if deviation exceeds threshold value.
7. Tunnel Convergence reading taken after every tunnel blast round until tunnel is 100 feet away (Station 1+67), then take readings once per week until work in tunnel is complete
8. Deviation: subtract mean reading from initial mean reading, therefore positive deviation indicates convergence.

Date & Time of Reading		Convergence Measurments 1 to 4 (mm)	1 to 2 (mm)	4 to 1 (mm)	4 to 3 (mm)	COMMENTS
4-22-08 1600 hrs	**Initial Mean**	**3467**	**2782**	**3467**	**2725**	Tunnel 1 at Sta 0+82 Pre-blast TB-12
9/14/10		3462	2781	3462	NR	
0900 hrs		3462	2781	3461	NR	Tunnel 1 at Sta 3+38
		3462	2781	3462	NR	Tunnel 2 at Sta 2+92
	Mean	**3462**	**2781**	**3462**	**NR**	Tunnel 3 at Sta 3+50
	Deviation	**5**	**1**	**5**	**NR**	Weekly Reading

Note: Tunnel heading is greater than 100 ft from convergence therefore, began weekly readings after Tunnel Blast 25.

NR = No reading, line of measurement obstructed by steel water pipe installed on 6-7-08.

1-5-09: Tunnel work complete, begin Monthly readings.

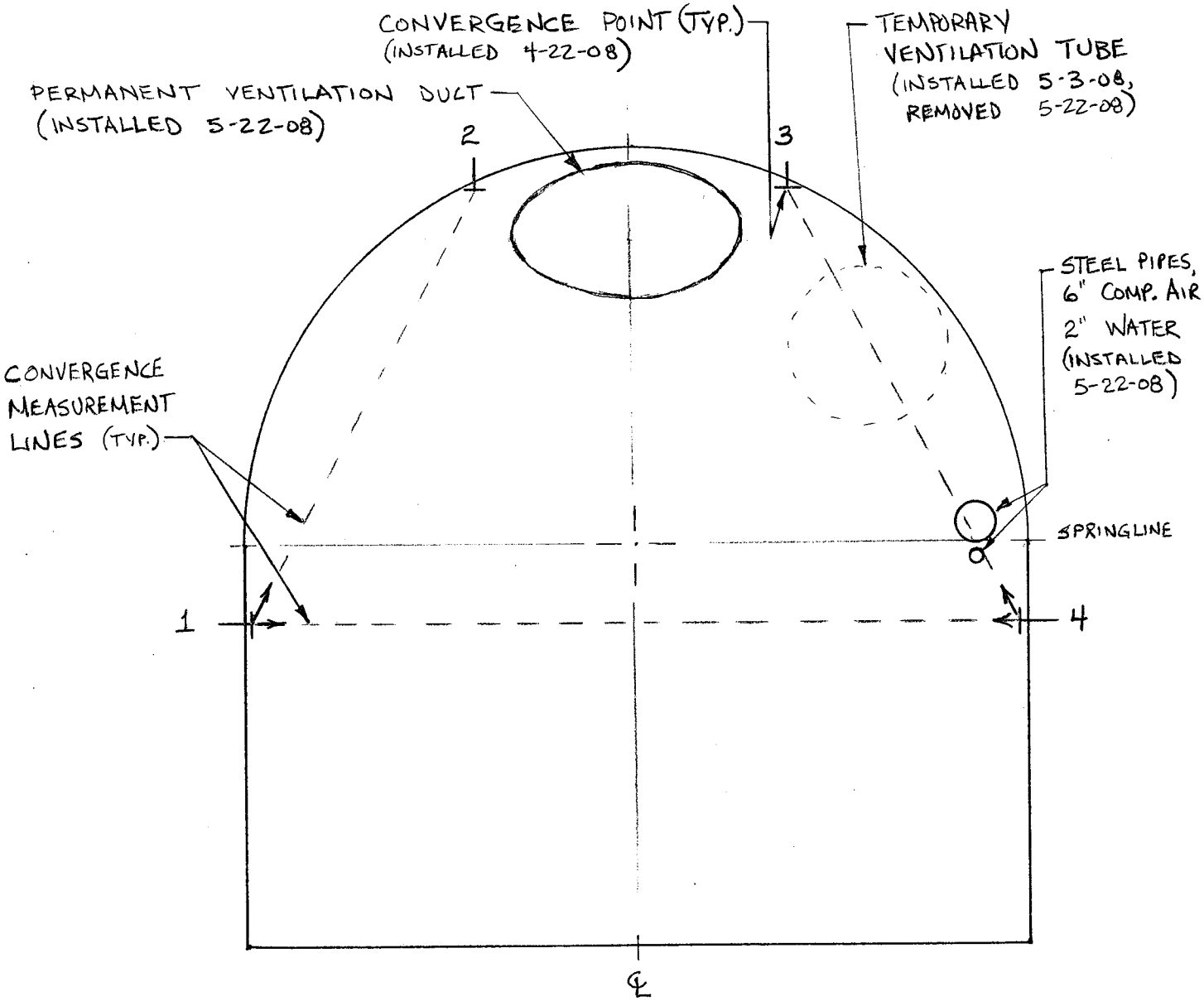
No readings exceeded the Threshold Value of 6mm from the first reading on 4-23-08 to the most recent reading on 9-14-10.

BY JFB DATE 4-25-08 PROJECT HUDSON FALLS TDCS SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ TUNNEL CONVERGENCE POINTS PROJ. NO. _____

SCALE: 1" = 2 FT

TUNNEL 1 STATION 0+67 REVISION 2 5-27-08



TUNNEL SECTION LOOKING UP STATION

HSI GEOTRANS

GE TDCS Project
Summary of Convergence Monitoring - Tunnel 1 Station 1+43

Report Date: 9/14/2010

NOTES

1. Convergence Points were installed in Tunnel 1 at Station 1+43 by GeoTrans on Saturday 10 May 2008.
2. Four Points were installed: Two in the left and right ribs at the Springline and; Two in the crown about 2.5 feet either side of centerline. Located to avoid ventilation lines to be installed later.
3. Convergence points in Tunnel 1 are steel plates 5"x5"x1/4" with a 3/4" diameter threaded rod anchored with two part quick setting acrylic grout 6" to 8" into rock.
4. Readings are taken with a Leica A6 laser distance meter reading from the two points in the ribs across to points at the opposite rib and at the crown
5. Initial readings were taken on Saturday 10 May 2008 and the mean average of the first twenty-four readings rounded to the nearest millimeter is the initial mean reading.
6. The threshold value is 0.25 inches (6 mm) and the limit value is 0.75 inches (19 mm), notify Tunnel Design Engineer if deviation exceeds threshold value.
7. Tunnel Convergence reading taken after every tunnel blast round until tunnel is 100 feet away (Station 2+43), then take readings once per week until work in tunnel is complete
8. Deviation: subtract mean reading from initial mean reading, therefore positive deviation indicates convergence.

Date & Time of Reading		From Point 1 to Point: From Point 4 to Point: 1 to 4 (mm)	1 to 3 (mm)	4 to 1 (mm)	4 to 2 (mm)	COMMENTS
5-10-08 1220 hrs	**Initial Mean**	**3510**	**3115**	**3511**	**2869**	Tunnel 1 at Sta 1+43 Pre-blast TB-25
		3506	NR	3506	NR	
		3506	NR	3505	NR	Tunnel 1 at Sta 3+38
		3507	NR	3506	NR	Tunnel 2 at Sta 2+92
	Mean	**3506**	**NR**	**3506**	**NR**	Tunnel 3 at Sta 3+50
	Deviation	**4**	**NR**	**5**	**NR**	Weekly reading

Note: Tunnel heading is greater than 100 ft from convergence point, began weekly readings after Tunnel Blast 39.

NR = No reading; line of measurement obstructed by permanent ventilation oval duct installed on 6-7-08.

1-5-09: Tunnel work complete, begin Monthly readings.

No readings exceeded the Threshold Value of 6 mm from the first reading on 5-10-08 to the most recent reading on 9-14-10.

BY JFB DATE 5-13-08

CHKD. BY _____ DATE _____

PROJECT HUDSON FALLS TDCS

TUNNEL CONVERGENCE

TUNNEL 1 STATION 1+43

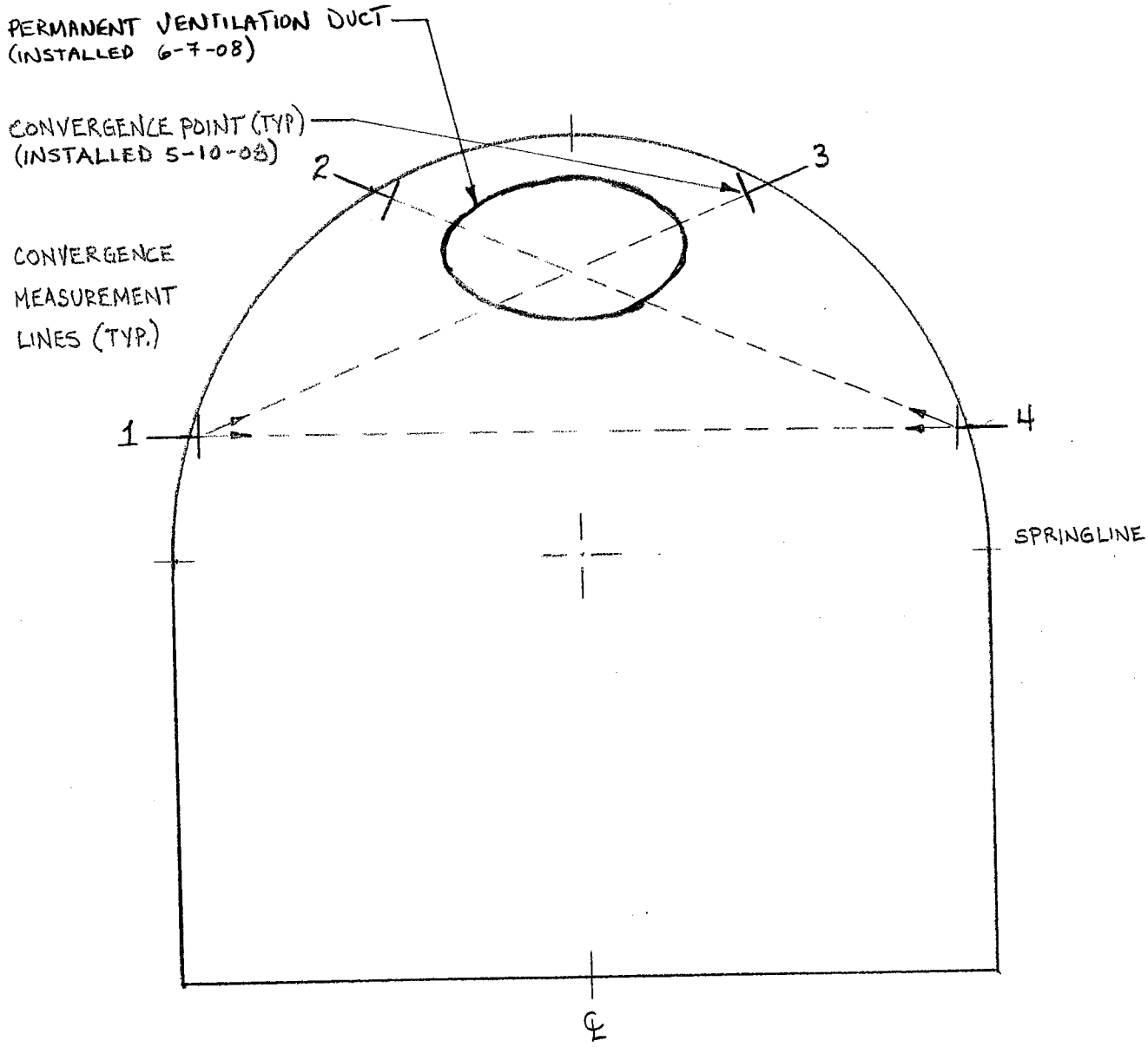
SCALE: 1 IN = 2 FT

SHEET NO. 1 OF 1

PROJ. NO. _____

REVISION 1, 5-19-08

REVISION 2, 6-10-08



TUNNEL SECTION
LOOKING UPSTATION

HSI GEOTRANS

GE TDCS Project
Summary of Convergence Monitoring - Tunnel 1 Station 2+44A

Report Date: 9/14/2010

NOTES

1. Convergence Points 5 and 6 were installed in Tunnel 1 at Station 2+44 by GeoTrans on Thursday 26 June 2008.
2. Two Points were installed: One in the left and right quarter arches about 3.5 feet above springline on the right and 5 feet above the springline on the left.
3. Convergence points in Tunnel 1 are steel plates 5"x5"x1/4" with a 3/4" diameter threaded rod anchored with two part quick setting acrylic grout 6" to 8" into rock.
4. Readings are taken with a Leica A6 laser distance meter reading from the two points in the ribs across to points at the opposite rib and at the crown
5. Initial readings were taken on Thursday 26 June 2008 and the mean average of the first twenty-four readings rounded to the nearest millimeter is the initial mean reading.
6. The threshold value is 0.25 inches (6 mm) and the limit value is 0.75 inches (19 mm), notify Tunnel Design Engineer if deviation exceeds threshold value.
7. Deviation: subtract mean reading from initial mean reading, therefore positive deviation indicates convergence.

Date & Time of Reading		From Points: 1 to 6 (mm)	From Points: 4 to 5 (mm)	COMMENTS
6-26-08	**Initial Mean**	**3346**	**3263**	Tunnel 1 at Sta 2+44A Pre-blast TB-55
9/14/10		3345	3261	
1218 hrs		3345	3261	Tunnel 1 at Sta 3+38
		3345	3261	Tunnel 2 at Sta 2+92
	Mean	**3345**	**3261**	Tunnel 3 at Sta 3+50
	Deviation	**1**	**2**	Weekly Reading

Tunnels 2 and 3 blasting is located 100 feet away therefore, the measurements will be taken once per week.

1-5-09: Tunnel work complete, begin Monthly readings.

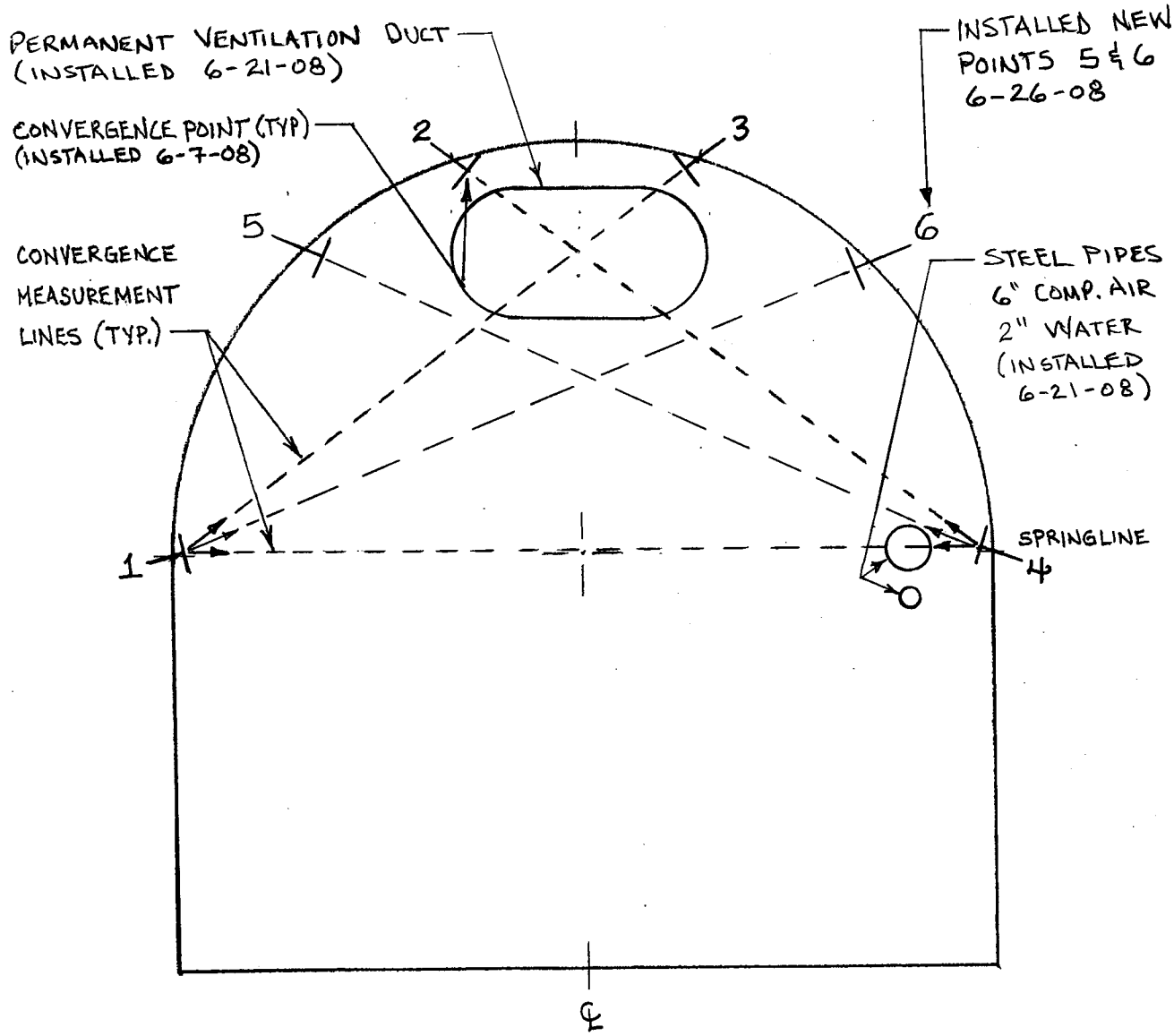
No readings exceeded the Threshold Value of 6 mm from the first reading on 6-26-08 to the most recent reading on 9-14-10.

BY JFB DATE 6-12-08 PROJECT HUDSON FALLS TDCS SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ TUNNEL CONVERGENCE PROJ. NO. _____

TUNNEL STATION 2+44A REV 1 6-26-08 (JFB)

SCALE: 1" = 2'



TUNNEL SECTION
LOOKING UPSTATION

HSI GEOTRANS

GE TDCS Project
Summary of Convergence Monitoring - Work Room 1-1

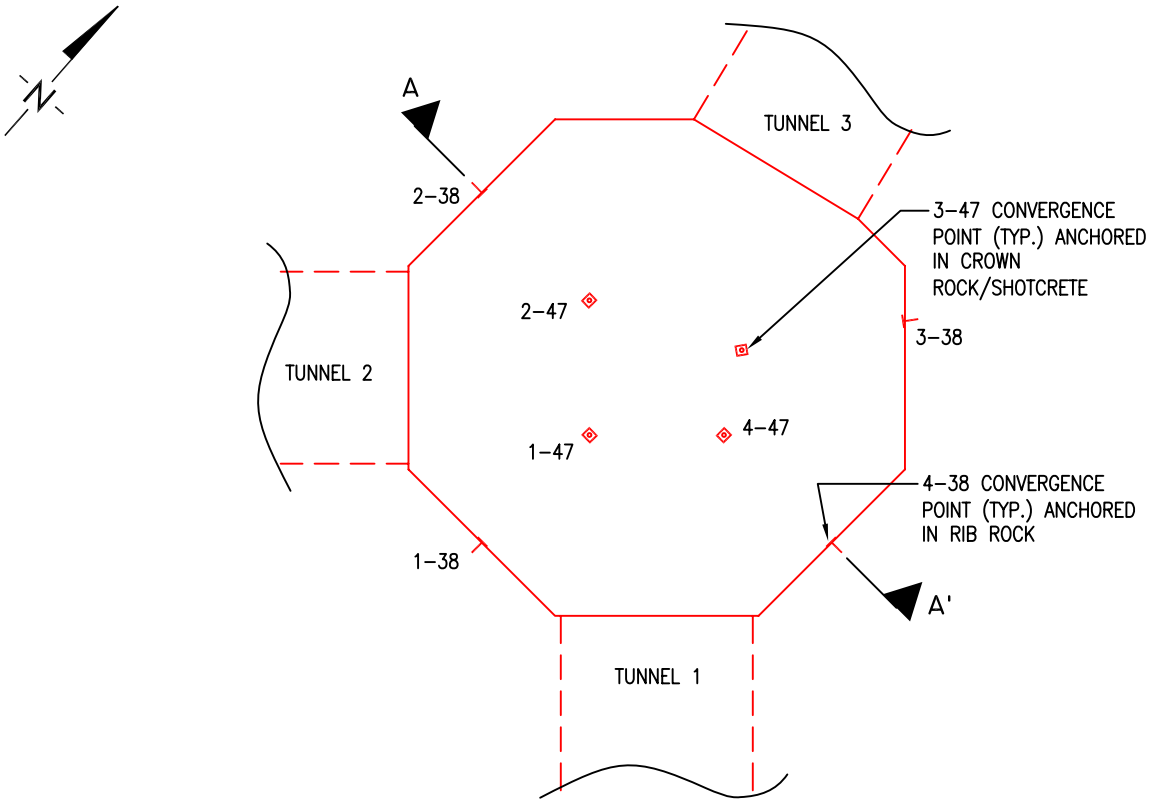
Report Date: 9/14/2010

NOTES

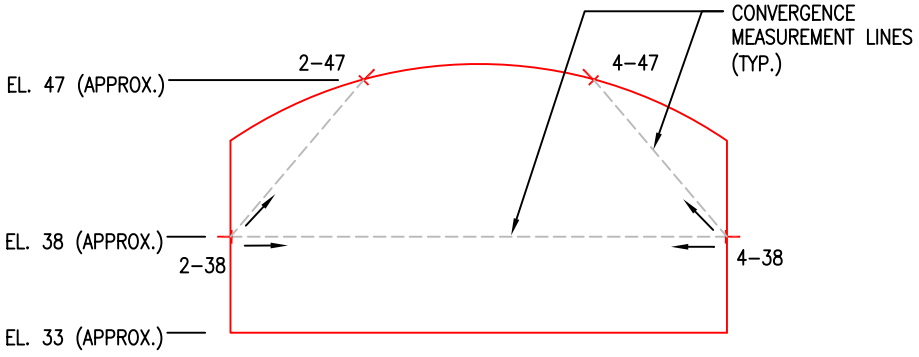
1. Convergence Points were installed in Work Room 1-1 by Merco Obayashi Joint Venture on Wednesday 16 July 2008.
2. Four sets of two points each were installed, one set in each quadrant - one point at El 38 in the rib and one at El 47 in the crown. The locations are: one set between tunnels 1 and 2; one set between tunnels 2 and 3 and; two sets between tunnels 1 and 3.
3. Convergence points in Work Room 1-1 are steel plates 5"x5"x1/4" with a 3/4" diameter threaded rod anchored with two part quick setting acrylic grout 6" to 8" into rock/shotcrete.
4. Readings are taken with a Leica A6 laser distance meter measuring from each rib to the opposite rib and from each rib up to the point above in the crown.
5. Initial readings were taken on 17 and 18 July 2008 and the mean average of the first twelve readings rounded to the nearest millimeter is the initial mean reading.
6. The threshold value is 0.5 inches (13 mm) and the limit value is 1.0 inches (25 mm), notify Tunnel Design Engineer if deviation exceeds threshold value.
7. Convergence readings are taken twice weekly until tunnel work is complete.
8. Deviation: subtract mean reading from initial mean reading, therefore positive deviation indicates convergence.

Measurement		Initial Mean Reading	Reading by: SL		Date: 5/5/09 Time: 0810 hrs			Reading by: GC		Date: 9/14/10 Time: 1235 hrs		
From	To	7/18/2008	Reading 1	Reading 2	Reading 3	Mean Reading	Deviation	Reading 1	Reading 2	Reading 3	Mean Reading	Deviation
Point ID	Point ID	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
1-38	3-38	8332	8331	8331	8331	8331	1	8330	8330	8332	8331	1
1-38	1-47	3217	3217	3216	3217	3217	0	3218	3218	3218	3218	-1
2-38	4-38	8282	8280	8281	8280	8280	2	8280	8282	8280	8281	1
2-38	2-47	3395	3394	3395	3394	3394	1	3395	3395	3394	3395	0
3-38	1-38	8331	8331	8330	8331	8331	0	8329	8329	8330	8329	2
3-38	3-47	3432	3433	3432	3432	3432	0	3432	3432	3432	3432	0
4-38	2-38	8282	8281	8281	8281	8281	1	8280	8280	8281	8280	2
4-38	4-47	3249	3250	3250	3250	3250	-1	3250	3250	3250	3250	-1

11-14-08: No readings because of plastic tarps for concrete pour obstructing lines of measurement.
Due to the holiday work schedule only 1 set of readings were taken and reported the weeks of 1-2-09 and 1-9-09.
1-5-09: Tunnel work complete, begin Monthly readings.
No readings exceeded the Threshold Value of 13 mm from the first reading on 3-22-08 to the most recent reading on 9-14-10.



WORK ROOM I-I PLAN @ ELEVATION 33± (ROCK INVERT)



WORK ROOM I-I SECTION A-A @ CONVERGENCE POINTS 2 & 4

0 10
Scale in feet

TITLE:	Room 1–1 Convergence Points Tunnel Drain Collection System		
LOCATION:	Hudson Falls, New York		
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED	JFB	FIGURE: 3–2
	DRAFTED	RMK	
	FILE		
	DATE	Aug. 2008	

G:\GE_HUDSV_2008\08-08-Convergence-Points\ConvPnts-dwg
Aug 14 , 2008 - 3:25pm

GE TDCS Project
Summary of Convergence Monitoring

Tunnel 2 Station 0+88

Report Date: 9/15/2010

NOTES

1. Convergence Points were installed in Tunnel 2 at Station 0+88 by GeoTrans on 2 August 2008.
2. Four Points were installed: Two in the left and right ribs below the Springline and; Two in the crown about 4 feet either side of centerline.
3. Convergence points in Tunnel 1 are steel plates 5"x5"x1/4" with a 3/4" diameter threaded rod anchored with two part quick setting acrylic grout 6" to 8" into rock.
4. Readings are taken with a Leica A6 laser distance meter reading from the two points in the ribs across to points at the opposite rib and at the crown.
5. Initial readings were taken on 2 August 2008 and the mean average of the first twenty-four readings rounded to the nearest millimeter is the initial mean reading.
6. The threshold value is 0.25 inches (6 mm) and the limit value is 0.75 inches (19 mm), notify Tunnel Design Engineer if deviation exceeds threshold value.
7. Tunnel Convergence reading taken after every tunnel round until tunnel is 100 feet away (Tunnel 2 Station 1+88), then take readings once per week until work in tunnel is complete.
8. Deviation: subtract mean reading from initial mean reading, therefore positive deviation indicates convergence.

		Convergence Measurements				
Date of		From Point 1 to:		From Point 4 to:		
Reading		1 to 4	1 to 3	4 to 1	4 to 2	
		(mm)	(mm)	(mm)	(mm)	COMMENTS
8-6-08	**Mean**	**3860**	**3883**	**3860**	**3791**	**Use Mean as Initial Reading**
9/15/10		3859	3882	3860	3790	
1015 hrs		3858	3884	3859	3791	Tunnel 1 at Sta 3+38
		3858	3884	3859	3791	Tunnel 2 Sta: 2+92
	Mean	**3858**	**3883**	**3859**	**3791**	Tunnel 3 Sta: 3+50
	Deviation	**2**	**0**	**1**	**0**	**Weekly Readings**

Note: Tunnel heading is greater than 100 ft from convergence therefore, began weekly readings after Tunnel Blast 92.

1-5-09: Tunnel work complete, begin Monthly readings.

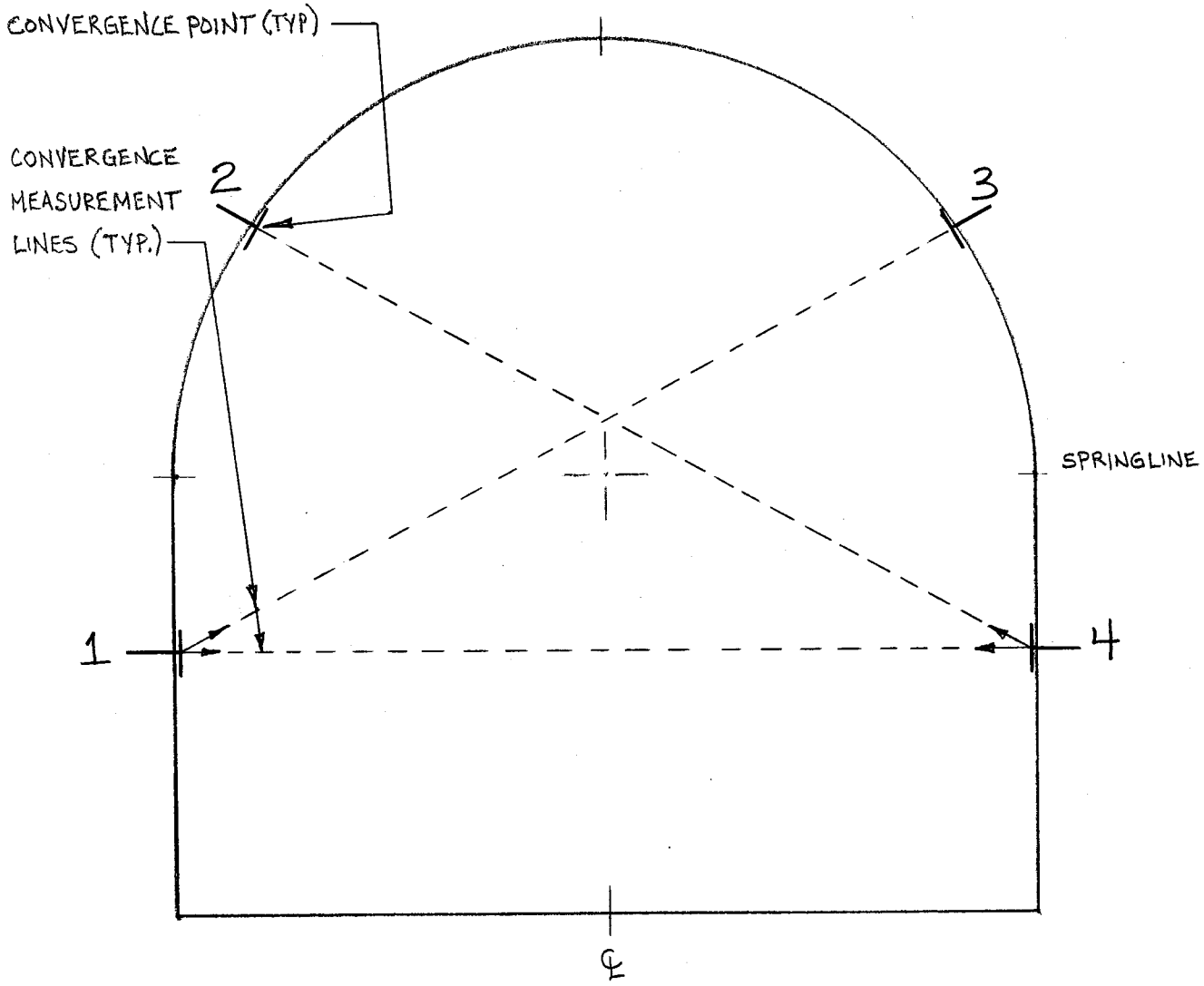
No readings exceeded the Threshold Value of 6mm from the first reading on 8-4-08 to the most recent reading on 9-15-10.

BY JFB DATE 8-7-08 PROJECT HUDSON FALLS TDCS SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ TUNNEL CONVERGENCE PROJ. NO. _____

TUNNEL 2 STATION 2:0+88

SCALE: 1 IN = 2 FT



TUNNEL SECTION
LOOKING UPSTATION

HSI GEOTRANS

GE TDCS Project
Summary of Convergence Monitoring

Tunnel 2 Station 1+75

Report Date: 9/15/2010

NOTES

1. Convergence Points were installed in Tunnel 2 at Station 1+75 by GeoTrans on 23 August 2008.
2. Points were installed: Two in the left and right ribs 2 ft below the Springline and; Two in the crown about 5 feet either side of centerline and 3 ft above the Springline.
3. Convergence points in Tunnel 1 are steel plates 5"x5"x1/4" with a 3/4" diameter threaded rod anchored with two part quick setting acrylic grout 6" to 8" into rock.
4. Readings are taken with a Leica A6 laser distance meter reading from the two points in the ribs across to points at the opposite rib and at the crown.
5. Initial readings were taken on 23 August 2008 and the mean average of the first twenty-four readings rounded to the nearest millimeter is the initial mean reading.
6. The threshold value is 0.25 inches (6 mm) and the limit value is 0.75 inches (19 mm), notify Tunnel Design Engineer if deviation exceeds threshold value.
7. Tunnel Convergence reading taken after every tunnel round until tunnel is 100 feet away (Tunnel 2 Station 2+75), then take readings once per week until work in tunnel is complete.
8. Deviation: subtract mean reading from initial mean reading, therefore positive deviation indicates convergence.

		Convergence Measurements				
Date of		From Point 1 to:		From Point 4 to:		
Reading		1 to 4	1 to 3	4 to 1	4 to 2	
		(mm)	(mm)	(mm)	(mm)	COMMENTS
8-23-08	**Mean**	**3844**	**3731**	**3844**	**3721**	**Use Mean as Initial Reading**
9/15/10		3842	3729	3842	3718	
1045 hrs		3842	3729	3842	3718	Tunnel 1 at Sta 3+38
		3842	3729	3842	3718	Tunnel 2 Sta: 2+92
	Mean	**3842**	**3729**	**3842**	**3718**	Tunnel 3 Sta: 3+50
	Deviation	**2**	**2**	**2**	**3**	Weekly Reading

9-11-08: Tunnel blasting is 100 ft away from convergence point; began weekly data collection after tunnel Blast 106.

1-5-09: Tunnel work complete, begin Monthly readings.

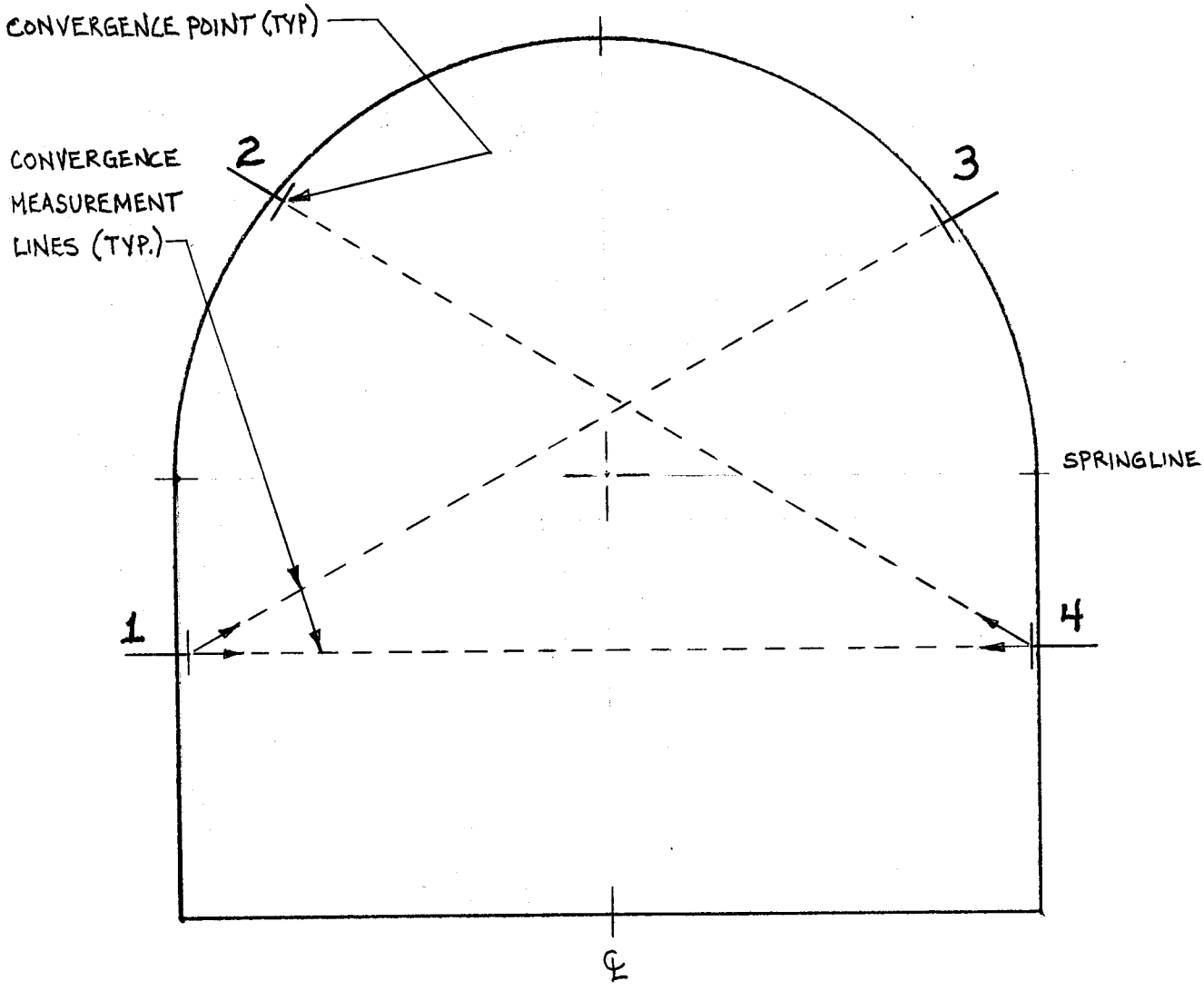
No readings exceeded the Threshold Value of 6mm from the first reading on 8-25-08 to the most recent reading on 9-15-10.

BY JFB DATE 8-25-08 PROJECT HUDSON FALLS TDCS SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ TUNNEL CONVERGENCE PROJ. NO. _____

TUNNEL 2 STATION 2:1+75

SCALE: 1 IN = 2 FT



TUNNEL SECTION
LOOKING UPSTATION

HSI GEOTRANS

GE TDCS Project
Summary of Convergence Monitoring - Work Room 2-1

Report Date: 9/15/2010

NOTES

1. Convergence Points were installed in Work Room 2-1 by Merco Obayashi Joint Venture on 2 October 2008.
2. Four sets of two points each were installed, one set in each quadrant - one point at El 42 in the rib and one at El 49 in the crown.
3. Convergence points in Work Room 2-1 are steel plates 5"x5"x1/4" with a 3/4" diameter threaded rod anchored with two part quick setting acrylic grout 6" to 8" into rock/shotcrete.
4. Readings are taken with a Leica A6 laser distance meter measuring from each rib to the opposite rib and from each rib up to the point above in the crown.
5. Initial readings were taken on 2 October 2008 and the mean average of the first twenty-four readings rounded to the nearest millimeter is the initial mean reading.
6. The threshold value is 0.5 inches (13 mm) and the limit value is 1.0 inches (25 mm), notify Tunnel Design Engineer if deviation exceeds threshold value.
7. Convergence readings are taken twice weekly until tunnel work is complete.
8. Deviation: subtract mean reading from initial mean reading, therefore positive deviation indicates convergence.

Measurement		Initial Mean Reading	Reading by: SL		Date: 5/5/09 Time: 0951 hrs			Reading by: GC		Date: 9/15/10 Time: 1105 hrs		
From	To	10/2/2008	Reading 1	Reading 2	Reading 3	Mean Reading	Deviation	Reading 1	Reading 2	Reading 3	Mean Reading	Deviation
Point ID	Point ID	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
1-42	3-42	8471	8471	8471	8471	8471	0	8470	8471	8470	8470	1
1-42	3-49	7440	7440	7439	7440	7440	0	7439	7440	7440	7440	0
2-42	4-42	8272	8271	8272	8271	8271	1	8271	8271	8271	8271	1
2-42	4-49	6426	6426	6427	6426	6426	0	6425	6425	6425	6425	1
3-42	1-42	8470	8472	8471	8471	8471	-1	8470	8470	8470	8470	0
3-42	1-49	7094	7095	7094	7094	7094	0	7093	7093	7093	7093	1
4-42	2-42	8271	8272	8271	8271	8271	0	8271	8272	8271	8271	0
4-42	2-49	6731	6731	6731	6731	6731	0	6731	6731	6731	6731	0

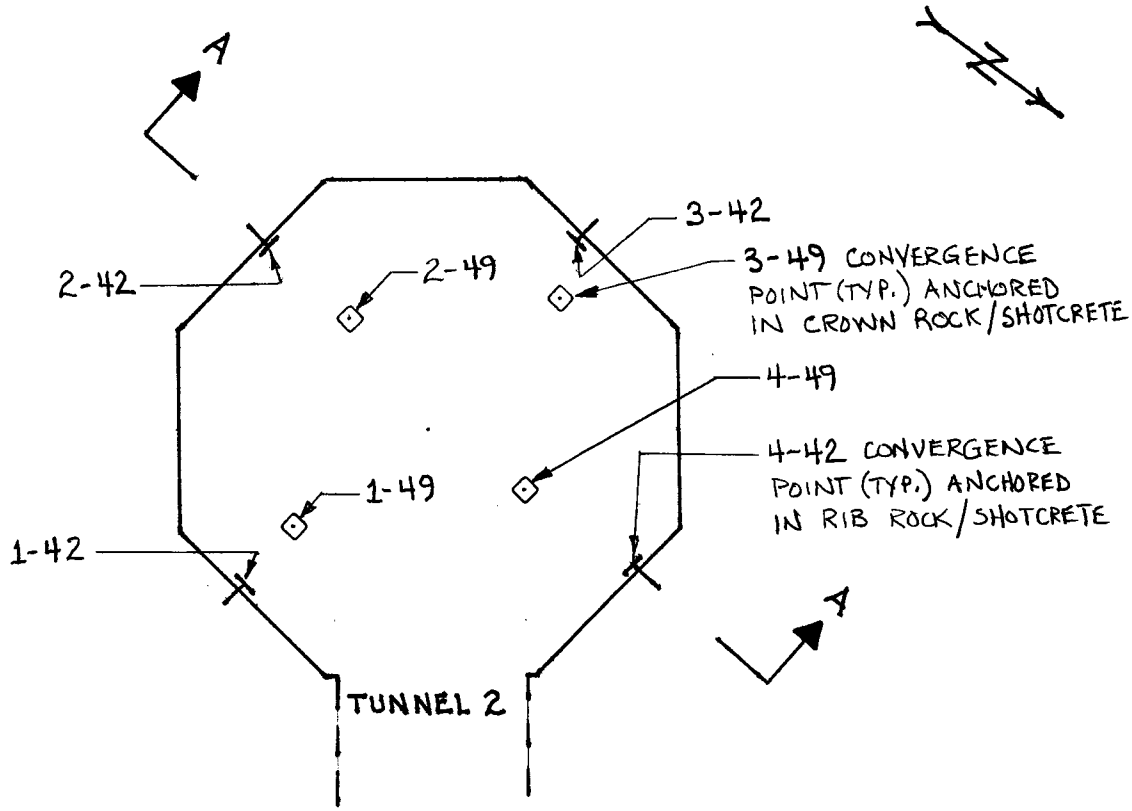
1-5-09: Tunnel work complete, begin Monthly readings.

No readings exceeded the Threshold Value from the first reading on 10-2-08 to the most recent reading on 9-15-10.

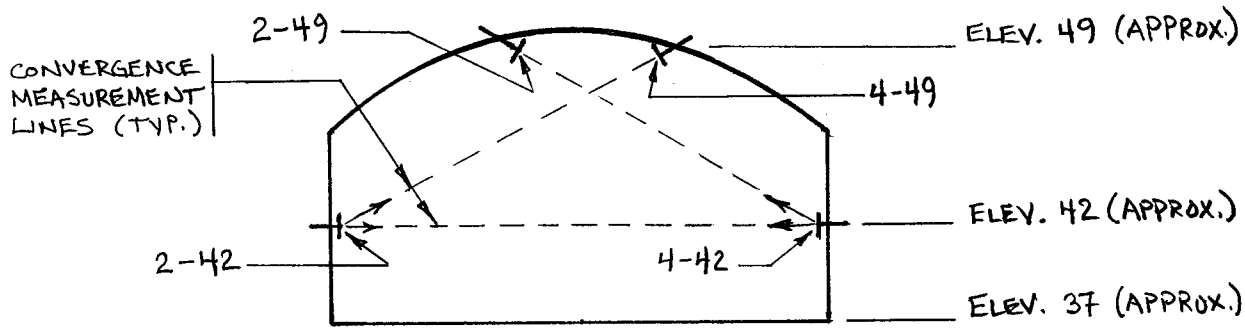
BY JFB DATE 10-7-08 PROJECT HUDSON FALLS-TDCS SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ WORK ROOM 2-1 CONVERGENCE POINTS PROJ. NO. _____

SCALE: 1 IN = 10 FT (APPROX.)



WORK ROOM 2-1 PLAN @ EL 37 +/- (ROCK INVERT)



WORK ROOM 2-1 SECTION A-A @ CONVERGENCE POINTS 2 & 4

GE TDCS Project
Summary of Convergence Monitoring

Tunnel 3 Station 0+72

Report Date: 9/15/2010

NOTES

1. Convergence Points were installed in Tunnel 3 at Station 0+72 by GeoTrans on 30 July 2008.
2. Four Points were installed: Two in the left and right ribs above the Springline and; Two in the crown about 3 feet either side of centerline.
3. Convergence points in Tunnel 1 are steel plates 5"x5"x1/4" with a 3/4" diameter threaded rod anchored with two part quick setting acrylic grout 6" to 8" into rock.
4. Readings are taken with a Leica A6 laser distance meter reading from the two points in the ribs across to points at the opposite rib and at the crown.
5. Initial readings were taken on 31 July 2008 and the mean average of the first twenty-four readings rounded to the nearest millimeter is the initial mean reading.
6. The threshold value is 0.25 inches (6 mm) and the limit value is 0.75 inches (19 mm), notify Tunnel Design Engineer if deviation exceeds threshold value.
7. Tunnel Convergence reading taken after every tunnel round until tunnel is 100 feet away (Tunnel 3 Station 1+72) then take readings once per week until work in tunnel is complete.
8. Deviation: subtract mean reading from initial mean reading, therefore positive deviation indicates convergence.

		Convergence Measurements				
Date of		From Point 1 to:		From Point 4 to:		
Reading		1 to 4	1 to 3	4 to 1	4 to 2	
7-30-08	**Mean**	**3552**	**3304**	**3552**	**3107**	**Use Mean as Initial Reading**
9/15/10		3552	3302	3552	3107	
0900 hrs		3552	3303	3552	3107	Tunnel 1 at Sta 3+38
		3554	3303	3553	3107	Tunnel 2 Sta: 2+92
	Mean	**3553**	**3303**	**3552**	**3107**	Tunnel 3 Sta: 3+50
	Deviation	**0**	**1**	**0**	**0**	**Weekly Reading**

8-18-08: Tunnel blasting is 100 ft away from convergence point, begin weekly data collection.

1-5-09: Tunnel work complete, begin Monthly readings.

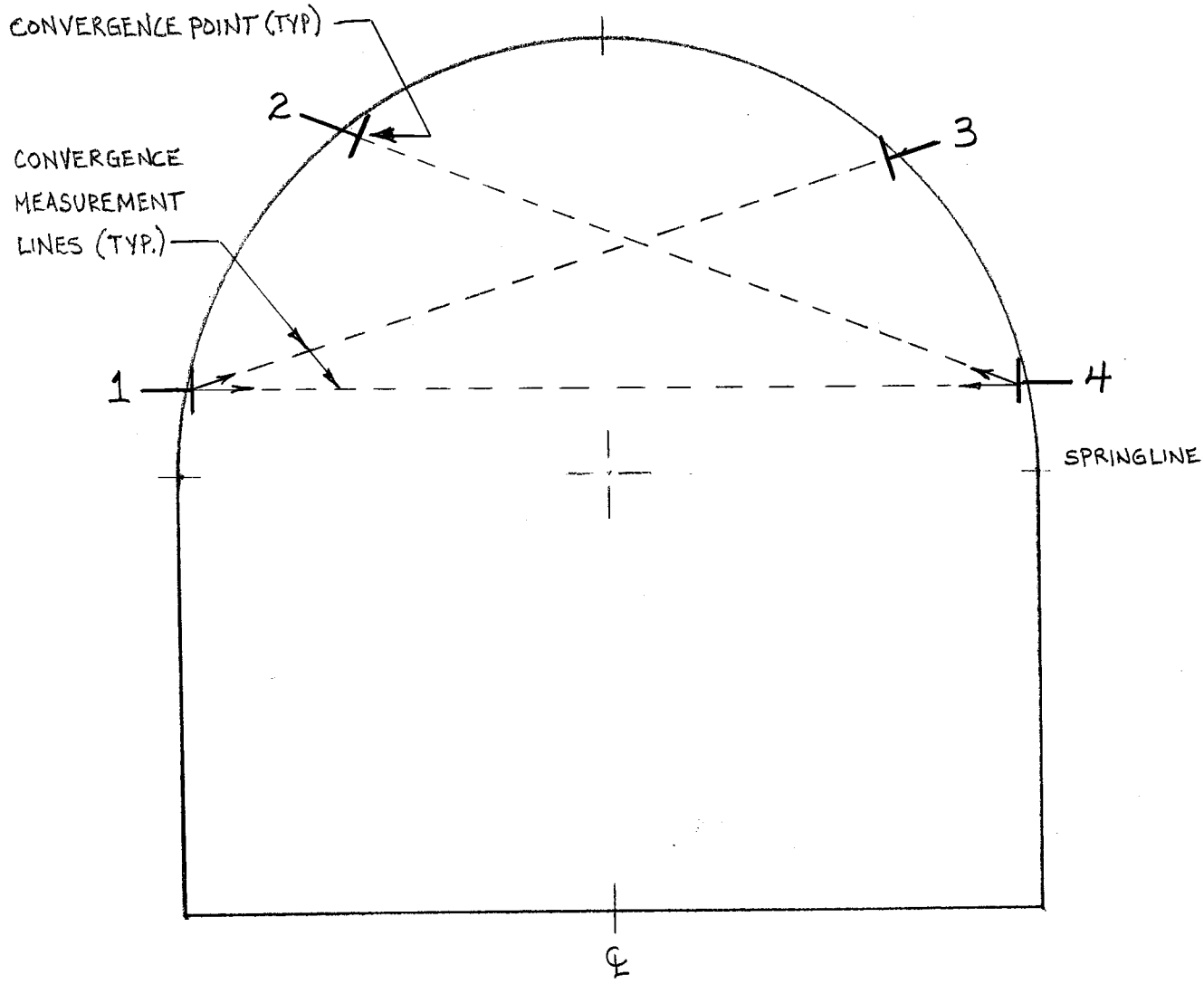
No readings exceeded the Threshold Value of 6mm from the first reading on 7-31-08 to the most recent reading on 9-15-10.

BY JFB DATE 8-7-08 PROJECT HUDSON FALLS TDCS SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ TUNNEL CONVERGENCE PROJ. NO. _____

TUNNEL 3 STATION 3:0+72

SCALE: 1 IN = 2 FT



TUNNEL SECTION
LOOKING UPSTATION

HSI GEOTRANS

GE TDCS Project
Summary of Convergence Monitoring

Tunnel 3 Station 1+97

Report Date: 9/15/2010

NOTES

1. Convergence Points were installed in Tunnel 3 at Station 1+97 by GeoTrans on 23 August 2008.
2. Points were installed: Two in the left and right ribs 2 ft below the Springline and; Two in the crown about 5 feet either side of centerline and 3 ft above the Springline.
3. Convergence points in Tunnel 1 are steel plates 5"x5"x1/4" with a 3/4" diameter threaded rod anchored with two part quick setting acrylic grout 6" to 8" into rock.
4. Readings are taken with a Leica A6 laser distance meter reading from the two points in the ribs across to points at the opposite rib and at the crown.
5. Initial readings were taken on 23 August 2008 and the mean average of the first twenty-four readings rounded to the nearest millimeter is the initial mean reading.
6. The threshold value is 0.25 inches (6 mm) and the limit value is 0.75 inches (19 mm), notify Tunnel Design Engineer if deviation exceeds threshold value.
7. Tunnel Convergence reading taken after every tunnel round until tunnel is 100 feet away (Tunnel 2 Station 2+97) then, take readings once per week until work in tunnel is complete.
8. Deviation: subtract mean reading from initial mean reading, therefore positive deviation indicates convergence.

		Convergence Measurements				
Date of		From Point 1 to:		From Point 4 to:		
Reading		1 to 4	1 to 3	4 to 1	4 to 2	
		(mm)	(mm)	(mm)	(mm)	COMMENTS
8-23-08	**Mean**	**3505**	**3628**	**3505**	**3684**	**Use Mean as Initial Reading**
9/15/10		3504	3627	3504	3683	
0925 hrs		3504	3627	3503	3683	Tunnel 1 at Sta 3+38
		3504	3627	3503	3683	Tunnel 2 Sta: 2+92
	Mean	**3504**	**3627**	**3503**	**3683**	Tunnel 3 Sta: 3+50
	Deviation	**1**	**1**	**2**	**1**	Weekly Reading

9-12-08: Tunnel blasting is 100 ft away from convergence point; began weekly data collection after Tunnel Blast 107.

1-5-09: Tunnel work complete, begin Monthly readings.

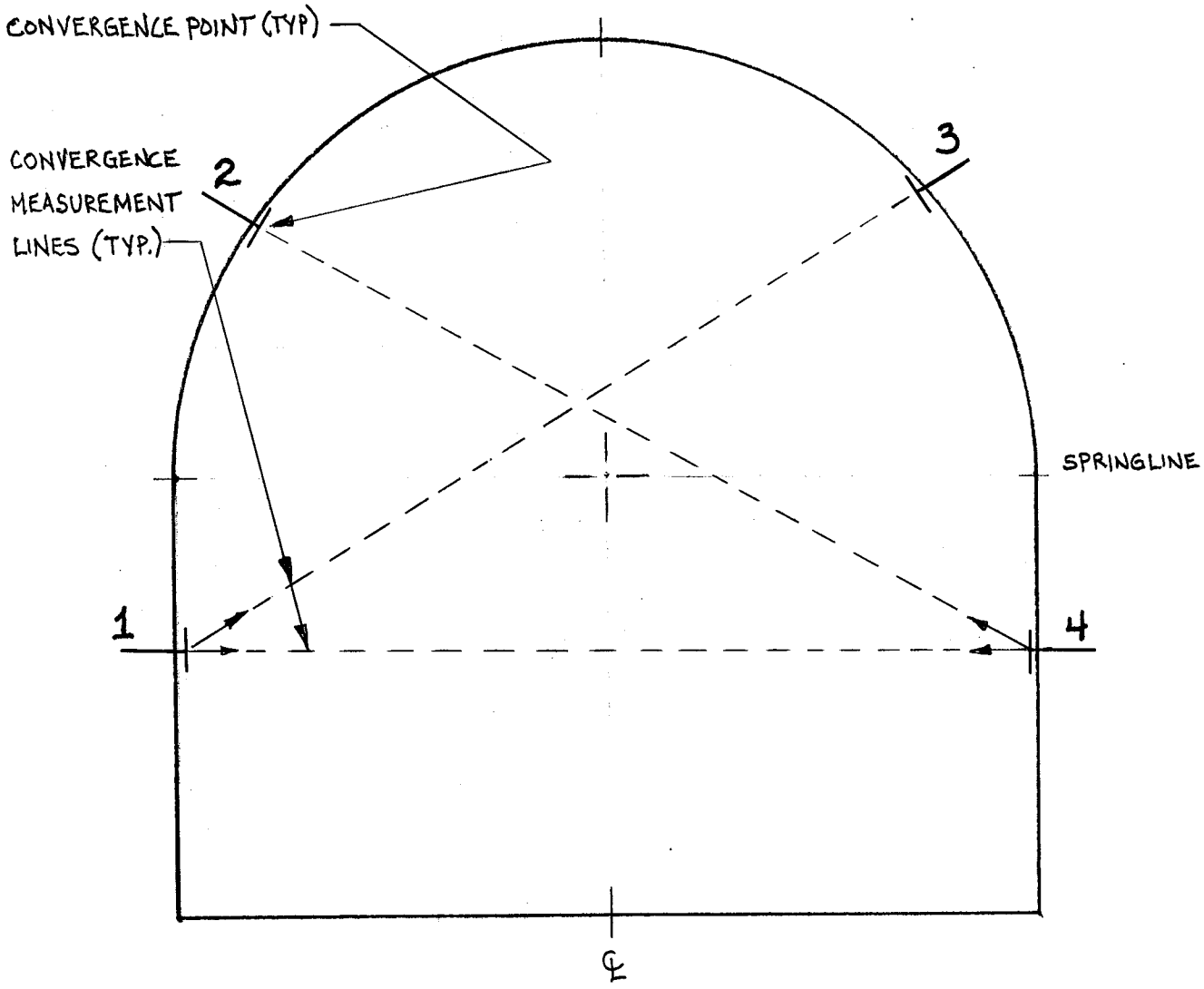
No readings exceeded the Threshold Value of 6mm from the first reading on 8-25-08 to the most recent reading on 9-15-10.

BY JFB DATE 8-25-08 PROJECT HUDSON FALLS TDCS SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ TUNNEL CONVERGENCE PROJ. NO. _____

TUNNEL 3 STATION 3:1+97

SCALE: 1" = 2'



TUNNEL SECTION
LOOKING UPSTATION

HSI GEOTRANS

GE TDCS Project
Summary of Convergence Monitoring

Tunnel 3 Station 2+80

Report Date: 9/15/2010

NOTES

1. Convergence Points were installed in Tunnel 3 at Station 2+80 by GeoTrans on 13 September 2008.
2. Points were installed: Two in the left and right ribs 2 ft below the Springline and; Two in the crown about 5 feet either side of centerline and 3.5 ft above the Springline.
3. Convergence points in Tunnel 3 are steel plates 5"x5"x1/4" with a 3/4" diameter threaded rod anchored with two part quick setting acrylic grout 6" to 8" into rock.
4. Readings are taken with a Leica A6 laser distance meter reading from the two points in the ribs across to points at the opposite rib and at the crown.
5. Initial readings were taken on 13 September 2008 and the mean average of the first twenty-four readings rounded to the nearest millimeter is the initial mean reading.
6. The threshold value is 0.25 inches (6 mm) and the limit value is 0.75 inches (19 mm), notify Tunnel Design Engineer if deviation exceeds threshold value.
7. Tunnel Convergence reading taken after every tunnel round until tunnel blasting is completed at sta 3+50 or is beyond 100 ft away, then take readings once per week until work in tunnel is complete.
8. Deviation: subtract mean reading from initial mean reading, therefore positive deviation indicates convergence.

		Convergence Measurements				
Date of		From Point 1 to:		From Point 4 to:		
Reading		1 to 4	1 to 3	4 to 1	4 to 2	
		(mm)	(mm)	(mm)	(mm)	COMMENTS
9-13-08	**Mean**	**3786**	**3683**	**3786**	**3758**	**Use Mean as Initial Reading**
9/15/10		3785	3683	3786	3758	
0937 hrs		3785	3683	3786	3758	Tunnel 1 at Sta 3+38
		3785	3683	3786	3758	Tunnel 2 Sta: 2+92
	Mean	**3785**	**3683**	**3786**	**3758**	Tunnel 3 Sta: 3+50
	Deviation	**1**	**0**	**0**	**0**	

9-26-08: Tunnel blasting was completed after Tunnel Blast 117, began weekly data collection for the week ending 10-3-08.

1-5-09: Tunnel work complete, begin Monthly readings.

No readings exceeded the Threshold Value of 6mm from the first reading on 9-13-08 to the most recent reading on 9-15-10.

BY JFB DATE 9-15-08

CHKD. BY _____ DATE _____

PROJECT HUDSON FALLS TDCS

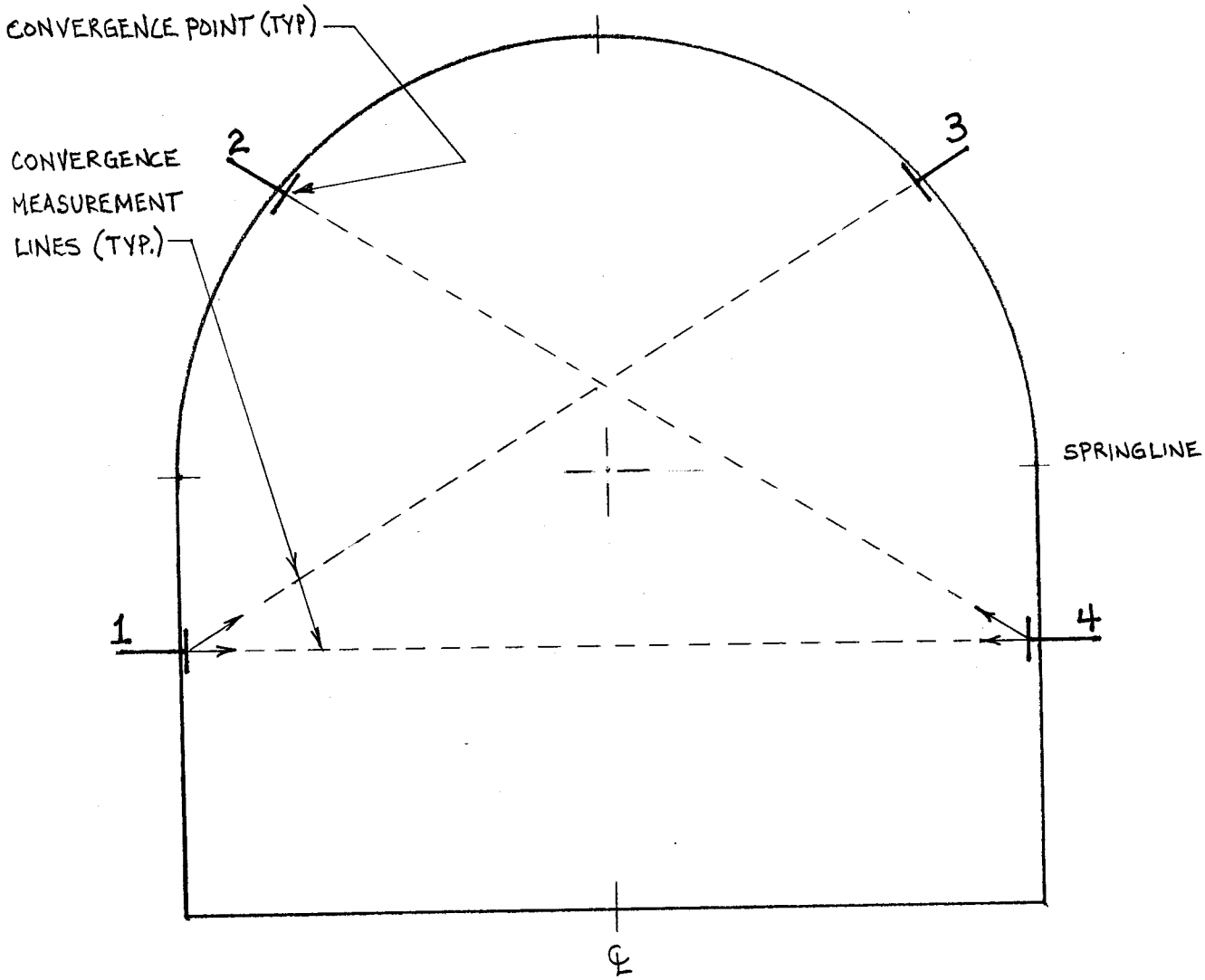
TUNNEL CONVERGENCE

SHEET NO. 1 OF 1

PROJ. NO. _____

TUNNEL 3 STATION 3:2+80

SCALE: 1" = 2'



TUNNEL SECTION
LOOKING UPSTATION

HSI GEOTRANS

GE TDCS Project
Summary of Convergence Monitoring

Work Room 3-1

Report Date: 9/15/2010

NOTES

1. Convergence Points were installed in Work Room 3-1 by Merco Obayashi Joint Venture on 2 October 2008.
2. Four sets of two points each were installed, one set in each quadrant - one point at El 53 in the rib and one at El 65 in the crown.
3. Convergence points in Workroom 3-1 are steel plates 5"x5"x1/4" with a 3/4" diameter threaded rod anchored with two part quick setting acrylic grout 6" to 8" into rock/shotcrete.
4. Readings are taken with a Leica A6 laser distance meter measuring from each rib to the opposite rib and from each rib up to the point above in the crown.
5. Initial readings were taken on 3 October 2008 and the mean average of the first twenty-four readings rounded to the nearest millimeter is the initial mean reading.
6. The threshold value is 0.5 inches (13 mm) and the limit value is 1.0 inches (25 mm), notify Tunnel Design Engineer if deviation exceeds threshold value.
7. Convergence readings are taken twice weekly until tunnel work is complete.
8. Deviation: subtract mean reading from initial mean reading, therefore positive deviation indicates convergence.

Measurement		Initial Mean Reading	Reading by: SL		Date: 5/5/09 Time: 0802 hrs			Reading by: GC		Date: 5/5/09 Time: 1000 hrs		
From	To	10/3/2008	Reading 1	Reading 2	Reading 3	Mean Reading	Deviation	Reading 1	Reading 2	Reading 3	Mean Reading	Deviation
Point ID	Point ID	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
1-53	3-53	8344	8345	8345	8345	8345	-1	8345	8344	8345	8345	-1
1-53	3-65	6737	6737	6737	6737	6737	0	6737	6737	6737	6737	0
2-53	4-53	8459	8459	8460	8459	8459	0	8459	8459	8459	8459	0
2-53	4-65	7141	7142	7141	7142	7142	-1	7141	7142	7141	7141	0
3-53	1-53	8344	8344	8344	8344	8344	0	8344	8344	8344	8344	0
3-53	1-65	6923	6922	6922	6922	6922	1	6922	6922	6922	6922	1
4-53	2-53	8459	8459	8459	8459	8459	0	8459	8459	8459	8459	0
4-53	2-65	6404	6404	6405	6404	6404	0	6404	6404	6404	6404	0

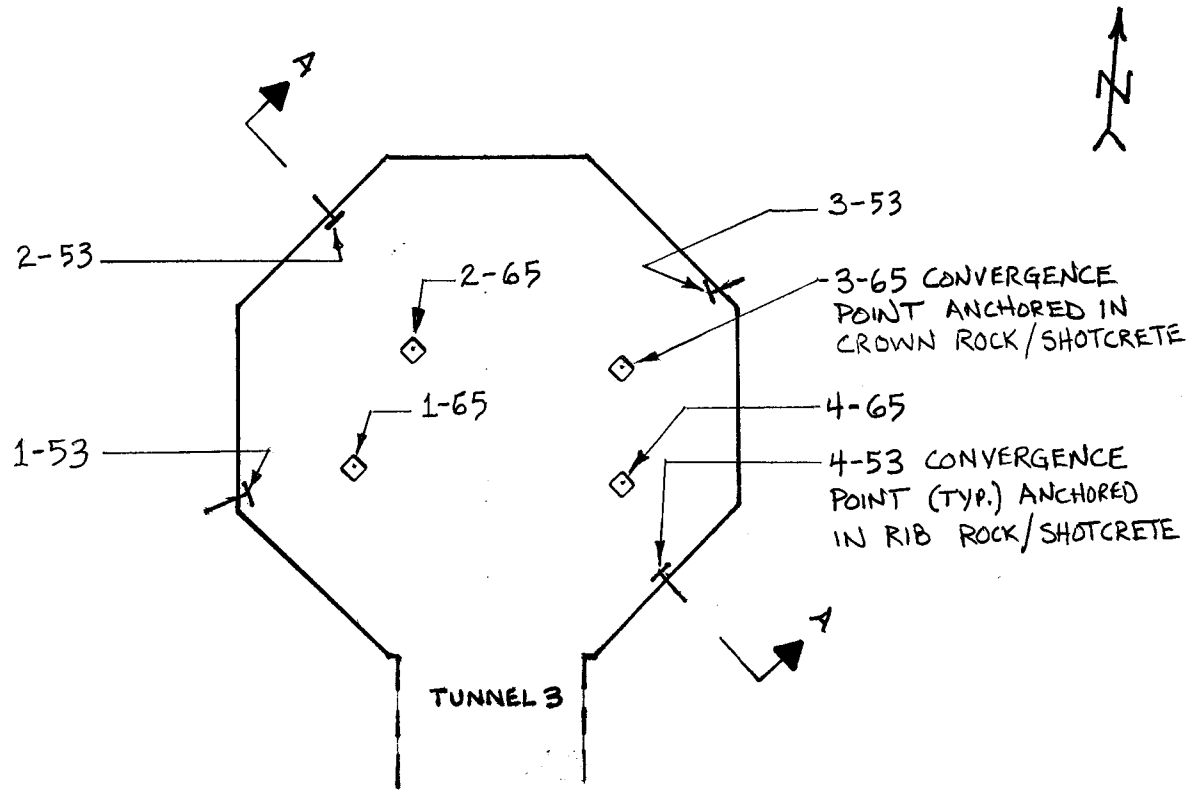
1-5-09: Tunnel work complete, begin Monthly readings.

No readings exceeded the Threshold Value from the first reading on 10-3-08 to the most recent reading on 9-15-10.

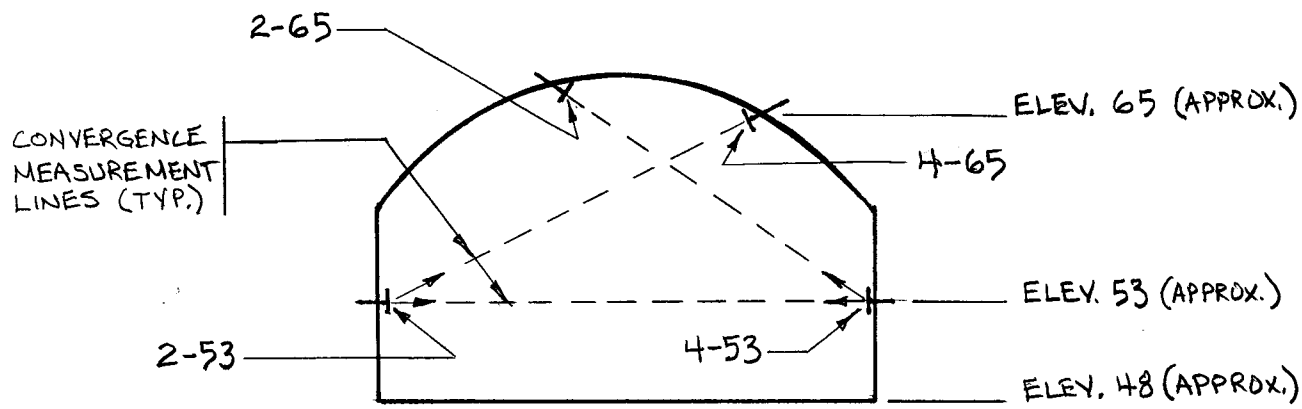
BY JFB DATE 10-7-08 PROJECT HUDSON FALLS - TDCS SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ WORK ROOM 3-1 CONVERGENCE POINTS PROJ. NO. _____

SCALE: 1 IN = 10 FT (APPROX.)



WORK ROOM 3-1 PLAN @ EL. 48 +/- (ROCK INVERT)



WORK ROOM 3-1 SECTION A-A @ CONVERGENCE POINTS 2 & 4

TDCS Entry Report – September 2010

Attachment 6
GeoTrans TDCS Inspection Report

TDCS Shaft and Tunnel Inspection - SUMMARY REPORT

May 2009 To September 2010

GE Hudson Falls Plant Site
Tunnel Drain Collection System

Purpose:

The purpose of this report is to summarize the maintenance inspection of the Tunnel Drain Collection System (TDCS) conducted by GeoTrans over the past year during the thirty-four TDCS Entries since the end of construction May 15, 2009 through September 2010 (refer to Attachment 1 TDCS Entry Log). The inspections included the ground support and utilities in the TDCS vertical service shaft and tunnels and involved visual observations of the shotcrete, rock dowels, utility support brackets and physical sounding and scaling of the tunnel roof. The inspection included measurements of the 12 existing convergence stations in the bell-out and tunnels.

Additionally, recommendations are provided for future utility support improvements and tunnel roof scaling activities.

Summary:

TDCS Maintenance During Construction Phases 1, 2 and 3: Throughout the construction of the TDCS, from September 2007 until May 15, 2009, the general contractor maintained the TDCS rock excavation with daily inspections and tunnel roof scaling as required for safety. The TDCS tunnels remained in good condition and only required spot scaling from time to time at various locations with no single area requiring additional ground support. The TDCS shaft lining remained in good condition and required no maintenance or additional support throughout the construction period.

TDCS Maintenance After Construction Phase 3: After May 15, 2009 GeoTrans took over responsibility for the maintenance of the TDCS. The TDCS shaft maintenance includes regular visual inspections of the shaft lining and utilities and supports. The tunnel maintenance includes regular inspections of the ground support and the sounding and scaling of the exposed rock roof in the tunnels. GeoTrans has performed 34 days of entries into the TDCS since taking over maintenance responsibility in May 2009. Of the 34 entries, 16 days were for OM&M activities related to the monitoring and collection systems, 2 days were for two Annual Rescue Drills (July 2009 and September 2010) by Glens Falls Fire Department and 18 days were dedicated to the installation of permanent piping, permanent sump deck, permanent vertical turbine pumps and additional multi level piezometer PZ-202 in probehole PH-2. The vertical shaft and tunnels were visually inspected during each entry and before workers entered the spaces and found to be in good condition.

TDCS Shaft Condition: The shaft ground support and the shaft utility support brackets were found to be in good condition throughout the period from May 2009 up to and including the latest entry, September 13 through 17, 2010.

TDCS Shaft Description: The TDCS shaft is a 25 feet diameter by 205 feet deep vertical shaft excavated by drill and blast method in ten foot deep rounds. Ground support is provided by rock

dowels and shotcrete. Rock dowels are 1 inch diameter steel (grade 75 ksi, deformed threadbar, 35 kip design load) by 10 feet long deformed thread steel bars (untensioned) with full encapsulation epoxy resin grout installed on a 5 feet by 5 feet staggered pattern. Shotcrete was installed immediately after rock dowels and is 2 inches to 3 inches thick with synthetic fiber reinforcement. Groundwater infiltrates through the shotcrete lining and at a number of locations ¾ inch hoses are used to convey the water to the bottom of the shaft. The lower 35 feet of the shaft has a bell-out enlargement from 25 feet diameter to 44 feet diameter (at bottom) with ground support provided by rock dowels, as in the shaft, and steel fiber reinforced shotcrete with thickness of 6 inches in the lower 10 feet and 8 inches to 12 inches in the upper 25 feet. The shotcrete was a wet mix sprayed on in 2 inch layers after installation of the rock dowels. Groundwater relief drainage behind the shotcrete is provided by 8 vertical geo-composite drains manufactured with geotextile filter fabric and geonet drain material. The vertical drains run from the top of the bell-out to the floor (tunnel invert) level (elevation 24) and the bottom of the drains are exposed and open to allow groundwater to flow to the perimeter drain gutter in the bell-out floor.

Shaft Utilities / Supports: The utility lines in the vertical service shaft (ventilation duct, dewatering pipe, compressed air pipe, domestic water pipe, electrical power cables, instrumentation and control cables) are suspended from support brackets for either the ventilation duct or the dewatering pipe. The support brackets are uncoated structural steel angles held in place by uncoated threaded rods anchored with epoxy in drill holes in the wall of the shaft. The uncoated steel is showing surface corrosion at various rates, depending on the amount of water present. The replacement of utility supports with more permanent corrosion resistant materials is recommended and will need to be addressed in the next 5 years.

TDCS Tunnel Conditon: The condition of the tunnels throughout the period from May 2009 up to and including the latest entry, September 13 through 17, 2010 was visually inspected upon each tunnel entry and found to be in good condition with no obvious indications of instability and only several incidental rockfalls (less than 0.2 ft^3).

TDCS Tunnel Description: The TDCS tunnel system consists of a 10 feet by 10 feet (nominal) by 968 feet long, D-Shaped Tunnel in a “Y” configuration with three 26 feet diameter by 14 feet high work rooms excavated by drill and blast method in 6 feet deep rounds. Tunnel 1 runs 325 feet from the TDCS Bell-out to workroom 1-1. Tunnel 2 runs 293 feet from work room 1-1 to work room 2-2. Tunnel 3 runs 350 feet from work room 1-1 to work room 3-1. The ground support in the tunnels is provided by 1 inch diameter by 6 feet long steel (grade 75 ksi, deformed threadbar, 35 kip design load) rock dowels (untensioned) with full encapsulation epoxy resin grout in rows of three dowels, located in the left arch, crown, and right arch, and spaced every 5 feet along the tunnel. Additionally, Tunnel 1 has a 3 inch thick shotcrete lining for the first 17 feet in from the portal (at the bellout) up to station 0+40.

Tunnel Roof Inspection: In February 2010 a tunnel roof integrity inspection program was instituted to test and verify the soundness of the tunnel roof and remove potential rockfall hazards. This program was continued during the TDCS entry in September 2010. Refer to Attachment 2, Tunnel Roof Scaling Logs, for more details. The tunnel roof was sounded from springline to springline and loose rock was removed, by two-man crews using 8 and 10 feet long scaling bars. Scaling crews were provided: one by Alpine Construction LLC and; one by GeoTrans and worked under the

supervision of a geotechnical engineer. GeoTrans and Alpine crews performed thorough sounding and scaling of the tunnel roof during which loose rock was identified visually and/or by tapping with the scaling bar and was scaled down. If the sounding revealed apparent loose rock areas of hollow or "drummy" sounding rock and subsequent efforts to remove the loose rock were unsuccessful then the drummy area was painted with white paint for future reference. The scaling crews received training for scaling that consisted of supervised direction of geotechnical engineer after watching two DVDs on scaling and rockfall injury prevention obtained from the Mine Safety and Health Administration (MSHA). Details of the tunnel roof inspections follow.

Feb-Mar 2010 Scaling: An initial detailed visual inspection of the tunnels by geotechnical engineer revealed ten "spot" locations in the tunnels as having potentially loose rock. The spot locations were sounded and loose rock was removed, by GeoTrans personnel, using 10 feet long scaling bars. The sounding confirmed the loose areas noted visually however, none of the ten areas proved to have imminent rockfall hazards since moderate to considerable effort was needed to pry and dislodge the loose rock. Loose rock in one of the ten areas did not yield and was painted white for future reference. Following the initial "spot" scaling, GeoTrans and Alpine personnel performed thorough sounding and scaling of the roof in tunnels 1 and 2 during which the tunnel roof was sounded and loose rock was scaled down. The thorough sounding and scaling in tunnel 3 was not performed due to time constraints. The rock debris from scaling was shoveled into and approximately filled seven drums (55 gallon) with an estimated volume about 2 cubic yards of loose rock. The drums were removed from the TDCS shaft using a barrel picker clamp and were taken to the Hudson Falls Building 4B and deposited into the hazardous waste roll-off for proper disposal. The rock debris that fell in the tunnel gutter drains and the biologic matter from the gutters amounted to about one-quarter of a drum that was disposed 'in-the-drum' separately under another waste profile.

Sept 2010 Scaling: The sounding and scaling was completed for the full length of all tunnels. The rock debris from scaling was shoveled into and filled six and one-quarter drums (55 gallon) with an estimated volume about 1.7 cubic yards of loose rock. The drums were removed from the TDCS shaft using a barrel picker clamp and were taken to the Hudson Falls Building 4B and deposited into the hazardous waste roll-off. The rock debris that fell in the tunnel gutter drains and the biologic matter from the gutters amounted to about one-quarter of a drum that was disposed 'in-the-drum' separately under another waste profile.

TDCS Tunnel Utilities / Suports: The utility lines in the tunnels (ventilation duct, compressed air pipe and domestic water pipe) are suspended from rock anchors with mild steel wire (#9 gage) that is corroding at various rates, depending on the amount of water present. The replacement of utility supports with more permanent corrosion resistant materials is recommended and will need to be addressed in the next couple of years. The electrical power supply in a conduit is suspended from the roof with uncoated threaded rods anchored with epoxy in drill holes.

TDCS Workroom Condition: The three TDCS tunnel work rooms and shotcrete lining were found to be in good condition throughout the period from May 2009 until the tunnel inspection in September 2010.

TDCS Workroom Description: The three work rooms are 26 feet diameter by 14 feet high. The rock support in the Work Rooms is provided by 1 inch diameter by 10 feet long steel (grade 75 ksi, deformed threadbar, 35 kip design load) rock dowels (untensioned) with full encapsulation epoxy resin grout installed on a 5 feet by 5 feet staggered pattern. Additional support is provided by 4 inch thick steel fiber reinforced shotcrete lining installed after rock dowels.

Recommendation: Perform future Shaft and Tunnel inspections and Tunnel roof for each TDCS Entry as follows.

1. With Qualified Personnel
    a. Competent Person: Shaft and Tunnel Inspection performed by Engineering Geologist or Geotechnical Engineer or similar qualified individual.
    b. Tunnel Roof Sounding and Scaling performed by individuals trained and supervised by Competent Person.
2. Inspection Prior to Occupation
    a. Inspection and Scaling should be performed prior to the occupation of the work space by workers as follows:
        i. Perform sounding and scaling prior to initial occupation by workers and there after once every 4 calendar weeks or more often as determined by competent person based on evaluation of tunnel scaling history and visual inspection and;
        ii. Competent Person perform daily inspections prior to worker occupation.
3. With JSA - Perform Tunnel Roof Sounding and Scaling with the approved Job Safety Analysis (JSA).
4. Training
    a. View Training DVD's (refer to Attachment 3)
        i. MSHA, *Scaling*, 10 minutes (MSHA DVD 585)
        ii. NIOSH, *Rock Falls - Preventing Rock Fall Injuries in Underground Non-Coal Mines,* 20 minutes (MSHA DVD 607)
    b. Read MSHA Best Practices Guidelines Refer to Attachment 3
        i. MSHA (BP-26) Roof Evaluation and Examination (MSHA 1026) - Best Practices

ii. MSHA (BP-72) Examination/Testing/Scaling – Ground Control for Underground Gold Mines – Best Practices

c. On-The-Job Training by Competent Person during scaling operations underground

5. Tools and Equipment

a. Scaling bars – 8 to 10 feet long aluminum bars with steel points (chisel point and angled chisel point). The length of bar should be sufficient to ensure that worker can scale without being directly under the point of the scale bar and the rock being scaled.

b. Spray can of white spray paint

c. Flat pointed shovels

d. 55 gallon drums with open top, drum dolly and drum picker clamp for lifting drums with crane or other suitable container and transport system

e. Push broom

f. High powered hand held lantern, miners cap lamp or work light as necessary to provide sufficient illumination required to observe the area being scaled

g. Planning

i. Rate of Progress of sounding and scaling has improved from February 2010 to September 2010. Based on September 2010 scaling, the total estimated tunnel scaling duration is about **11.5 crew hours.** The estimated progress rates for each tunnel segment: Tunnel 1 at 275 feet should take about 4.0 crew hours; Tunnel 2 at 250 feet should take about 3.5 crew hours and; Tunnel 3 at 310 feet should take about 4.0 crew hours.

ii. For scheduling purposes for the next TDCS Entry (March 2011) figure scaling and cleanup operations will take place during the first two entry days. Day-1 Scale all tunnels: one-half day for Tunnel 1 and one half day for tunnels 2&3 with two crews working simultaneously. Day-2 Cleanup all tunnels utilizing the two scaling crews.

iii. Manpower – assume one competent person and one two-man crew with scaling bars for the first day (tunnel 1) a second two-man crew should be added after tunnel 1 is completed so that tunnels 2 and 3 can be worked separately and simultaneously.

iv. 55 gallon drums for transport of rock debris to Building 4B - assume one drum will be filled for every 130 feet of tunnel roof scaled (based on September 2010 yield). For a total of 835 feet of tunnel roof to be scaled divided by 130 yields 6.4 drums – plan for 7 drum loads of rock debris to be removed.

h. Procedures

i. Documentation: Maintain a Daily Field Log of activities that documents the progress and key information of scaling activities. Refer to Attachment 4 for blank Daily Field Log. Record the location (tunnel number and station in feet) and the estimated volume (cubic feet) of rock scaled down especially in high yield areas - as this will be useful data when considering whether additional ground support may be required in the future. Record where rock falls were found on tunnel floor prior to scaling and the areas painted white. Record the volume of rock debris and number of 55 gallon drums from each tunnel.

ii. Do not work under rock that has not been sounded/scaled

iii. Work in teams of two: one barman (at-a-time) performing sounding/scaling and one observer to closely watch the effects of the roof sounding and to warn barman of potential hazards from adjacent areas. Due to the narrow width of tunnel and possibility of interference with two crew working side by side and the related safety issues, the work should be limited to only one crew at a time per tunnel.

iv. Begin sounding rock near the portal of tunnel 1 at the shaft bellout and work up station (away from the shaft)

v. Proceed in 10 foot increments - Work one side and to center of roof above ventilation duct for 10 feet then switch to opposite side always working beneath a scaled surface. Estimate/record the volume of rock debris/10 feet.

vi. Move fallen rock to the side or center of tunnel (out-of-the way)

vii. Look for previously painted “spots” from previous inspections that indicate potential loose areas.

viii. Roof areas that appear or sound loose but do not easily yield to pry bars (i.e. require considerable effort to dislodge rock) should be painted with white paint outlining the area to ‘look-out for’ in the future – record these painted locations on Daily Field Log.

ix. Shovel rock debris from tunnel floor into 55 gallon drums for removal from shaft. Record on Daily Field Log the tunnel and number of drums and fraction of drums of debris removed.

x. Remove rock debris and biologic growth from tunnel gutters and place in separate drum for removal and proper disposal.

xi. Cleanup shall include broom cleaning (minimum) of the tunnel inverts so that any new rockfalls can be immediately identified upon the next entry.

TDCS INSPECTION REPORT – SEPTEMBER 2010

ATTACHMENT 1

TDCS ENTRY LOG

GeoTrans, Inc.

TDCS Entry Log

General Electric Hudson Falls Plant Site
Tunnel Drain Collection System - TDCS

TDCS Entry		
Number	**Date**	**Purpose**
NA	5/15/2009	Final Inspection of TDCS Phase 3 Construction - last day of MO-JV Responsibility
1	6/19/2009	OM&M: Replace temporary TDCS pump, P-1 with spare provided by MO-JV
2	7/30/2009	OM&M: Glens Falls Fire Department - familiarization and rescue drill
3	8/4/2009	OM&M: Replace temp. pump, P-1 with spare provided by MO-JV - failed, use ABS
4	8/7/2009	OM&M: Check New P-1, ABS pump continuous pumping, install float switches for P-2
5	8/28/2009	OM&M: Verify as-built dimensions of sump walls for sump deck steel fabrication
6	9/8/2009	OM&M: Repair TDCS pump P-1 hose
7	9/21/2009	OM&M: Repair TDCS pump P-1 hose
8	10/14/2009	Phase 4: Prep for new pipe at shaft collar
9	10/15/2009	Phase 4: Remove temporary sump deck
10	10/19/2009	Phase 4: Install new pipe at shaft collar, disconnect N.Frac Tank, cutover to new pipe
11	10/20/2009	Phase 4: Begin installation of new galvanized steel sump deck and pump support frame
12	10/21/2009	Phase 4: Install new sump deck and piping from abandon HF-303 casing to gutter drain
13	10/22/2009	Phase 4: New sump deck installation complete
14	10/29/2009	Phase 4: Electrical wiring for new TDCS vertical turbine pumps
15	10/30/2009	Phase 4: Install pump frame, electrical wiring for new pumps
16	11/2/2009	Phase 4: Install & level two vertical turbine pump bases, electrical boxes
17	11/3/2009	Phase 4: Install, assemble two new vertical turbine pumps
18	11/4/2009	Phase 4: Install chemical resistant discharge hoses, level transducers, electrical boxes
19	11/17/2009	Phase 4: Install new steel support bracket, 6" valve for steel header discharge pipe
20	11/18/2009	Phase 4: Final assembly of two new vertical turbine pumps, hose anchoring
21	11/19/2009	Phase 4: Testing and start-up of new vertical turbine pumps
22	11/20/2009	Phase 4: Final inspection of new vertical turbine pump system
23	2/23/2010	OM&M: pump lubrication, drainwell testing and sampling, tunnel rock scaling
24	2/24/2010	OM&M: tunnel rock scaling (1/2 day due to snow storm)
25	3/1/2010	Phase 4: Install Multi Level VW PZ-202 in PH-2; OM&M: tunnel rock scaling
26	3/2/2010	Phase 4: Install Multi Level VW PZ-202 in PH-2; OM&M: tunnel rock scaling
27	3/3/2010	Phase 4: Install Multi Level VW PZ-202 in PH-2; OM&M: tunnel rock scaling
28	3/26/2010	OM&M: Repair TDCS vertical turbine pump VTP-2 - motor failure - remove for repair
29	4/15/2010	OM&M: Repair VTP-2, install rebuilt drive motor and test pump
30	9/13/2010	OM&M: Pump lubrication and Tunnel 1 roof integrity inspection and scaling
31	9/14/2010	OM&M: Tunnel 1, 2 and 3 roof integrity inspection and scaling, Convergence readings
32	9/15/2010	OM&M: Tunnel 2 roof insp/scaling, Convergence rdgs, Replace MUX2, Brierley Inspects
33	9/16/2010	OM&M: debris removal, drainwell test/sample, DNAPL Sump Collect, Hydrogeo inspect
34	9/17/2010	OM&M: Glens Falls Fire Department - familiarization and rescue drill - Tunnel 3

TDCS INSPECTION REPORT – SEPTEMBER 2010

ATTACHMENT 2

TDCS TUNNEL ROOF SOUNDING / SCALING LOGS
September 2010
And
March 2010

GeoTrans, Inc.

TDCS Tunnel Roof Sounding / Scaling Summary

Date Sep-10

General Electric Hudson Falls Plant Site

Tunnel Drain Collection System - TDCS

Scaling Date	Tunnel	Total Length of Unlined Tunnel (Ft)	Length Scaled (Ft)	Duration Two Man Crew (hrs:mins)	Rate Two Man Crew (Ft/hr)	Volume of Rock Debris (55 gal Drums)	Feet of Tunnel Scaled per Drum
Mar-10	1	275	275	7:30	36.7	4	69
	2	250	250	5:25	46.2	2.5	100
	3	310	15	0:30	30.0	0.5	30
	Total All	835	540	13:25	40.2	7	77
Sep-10	1	275	275	4:10	66.0	3.5	79
	2	250	250	3:23	73.9	1.25	200
	3	310	310	3:55	79.1	1.5	207
	Total All	835	835	11:28	72.8	6.25	134

GeoTrans, Inc.

TDCS Tunnel Roof Sounding / Scaling Log

TUNNEL 1 **Monday 13 September 2010**

Tuesday 14 September 2010

General Electric Hudson Falls Plant Site
Tunnel Drain Collection System - TDCS

General Summary: Scaled all **275 ft** of Tunnel 1 in **4hr 10m** (1hr 20m on 9-13-10; 2hr 50m on 9-14-10) Work performed by Alpine Construction 2-man crew supervised by GeoTrans Geotechnical Engineer. No rocks on floor of Tunnel 1 observed prior to scaling. On 9-13-10 at 1450 hours, evacuated the TDCS due to approching electrical storm.

Recorded by: J. F. Baltz, P.E., Supervising Geotechnical Engineer

Location			Time of Day Begin-End (24 hour)	Observation	Estimated Volume (ft^3)
Tunnel	**Station**	**Roof Area**			
MONDAY 9-13-10					
1	0+35 to 0+50	Left , Crown, Right	1330-1350	Small pieces scaled	0.2
1	0+50 to 0+70	Left , Crown, Right	1350-1405	Small pieces scaled	0.2
1	0+70 to 1+00	Left , Crown	1405-1410	Small pieces scaled	0.1
1	0+70 to 1+00	Crown, Right	1410-1415	Small pieces scaled	0.1
1	1+00 to 1+15	Crown, Right	1415-1425	Small pieces scaled	0.1
1	1+00 to 1+25	Left, Crown	1425-1435	Small pieces scaled	0.1
1	1+15 to 1+35	Crown, Right	1435-1440	Small pieces scaled	0.1
	1+25 to 1+40	Left , Crown	1440-1450	Sta 1+40 - Piece scaled from crown	0.5
TUESDAY 9-14-10					
1	1+30 to 1+50	Crown, Right	0845-0850	Small pieces scaled	0.1
1	1+40 to 1+70	Left , Crown	0850-0900		
1	1+45	Crown		pieces scaled	0.2
1	1+50 to 1+80	Crown, Right	0900-0915	Small pieces scaled	0.1
1	1+70 to 1+90	Left , Crown	0915-0925	Small pieces scaled	0.1
1	1+80 to 1+90	Crown, Right	0925-0930		
1	1+90	Crown		Piece scaled	0.2
1	1+90 to 2+20	Left , Crown	0930-0935	Small pieces scaled	0.1
1	1+90 to 2+00	Crown, Right	0935-0950		
1	1+95	Crown		Piece scaled, loose plate on rock dowel	0.5
1	2+00 to 2+20	Crown, Right	0952-1002		
1	2+00	Crown		Piece scaled	0.1
1	2+20	Crown		Piece scaled	0.3
1	2+20 to 2+40	Crown, Right	1105-1115	Small pieces scaled	0.1
1	2+20 to 2+40	Left , Crown	1115-1140	Small pieces scaled	0.1
1	2+40 to 2+55	Left , Crown	1140-1150	Sta 2+45 - roof drummy & spot painted	0
1	2+40 to 2+50	Crown, Right	1150-1210		
1	2+50	Crown		Large piece (2' x 2' x 0.5') scaled, cut	2.0
1	2+50 to 2+65	Crown, Right	1210-1213	Small pieces scaled	0.1
1	2+50 to 2+65	Left , Crown	1213-1220	Small pieces scaled	0.1
1	2+65 to 2+80	Crown, Right	1220-1225	Small pieces scaled	0.1
1	2+65 to 3+10	Left , Crown	1225-1230	Small pieces scaled	0.1
1	2+80 to 3+10	Crown, Right	1230-1240	Small pieces scaled	0.2
Volume (cubic feet) of Rock Debris Removed from Tunnel 1 was 3.5 Drums*55 gal÷7.48 = 25.7 ft^3					**5.7**

GeoTrans, Inc.

TDCS Tunnel Roof Sounding / Scaling Log

TUNNEL 2 **Tuesday 14 September 2010**
Wednesday 15 September 2010

General Electric Hudson Falls Plant Site
Tunnel Drain Collection System - TDCS

General Summary: Scaled all **250 ft** of Tunnel 2 in **3hr 23m** (2hr 23m on 9-14-10; 1hr 0m on 9-15-10) Work performed by Alpine Construction 2-man crew supervised by GeoTrans Geotechnical Engineer. No rocks on floor of Tunnel 2 observed prior to scaling.

Recorded by: J. F. Baltz, P.E., Supervising Geotechnical Engineer

Location			Time of Day Begin-End (24 hour)	Observation	Estimated Volume (ft^3)
Tunnel	Station	Roof Area			
TUESDAY 9-14-10					
2	0+15 to 0+35	Left , Crown, Right	1400-1415		
2	0+30	Crown		pieces scaled	0.1
2	0+35 to 0+55	Left , Crown, Right	1415-1435	Small pieces scaled	0.1
2	0+55 to 0+85	Left , Crown, Right	1445-1455	Small pieces scaled	0.1
2	0+85 to 0+90	Left , Crown, Right	1500-1508	Small pieces scaled	0.1
2	0+90 to 1+00	Left , Crown, Right	1515-1530	Small pieces scaled	0.1
2	1+00 to 1+35	Left , Crown, Right	1540-1600	Small pieces scaled	0.2
2	1+35 to 1+95	Left , Crown, Right	1610-1650		
2	1+35 to 1+45	Left , Crown, Right		Small pieces scaled	0.1
2	1+45 to 1+55	Left , Crown, Right		Small pieces scaled	0.1
2	1+55 to 1+65	Left , Crown, Right		Small pieces scaled	0.1
2	1+65 to 1+75	Left , Crown, Right		Small pieces scaled	0.2
2	1+75 to 1+85	Left , Crown, Right		Small pieces scaled	0.1
2	1+85 to 1+95	Left , Crown, Right		Small pieces scaled	0.2
WEDNESDAY 9-15-10					
2	1+95 to 2+65	Left , Crown, Right	0910-1010		
2	1+95 to 2+05	Left , Crown, Right		Small pieces scaled	0.1
2	2+05 to 2+10	Left , Crown, Right		Pieces scaled	0.7
2	2+15 to 2+20	Left , Crown, Right		Pieces scaled	0.3
2	2+20 to 2+30	Left , Crown, Right		Small pieces scaled	0.1
2	2+30 to 2+65	Left , Crown, Right		Small pieces scaled	0.1
Volume (cubic feet) of Rock Debris Removed from Tunnel 2 was 1.25 Drums*55 gal÷7.48 = 9.2 ft^3					**2.7**

GeoTrans, Inc.

TDCS Tunnel Roof Sounding / Scaling Log

TUNNEL 3 Tuesday 14 September 2010

General Electric Hudson Falls Plant Site
Tunnel Drain Collection System - TDCS

General Summary: Scaled all **310 ft** of Tunnel 3 in **3hr 55m** (3hr 55m on 9-14-10)
Work performed by GeoTrans 2-man crew supervised by GeoTrans Geotechnical Engineer. No rocks on floor of Tunnel 3 observed prior to scaling.

Recorded by: J. F. Baltz, P.E., Supervising Geotechnical Engineer

Location			Time of Day Begin-End	Observation	Estimated Volume
Tunnel	Station	Roof Area	(24 hour)		(ft^3)
TUESDAY 9-14-10					
3	0+15 to 0+25	Left , Crown, Right	1245-1300	Small pieces scaled	0.1
3	0+25 to 0+40	Left , Crown, Right	1300-1315		
3	0+35	Crown		Pieces scaled	0.3
3	0+37	Crown		Pieces scaled	0.5
3	0+40 to 0+60	Left , Crown, Right	1315-1355		
3	0+55	Crown		Pieces scaled	2
3	0+60 to 0+70	Left , Crown, Right	1355-1358	Small pieces scaled	0.1
3	0+70 to 0+90	Left , Crown, Right	1358-1405		
3	0+90	Crown		Pieces scaled	0.3
3	0+90 to 1+30	Left , Crown, Right	1405-1435		
3	0+90 to 1+00	Left , Crown, Right		Small pieces scaled	0.1
3	1+00 to 1+10	Left , Crown, Right		Small pieces scaled	0.1
3	1+10 to 1+20	Left , Crown, Right		Small pieces scaled	0.1
3	1+20 to 1+30	Left , Crown, Right		Small pieces scaled	0.1
3	1+30 to 1+90	Left , Crown, Right	1435-1530		
3	1+30	Crown		Small pieces scaled	0.1
3	1+40	Crown		Small pieces scaled	0.1
3	1+50	Crown		Small pieces scaled	0.1
3	1+60	Crown		Small pieces scaled	0.1
3	1+70	Crown		Small pieces scaled	0.1
3	1+80	Crown		Small pieces scaled	0.1
3	1+90 to 2+30	Left , Crown, Right	1530-1605	Small pieces scaled	0.2
3	2+30 to 3+25	Left , Crown, Right	1605-1640		
3	2+30	Left , Crown, Right		Small pieces scaled	0.2
3	2+40	Left , Crown, Right		Small pieces scaled	0.3
3	2+70	Left , Crown, Right		Small pieces scaled	0.1
Volume (cubic feet) of Rock Debris Removed from Tunnel 3 was 1.5 Drums*55 gal÷7.48 = 11 ft^3					**5.0**

TDCS Tunnel Roof Sounding / Scaling Summary

3-Mar-10

General Electric Hudson Falls Plant Site
Tunnel Drain Collection System - TDCS

Reported by: J. F. Baltz, P.E.

Tunnel			Volume (ft3)
SUMMARY OF ALL SCALING FEB-MAR 2010			
Tunnel 1	**4 Drums Removed**	**Sub-total Estimated Volume of Scaled Rock (ft3)**	**28**
Tunnel 2	**2.5 Drums Removed**	**Sub-total Estimated Volume of Scaled Rock (ft3)**	**17.8**
Tunnel 3	**0.5 Drums Removed**	**Sub-total Estimated Volume of Scaled Rock (ft3)**	**3.7**
		Total Estimated Volume of Scaled Rock (ft3)	**49.5**
All Tunnels	**7**	**Total Number of 55 Gallon Drums of Scaled Rock Debris Removed**	

GeoTrans, Inc.

TDCS Tunnel Roof Sounding / Scaling Summary

Tuesday 23 February 2010

General Electric Hudson Falls Plant Site
Tunnel Drain Collection System - TDCS

Recorded by: J. F. Baltz, P.E.

General Summary: 09:30 to 11:00 engineering inspection of tunnel roof - found areas of potential loose rock that was subsequently sounded and scaled down 11:30 to 14:40.

Location			Observation	Volume (ft^3)
Tunnel	Station	Roof Area		
1	1+95 to 2+00	Left 1/4 Arch	Area of potential loose rock - was scaled down	2
2	0+65	Left Crown	Potential loose rock - was scaled down	0.5
2	1+42	Left 1/4 Arch	Rockfall found on floor during inspection	0.2
2	1+42	Left 1/4 Arch	Potential loose rock - was scaled down	0.1
3	0+60	Right 1/4 Arch	Potential loose rock - was scaled down	0.5
3	0+90	Left 1/4 Arch	Potential loose rock - was scaled down	0.5
3	1+10	NA	Small rockfall on floor	0.1
3	1+35	Right 1/4 Arch	Potential loose rock - was scaled down	0.1
3	1+47	Right 1/4 Arch	Potential loose rock - was scaled down	2
3	1+85	Right 1/4 Arch	Potential loose rock - was scaled down	0
3	2+70	Right 1/4 Arch	Potential loose rock - was scaled down	0.5
			Tunnel 1 - Estimated Volume of Scaled Rock (ft3)	**2**
			Tunnel 2 - Estimated Volume of Scaled Rock (ft3)	**0.8**
			Tunnel 3 - Estimated Volume of Scaled Rock (ft3)	**3.7**
			Daily Sub-total Estimated Volume of Scaled Rock (ft3)	**6.5**

TDCS Tunnel Roof Sounding / Scaling Summary

Wednesday 24 February 2010

General Electric Hudson Falls Plant Site
Tunnel Drain Collection System - TDCS

Recorded by: J. F. Baltz, P.E.

General Summary: Began program of sounding TDCS tunnel roof to determine the presence of potentially loose rock and removing loose rock by scaling. Work was performed by GeoTrans personnel supervised by Geotechnical Engineer. One half day of work due to heavy snowfall that could impede emergency rescue team.

Location			Observation	Volume (ft^3)
Tunnel	Station	Roof Area		
2	2+65 to 2+25	Springline to springline	Small pieces throughout were scaled down from 09:00 to 10:00 - 40 feet per hour. Volume excludes high yield area at Station 2+00.	1
2	2+25 to 1+85L, 1+70R	Springline to springline	Small pieces throughout were scaled down from 10:50 to 11:50 - 47.5 feet per hour. Volume excludes high yield area at Station 2+00.	1
2	2+00	Right Crown	High yield area - large rock removed	3
			Tunnel 1 - Estimated Volume of Scaled Rock (ft3)	**5**
			Tunnel 2 - Estimated Volume of Scaled Rock (ft3)	**0**
			Tunnel 3 - Estimated Volume of Scaled Rock (ft3)	**0**
			Daily Sub-total Estimated Volume of Scaled Rock (ft3)	**5**

GeoTrans, Inc.

TDCS Tunnel Roof Sounding / Scaling Summary

Monday 1 March 2010

General Electric Hudson Falls Plant Site
Tunnel Drain Collection System - TDCS

Recorded by: J. F. Baltz, P.E.

General Summary: Continued sounding and scaling program of TDCS tunnel roof. Work performed by Alpine Construction personnel supervised by GeoTrans Geotechnical Engineer.

Location			Observation	Volume (ft^3)
Tunnel	Station	Roof Area		
2	1+85L, 1+70R to 0+15	Springline to Springline	Small pieces throughout were scaled down from 08:25 begin, to 12:05 end; 162 feet in 3.0 hours - 54 feet of tunnel covered per hour - excludes coffee breaktime. Volume excludes high yield areas noted individually below at Tunnel 2 stations 1+45, 1+15, 1+10 and 0+40.	3
2	1+45	Left 1/4 Arch	High yield area of loose rock removed	5
2	1+15 to 1+20	Right 1/4 Arch	High yield area of loose rock removed	3
2	1+10 to 1+15	Crown	High yield area, 5 ft by 5 ft, of loose rock removed	3
2	0+40	Left 1/4 Arch	High yield area of loose rock removed	3
1	0+35 to 1+70L, 1+50R	Sprinline to Springline	Small pieces throughout were scaled down from 13:30 began, to 15:15 end; 122.5 feet in 1.75 hours - 70 feet of tunnel covered per hour.	3
1	3+10 to 2+70R, 2+50L	Springline to Springline	Small pieces throughout were scaled down from 15:20 begin, to 16:25 end; 55 feet in 1 hour - 55 feet of tunnel covered per hour. Volume excludes high yield area noted individually below at Tunnel 1 station 2+55.	1
1	2+55 to 2+60	Left 1/4 Arch	High yield area of loose rock removed	5
			Tunnel 1 - Estimated Volume of Scaled Rock (ft3)	9
			Tunnel 2 - Estimated Volume of Scaled Rock (ft3)	17
			Tunnel 3 - Estimated Volume of Scaled Rock (ft3)	0
			Daily Sub-total Estimated Volume of Scaled Rock (ft3)	**26**

TDCS Tunnel Roof Sounding / Scaling Summary

Tuesday 2 March 2010

General Electric Hudson Falls Plant Site
Tunnel Drain Collection System - TDCS

Recorded by: J. F. Baltz, P.E.

General Summary: Continued sounding and scaling program of TDCS tunnel roof. Work performed by Alpine Construction personnel supervised by GeoTrans Geotechnical Engineer. Work interupted for PZ-202 installation work.

Location			Observation	Volume (ft^3)
Tunnel	Station	Roof Area		
1	1+50L to 2+10	Left 1/4 Arch	Small pieces throughout were scaled down from 08:40 begin, to 1005 end. Volume excludes high yield area at Tunnel 1 Station 2+10 noted below.	3
1	2+10 to 1+95	Left Crown	08:40 began, 1005 end; High yield area of loose rock removed.	5
			Tunnel 1 - Estimated Volume of Scaled Rock (ft3)	8
			Tunnel 2 - Estimated Volume of Scaled Rock (ft3)	0
			Tunnel 3 - Estimated Volume of Scaled Rock (ft3)	0
			Daily Sub-total Estimated Volume of Scaled Rock (ft3)	**8**

GeoTrans, Inc.

TDCS Tunnel Roof Sounding / Scaling Summary

Wednesday 3 March 2010

General Electric Hudson Falls Plant Site
Tunnel Drain Collection System - TDCS

Recorded by: J. F. Baltz, P.E.

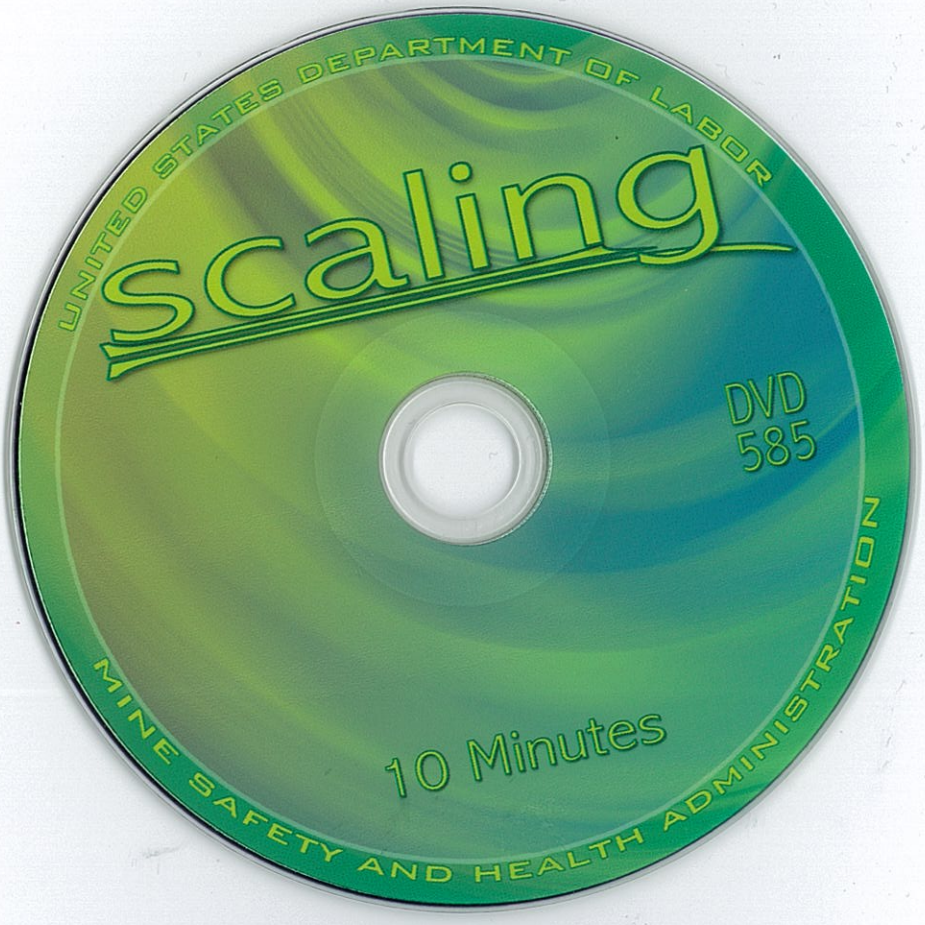
General Summary: Continued sounding and scaling program of TDCS tunnel roof. Work performed by Alpine Construction personnel supervised by GeoTrans Geotechnical Engineer. Work progress sporadic due to PZ-202 installation work.

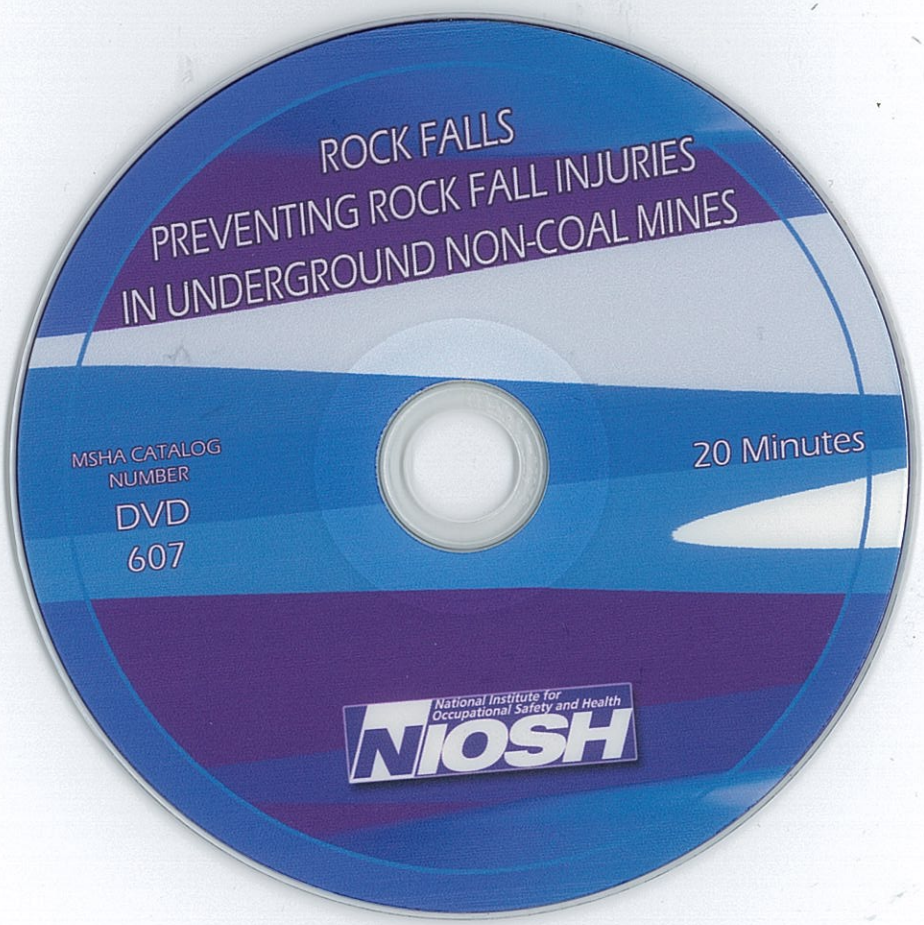
Location			Observation	Volume (ft^3)
Tunnel	Station	Roof Area		
1	2+10 to 2+60	Left 1/4 Arch and Crown	Small pieces throughout were scaled down at various times throughout the day.	2
1	1+50 to 2+70	Right 1/4 Arch and Crown	Small pieces throughout were scaled down at various times throughout the day.	2
			Tunnel 1 - Estimated Volume of Scaled Rock (ft3)	4
			Tunnel 2 - Estimated Volume of Scaled Rock (ft3)	0
			Tunnel 3 - Estimated Volume of Scaled Rock (ft3)	0
			Daily Sub-total Estimated Volume of Scaled Rock (ft3)	**4**

TDCS INSPECTION REPORT – SEPTEMBER 2010

ATTACHMENT 3

MSHA BEST PRACTICES GUIDELINES


UNITED STATES DEPARTMENT OF LABOR
Scaling
DVD
585
10 Minutes
MINE SAFETY AND HEALTH ADMINISTRATION


ROCK FALLS
PREVENTING ROCK FALL INJURIES
IN UNDERGROUND NON-COAL MINES
MSHA CATALOG
NUMBER
DVD
607
20 Minutes
National Institute for
Occupational Safety and Health
NIOSH

Roof Evaluation and Examination

MSHA 1026 (BP-26)

Many roof and rib accidents occur during roof testing and scaling. To safely conduct a roof evaluation and examination, these practices should be followed:

- ✓ Know your immediate roof (from the roof control plan).
- ✓ Be aware of geological features in the area.
- ✓ Constantly observe and test the roof for adverse conditions.
- ✓ Always make a visual examination of the area before testing or scaling the roof. If hazardous conditions are observed, testing is not required.
- ✓ Wear safety glasses when sounding the roof.
- ✓ Keep all lines of communication open with all coworkers regarding adverse roof and rib conditions.
- ✓ When a hazard is observed, eliminate the condition as soon as possible; do not depend on others.
- ✓ If the roof or ribs are hazardous, support them or remove the hazard by pulling down the hazardous material.
- ✓ Always stand under supported top when scaling and testing roof.

- ✓ Use proper equipment, such as a scaling bar of sufficient length, when scaling roof. **(Pry Up, Not Down!)**
- ✓ To prevent hand injuries while using a scaling bar, one method is to slip a piece of water hose about halfway onto the bar; it is deflected away from the hands.
- ✓ Communicate with the roof bolter operator about the condition of the roof he or she has been drilling so adverse roof can be identified.
- ✓ Frequently use test hole information for roof evaluation.

Arrive Home Alive

U.S. Department of Labor
Mine Safety and Health Administration
Visit our website at www.msha.gov

February 2009

Examination/Testing/ Scaling – Ground Control for Underground Gold Mines

Best Practice Series

BP-72

Ground fall accidents have claimed many lives and resulted in nonfatal injuries to many miners in underground U.S. gold mines.

Proper examination and testing are critical first steps in the prevention of injuries due to ground falls. These activities are necessary to identify hazardous ground so that affected areas can be taken down, properly supported, or dangered off.

When Examining and Testing, You Should:

- Never assume an area is safe.
- Always make a visual examination first.
- Always stay under stable ground.
- Include face areas and surrounding areas that may have been affected by blasting.
- Use sufficient lighting.
- Use elevated platforms or lifts, where necessary, in high back areas.
- Check test holes, if available, to detect fractures or separations in the ground.

When Scaling, You Should:

- Always stay under stable ground.
- Take precautions to protect yourself and others from scaled material.
- Make sure that you have secure footing.
- Use proper equipment - such as a scaling bar of sufficient length.
- Pry Up, Not Down!
- Work under a canopy if a mechanical scaler is used.
- Eliminate ground hazards as soon as possible.

If a Ground Hazard Cannot Be Corrected Immediately, You Should:

- Post a warning to prevent miners from entering the area.
- Install a barrier to impede entry if the area is to be left unattended.

Always communicate any concerns from examination, testing, or scaling to your supervisor and other miners.

Visit the MSHA home page at www.msha.gov

U.S. Department of Labor
Mine Safety and Health Administration

February 2002

TDCS INSPECTION REPORT – SEPTEMBER 2010

ATTACHMENT 4

TUNNEL ROOF SOUNDING / SCALING - DAILY FIELD LOG BLANK FORM

TUNNEL: ____ DATE:_____

TDCS Tunnel Roof Sounding / Scaling - DAILY FIELD LOG

General Electric Hudson Falls Plant Site
Tunnel Drain Collection System - TDCS

Recorded by: _____

General Summary: _____

_____

_____

Rocks on tunnel invert prior to scaling? **Number of drums (55 gal) removed during cleanup?**

Location			Time of Day	Observation: Note Rocks on Floor Prior to Scaling;	Volume
Tunnel	Station	Roof Area	(24 hours)	High Yield Areas; Loose Areas Painted; etc.	(ft^3)
	0+15				
	0+25				
	0+35				
	0+45				
	0+55				
	0+65				
	0+75				
	0+85				
	0+95				
	1+05				
	1+15				
	1+25				
	1+35				

TUNNEL: ____ DATE:_____

Location			Time of Day	Observation: Note Rocks on Floor Prior to Scaling;	Volume
Tunnel	Station	Roof Area	(24 hours)	High Yield Areas; Loose Areas Painted; etc.	(ft^3)
	1+45				
	1+55				
	1+65				
	1+75				
	1+85				
	1+95				
	2+05				
	2+15				
	2+25				
	2+35				
	2+45				
	2+55				
	2+65				
	2+75				
	2+85				
	2+95				
	3+05				
	3+15				

TDCS INSPECTION REPORT – SEPTEMBER 2010

END OF REPORT

TDCS Entry Report – September 2010

Attachment 7
Brierley Associates TDCS Shaft/Tunnel Inspection Report

TDCS Entry Report – September 2010

Attachment 8
Vertical Turbine Pump Maintenance Log and Lubrication Interval

BY JFB DATE 7-13-10 PROJECT GE HF TDCS VERTICAL TURBINE PUMPS SHEET NO. 1 OF _____

CHKD. BY _____ DATE _____ PROJ. NO. _____

MAINTENANCE LOG

ADD Col. BACKUP PUMP P-3 (ABS submersible)

DATE	RUN TIME HOURS VTP-1	VTP-2	COMMENT (ADD EMERICK NOTES)
11-19-09	0	0	TWO PUMPS COMMISSIONED & IN SERVICE (FACTORY GREASED)
2-23-10	1136.8	1161.3	TDCS ENTRY - FOR PUMP MAINTENANCE CHECK, TROUBLE SHOOT PUMP CONTROLLER TO ADD SWITCH TO LEVEL TRANSMITTERS - ONLY ONE TRANSDUCER OPERATING (#2) (Re-Wire # -NOT GREASED)
3-2-10	1201.0	1235.7	TDCS ENTRY - Re-wired Manual Primary/Secondary Transducer switch Transducer # 2 appears faulty Installed Two New Transducers
3-13-10	NR (ABS)	NR (ABS)	VTP-2 Drive tripped off on over temperature. and VTP-1 did not start, Backup pump - ABS on-line
3-15-10	NR (ABS)	NR (ABS)	VTP-1 Drive tripped off control circuit breaker (Internal) VTP-2 had been short cycling and caused Motor to thermal overload Alternating interval re-programmed to 1 hour (i.e. 1 hour on, 1 hour off)
3-22-10	NR (ABS)	NR (ABS)	VTP-2 Failed to start, Replaced Pump Smart Control Board in VFD 2. Motor still did not start normally, speed only 30 rpm & 25 amps. Switch Motor leads from VTP-1 to VTP-2 same response - concluded that VTP-2 Motor should be inspected.
3-26-10	1387.0	1424.0 (from 4-15-10 Emerick)	TDCS ENTRY TO INSPECT VTP-2 Drive Motor. MOTOR DOES NOT TURN (Pump shaft disconnected at coupling turns freely). Removed MOTOR. Transducer #2 grounding lead was found "loose" which may have caused faulty control response. GREASED VTP-1 DRIVE MOTOR (AS PRECAUTION) Tested VTP-1 Results OK VTP-1 programmed to run as single pump while VTP-2 Drive Motor is repaired/replaced.
4-1-10	NR	NR.	VTP-2 Drive Motor dissassembled, inspected, reassembled with new upper/lower bearings & regreased by Northeast Electric Motors. No obvious obstructions causing non-rotation - strap for Motor space heater wrap found broken & replaced.

BY JFB DATE 7-13-10 PROJECT GE HF TDCS SHEET NO. 2 OF _____

CHKD. BY _____ DATE _____ VERTICAL TURBINE PUMPS PROJ. NO. _____

MAINTENANCE LOG

DATE	RUN TIME HOURS VTP-1	VTP-2	COMMENT
4-15-10	1867 (EST'D 1387+ 480)	1424.0 ↓ Reset TO 0	TDCS ENTRY TO REPLACE NEWLY REBUILT VTP-2 DRIVE MOTOR. CONTROLLERS REPROGRAMMED TO ALTERNATE PUMPS EVERY 24 HOURS. TEST VTP-2 Results OK.
9-13-10	3598	1824	TDCS ENTRY FOR OM&M - GREASED VTP-1 and VTP-2

BY JFB DATE 7-12-10 PROJECT GE HF TDCS SHEET NO. 1 OF 3

CHKD. BY _____ DATE _____ VERTICAL TURBINE PUMP MAINTENANCE PROJ. NO. _____

CALCULATIONS

DETERMINE: DATE FOR NEXT TDCS ENTRY FOR VT PUMP MAINTENANCE BASED ON MANUFACTURERS RECOMMENDED LUBRICATION INTERVAL (Sheet 3 of 3)

BACKGROUND: PUMP MAINTENANCE INTERVAL IS BASED ON THE DRIVE MOTOR MANUFACTURER RECOMENDATIONS FOR MOTOR GREASE INTERVAL:

UPPER BEARING: 0.4 FL.OZ. } EVERY 3 MONTHS RUNTIME (VERTICAL MTD. MOTOR)
LOWER BEARING: 0.6 FL.OZ. }

USE: "NLGI GRADE 2" { POLYREX-EM BY MOBIL / SRI No.2 BY CHEVRON }

MAINTENANCE / GREASE HISTORY: THE TWO VERTICAL TURBINE PUMPS (VTP-1, VTP-2) WERE FIRST INSTALLED IN TDCS SUMP NOV 19, 2009. WITH ZERO ("0") RUN TIME HOURS. THE FIRST MAINTENANCE WAS ON FEB. 23, 2010 AT WHICH TIME THE MOTORS RUN TIMES WERE ABOUT 1100 HOURS WHICH IS ABOUT HALF-WAY TOWARDS THE 3 MONTH INTERVAL (2190 HRS IN 1/4 YEAR) PUMP VTP-2 BEGAN HAVING TROUBLE ON 13 MARCH AND ON 22 MARCH FAILED PUMP VTP-1 WAS REPROGRAMMED TO OPERATE AS SINGLE PUMP UNTIL VTP-2 WAS REPAIRED. ON 26 MARCH 2010, VTP-2 Drive Motor was found to be SEIZED AND WAS REMOVED FOR REPAIRS AND DRIVE MOTOR ON VTP-1 WAS GREASED AT 1387 HOURS (AS A PRECAUTION), VTP-2 DRIVE MOTOR WAS TAKEN APART & NEW BEARINGS INSTALLED ON 4-1-10. AND RE-INSTALLED ON PUMP ON 4-15-10 WITH ZERO HOURS SET ON RUN TIME COUNTER IN PUMP SMART. REFER TO ATTACHED TABLE OF PUMP MAINTENANCE. PUMPS VTP-1 AND VTP-2 WERE PROGRAMMED TO RUN CONTINUOUSLY FOR 24 HOURS ALTERNATELY. (i.e. ON 24 HOURS OFF 24 HOURS). MAX SPEED SET @ 3000 rpm.

NEXT MOTOR GREASE: WHEN EITHER VTP-1 OR VTP-2 ACCUMULATES 2190 HOURS OF RUNTIME. IF THERE ARE NO CHANGES TO THE CURRENT PUMP OPERATION (ALTERNATE 24 HR ON, 24 HR OFF) THEN VTP-1 WOULD REACH 2190 HOURS FIRST (NOTE: 2190 HRS = 1/4 YEAR = $\frac{365 d}{4} \times 24 \frac{HR}{d}$

VTP-1 LAST GREASE 3-26-10 @ 1387 HRS. + 2190 HR = 3577 HR TOT. RUN TIME
RUN TIME ON 4-15-10 1867 HRS.
DAYS FROM 4-15-10 TO REACH 3577 HRS. = 3577 - 1867 = 1710 HRS.
1710 ÷ 24 = 71.25 DAYS of RUNNING. X 2 = 142.5 CALENDAR DAYS
TARGET DATE TO GREASE VTP-1 4-15-10 + 142 DAYS = 9-4-10 SAT. of LABOR DAY WEEKEND. IF GREASE IS DONE ON 9-13-10 MON. THE RUNTIME HOURS WOULD BE 9 days ÷ 2 = 4.5 days Say 5 days x 24 = 120 HR
120/2190 = .05 = +5% OVER REC'D INTERVAL - OK SET DATE = 9/13-10
5% OVER IS NOT UNREASONABLE SINCE MOTOR SPEED IS BETWEEN 2700 & 3000 RPM IS < 3600 DESIGN MAX MOTOR SPEED.

CALCULATIONS

NEXT MOTOR GREASE: (CONT'D)

VTP-2 LAST GREASE 4-15-10 @ 0 HRS.
NEXT GREASE @ 2190 HRS
RUNTIME TILL NEXT GREASE 6 MONTHS APPROX.
TARGET DATE TO GREASE VTP-2: 4-15-10 + 6 Mos. = 10-15-10
which is one-month after VTP-1

SUMMARY & RECOMMENDATIONS

VTP-1 MOTOR WAS LAST GREASED 3-26-10 RAN 20 DAYS (480 HOURS) AND ON 4-15-10 ALTERNATED OFF 24 HR AND ON 24 HOURS. BASED ON THE ACCUMULATED RUN TIME ON 4-15-10 AND THE ALTERNATING OPERATION, VTP-1 IS ESTIMATED TO HAVE 2190 HOURS ON ABOUT 9-4-10. THE PUMP IS PROGRAMMED TO RUN AT SPEEDS BETWEEN 2700 & 3000 RPM, WHICH IS AT ABOUT 80% OF MAXIMUM DESIGN SPEED. THE LUBRICATION INTERVAL INCREASES AS PUMP SPEED DECREASES. THEREFORE IT IS REASONABLE TO ASSUME THAT IF PUMP SPEED IS LESS THAN 3600 RPM THEN THE LUBRICATION INTERVAL COULD BE INCREASED. THE NEXT DATE FOR RE-GREASING VTP-1 WILL BE EXTENDED 9 DAYS AFTER 9-4-10 TO 9-13-10. REFER TO ATTACHED MANUF. LUBRICATION TABLES.

VTP-2 MOTOR WAS LAST GREASED 4-15-10 AND HAS RUN ONT ALTERNATING DAYS. THE NEXT GREASE DATE FOR VTP-2 IS OCT 15, 2010.

RECOMMENDED REGREASING DATE FOR BOTH VTP-1 & VTP-2 IS 9-13-10.

B. Change of Lubricant

Motor must be disassembled as necessary to gain full access to bearing housing(s).

Remove all old grease from bearings and housings (including all grease fill and drain holes). Inspect and replace damaged bearings. Fill bearing housings both inboard and outboard of bearing approximately 30 percent full of new grease. Grease fill ports must be completely charged with new grease. Inject new grease into bearing between rolling elements to fill bearing. Remove excess grease extending beyond the edges of the bearing races and retainers.

Table 1
Recommended Grease Replenishment Quantities & Lubrication Intervals

Bearing Number		Grease Replenishment Quantity (Fl.Oz.)	Lubrication Interval		
62xx, 72xx	63xx, 73xx		1801 thru 3600 RPM	1201 thru 1800 RPM	1200 RPM and slower
03 thru 07	03 thru 06	0.2	1 Year	2 Years	2 Years
08 thru 12	07 thru 09	0.4	6 Months	1 Year	1 Year
13 thru 15	10 thru 11	0.6	6 Months	1 Year	1 Year
16 thru 20	12 thru 15	1.0	3 Months	6 Months	6 Months
21 thru 28	16 thru 20	1.8	3 Months	6 Months	6 Months

Refer to motor nameplate for bearings provided on a specific motor. For bearings not listed in Table 1, the amount of grease required may be calculated by the formula:

* NOTE: 6 MONTH LUBRICATION INTERVAL REDUCED TO 3 MONTHS DUE TO VERTICAL INSTALLED MOTOR.

$G = 0.11 \times D \times B$

Where: G = Quantity of grease in fluid ounces.
D = Outside diameter of bearing in inches.
B = Width of bearing in inches.

Table 2
Recommended Greases

Motor Frame Size	Motor Enclosure	Grease Manufacturer	Grease (NLGI Grade 2)
All Thru 447	All	Chevron USA, Inc. Exxon Mobil	Grease No. 83343 SRI No. 2 Polyrex-EM
449 and Up	Open Dripproof		
449 and Up	TEFC and Explosionproof	Exxon Mobil	Grease No. 974420 Mobilith SHC-100

The above greases are interchangeable with the grease provided in units supplied from the factory (unless stated otherwise on motor lubrication nameplate).

TDCS Entry Report – September 2010

Attachment 9
Emerick Associates Maintenance Inspection Report

1107 Loudon Road, Cohoes, NY 12047
Phone (518) 785-6692, Fax (518) 785-6944

Emerick Associates, Inc.

Preventative Maintenance/Inspection Checklist

Customer Geo-trans	Site Location Hudson Falls
Facility Identification TDCS sump	Contact Name Contact Phone # Fletcher Baltz 518-926-9251
PMI. Date Performed 9/13/10	Contact Name Contact Phone # Kevin Dodge 518-368-3457

Pump Manufacturer Goulds	Pump Model VIT-FFF	Pump Serial #1 565426-1
Type Turbine	Size 8RALC 3 stage	Pump Serial #2 565426-2

Motor Manufacturer US Motors	Motor Model 08698570-100	Motor Serial #1 P0986985700001M0002
Horsepower 15	Max R.P.M. 3520	Motor Serial #2 P0986985700001M0001

Pump Controller PS 200	Manufacturer Goulds / ABB	Drive Serial #1
Software Version 5.05	Configuration ACS 800 0016_5SR	Drive Serial #2

Pump(s) is secured to foundation – yes (bolts checked for tightness)
Motor is secured to foundation (pump) - yes (bolts checked for tightness)
Motor Bearings greased with approved grease – re-greased and relieved
Correct motor rotation verified - yes
Coupling or driveshaft aligned and serviced - yes
Is the mechanical seal set properly – yes
Is the mechanical seal leaking - no
Is the pump primed – yes, suction level adequate
Are the flush lines (seal chambers) bled/clear – yes, verified flow
Is there a suction gauge(pressure/level transmitter) – Yes, Level transmitter
Is there a discharge gauge (pressure/level transmitter) – Yes, gauge
How is the pump started – remotely via pumpsmart or Hand switch
Visual inspection of piping – adequate
Any excessive noise or vibration – nothing excessive
Backup Transducer Functioning – yes, tested
Backup Transducer switch and indication lights functioning – yes, tested

Pump Smart #1
Display ok – yes
Keypad/Controls ok - yes
Hours Run – 3597.56
Incoming Voltage – 487.8
Pump Running – yes
Amperage draw – 11.4
Torque – 68%
Power – 58%
Pump Speed – 2999 rpm
Pressure Reference – 52 in
Pressure Actual – 55.4 in
Flowmeter reading – 63 gpm
Faults/Warnings – cond #1 (see note)

Pump Smart #2
Display ok – yes
Keypad/Controls ok - yes
Hours Run – 1824.3
Incoming Voltage – 478.6
Pump Running – yes
Amperage draw – 11.3
Torque – 67.96%
Power – 57.8%
Pump Speed – 2999 rpm
Pressure Reference – 52 in
Pressure Actual – 53.79 in
Flowmeter reading – 66 gpm
Faults/Warnings – cond #1 (see note)

Observations –

1. Pump #1 running in hand, discharge gauge display 95 psi @ 3000 rpm
2. Pump #2 running in hand, discharge gauge display 95 psi @ 3000 rpm
3. Primary Transducer reading 54.3”, Backup transducer reading 52.9”
4. Re-set fault/error log

Notes –

Both drives logged cond #1 warning errors. This is a secondary control protection programming circuit to monitor pump amperage. Warning caused by low end setting of 7 amps too close to actual amp draw with pumps running at minimum speed. Drives re-programmed to low end setting of 6.7 amp to protect against low flow condition.

Pump #1 green run light indication not working, also hour meter appears stopped. Control transformer circuit breaker tripped in panel. Clinton controls worked with me via phone to eliminate possible problems in circuit. Actual breaker itself appears to be “weak”. Eventually accepted a re-set and now system running as designed and built. Kevin to monitor over remaining part of week to verify proper operation.

Flows, pressures, and power draw all appear hydraulically stable on pump curve

Technician Performing Inspection **Date(s)** 9/13/10

Thomas Pfeiffer

Emerick Associates
Phone (518) 785-6692
Fax (518) 785-6944
tpfeiffer@emerickassociates.com

TDCS Entry Report – September 2010

Attachment 10
Drainwell Summary

Hudson Falls Tunnel Drain Collection System						
Phase 3 Drain Wells and Piezometers						
Drain Well Hydraulic Testing Data Sheet						DRAIN WELL SUMMARY
		Tunnel 1	Tunnel 2	Tunnel 3	Total	
Date	Time	Flow	Flow	Flow	Flow	
mm-dd-yy	24 hour	(gpm)	(gpm)	(gpm)	(gpm)	Remarks
4/22/2009	15:05		0.0	0.0	0.0	Tunnel 2 Initial rdg, valves closed
4/22/2009	15:07		12.5	0.0	12.5	Flow from Tunnel 2 wells only
4/23/2009	10:52		8.8	27.9	36.7	Flow from Tunnel 2 and 3 wells
4/24/2009	14:33		6.7	18.0	24.7	
4/25/2009	13:33		7.7	17.2	24.9	
4/27/2009	11:22		8.7	17.5	26.2	
4/28/2009	9:09		8.7	17.2	25.9	
4/29/2009	14:31		9.1	17.7	26.9	
4/30/2009	15:13		8.6	17.2	25.8	
5/1/2009	14:31		7.6	17.2	24.8	
5/2/2009	10:22		8.7	17.0	25.7	
5/4/2009	9:29		8.4	17.0	25.4	
5/5/2009	7:45		8.6	16.9	25.5	
5/7/2009	10:48		0.0	0.0	0.0	
5/9/2009	8:32		0.0	0.0	0.0	
5/9/2009	14:50	7.36	1.3	33.7	42.4	Open All Drain Wells
5/11/2009	8:00	1.31	10.8	20.7	32.7	All Wells Open
5/12/2009	14:38	1.34	12.2	19.9	33.4	All Wells Open
5/14/2009	10:36	1.27	12.8	18.0	32.1	All Wells Open
7/30/2009	10:15	1.39	11.9	15.9	29.2	All Wells Open
11/2/2009	10:03	1.85	14.5	14.6	30.9	All Wells Open
2/23/2010	11:18	1.03	10.6	11.5	23.1	All Wells Open
9/16/2010	9:40	1.46	10.0	11.5	23.0	All Wells Open
AVE since 5/9/09		2.1	10.5	18.2	30.8	

GE-Hudson Falls-TDCS
Flow Rate Monitoring

Date 9/16/10
Data Collected by: Sam LaPoint + Gerard Colling

	Drainwell	Time	Pressure	Flow	DNAPL (N, Y, Qty?)	Flow on 11/2/09 (gpm)	Notes: Observations, Condition of piping, etc; DNAPL, VOC Samples Collected
✓	DW-101	1120	–	185mL	N	0.21	1min
X	DW-102	1115	–	81drips/min	N	0.01	1min No PCB Sample
✓	DW-103	1105	–	1150mL	N	0.5	1min
X	DW-104	1102	–	37drips/min	N	56 drips/min	1min No PCB sample
✓	DW-105	1055	–	5gal	Odor	1	5min
✓	DW-106	1050	–	425mL	N	0.13	1min
✓	DW-201	1043	–	125mL	N	0.08	1min
X	DW-202	–	–	–	–	NF	1min No PCB sample taken. DRY
✓	DW-203	1038	–	1050mL	N	0.58	1min
X	DW-204	1035	–	150mL	N	0.02	1min No PCB sample taken
✓	DW-205	1030	–	950mL	N	0.33	1min
✓	DW-206	1024	–	5gal	N	10	36s
✓	DW-207	1015	–	5gal	N	3.5	4min 40s
✓	DW-301	1009	–	5gal	N	3.5	1min 48s
✓	DW-302	1004	–	650mL	N	0.36	1min
✓	DW-303	1001	–	5gal	N	5	1min 18sec
✓	DW-304	0956	–	1550mL	N	0.48	1min
✓	DW-305	0952	–	5gal	N	2.5	2min 10sec
✓	DW-306	0943	–	5gal	N	2.5	2min 45sec
✓	DW-307	0940	–	550mL	N	0.24	1min
	PH-1					shut off	should be opened to allow overflow & DNAPL accumulation
	PH-2					NA	Converted to PZ-202 on 3-2-10

Total Flow:

Scan Field data sheet, save to network drive and input data to this form to be used for summary reporting

101 $\frac{185\ mL}{1\ min}$. 185 mL/min → 0.05 gpm

102 ~~0.01~~ → 81 drips/min

103 $\frac{1150\ mL}{min}$ → 0.3 gpm

104 37 drips/min

105 $\frac{5\ gal}{5\ min}$ = 1 gpm

106 $\frac{425\ mL}{1\ min}$ = 0.11 gpm

201 $\frac{125\ mL}{1\ min}$ = 0.03 gpm

202 NF

203 $\frac{1050\ mL}{1\ min}$ → 0.28 gpm

204 $\frac{150\ mL}{1\ min}$ = 0.04 gpm

205 $\frac{950\ mL}{1\ min}$ → 0.25 gpm

206 $\frac{5\ gal}{36\ sec.} * \frac{60\ sec}{1\ min}$ = 8.3 gpm

~~207~~ $\frac{5\ gal}{280\ sec.} * \frac{60\ sec}{min}$ = 1.1 gpm

301 $\frac{5\ gal}{108\ sec} * \frac{60\ sec}{1\ min}$ → 2.8 gpm.

302 $\frac{650\ mL}{1\ min}$ = 0.17 gpm

303 $\frac{5\ gal}{70\ sec} \cdot \frac{60\ sec}{1\ min}$ = 3.9 ~~gpm~~ 3.9 gpm

304 $\frac{1550\ mL}{1\ min}$ = 0.41 gpm

305 $\frac{5\ gal}{130\ sec} \cdot \frac{60\ sec}{min}$ = 2.3 gpm

306 $\frac{5\ gal}{165\ sec} \cdot \frac{60\ sec}{1\ min}$ = 1.8 gpm

307 $\frac{550\ mL}{1\ min}$ = 0.15 gpm

Calculations - 10.6.10
JFL

TDCS Entry Report – September 2010

Attachment 11
Drainwell Sample Chain of Custody

CHAIN OF CUSTODY RECORD

NORTHEAST ANALYTICAL, INC.

2190 Technology Drive, Schenectady, NY 12308
Telephone (518) 346-4592 Fax (518) 381-6055
www.nealab.com information @nealab.com

PAGE ___ OF <10090209P1>

LRF # 100902091

DISPOSAL REQUIREMENTS: (To be filled in by Client)
- ○ RETURN TO CLIENT
- ○ DISPOSAL BY NORTHEAST ANALYTICAL
- ○ ARCHIVAL BY NORTHEAST ANALYTICAL

Additional charges incurred for disposal (if hazardous) or archival. Call for details.

CLIENT (REPORTS TO BE SENT TO): GeoTrans
PROJECT MANAGER: Jay Bridge
PHONE: 518-695-3092
SAMPLED BY: (Please Print) S. LaPoint, G. Colling
SAMPLING FIRM: GeoTrans
PROJECT#/PROJECT NAME: TDCS
PROJECT LOCATION (CITY/STATE) ADDRESS: GE HF
REQUIRED TURN AROUND TIME: Normal
NAME OF COURIER (IF USED): NEA
Data Report: ☐ CLP* ☐ Certificates Only
ELECTRONIC RESULTS FORMAT: .PDF ☐ EXCEL (.CSV) ☐
E-MAIL ADDRESS:
FAXED RESULTS ☐
FAX #:

ENTER ANALYSIS AND METHOD NUMBER REQUESTED

PRESERVATIVE KEY: 0 - NONE; 1 - HCL; 2 - HNO3; 3 - H2SO4; 4 - NaOH; 5 - Zn. Acetate; 6 - MeOH; 7 - NaHSO4; 8 - Other ___

SAMPLE ID	DATE	TIME	MATRIX	GRAB/ COMP	LAB SAMPLE ID (NEA USE ONLY)	PRESERVATIVE CODE	BOTTLE TYPE	BOTTLE SIZE	NUMBER OF CONTAINERS	PCB 8082	VOC 8260	REMARKS:
DW-101	9.16.10	1120	W	G	AN13920	0	G	1L	3	1	2	
DW-102		1115			AN13921	0	G	1L	3	1	2	
DW-103		1105			AN13922	0	G	1L	3	1	2	
DW-104		1102			AN13923	0	G	1L	3	1	2	
DW-105		1055			AN13924	0	G	1L	3	1	2	
DW-106		1050			AN13925	0	G	1L	3	1	2	
DW-201		1043			AN13926	0	G	1L	3	1	2	
DW-203		1038			AN13927	0	G	1L	3	1	2	
DW-204		1035			AN13928	0	G	1L	3	1	2	
DW-205		1030			AN13929	0	G	1L	3	1	2	

AMBIENT OR CHILLED: TEMP: 4.2, 5.4
RECEIVED BROKEN OR LEAKING: Y (N)
COC TAPE: Y (N)
COC DISCREPANCIES: Y (N)
PROPERLY PRESERVED: (Y) N
RECVD W/I HOLDING TIMES: (Y) N
OTHER NOTES:

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
SIGNATURE: [signature]	SIGNATURE: [signature]	SIGNATURE: [signature]	SIGNATURE: [signature]	SIGNATURE	SIGNATURE
PRINTED NAME: Sam LaPoint	PRINTED NAME: Mike Carraway	PRINTED NAME: M. Carraway	PRINTED NAME: A. MOORE	PRINTED NAME	PRINTED NAME
COMPANY: GeoTrans	COMPANY: NEA	COMPANY: NEA	COMPANY: NEA	COMPANY	COMPANY
DATE/TIME: 9/17/10 0730	DATE/TIME: 9/17/10 1233	DATE/TIME: 9/17/10 1410	DATE/TIME: 9/17/10 1410	DATE/TIME	DATE/TIME

CLP LIKE DATA PACKAGE ADDITIONAL COST

CHAIN OF CUSTODY RECORD

PAGE _____ OF _____

NORTHEAST ANALYTICAL, INC.
2190 Technology Drive, Schenectady, NY 12308
Telephone (518) 346-4592 Fax (518) 381-6055
www.nealab.com information @nealab.com

LRF # <10090209P2> 100902092

DISPOSAL REQUIREMENTS: (To be filled in by Client)
- ○ RETURN TO CLIENT
- ○ DISPOSAL BY NORTHEAST ANALYTICAL
- ○ ARCHIVAL BY NORTHEAST ANALYTICAL

Additional charges incurred for disposal (if hazardous) or archival. Call for details.

CLIENT (REPORTS TO BE SENT TO): GeoTrans	PROJECT#/PROJECT NAME: TDCS
PROJECT MANAGER: Jay Bridge	LOCATION (CITY/STATE) ADDRESS: GE HF
PHONE: 518 695-3092	
SAMPLED BY: (Please Print) S. LaPoint, G. Colling	REQUIRED TURN AROUND TIME: Normal
SAMPLING FIRM: GeoTrans	NAME OF COURIER (IF USED): NEA

RESULTS TO BE E-MAILED ☐ E-MAIL ADDRESS:
RESULTS TO BE FAXED ☐ FAX #:

ENTER ANALYSIS AND METHOD NUMBER REQUESTED

SAMPLE ID	DATE	TIME	MATRIX	GRAB/ COMP	LAB SAMPLE ID (NEA USE ONLY)	NUMBER OF CONTAINERS	PCB8082	VOC-8260						REMARKS:
PRESERVATIVE CODE							0	1						
BOTTLE TYPE:							G	G						
BOTTLE SIZE:							1L	40mL						
DW-206	9.16.10	1024	W	G	AN13930	3	1	2						
DW-207		1015			AN13931	3	1	2						
DW-301		1009			AN13932	3	1	2						
DW-302		1004			AN13933	3	1	2						
DW-303		1004			AN13934	3	1	2						
DW-304		0956			AN13935	3	1	2						
DW-305		0952			AN13936	3	1	2						
DW-306		0943			AN13937	3	1	2						
DW-307		0940			AN13938	3	1	2						
TB091610		0700			AN13939	4								

PRESERVATIVE KEY: 0 - NONE; 1 - HCL; 2 - HNO3; 3 - H2SO4; 4 - NaOH; 5 - Zn. Acetate; 6 - MeOH; 7 - NaHSO4; 8 - Other _____

AMBIENT OR CHILLED: TEMP: 4.2, 5.4
RECEIVED BROKEN OR LEAKING: Y (N)
COC TAPE: Y (N)
COC DISCREPANCIES: Y (N)
PROPERLY PRESERVED: (Y) N
RECVD W/I HOLDING TIMES: (Y) N
OTHER NOTES:

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
SIGNATURE Sam LaPoint	SIGNATURE Milin Carraway	SIGNATURE M. Carraway	SIGNATURE A. Moore	SIGNATURE	SIGNATURE
PRINTED NAME Sam LaPoint	PRINTED NAME Milin Carraway	PRINTED NAME M. Carraway	PRINTED NAME A. MOORE	PRINTED NAME	PRINTED NAME
COMPANY GeoTrans Inc	COMPANY NEA	COMPANY NEA	COMPANY NEA	COMPANY	COMPANY
DATE/TIME 9/17/10 0730	DATE/TIME 9/17/10 1233	DATE/TIME 9/17/10 1410	DATE/TIME 9/17/10 1410	DATE/TIME	DATE/TIME

TDCS Entry Report – September 2010

Attachment 12
Piezometer Field Data 9-15-10

JFBALTZ - 9-15-10

FIELD DATA/NOTES

Most Recent Piezometer Readings and Temperature

	A	B	C	
PZ- 201	7484.941	7672.851	7851.932	
9/13@ 08:00	8.208008	7.008789	8.724152	
9/15/10 @ 0925	7486 ✓	7673 ✓	7852 ✓	← TYP. MANUAL READINGS AT MUX-1 USING GK-404
PZ- 301	8036.885	8790.65	8314.077	PZ-201 ↓ HF-303 PZ-202 } ALL LOOK GOOD
9/13@ 08:00	11.2533	11.0589	11.71158	
9/15/10@0925	8059 ✓	8813 ✓	8313 ✓	
PZ- 302	7350.958	7851.07	8605.856	
9/13@ 08:00	11.50269	11.00327	12.76031	
9/15/10@ 0925	7359 ✓	7856 ✓	8610 ✓	
PZ- 303	7984.311	8415.929	7947.06	
9/13@ 08:00	11.09032	10.40939	10.43851	
9/15/10 @ 0925	8017 ✓	8451 ✓	7951 ✓	
PZ- 304	6579.774	7928.279	8829.954	
9/13@ 08:00	11.00702	11.1378	15.8192	
9/15/10 @ 0925	6594 ✓	7943 ✓	8830 ✓	
HF- 303	5653.371			
9/13@ 08:00	11.87671			
9/15/10 @0925	5653 ✓			
PZ- 202	7721.658	7722.003	7721.99	
7/17@03:00	10.09735	10.0975	10.09729	
9/13 @ 08:00	10412.19	10414.73	10410.64	← RECENT READING FROM DATA LOGGER
	-44.7894	-44.7989	-44.8705	
9/15/10@0925	7816 ✓	7963 ✓	8068 ✓	← MANUAL READING @ MUX-2 USING GK-404 LOOKS GOOD COMPARED TO NORMAL VALUES ON 7/17/10

- REPLACE MUX & READINGS WITH GK-403 & CABLES LOOK GOOD (i.e. NO NEG. TEMP. & DIGITS CLOSER TO 8000 NOT 10,000 !)
- THESE RESULTS INDICATE MUX WAS CAUSING INVALID DATA
- READINGS USING GK-403 & CABLE ARE SIMILAR TO 9/13/10 @ 0800
- TRY REPLACING MUX

TDCS Entry Report – September 2010

Attachment 13
Electrical Inspection

From:	John Conley
To:	Baltz, Fletcher
Cc:	"John Conley"
Subject:	Hudson Falls - Utility Tunnel / Hour Electric Assessment
Date:	Wednesday, October 20, 2010 2:23:28 PM
Attachments:	Hour Electric - Electrical System Assessment.pdf

---

Fletcher,

See the attached from Hour Electric. Though short and sweet, he does note the deterioration of the outside of the cabinets. As you know we have worked in the electrical cabinets over the past year and can confirm the following in addition to Hours observations:

1. Water was observed inside various distribution panels in the “bell out” area when opened to connect and disconnect pumps last year.
2. One of the spare 480 volt circuit breaker that was used to feed the backup pump last summer failed and had to be replaced. This maybe symptomatic of other problems lurking if the system was to put back into heavy use.
3. The outlets around the main shaft all have some corrosion and are susceptible to ground fault trips.
4. Transformers and distribution panels further up the tunnels appear to be in much better condition than at the main shaft and probably would not warrant replacement at this time.

Also, we should keep the main disconnect at electrical shed in the back of our mind. There are several connections that tie all the circuits together inside the main disconnect. The connections all appeared in good condition when they were inspected last fall (fall 09), but it was not an orderly installation. You should probably have an electrician inspect periodically and consider an upgrade if the installation was to remain for an extended period.

With respect to the utility tunnel, the steel fabrication is complete. We are just finishing up a small job in Vermont and would like to start the utility tunnel around the second week of November. Let me know if this is acceptable.

Please let me know if I can be of further assistance.

John Conley, PE
Alpine Construction, LLC
Ph 518-695-6739
Fx 518-695-6824
Cl 518-312-6511
jconley@alpineconstruction..biz

30 East Street
P. O. Box 325
Fort Edward, N. Y. 12828-0325
Telephone (518) 747-4144
Fax (518) 747-2725
email: hourelec@capital.net

Hour Electric Co., Inc.

September 16, 2010

Alpine Construction
10 Broad Street
Schuylerville, N. Y. 12871
Attn: John Conley

Re: Review of Electrical Distribution System in Tunnel at Hudson Falls Site

Dear John,

The Main Distribution is located at the bottom of the Main Street, and consists of:

a) (1) 200A, 480V, 3P Panel Board
b) (1) 30Kva, 480 208/120V Transformer
c) (1) 150A, 208/120V Panel Board

These components are all rated Nema 3R. The Transformer is rated for outside use.

There is constant water dripping on and around these components. The high humidity and constant dampness has already deteriorated the outside of the cabinets (less than 2 yrs old). Typically, if there is moisture on the outside the buss will become contaminated overtime.

Solution:

Pre-build a insulated building above ground, with all the components inside, and lower it down the shaft to replace the existing installation; properly coordinated, this could be accomplished in one day. I recommend the installation of a Dehumidifier and Heater.

Sincerely,

Peter Caldwell/ Field Representative
Cc; Simeon Hunsdon/ President
Cc; file

TDCS Entry Report – September 2010

Attachment 14
Geokon Equipment Wipe Test Report

CHAIN OF CUSTODY RECORD

NORTHEAST ANALYTICAL, INC.

2190 Technology Drive, Schenectady, NY 12308
Telephone (518) 346-4592 Fax (518) 381-6055
www.nealab.com information @nealab.com

PAGE _ OF _

<10100094P1>

LRF # 101000941

DISPOSAL REQUIREMENTS: (To be filled in by Client)

- ○ RETURN TO CLIENT
- ○ DISPOSAL BY NORTHEAST ANALYTICAL
- ○ ARCHIVAL BY NORTHEAST ANALYTICAL

Additional charges incurred for disposal (if hazardous) or archival. Call for details.

CLIENT (REPORTS TO BE SENT TO): GeoTrans	PROJECT#/PROJECT NAME: GEHF - TOCS
PROJECT MANAGER: Chris Tallon	PROJECT LOCATION (CITY/STATE) ADDRESS: 1 John St Hf NY 12839
PHONE: 695-3092	
SAMPLED BY: (Please Print) C. Tallon	REQUIRED TURN AROUND TIME: Standard
SAMPLING FIRM: GeoTrans	NAME OF COURIER (IF USED): NEA
	Data Report: ☐ CLP* ☐ Certificates Only
ELECTRONIC RESULTS FORMAT: .PDF ☐ EXCEL (.CSV) ☐	E-MAIL ADDRESS:
FAXED RESULTS ☐	FAX #:

ENTER ANALYSIS AND METHOD NUMBER REQUESTED

PRESERVATIVE KEY: 0 - NONE; 1 - HCL; 2 - HNO3; 3 - H2SO4; 4 - NaOH; 5 - Zn. Acetate; 6 - MeOH; 7 - NaHSO4; 8 - Other

SAMPLE ID	DATE	TIME	MATRIX	GRAB/ COMP	LAB SAMPLE ID (NEA USE ONLY)	NUMBER OF CONTAINERS	PCB 8082	REMARKS:
0832-WIPE	10/8/10	845	WIPE	g	AN16357		✓	SN # 0832 -16 - 15X
GK-403-WIPE	10/8/10	850	WIPE	g	AN16358		✓	Model GK-403

PRESERVATIVE CODE:
BOTTLE TYPE:
BOTTLE SIZE:

AMBIENT OR CHILLED: TEMP: 16.0°C
RECEIVED BROKEN OR LEAKING: Y (N)
COC TAPE: Y (N)
COC DISCREPANCIES: (Y) N
PROPERLY PRESERVED: (Y) N
RECVD W/I HOLDING TIMES: (Y) N
OTHER NOTES:

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
SIGNATURE: C Tallon	SIGNATURE:	SIGNATURE:	SIGNATURE: A Moore	SIGNATURE:	SIGNATURE:
PRINTED NAME: Chris Tallon	PRINTED NAME: M. RANUCCI	PRINTED NAME: M. RANUCCI	PRINTED NAME: A. MOORE	PRINTED NAME:	PRINTED NAME:
COMPANY:	COMPANY: NEA	COMPANY: NEA	COMPANY: NEA	COMPANY:	COMPANY:
DATE/TIME:	DATE/TIME: 10-8-10 1640	DATE/TIME: 10-8-10 1800	DATE/TIME: 10-8-10 1800	DATE/TIME:	DATE/TIME:

* CLP LIKE DATA PACKAGE ADDITIONAL COST

TEMP 16 °C

CERTIFICATE OF ANALYSIS
10/15/2010
GEOTRANS, INC.
12 SPRING ST, SUITE 102
SCHUYLERVILLE, NY 12871
CONTACT: JAY BRIDGE

CUSTOMER ID: 0832-WIPE **NEA ID:** AN16357 **NEA LRF:** 10100094-01
MATRIX: WIPE **DATE SAMPLED:** 10/08/2010 **TIME:** 08:45
DATE RECEIVED: 10/08/2010 **TIME:** 18:00 **PROJECT:** GE HF -TDCS
SAMPLED BY: C. TALLON **LOCATION:** HUDSON FALLS, NY
CUSTOMER PO: N/A **LAB ELAP#:** 11078

PARAMETER PERFORMED	RESULTS	RL	UNITS	DATE ANALYZED	FLAGS
SW-846 8082 (PCB)					
Aroclor 1016	ND	0.500	ug/Wipe	10/13/2010	U
Aroclor 1221	ND	0.500	ug/Wipe	10/13/2010	U
Aroclor 1232	ND	0.500	ug/Wipe	10/13/2010	U
Aroclor 1242	ND	0.500	ug/Wipe	10/13/2010	U
Aroclor 1248	ND	0.500	ug/Wipe	10/13/2010	U
Aroclor 1254	ND	0.500	ug/Wipe	10/13/2010	U
Aroclor 1260	ND	0.500	ug/Wipe	10/13/2010	U
Total PCB's	ND				U

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the RL.
RL: Denotes the reporting limit for the sample.

AUTHORIZED SIGNATURE:

William A. Kotas
Sr. Laboratory Representative
Robert E. Wagner
Laboratory Director

2190 Technology Drive Schenectady, NY 12308 Phone 518.346.4592 Fax 518.381.6055 Email : information@nealab.com

CERTIFICATE OF ANALYSIS
10/15/2010
GEOTRANS, INC.
12 SPRING ST, SUITE 102
SCHUYLERVILLE, NY 12871
CONTACT: JAY BRIDGE

CUSTOMER ID: GK-403-WIPE **NEA ID:** AN16358 **NEA LRF:** 10100094-02
MATRIX: WIPE **DATE SAMPLED:** 10/08/2010 **TIME:** 08:50
DATE RECEIVED: 10/08/2010 **TIME:** 18:00 **PROJECT:** GE HF -TDCS
SAMPLED BY: C. TALLON **LOCATION:** HUDSON FALLS, NY
CUSTOMER PO: N/A **LAB ELAP#:** 11078

PARAMETER PERFORMED	RESULTS	RL	UNITS	DATE ANALYZED	FLAGS
SW-846 8082 (PCB)					
Aroclor 1016	ND	0.500	ug/Wipe	10/13/2010	U
Aroclor 1221	ND	0.500	ug/Wipe	10/13/2010	U
Aroclor 1232	ND	0.500	ug/Wipe	10/13/2010	U
Aroclor 1242	ND	0.500	ug/Wipe	10/13/2010	U
Aroclor 1248	ND	0.500	ug/Wipe	10/13/2010	U
Aroclor 1254	ND	0.500	ug/Wipe	10/13/2010	U
Aroclor 1260	ND	0.500	ug/Wipe	10/13/2010	U
Total PCB's	ND				U

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the RL.
RL: Denotes the reporting limit for the sample.

AUTHORIZED SIGNATURE:

William A. Kotas
Sr. Laboratory Representative
Robert E. Wagner
Laboratory Director

2190 Technology Drive Schenectady, NY 12308 Phone 518.346.4592 Fax 518.381.6055 Email : information@nealab.com

TDCS Entry Report – September 2010

Attachment 15
Glens Falls Fire Department Confined Space Rescue Drill Report

CITY OF GLENS FALLS FIRE DEPARTMENT

JAMES P. SCHRAMMEL
Fire Chief

134 Ridge Street
Glens Falls, NY 12801
518-761-3822
Fax: 518-761-3824
firechief@cityofglensfalls.com
www.cityofglensfalls.com

Glens Falls Fire Department - After Action Report

Location: 25 Allen Street, Hudson Falls, NY 12839; GE Hudson Falls, Recovery Tunnel

Date: September 17, 2010

Time: 0900

Participants: General Electric, GeoTrans, Alpine Construction and Glens Falls Fire Department

Drill Scenario

On September 17, 2010 at about 0905 hours, the attendant at the top of the recovery tunnel received a report of a male worker who was struck in the head by a falling rock. The report was that the male was unconscious and bleeding from the head. A call was made activating Glens Falls Fire Department's Confined Space Rescue Team. The call was received by the Glens Falls Fire Department at 0907 hours. Drill begins….

Response

The Glens Falls Fire Department responded from their station at 134 Ridge Street Glens Falls, NY 12801 approximately 4.4 miles from the Hudson Falls site. The response consisted of a fully equipped confined space rescue trailer towed by a response vehicle with five men and an additional response vehicle with three men. The vehicles responded to the drill location in non-emergency mode. The response time was 13 minutes from the initial call at 0907 to the arrival of rescue units at 0920.

Important Benchmarks (times)

0907 Call made from incident location

0908 Dispatched from Fire Station

0920 Rescue units arrive on scene

0923 Rescue units start deploying equipment

0938 Entry team ready

0947 Entry team at bottom of shaft

0955 Rescuer at victim's side

1002 Patient packaged and being moved to the shaft

1007 Patient on his way up in the crane basket

1009 Patient out of space at decontamination area

Summary

The rescue team response from the Fire station to the drill location was 13 minutes. The response was made observing all traffic regulations without the use of emergency lights and sirens.

On arrival, Assistant Chief Girard started size-up and held informational/safety meetings with personnel from GE, GeoTrans and Alpine Construction. Permits, Air monitoring, lockout Tag-out, entry conditions and other safety concerns were reviewed. During this time the rescue team staged equipment, placed the hardwire communications system in service, readied air monitoring and rescue equipment and prepared rescuers for entry.

Assistant Chief Girard held a pre-entry rescue meeting with the team, and entry was made into the space 39 minutes after the initial call. The patient was reached and started receiving care by rescuers within 10 minutes of entry. The patient was treated, packaged and removed from the space at 1009. This was 14 minutes after initial patient contact and less than an hour from the initial call.

Decontamination of the patient was simulated. We reviewed the procedures associated with repackaging the patient during the decontamination process so they could be turned over to Fort Edward Ambulance for transport to Glens Falls Hospital.

Areas in Need of Improvement

The hard wire communication system should be operated from outside the fenced enclosure. This will ensure that the communication officer is operating from a safe location and that the Incident Commander and Operations Officer have easy access to the system when necessary. This also eliminates the need to use safety lines while operating the system.

Safety lines shall be used when inside the fenced in area at the top of the shaft. These lines shall be secured to the plates attached to the concrete slab around the perimeter of the enclosure. The attachments to the plate shall be made with a locking carabiner or device. The rebar welded to the top of the fencing shall not be used as an attachment point for safety lines.

Conclusion

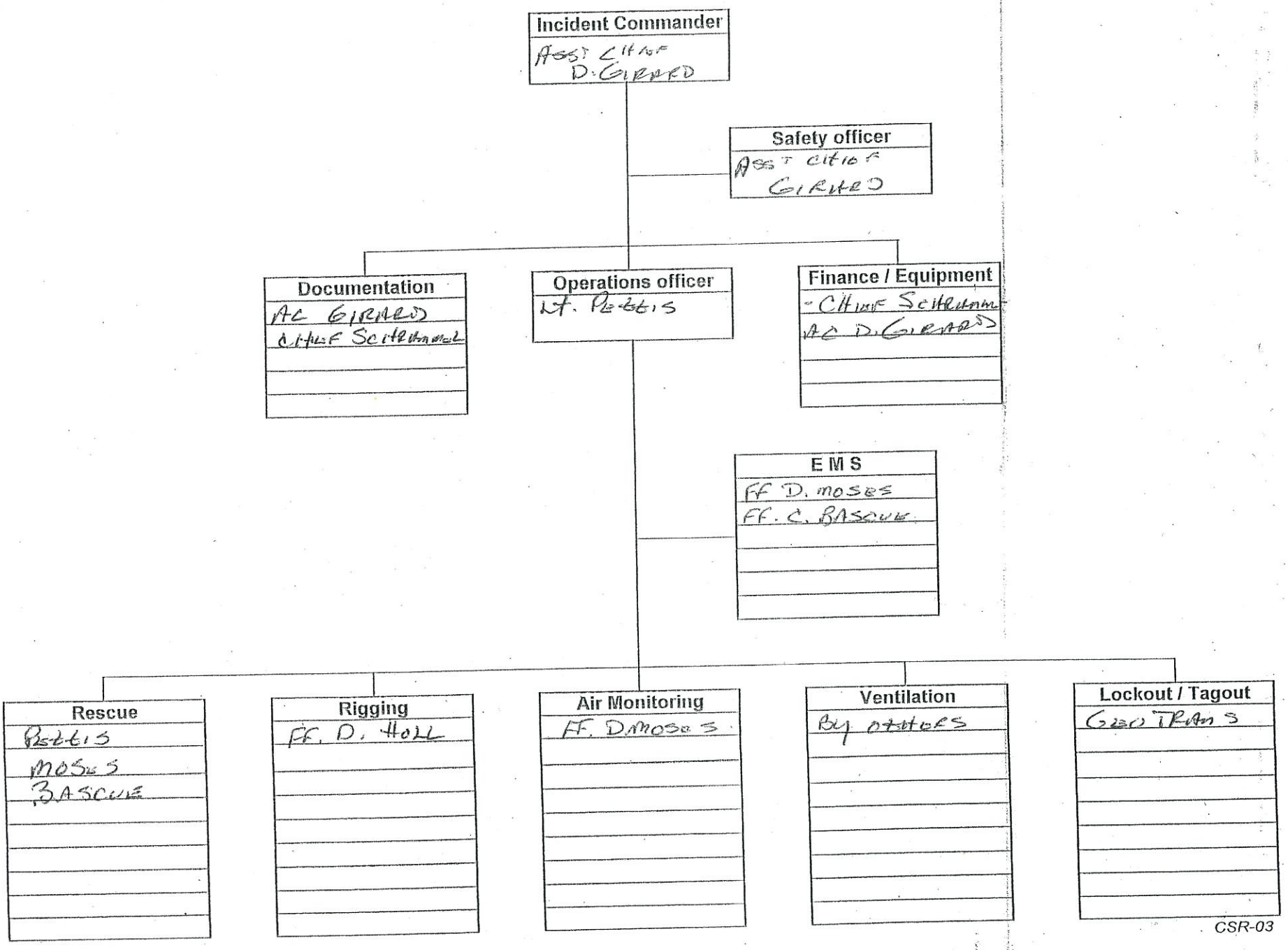
The drill was successful with exceptionally few issues. The working relationship between all parties was very professional.

All aspects of Lockout Tag-out (OSHA 1910.147) and Confined Space (OSHA 1910.146) were covered making it an extremely safe operation. The drill gave another group of rescuers access to the tunnel. This creates familiarity and confidence if they are required to perform a rescue from within the space in the future.

Enclosures

1. Glens Falls Fire Department Incident Command Log
2. Glens Falls Fire Department Confined space Time Log
3. Glens Falls Fire Department Confined Space Entry Permit
4. Glens Falls Fire Department Preplan Information Form
5. Glens Falls Fire Department Preplan Sketch Form
6. Glens Falls Fire Department Confined Space Rescue Checklist
7. Glens Falls Fire Department Entrant accountability Log

GLENS FALLS FIRE DEPARTMENT
CONFINED SPACE INCIDENT COMMAND LOG



GLENS FALLS FIRE DEPARTMENT
CONFINED SPACE TIME LOG

Incident location: GF

Date: 09-17-10 Time of call: 0908 Time on scene: 0920 Time of completion: _____

Log time frame From: 0907 hrs. To: _____ hrs. Log page #: 1

Time (hrs.)	Event / Description
0907	CALL RECEIVED @ FIREHOUSE / MALE UNCONSCIOUS HIT BY ROCK HEAD INJURY BLEEDING
0908	DISPATCHED FROM FIRE HOUSE
0920	CAR 200 ON SCENE
0921	UTILITY 100 ON SCENE
0923	DEPLOYING EQUIPMENT
0929	PRE-ENTRY PAPERWORK / ASSESSMENT / METERS COMPLETE
0938	ENTRY TEAM ASSIGN
0940	CABLE CON-SPACE IN SPACE & READY FOR USE
0944	PRE-ENTRY / RESCUE METERS COMPLETE
0946	TEAM ENTERS TOP OF SHAFT TO CROSS OVER
0947	TEAM AT BOTTOM OF SHAFT
0949	COMMUNICATIONS CHECK CONNECTED RADIO & HANDLINE FROM SHAFT
0951	RESCUERS ON WAY TO PATIENT & ONE RESCUER IN POSS 2 "Y" OF TUNNEL
8:00	TEAM AT BOTTOM OF SHAFT PRIMARY METERS OK O2 @ 20.2
0953	COMUNICATIONS IN PLACE (CON-SPACE) TO PATIENT LOCATION
0955	295' FROM PATIENT FOUND 40' BEHIND ON RIGHT SIDE TUNNEL PT. UNCONSCIOUS
0956	TEAM RESCUERS ON THE WAY TO PATIENTS LOCATION PROCESSING SMALL
0957	RESCUERS AT PATIENT STARTING PACKAGING (BOARDING, COLLAR, STRAPS)
0958	O_2 22.0 0.0 0.0 0.0
1001	O_2 22.0 " " "
1002	PT. IN STOKES FULLY PACKAGED ON WAY TO SHAFT
10 05	PT. & RESCUERS AT POSITION #2 "Y" OF SHAFT
5 MIN	O_2 22.00 0.0 0.0 0.0
10 06	AT BOTTOM OF SHAFT CAMMING SHAFT
10 07	ON WAY UP THRU SHAFT MOSES, BASKET & PATIENT
10 09	BASKET OUT OF SHAFT
10 09	BASKET ON GROUND @ DECON ENTRY POINT
10 10	PT. DECON STARTED
10 12	

CSR-05

PT. UNCONSCIOUS SMALL LACERATION TO FOREHEAD BLEEDING CONTROLLED GOOD PULSES NO EXTREMITIES

CONFINED SPACE ENTRY PERMIT

GENERAL ENTRY PERMIT INFORMATION

Space Location / I.D. : GE HF TDCE 25 Allen St. Hfrm

Permit Issued Date : 9/17 Time : 0815 Permit Expiration Date : _____ Time : _____

Work To Be Performed In Space : Rescue - Injured worker

Supervisor Chris Tallon. - Assistant Guy - Honkie

Company Working in Space (ie. Sub-Contractor) : GLO Trans

SPACE HAZARDS ASSESSMENT

Hazard	Check	Hazard	Check	Chemical hazards	Monitoring dev.
Oxygen less than 19.5%	✓	Entrapment	✓		yes no
Oxygen more than 23.5%	NA	Mechanical	✓		yes no
Explosive gasses/vapors	—	Electrical	✓		yes no
Explosive dust	NA	Heat stress			yes no
Toxic gases/vapors	~	Noise			yes no
Engulfment	✓	Fall/slippery surfaces	✓		yes no

PERSONAL PROTECTIVE EQUIPMENT REQUIRED

(CIRCLE)

Hard Hat / Gloves / Safety Glasses / Goggles / Face Shield / Ear Protection / SCBA / Respirator / Chemical Suit /

Other _____

OTHER SAFETY EQUIPMENT REQUIRED

(CIRCLE)

Harness / Lifeline / Tripod / Gas Metering Device / Flashlight / Radio / Fans / First Aid Kit / Ladders

Other _____

COMMUNICATION SYSTEM TO BE USED (To Maintain Contact Between Attendant And Entrant)

(CIRCLE)

Verbal / Radio / Hardwire Communications / Rope Signals / Hand Signals

Other _____

PRE- ENTRY AND LOCKOUT TAGOUT CHECK OFF LIST

	YES	NO	N/A	SIGNATURE
Isolation Complet Lockout of all Electrical & Mechanical, Blank/Blinding, Double Block & Bleed, or Other	✓			D/S w chris Tallon.
Contents Removed, Purged, Flushed			✓	
Inerting	✓			
Continuous Ventilation in Use	✓			
Rescue Equipment Available	✓			
Pre-entry Meeting Held - Supervisor, Maintenance, Contractor	✓			
Familiarize Attendant with emergency procedures	✓			

PROCEDURES FOR ACTIVATING EMERGENCY RESCUE

1. **DIAL 911**
2. *WHEN DISPATCHER IS REACHED CONVEY THE FOLLOWING INFORMATION :*
   - *A. THAT YOU ARE IN NEED OF A CONFINED SPACE RESCUE.*
   - *B. LOCATION OF THE RESCUE INCLUDING THE SPACE DESIGNATION (NUMBER).*
   - *C. NUMBER OF VICTIMS AND THEIR CONDITION IF KNOWN.*
   - *D. ANY OTHER INFORMATION THAT YOU BELIEVE MAY BE IMPORTANT TO RESPONDING RESCUERS.*

GLENS FALLS FIRE DEPARTMENT
PREPLAN INFORMATION FORM

GENERAL PREPLAN INFORMATION

Location: GFD TEAMS - GE PCB TUNNEL @ John St HFNY

Preplan / Sketch Form completed: (YES) NO

Industry has Confined Space Plan: (YES) NO

Preplan Entry Permit (blank): (YES) NO

Industry has Lockout/Tagout system: (YES) NO

Date Preplan completed: 9-15-2010 Person(s) involved in Preplan: A/C GIRARD, LT PERRY, Chief Schramm

POSSIBLE HAZARDS - ASSESSMENT

Hazard	Check	Hazard	Check	Chemical hazards	Monitoring dev.
Oxygen less than 19.5%	✓	Entrapment	✓	VOC	(yes) no
Oxygen more than 23.5%		Mechanical	✓		yes no
Explosive gasses/vapors		Electrical	✓		yes no
Explosive dust		Heat stress			yes no
Toxic gases/vapors		Noise			yes no
Engulfment	✓	Fall/slippery surfaces	✓		yes no

SYSTEMS, ANCHORS, AND SUPPLIES

Legend #	Anchoring points - description, use, and location

Legend #	Mechanical advantage systems - description, use, and location

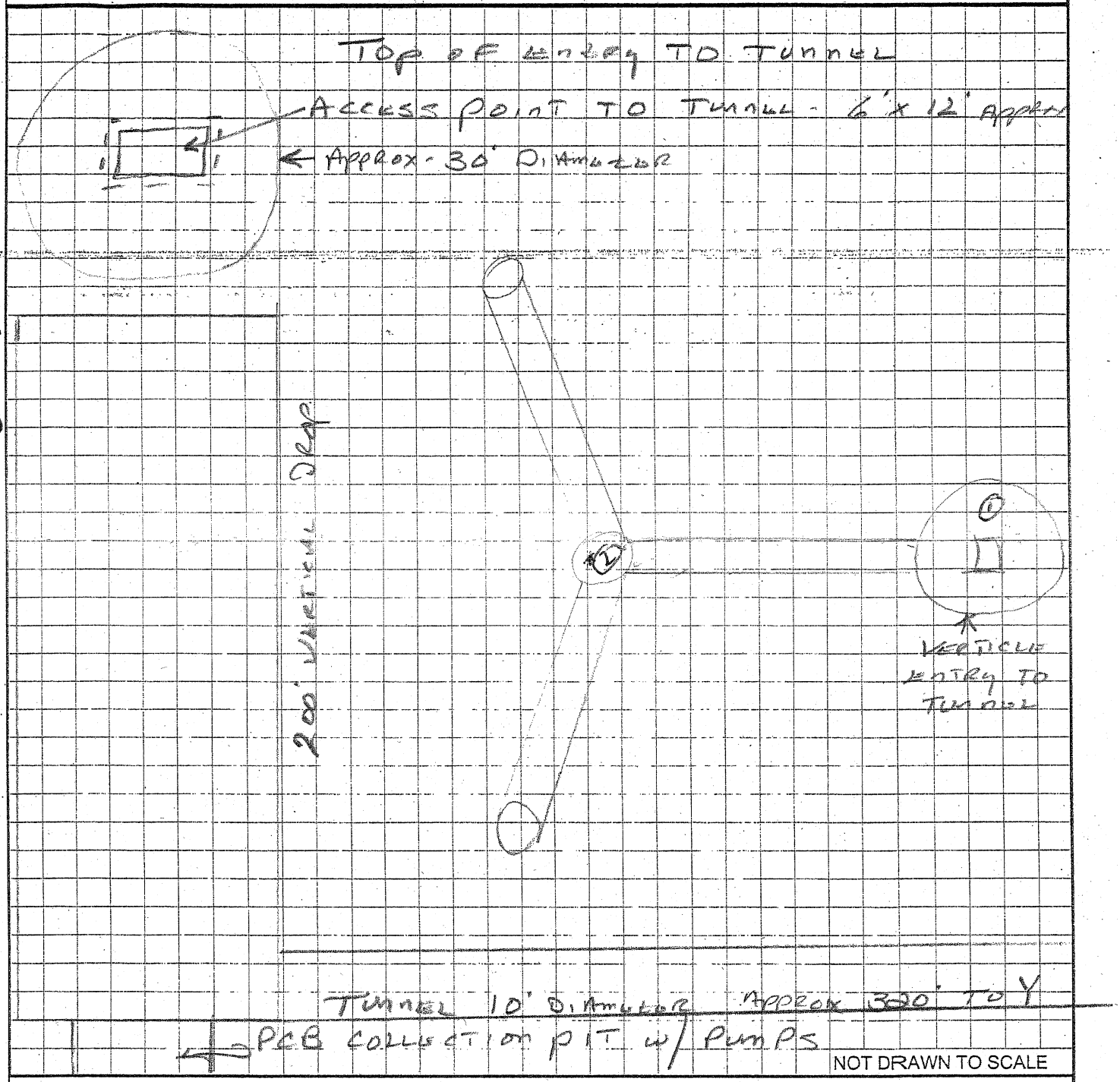
Supplies needed for performance of the rescue (list): Communication Equipment, Harness Webbby, Helmet, Stokes, BACKBOARD, Straps, Head Blocks, EMS Equipment, Escape Packs, Hand Lights,

PATIENT PACKAGING OPTIONS

CIRCLE OPTION(S)

Wristlet Quick full body harness S.K.E.D. (vertical) S.K.E.D. (horizontal) Stokes (vertical) Stokes (horizontal)

GLENS FALLS FIRE DEPARTMENT
CONFINED SPACE PREPLAN / SKETCH FORM



LOCATION : GE TUNNEL HUDSON FALLS NY - GEOTRANS

LEGEND

1.	7.
2.	8.
3.	9.
4.	10.
5.	11.
6.	12.

SKETCHER(S) :

CSR-02

GLENS FALLS FIRE DEPARTMENT
CONFINED SPACE RESCUE CHECKLIST

Location of rescue: 800' FROM VERTICAL DROP IN TUNNEL

Entry permit available: ☑ Yes ☐ No Number of occupants: FIVE ONE INJURED

Condition of occupants: 4 OK · ONE · INJURED · HARD INJURY

Approximate time incapacitated: 0900

Number of rescuers in space: - THRU 25

Permit Space Hazards

NOTE: The control proceedures and equipment needed will depend on the specific incident. It is the responsibility of the rescue personnel to determine the appropriate action. Listed are speciffis hazards, with their sugested considerations as to the control proceedures and equipment needed.	CHECK ALL THAT APPLY	Test Atmosphere	Determine cause for hazard	Ventilate Space	SCBA / SAR	Standby person with SCBA	Control / Eliminate ignition sources	Use non-sparking tools	Fire suppression equipment	Lockout energy sources and controls, dissipate stored energy	Lockout valve, break line, misalignment of pipe, etc..	Appropriate PPE	Chemical protective clothing, and appropriate decon procedures	Rescue ropes and appropriate packaging system	mechanical advantage, tripod, fall arrester	Explosion proof lighting	Constant communication
Oxygen less than 19.5 %	✓	X	X	X	X	X						X		X	X	X	X
Oxygen more than 23.5%		X	X	X	X O	X	X	X	X	X		X		X	X	X	X
Explosive Gases/vapors	✓	X	X	X	X O	X	X	X	X	X	X	X	X	X	X	X	X
Explosive Dust		X	X	X	X O	X	X	X	X	X	X	X	X	X	X	X	X
Toxic gases/vapors	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Engulfment	✓	X	X		X	X				X	X	X	X	X	X	X	X
Entrapment	✓	X	X			X						X		X	X	X	X
Mechanical	✓	X	X			X				X		X		X	X	X	X
Electrical	✓	X	X			X			X	X		X		X	X	X	X
Chemical	✓	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
Heat stress		X	X	X		X						X		X	X	X	X
Noise		X	X			X						X		X	X	X	X
Falls/Slippery surfaces	✓	X	X			X						X		X	X	X	X
CHECK WHEN COMPLETE		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

X - Control procedures and equipment suggested O - Entry must not be made until the explosive atmosphere is removed

Atmospheric Testing Record

Substance		Acceptable level	Readings & Time hrs	hrs	hrs	hrs	hrs	hrs
Oxygen	O2	19.5% to 23.5%						
Explosive gas/vapor	LEL	< 10% LEL						
Explosive dust	LFL	< LFL (5 ft. Visibility)						
Carbon monoxide	CO	50 PPM						
Hydrogen Sulfide	H2S	10 PPM						

ENTRANT ACCOUNTABILITY LOG

Name	Date	Time In	Time Out	Time In	Time Out	Time In	Time Out	Time In	Time Out	Time In	Time Out	Time In	Time Out
LT Petris	9/17	0946	1020										
F.F. MOSES	9/17	0946	1009										
FF BASCUE	9/17	0946	1009										