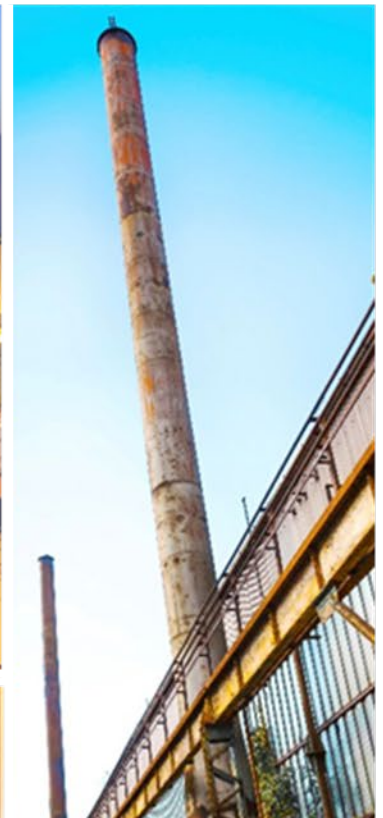




Site Management Plan

Carborundum – Abrasive Division Site
NYSDEC Site No. 932007
6600 Walmore Road
Wheatfield, New York 14304

Saint-Gobain Abrasives, Inc.





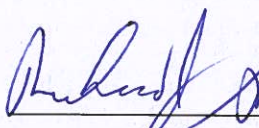
Site Management Plan approved by New York State Department of Environmental Conservation (NYSDEC) in May 2020
Revisions to Final Approved Site Management Plan

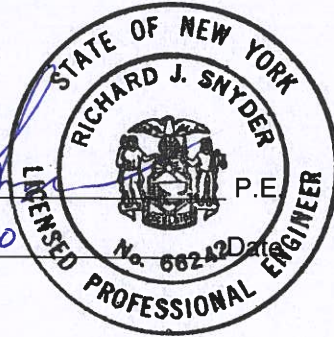
Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date



Certification Statement

I Richard J. Snyder certify that I am currently a New York State (NYS) registered professional engineer or Qualified Environmental Professional as in defined in 6NYCRR Part 375 and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10).


June 8, 2020



The seal is circular with the text "STATE OF NEW YORK" at the top, "RICHARD J. SNYDER" in the middle, "LICENSED PROFESSIONAL ENGINEER" at the bottom, and "P.E." and "No. 66242" near the center. It features a central emblem of a figure holding a scale and a sword.



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Executive Summary

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance, and reporting activities required by this Site Management Plan (SMP):

Site Identification:	NYSDEC Site No. 932007 Carborundum – Abrasive Division 6600 Walmore Road Wheatfield, New York
Institutional Controls (ICs):	1. Groundwater Sampling and Analysis Plan (11/24/1999, revised 11/19/2012, revised again April 2020 and incorporated within this SMP)
	2. Operations & Maintenance Plan (10/4/1999, revised 11/19/2012, revised again April 2020 and incorporated within this SMP)
Engineering Controls (ECs):	1. Cover system (clay landfill cap: 1982)
	2. Monitoring wells (OW1-81 through OW4-81)

Inspections:	Frequency
Site Inspection (cap inspection and monitoring well inspections)	Annually, in July
Monitoring:	
Groundwater Monitoring	Biennially (every two years), in March/April
Maintenance:	
1. Cap maintenance	Mow cap vegetation annually, after August 15 and as needed to abate woody growth
2. Monitoring Well Maintenance	Redevelopment immediately prior to biennial groundwater monitoring event, and as needed
Reporting:	
1. Groundwater Monitoring Results	Interim data report within 30 calendar days of receipt of laboratory report, and annually as a section in the Periodic Review Report (PRR) for years in which groundwater monitoring is conducted
2. PRR	Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this SMP.



1. Introduction

1.1 General

GHD, on behalf of Saint-Gobain Abrasives, Inc. (SGA), has prepared this Site Management Plan (SMP) for the Carborundum – Abrasive Division Site ("Site") in accordance with the requirements of the New York State Department of Environmental Conservation's (NYSDEC) DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010. This SMP combines and updates the site management documents titled "Groundwater Sampling & Analysis Plan (SAP)" and "Operations and Maintenance Plan (O&M Plan)", prepared by Frontier Technical Associates Inc. (FTA), dated November 19, 2012, and addresses the means for implementing the institutional controls (ICs) and engineering controls (ECs) required for the Site.

The Site is listed in the State Superfund program with a classification of 4, indicating that the Site has been properly closed but requires continued site management (SM) consisting of operation, maintenance, and/or monitoring. ICs and ECs have been emplaced at the Site to control exposure to "remaining contamination", defined as waste materials buried at the Site beneath the clay cap, to ensure protection of public health and the environment. The ICs for the Site consist of the SAP and O&M Plan, which are now incorporated within this SMP. The ECs for the Site consist of a clay cap that was installed in 1982 and four monitoring wells located proximate to the perimeter of the Site ("perimeter monitoring wells"). SM requirements for the Site consist of an annual Site inspection, which includes a cap inspection and an inspection of the four perimeter monitoring wells; biennial groundwater monitoring; and cap maintenance.

This SMP has been approved by the NYSDEC, and compliance with this plan is required by SGA and SGA's successors and assigns. This SMP may only be revised with the approval of the NYSDEC. All reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the Site is provided in Appendix D of this SMP.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's Project Manager. Revisions will be necessary upon, but not limited to, the following occurring:

- A change in media monitoring requirements
- Addition of a remedial system
- Removal of contaminated soil or waste materials
- Other significant change to Site conditions

The NYSDEC will provide a notice of any approved changes to the SMP and append these notices to the SMP that are retained in its files.



1.3 Notifications

Notifications will be submitted by the Remedial Party to the NYSDEC, as needed, in accordance with NYSDEC's DER-10 for the following reasons:

- Sixty-day advance notice of any proposed changes in Site use.
- Seven-day advance notice of any field activity associated with this SMP.
- Fifteen-day advance notice of any proposed ground-intrusive activity within the boundaries of the Site.
- Notice within 48 hours of any damage or defect to the clay cap that reduces or has the potential to reduce the effectiveness of the clay cap, and likewise, any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of the clay cap, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days, describing and documenting actions taken to restore the effectiveness of the clay cap.

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser or new Remedial Party has been provided with a copy of this SMP and all of the governing and legal documents associated with the Site (i.e., Consent Order, Record of Decision, approved work plans and reports, etc.).
- Within 15 days after the transfer of all or part of the Site, the new owner's name (or new Remedial Party's name), contact representative, and contact information will be confirmed in writing to the NYSDEC.

The notifications will be made to the NYSDEC DER Project Manager, NYSDEC Regional Hazardous Waste (HW) Engineer, and NYSDEC Site Control. Appendix D provides contact information for these personnel, as well as a full list of Site-related contact information. The information in Appendix D will be updated as necessary to provide accurate contact information. Should contact information change, the Remedial Party will submit a letter to the NYSDEC notifying them of the change. This SMP will not need to be resubmitted for NYSDEC approval based on a change in contact information.

1.4 Contingency Plan

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions. In the event of any environmentally related situation or unplanned occurrence requiring assistance, the Site Operator or Site Operator's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response



personnel should be contacted. These emergency contact lists must be maintained in an easily accessible location at the Site.

Emergency Contact List

Organization/Name	Title/Location	Telephone
Medical, Fire, and Police		911
Niagara Falls Memorial Medical Center	621 Tenth Street Niagara Falls, NY 14302	716-278-4395 (Emergency Department)
One Call Center (3-day notice required for utility mark out)		800-272-4480
Poison Control Center		800-222-1222
National Response Center (Pollution/Toxic Chemical/Oil Spills)		800-424-8802
NYSDEC Spills Hotline		800-457-7362
Site Operator	Saint-Gobain Abrasives, Inc. 6600 Walmore Road Wheatfield, NY 14304	610-893-5667 (James Smith, Manager of Environmental Programs, Saint-Gobain Corporation) 716-731-8200 (Chris Ciccarelli, Site Operations Manager)
Saint-Gobain's Environmental Consultant	GHD 2055 Niagara Falls Boulevard Niagara Falls, NY 14304	716-297-6150 Margaret Popek, Geologist/Project Manager Richard Snyder, P.E., Associate/Professional Engineer

In the case of an emergency, the Niagara Falls Memorial Medical Center is the nearest health facility to the Site. The hospital is located at 621 Tenth Street in Niagara Falls, New York, a distance of approximately 6.9 miles (15 minutes).

2. Site Overview

2.1 Site Location and Features

The Site is located at 6600 Walmore Road in the Town of Wheatfield, Niagara County, New York (Figure 1), and encompasses approximately one acre of land on a greater 54.52-acre parcel identified as Section-Block-Lot (SBL) number 146.00-1-9.2. The greater parcel is owned by Patriot Wheatfield Associates, LP. The remainder of the parcel is occupied by the Saint-Gobain Abrasives facility.

The Site consists of a clay-capped landfill (Figure 2), and is bordered by the Niagara Falls Air Reserve Station and Cayuga Creek to the north; light industrial complexes or undeveloped areas to



the east and south; and the Niagara Falls International Airport (NFIA) to the west. The "A" sewer line (West Branch), catch basins A-9 and A-10, and NFTA security fence are also depicted on Figure 2. Catch basin A-9 drains the surface runoff and subsurface drainage from the landfill area.

2.1.1 Monitoring Wells

Four monitoring wells are associated with the Site. Two of the wells, identified as OW2-81 and OW3-81, are located west of the Site on the NFIA property, which is owned by the Niagara Frontier Transportation Authority (NFTA). The two remaining wells, identified as OW4-81 and OW5-81, are located east of the Site in a concrete area. A fifth well, identified as OW1-81, was formerly located within the interior of the landfilled waste and was decommissioned in 1991 because it had fallen into disrepair.

The five monitoring wells OW1-81 through OW5-81 were installed by Empire Soil Investigations, Inc. from January 20-22, 1981, following placement of the clay cap by Secured Landfill Contractors, Inc. The four perimeter wells, OW2-81 through OW5-81, were installed to the overburden-bedrock interface, or may slightly penetrate the bedrock. Monitoring well OW5-81 extended to the bottom of the landfilled materials. All five wells are/were constructed of two-inch diameter black steel pipe attached to a two-foot long stainless steel slotted well point. All joints were welded during installation. Each well has a lockable cap. Figure 3 illustrates a typical well construction.

Wells OW2-81 and OW3-81 on the NFTA property were last developed in October 1998, and wells OW4-81 and OW5-81 east of the Site were last developed on December 17, 2018. Table 1 displays the well depths measured following the redevelopment activities.

2.2 Site History

The former Carborundum – Abrasives Company landfill (Site) was identified by the Inter-Agency Task Force on Hazardous Wastes in a March 1979 report titled *Draft Report on Hazardous Waste Disposal in Erie and Niagara County, New York*. The Site was used from 1968 to 1976 to dispose of wastes generated at the adjacent Carborundum – Abrasives Division plant (currently occupied by Saint-Gobain Abrasives). The wastes were described in the report as "partially solidified and solidified resins, floor sweepings, waste fillers including calcium carbonate, clays and animal glue (estimated 400 tons total) with free phenols (resins) (estimated 800 to 1,600 pounds total)." The wastes were disposed by excavation of a long, narrow trench estimated to be approximately 450 feet long, 20 feet wide, and 12 feet deep. As the wastes were deposited into the trench, a soil cover comprised of the excavated soil (glacio-lacustrine clays) was placed over the waste.

The Carborundum – Abrasives Division ceased operations in 2003. A hydrogeological investigation of the Site was conducted in 1981. Monitoring wells confirmed the presence of phenols in Site groundwater. In late summer of 1982, a remedial program was implemented which consisted of the installation of an improved clay cap over the landfill area.

Table 2 displays the results of the historical groundwater sampling conducted for the Site. As indicated in the table, phenolic compounds have not been detected at concentrations above the laboratory's reporting limits in any of the groundwater samples collected since 1993, at which time phenol was detected in the sample collected from OW3-81 at a concentration of 32 micrograms per liter ($\mu\text{g/l}$). This well is located upgradient of the Site.



2.3 Site Geology

The area in the immediate vicinity of the Site is underlain by approximately 10 to 15 feet of clayey to sandy silt, glacio-lacustrine deposits, and glacial till. These deposits thicken southward across the Site. The hydraulic conductivity of these soils is low, estimated to be in the range of 10^{-5} to 10^{-8} cm/sec. Figure 4 illustrates a typical surficial geologic cross-section for the Site and surrounding area. Layers of silt and clay fill and silty clay fill that support grass cover are present beneath the ground surface. It is suspected that these fill materials were graded and compacted prior to installation of the concrete area adjacent to the Site. Beneath the silty clay fill is reddish-brown, medium to stiff silty clay, which overlies till comprised of reddish-brown silt to clayey silt. Fill materials encountered in OW1-81 completed within the waste materials included wood, silt, sand, screen materials, paper, and backing cloth used for sandpaper manufacturing. Based on this, it is suspected that most of the materials disposed of in the landfill consisted of general plant trash and off-spec materials and damaged goods from the manufacturing process.

The bedrock underlying the Site consists of approximately 160 feet of dolomite belonging to the Lockport Formation. The upper zone of the Lockport Formation is generally characterized as a highly weathered, medium gray dolomite with extensive vertical fractures. It is generally striated on the surface and has extensive partings which are argillaceous or gypsum-coated. Water produced from this upper zone in the Bergholtz area of Wheatfield is generally of very poor quality, with a characteristic odor. The bedrock surface is generally encountered at elevations between approximately 560 and 570 feet above mean sea level (AMSL) proximate to the Site and dips gently to the south.

The area surrounding the Site is served by a municipal water supply system. Wells that were historically used along Walmore Road to the east were closed as part of a groundwater remediation effort conducted by the former Bell Aerospace-Textron in the late 1980s and early 1990s. The groundwater withdrawal and treatment system on the nearby Bell-Aerospace Textron property is still in operation.

2.4 Site Hydrogeology

Groundwater is encountered at the Site and in the surrounding area in a silty till material immediately overlying bedrock. At the time of the initial investigation in 1981, perched groundwater was observed in landfill monitoring well OW1-81. Installation of the sloped landfill cap coupled with the low permeability of the soils surrounding the landfill resulted in the water within the landfill being contained to the landfill. The source of the water in the landfill is precipitation infiltration. The terrain outside of the capped landfill is relatively flat. Soils remain moist throughout most of the summer west of the Site due to runoff from the airport runways and taxiways and the low permeability of the underlying soils. Groundwater flow at the Site is generally to the east-southeast, and has remained relatively consistent throughout the time period monitored. Figure 5 displays a potentiometric surface map of overburden groundwater elevations measured on April 21, 2020.



3. Site Management and Monitoring

Site management requirements for the Site currently consist of an annual Site inspection, biennial groundwater monitoring, and cap maintenance. Details regarding the site management and monitoring activities performed at the Site are included below. All work will be performed in accordance with the Health and Safety Plan (HASP) included as Appendix C of this SMP and Saint-Gobain's safety requirements for contractors and visitors to the facility. All work will be performed by qualified environmental personnel in accordance with industry-accepted standard operating procedures.

3.1 NFTA Access

Access to monitoring wells OW2-81 and OW3-81 on the NFTA property requires coordinating an access date with the NFTA so that access and an escort can be provided. Contact information for the NFTA is included in Appendix D.

3.2 Annual Site Inspection

The physical attributes of the Site will be inspected annually in July by an experienced field technician working under the supervision of a Qualified Environmental Professional (QEP). A QEP is defined in Section 1.3 of DER-10. This annual Site inspection consists of a cap inspection and inspections of the four perimeter monitoring wells. The results of the Site inspection will be documented on the Site Inspection form included as Appendix A.

3.2.1 Cap Inspection

The cap is intended to prevent contact between Site visitors and personnel and buried wastes in the landfilled area, and consists of low-permeability clay and vegetation (grass). During the annual Site inspection, the cap will be inspected visually through a walkover.

The cap inspection will evaluate the following items to ascertain the need for corrective action:

- Soil cover system - The presence of desiccation cracks, freeze/thaw damage, and the presence of seeps or leachate breakouts will be noted.
- Landscaping - The vigor and density of the vegetative cover on the cap will be assessed. Bare, sparse, and undernourished areas will be noted. Growth of any large-rooted vegetation will be noted.
- Erosion - The presence of any erosion will be noted.
- Settlement - Visual evidence of differential settlement and/or soil slumping will be noted and its impact on either the cap integrity or surface water drainage patterns will be assessed.
- Rodent burrows - Visual evidence of rodent burrows will be noted.

Any other conditions that could potentially compromise the integrity of the clay cap will be noted. The results of the cap inspection will be detailed in the Periodic Review Report (PRR).

The QEP overseeing the cap inspection will immediately notify Saint-Gobain Corporation's Manager of Environmental Programs and the Site Operations Manager, or his/her designee(s), if areas of



damaged or deteriorating cap materials and/or exposed soil/fill are identified. Contact information for these personnel is provided in Appendix D.

Cap inspections will also be performed in the event of an emergency and after all severe weather conditions that may affect the clay cap. These inspections will also be documented on the Site Inspection form located in Appendix A. If an emergency, such as a natural disaster or an unforeseen failure of the clay cap occurs that reduces or has the potential to reduce the effectiveness of the clay cap, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the Site will be conducted within 5 days of the event by a New York State Professional Engineer to verify the effectiveness of the clay cap. Written confirmation must be provided to the NYSDEC within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

3.2.2 Monitoring Well Inspection

The four perimeter monitoring wells OW2-81 through OW5-81 will be inspected visually by the field technician during the cap inspection. In addition, water levels and well depths will be measured in the wells to the nearest 0.01 foot using an electronic water level meter and using the top of the well riser as a reference point. Top of riser elevations and sounded well depths following redevelopment of the wells in 1998 and 2018 are included in Table 1. Water levels, well depths, and the results of the inspections will be recorded on the Site Inspection form in Appendix A. The water level meter will be decontaminated between wells using an Alconox™ and potable water rinse.

Any maintenance required on the wells based on the results of the well inspections will be scheduled following the inspections. In addition, if a well depth measurement indicates at least 0.50 feet of sediment/sand infilling relative to the post-redevelopment depths measured in 1998 and 2018, the well(s) will be redeveloped following the inspection to prevent further accumulation/compaction of sediment. Refer to Section 3.3.2 for the procedure for well redevelopment. Monitoring water level recovery will not be required.

3.3 Biennial Groundwater Monitoring

Groundwater monitoring will be performed on a biennial basis (every two years) to assess groundwater flow direction and chemistry and determine the nature and extent of contaminant migration from the Site (if any). Wells downgradient of the Site (OW4-81 and OW5-81) will be monitored to evaluate the effectiveness of the clay cap, and wells upgradient of the Site (OW2-81 and OW3-81) will be monitored to assess if upgradient groundwater, rather than the Site, might be a source of any downgradient impacts.

The monitoring activities consist of hydraulic gauging, groundwater sampling, and well inspections. The monitoring is currently performed every two years, with the next monitoring event scheduled for October 2020. Following the October 2020 monitoring event, monitoring will be performed in March/April during odd-numbered years, starting with March/April 2021.

3.3.1 Hydraulic Gauging and Well Inspections

At the beginning of the monitoring event, water levels and well depths will be measured in the four perimeter monitoring wells to the nearest 0.01 foot using an electronic water level meter and using



the top of the well riser as a reference point. Top of riser elevations and sounded well depths following redevelopment of the wells in 1998 and 2018 are included in Table 1. Water levels and well depths will be recorded on the Site Inspection form located in Appendix A, and will be measured **prior** to the removal of water from any of the four wells in order to obtain undisturbed static water levels. The water level meter will be decontaminated between wells using an Alconox™ and potable water rinse.

The wells will also be inspected visually and the results of the inspections recorded on the Site Inspection form. Any maintenance required on the wells based on the results of the well inspections will be scheduled following the inspection. The remainder of the Site Inspection form will be completed by an experienced field technician working under the supervision of a QEP during the annual Site inspection.

3.3.2 Well Redevelopment

Following the hydraulic gauging and well inspections, the four perimeter monitoring wells will be redeveloped to remove suspended sediment and biological growth (if any) to the extent practicable. Each well will be redeveloped using a dedicated section of 5/8-inch diameter rigid poly tubing fitted with either a foot valve or 2-inch diameter surge block, or similar. Each well will be surged manually using the tubing-foot valve assembly, and sediment-laden water will be removed through the tubing until the well is dry. Potable water will then be added to the well, and the surging repeated until the well is dry. This process will be repeated until the water purged from each well is clear, and then the well will be purged dry. Purging will be completed with dedicated bailers. Following completion of purging, the well depth and water level (if not dry) in each well will be measured, and the date and time recorded so that well recovery can be assessed (if needed).

All well redevelopment activities will be documented in a field notebook, including the volume of water added and removed from each well. Consistent with previous purging events, purged water will be discharged to the Site sanitary sewer system at a location specified by Site personnel. The water level meter, foot valve, surge block, and any other non-dedicated down-well equipment will be decontaminated between wells using an Alconox™ and potable water rinse.

Following well redevelopment, water levels will be measured in the four monitoring wells on a daily basis. Each well will be sampled as soon as enough groundwater has recharged in the well to fill the sample bottles. This may result in wells being sampled on different days. The water level in each well and well depth will be recorded immediately before sampling.

3.3.3 Groundwater Sampling

The four perimeter monitoring wells and catch basin A-9 will be sampled using dedicated bailers and new, clean, laboratory-supplied sample bottles. One field duplicate sample will be collected from one of the downgradient wells (OW4-81 or OW5-81) and submitted blind to the laboratory. If sample recharge volume permits, one matrix spike/matrix spike duplicate (MS/MSD) sample will also be collected, and can be collected from any of the wells or catch basin. As disposable and/or dedicated equipment will be used for sampling, equipment blanks will not be required.

Temperature, pH, specific conductivity, and turbidity of the recharged groundwater at each well will be measured in the field using a hand-held water quality meter and a turbidity meter **following** filling



of the sample bottles. The sampling event(s) will be documented in a field notebook and on the Sample Collection Data Sheet included in Appendix B. Calibration of the hand-held water quality meter and turbidity meter will be documented prior to the start of the sampling event(s) on the field data record forms included in Appendix B.

The samples collected will be sealed in an ice-filled cooler at a temperature of 6°C or less and shipped to a New York State Department of Health (NYSDOH)-Environmental Laboratory Approval Program (ELAP)-certified laboratory for analysis of phenolic compounds via United States Environmental Protection Agency (USEPA) SW-846 Method 8270. The laboratory will be able to report results to a reporting limit of 1.0 µg/L for each phenolic compound, unless a reduced volume sample is required to be analyzed due to limited well recharge. The samples will be shipped under chain-of-custody the day of collection for next-day delivery to the laboratory. A Category B laboratory data deliverable will not be required.

3.3.4 Data Validation

Following receipt of the laboratory report, GHD chemists will validate the data and prepare a data validation report. A Data Usability Summary Report (DUSR) will not be required. An electronic data deliverable (EDD) will then be prepared and submitted for upload to the NYSDEC EQUiS™ database.

3.4 Cap Maintenance and Repair

3.4.1 General

The cap vegetation will be mowed annually after August 15 and as needed to abate woody growth. In addition, any brush or bushes present will be trimmed and the area will be kept clear of debris. Areas of erosion or settlement will be regraded and/or reseeded as needed.

Any ground-intrusive activities to be performed at the Site will be pre-planned with the NYSDEC and performed in accordance with the NYSDEC's requirements. As the Site does not contain any buried utilities or other infrastructure, it is not anticipated that any emergency excavations at the Site without NYSDEC oversight will be necessary.

3.4.2 Vegetative Cover Repair

The cap includes grass overlying the low permeability clay cap. In the event that an area of grass becomes damaged or bare where the underlying clay cap is exposed, the following procedures will be used. Assessment of the severity of deterioration or damage to the grass cover is subjective, and inspection personnel must use professional judgement in assessing what type and extent of deterioration/damage warrants repair or maintenance. As a guideline, the grass cover will be repaired if it is damaged or missing which causes direct exposure of the underlying clay cap.

Repair will consist of replacing topsoil to ensure that at least 6 inches of topsoil is present and reseeded with an appropriate grass seed mixture. The area will be watered and maintained as necessary to reestablish grass growth. Damaged areas may be temporarily covered with topsoil, mulch, plastic sheeting, tarps, or other material that will provide a temporary barrier during winter months until reseeded is possible.



3.4.3 Clay Cap Repair

In the event that damage to the low permeability clay cap occurs, which has the potential to expose underlying soil/fill and remaining contamination, corrective action to repair the damaged area will be promptly performed. The NYSDEC will be notified upon observation of the damage such that an appropriate solution can be devised.

3.5 Monitoring Well Repairs, Replacement, and Decommissioning

The monitoring wells will be inspected annually during the Site inspection and during the groundwater monitoring event. If biofouling or silt accumulation occurs in the monitoring wells, the wells will be physically agitated/surged and redeveloped if a well depth measurement indicates at least 0.50 foot of sediment/sand infilling relative to the post-redevelopment depths measured in 1998 and 2018. Refer to Section 3.2.2 for well redevelopment procedures. In addition, monitoring wells will be properly decommissioned and replaced if an event renders the wells unusable.

Repairs and/or replacement of monitoring wells will be performed based on assessments of structural integrity and overall performance. Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC. The NYSDEC will be notified prior to any repair (other than routine maintenance) or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent PRR.

Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled "CP-43: Groundwater Monitoring Well Decommissioning Procedures".

4. Reporting

4.1 Raw Analytical Data

The raw, unvalidated laboratory report from the groundwater monitoring event will be submitted to the NYSDEC within fourteen calendar days of receipt from the laboratory.

4.2 Interim Data Report

Within thirty calendar days of receipt of the laboratory report from the groundwater monitoring event, SGA will submit a brief letter to the NYSDEC that will serve as an interim data report. The letter will include the validated laboratory results and applicable standards, an overburden groundwater potentiometric surface contour map, and a brief statement regarding the significance of the sampling results. In years in which the groundwater monitoring event is not performed, an interim data report will only be submitted if the results of the Site inspection indicate deficiencies with the clay cap.

4.3 Periodic Review Report

A PRR will be prepared for the Site on an annual basis in accordance with Section 6.3 of DER-10 detailing compliance with this SMP and summarizing all activities performed at the Site during the



reporting period. The PRR will confirm that all engineering and institutional controls are in place, are performing properly, and remain effective; the monitoring plan is being implemented; operation and maintenance activities are being conducted properly; and the remedy continues to be protective of public health and the environment. Recommendations regarding any necessary changes to the remedy and/or monitoring or O&M activities will also be made in the PRR.

At a minimum, the PRR for the Site will include the following items:

- Figure showing locations of cap and monitoring wells
- Results of annual Site inspection, and recommendations for any maintenance, repairs, and/or well redevelopment
- Completed Site inspection form(s)
- IC/EC certification, provided by the NYSDEC and certified by a QEP
- Any additional records generated for the Site during the reporting period, including media sampling data and cap maintenance reports

For years in which groundwater monitoring is performed, the PRR will also include the following items:

- Date(s) of monitoring activities performed and a description of the activities performed
- Summary of well conditions based on visual inspection
- Tabular presentation of overburden potentiometric surface elevations and overburden potentiometric surface contour map
- Discussion of groundwater flow direction across the Site
- Tabular presentation of current and historical analytical results for groundwater sampling with applicable standards and reporting limits shown, and summary and discussion of groundwater analytical results
- Raw analytical laboratory report and data validation report
- Completed groundwater field forms and field notes from well redevelopment
- A determination regarding any changes to groundwater conditions since the last monitoring event; any observations, conclusions, or recommendations regarding groundwater conditions; and any proposed modifications to the groundwater monitoring program

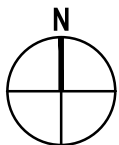
The PRR will be submitted to the NYSDEC electronically.

4.4 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a Corrective Measures Work Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC.



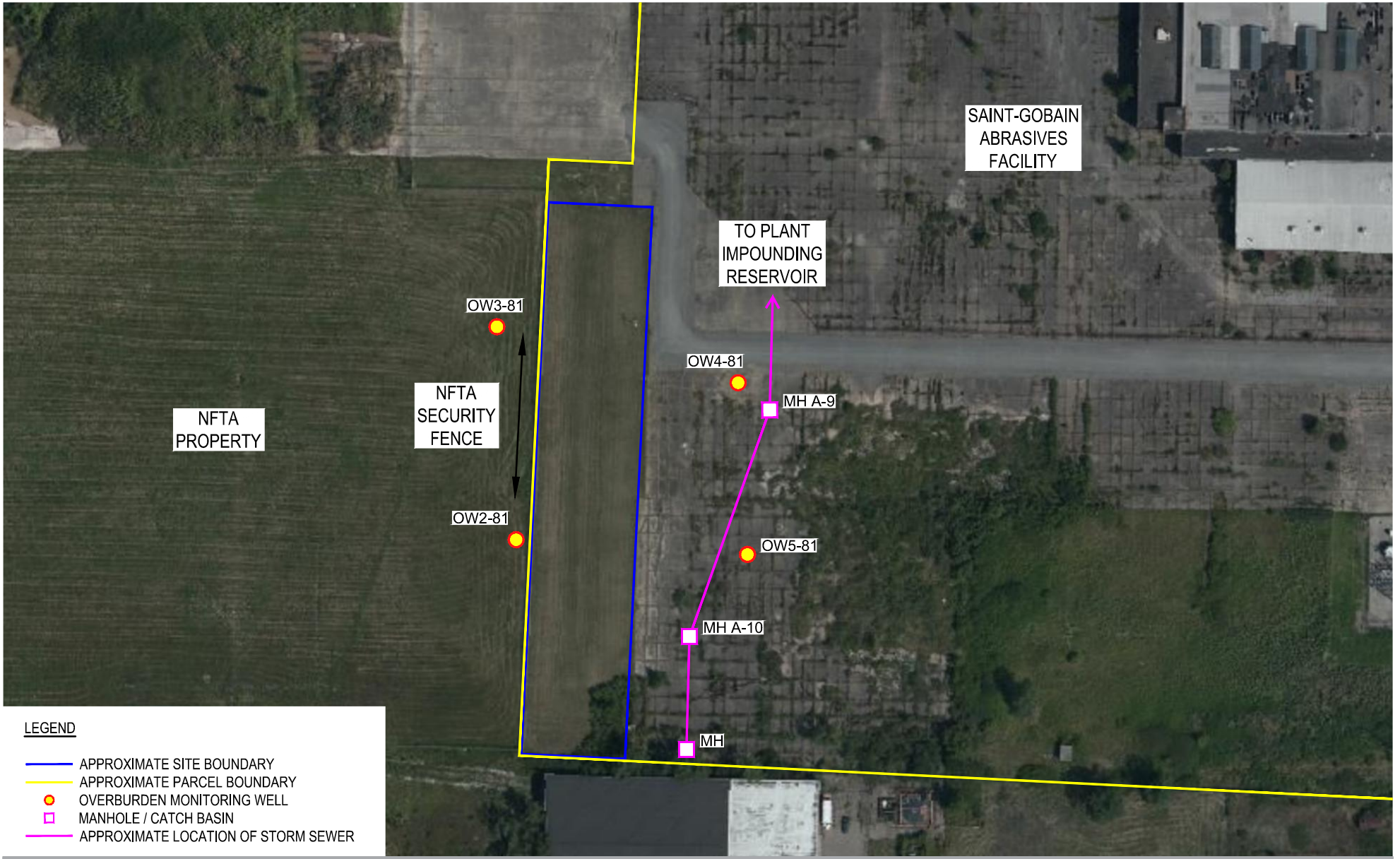
SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, TONAWANDA WEST, NY 2019



CARBORUNDUM - ABRASIVE DIVISION SITE
NYSDEC SITE No. 932007 - 6600 WALMORE ROAD
WHEATFIELD, NEW YORK
SITE LOCATION MAP

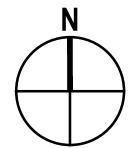
Project No. 11212053
 Report No. 002
 Date APR 2020

FIGURE 1



LEGEND

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE PARCEL BOUNDARY
- OVERBURDEN MONITORING WELL
- MANHOLE / CATCH BASIN
- APPROXIMATE LOCATION OF STORM SEWER

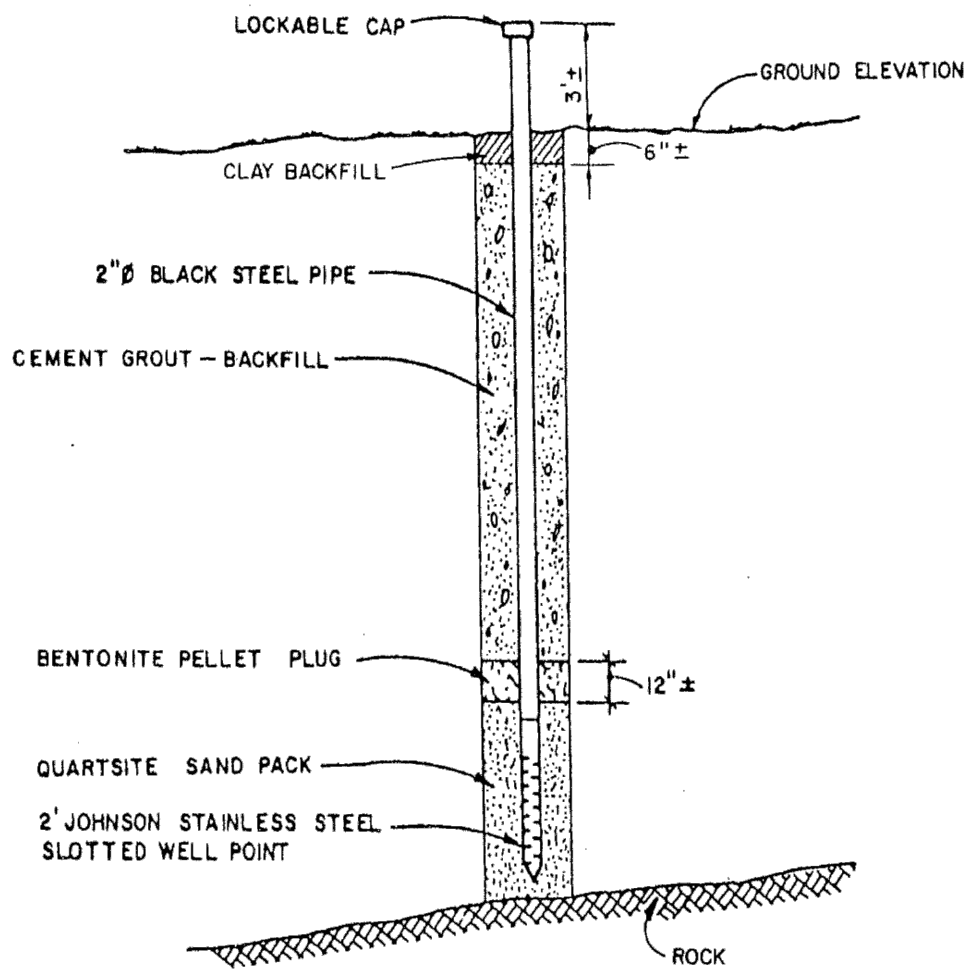


CARBORUNDUM - ABRASIVE DIVISION SITE
 NYSDEC SITE No. 932007 - 6600 WALMORE ROAD
 WHEATFIELD, NEW YORK

SITE PLAN

Project No. 11212053
 Report No. 002
 Date APR 2020

FIGURE 2



TAKEN FROM "PERIODIC REVIEW REPORT, INACTIVE LANDFILL AREA, SAINT-GOBAIN ABRASIVES, INC," FRONTIER TECHNICAL ASSOCIATES REPORT ET-19-703PRR, DATED MARCH 19, 2019.



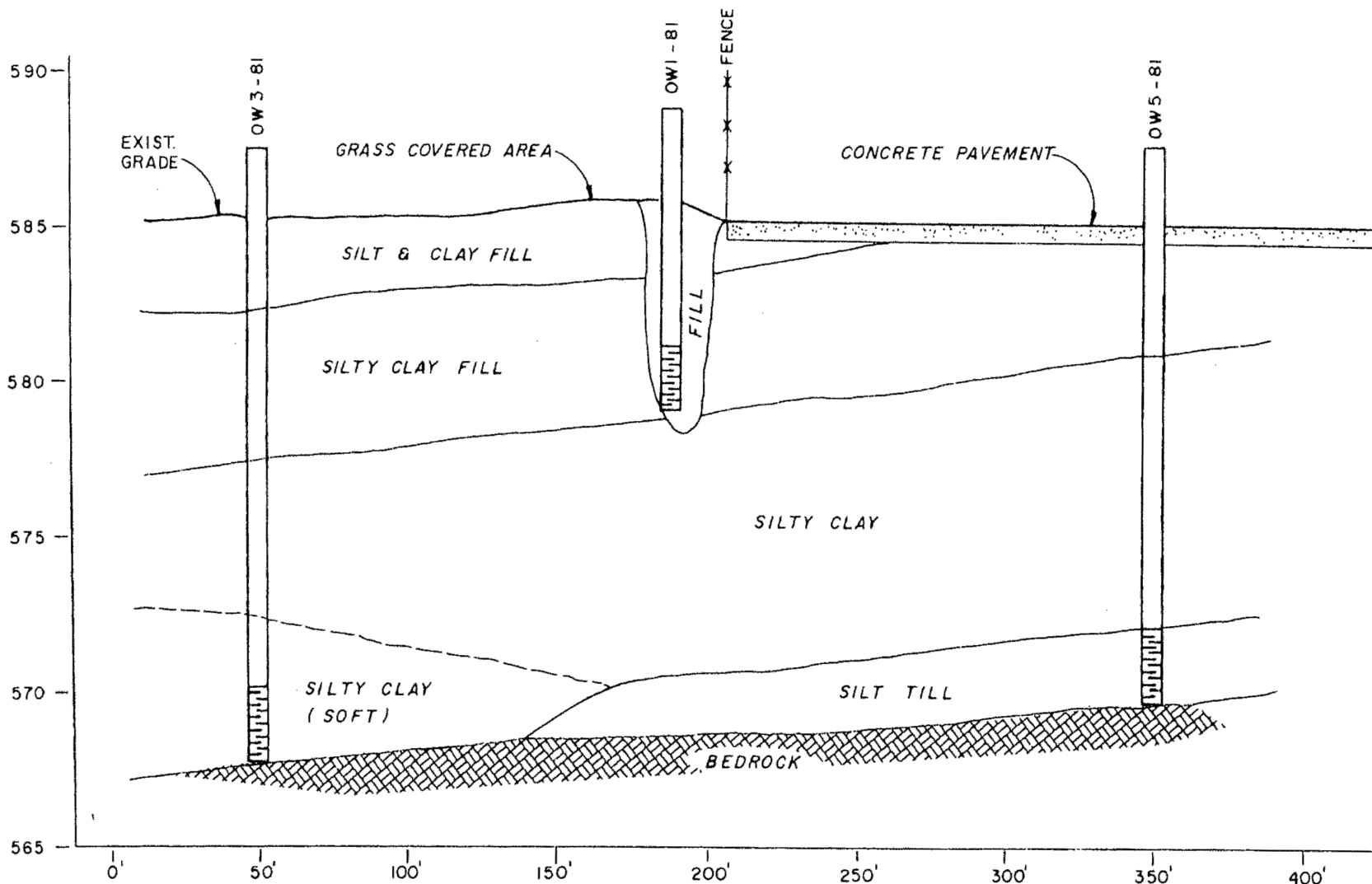
CARBORUNDUM - ABRASIVE DIVISION SITE
 NYSDEC SITE No. 932007 - 6600 WALMORE ROAD
 WHEATFIELD, NEW YORK
**TYPICAL MONITORING
 WELL INSTALLATION**

Project No. 11212053
 Report No. 002
 Date APR 2020

FIGURE 3

A
NORTH WEST

A'
SOUTH EAST



TAKEN FROM "PERIODIC REVIEW REPORT, INACTIVE LANDFILL AREA, SAINT-GOBAIN ABRASIVES, INC.," FRONTIER TECHNICAL ASSOCIATES REPORT ET-19-703PRR, DATED MARCH 19, 2019.

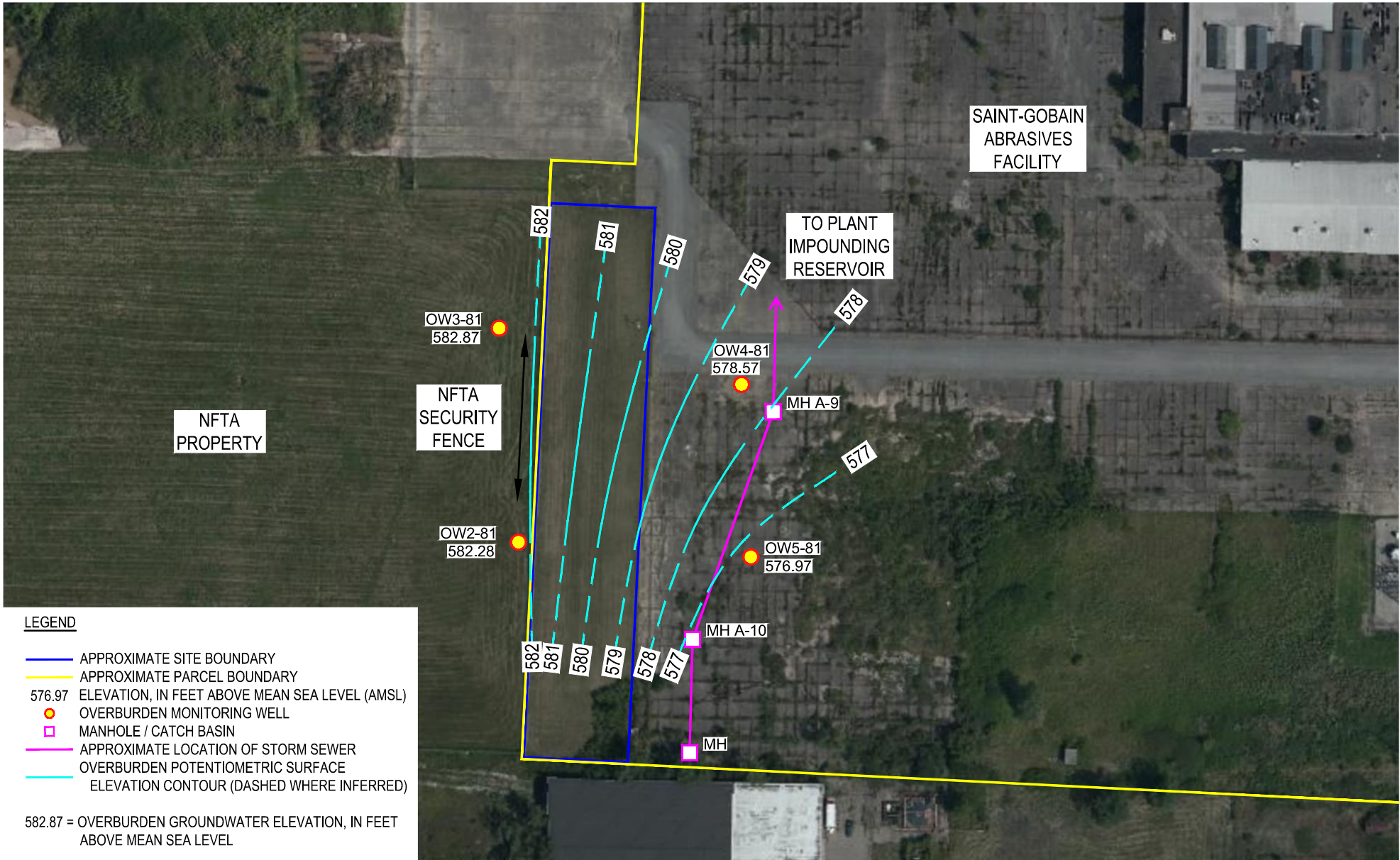


CARBORUNDUM - ABRASIVE DIVISION SITE
NYSDEC SITE No. 932007 - 6600 WALMORE ROAD
WHEATFIELD, NEW YORK

TYPICAL SURFICIAL
GEOLOGIC CROSS-SECTION

Project No. 11212053
Report No. 002
Date APR 2020

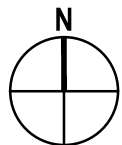
FIGURE 4



LEGEND

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE PARCEL BOUNDARY
- 576.97 ELEVATION, IN FEET ABOVE MEAN SEA LEVEL (AMSL)
- OVERBURDEN MONITORING WELL
- MANHOLE / CATCH BASIN
- APPROXIMATE LOCATION OF STORM SEWER
- OVERBURDEN POTENTIOMETRIC SURFACE
- ELEVATION CONTOUR (DASHED WHERE INFERRED)

582.87 = OVERBURDEN GROUNDWATER ELEVATION, IN FEET ABOVE MEAN SEA LEVEL



CARBORUNDUM - ABRASIVE DIVISION SITE
 NYSDEC SITE No. 932007 - 6600 WALMORE ROAD
 WHEATFIELD, NEW YORK

OVERBURDEN POTENTIOMETRIC SURFACE MAP - APRIL 21, 2020

Project No. 11212053
 Report No. 002
 Date APR 2020

FIGURE 5

Table 1

**Sounded Well Depths
Carborundum - Abrasive Division Site
NYSDEC Site No. 932007
Wheatfield, New York**

Well Number	Top of Riser Elevation ft. AMSL	Sounded Well Depth* (ft. BTOR)	
		10/22/98	12/17/18
OW2-81	588.50	18.20	NA
OW3-81	587.59	19.66	NA
OW4-81	587.74	19.38	19.06
OW5-81	587.52	18.23	17.53

Notes:

- * - Wells were sounded following redevelopment in 1998 and 2018
- NA - Not Applicable
- ft. AMSL - Feet Above Mean Sea Level
- ft. BTOR - Feet Below Top of Riser

Table 2

**Historical Groundwater Sampling Results
Carborundum - Abrasive Division Site
NYSDEC Site No. 932007
Wheatfield, New York**

Parameter	Groundwater Standard	OW2-81														
		6/2/1989	9/13/1990	4/30/1991	4/15/1993	4/21/1995	4/4/1996	8/7/2001	11/21/2003	7/19/2005	7/18/2007	9/16/2009	7/20/2011	8/16/2013	7/10/2015	8/7/2017
pH (SU)		7.00	6.88	6.52	7.19	7.57	7.57	7.11	7.12	7.26	7.23	8.01	7.84	7.11	11.13	7.89
Conductivity (µmhos/cm)		---	---	2900	2128	2557	4115	2370	3828	3279	2970	3497	3852	3760	1565	3520
Turbidity (NTU)		---	---	---	---	420	60	9	42	45	67	29	157	31.9	297	21.8
Total Phenolics (4AAP) (µg/l)	1*	40	160	70	---	---	---	---	---	---	---	---	---	---	---	---
Phenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.2	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2-Chlorophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<5.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2-Methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	--	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
4-Methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	--	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
2-Nitrophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.8	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dimethylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<3.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dichlorophenol (µg/l)	1*	---	---	<10	<10	<10	<10	<10	<2.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
4-Chloro-3-methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.8	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4,6-Trichlorophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4,5-Trichlorophenol (µg/l)	1*	---	---	<50	<50	<50	<5	<10	<1.6	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dinitrophenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<9.6	<50	<50	<47	<47	<47	<47	<50
4-Nitrophenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<2.8	<50	<50	<47	<47	<47	<47	<50
4,6-Dinitro-2-methylphenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<3.0	<50	<50	<47	<47	<47	<47	<50
Pentachlorophenol (µg/l)	1*	---	---	<50	<50	<50	<5	<50	<2.2	<50	<50	<47	<47	<47	<47	<50

Parameter	Groundwater Standard	OW3-81														
		6/2/1989	9/13/1990	4/30/1991	4/15/1993	4/21/1995	4/4/1996	8/7/2001	11/21/2003	7/19/2005	7/18/2007	9/16/2009	7/20/2011	8/16/2013	7/10/2015	8/7/2017
pH (SU)		7.05	7.05	7.07	6.89	7.76	7.18	7.32	7.02	6.83	6.78	9.91	6.92	7.00	7.23	6.81
Conductivity (µmhos/cm)		---	---	2069	1490	3547	2705	2540	2950	2754	3397	2296	3160	3150	1839	1212
Turbidity (NTU)		---	---	---	---	270	400	24	25	50	29	366	1064	250	332	139
Total Phenolics (4AAP) (µg/l)	1*	<5	50	<6	---	---	---	---	---	---	---	---	---	---	---	---
Phenol (µg/l)	1*	---	---	<10	32	<10	<5	<10	<2.2	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2-Chlorophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<5.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2-Methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	--	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
4-Methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	--	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
2-Nitrophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.8	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dimethylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<3.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dichlorophenol (µg/l)	1*	---	---	<10	<10	<10	<10	<10	<2.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
4-Chloro-3-methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.8	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4,6-Trichlorophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4,5-Trichlorophenol (µg/l)	1*	---	---	<50	<50	<50	<5	<10	<1.6	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dinitrophenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<9.6	<50	<50	<47	<47	<47	<47	<50
4-Nitrophenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<2.8	<50	<50	<47	<47	<47	<47	<50
4,6-Dinitro-2-methylphenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<3.0	<50	<50	<47	<47	<47	<47	<50
Pentachlorophenol (µg/l)	1*	---	---	<50	<50	<50	<5	<50	<2.2	<50	<50	<47	<47	<47	<47	<50

Table 2

**Historical Groundwater Sampling Results
Carborundum - Abrasive Division Site
NYSDEC Site No. 932007
Wheatfield, New York**

Parameter	Groundwater Standard	OW4-81														
		6/2/1989	9/13/1990	4/30/1991	4/15/1993	4/21/1995	4/4/1996	8/7/2001	11/21/2003	7/19/2005	7/18/2007	9/16/2009	7/20/2011	8/16/2013	7/10/2015	8/7/2017
pH (SU)		7.29	6.83	7.03	7.08	7.63	8.67	7.64	7.36	11.87	11.26	8.69	11.2	10.88	10.97	9.97
Conductivity (µmhos/cm)		---	---	2153	1495	2458	2232	3023	2698	2566	3612	2500	2360	1946	1333	2280
Turbidity (NTU)		---	---	---	---	130	90	22	13.5	85	57	10.7	47	over range	145	109
Total Phenolics (4AAP) (µg/l)	1*	70	65	20	---	---	---	---	---	---	---	---	---	---	---	---
Phenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.2	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2-Chlorophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<5.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2-Methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	--	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
4-Methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	--	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
2-Nitrophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.8	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dimethylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<3.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dichlorophenol (µg/l)	1*	---	---	<10	<10	<10	<10	<10	<2.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
4-Chloro-3-methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.8	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4,6-Trichlorophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4,5-Trichlorophenol (µg/l)	1*	---	---	<50	<50	<50	<5	<10	<1.6	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dinitrophenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<9.6	<50	<50	<47	<47	<47	<47	<50
4-Nitrophenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<2.8	<50	<50	<47	<47	<47	<47	<50
4,6-Dinitro-2-methylphenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<3.0	<50	<50	<47	<47	<47	<47	<50
Pentachlorophenol (µg/l)	1*	---	---	<50	<50	<50	<5	<50	<2.2	<50	<50	<47	<47	<47	<47	<50

Parameter	Groundwater Standard	OW5-81														
		6/2/1989	9/13/1990	4/30/1991	4/15/1993	4/21/1995	4/4/1996	8/7/2001	11/21/2003	7/19/2005	7/18/2007	9/16/2009	7/20/2011	8/16/2013	7/10/2015	8/7/2017
pH (SU)		7.25	6.47	6.32	6.74	7.67	7.20	6.83	6.53	5.83	6.27	4.58	6.13	6.01	6.67	6.97
Conductivity (µmhos/cm)		---	---	2841	1854	3134	3188	2915	4415	3196	4225	4949	5632	6270	2000	8410
Turbidity (NTU)		---	---	---	---	340	60	12	21	6	2	250	over range	over range	137	664
Total Phenolics (4AAP) (µg/l)	1*	50	35	<6	---	---	---	---	---	---	---	---	---	---	---	---
Phenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.2	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2-Chlorophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<5.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2-Methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	--	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
4-Methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	--	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
2-Nitrophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.8	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dimethylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<3.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dichlorophenol (µg/l)	1*	---	---	<10	<10	<10	<10	<10	<2.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
4-Chloro-3-methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.8	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4,6-Trichlorophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4,5-Trichlorophenol (µg/l)	1*	---	---	<50	<50	<50	<5	<10	<1.6	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dinitrophenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<9.6	<50	<50	<47	<47	<47	<47	<50
4-Nitrophenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<2.8	<50	<50	<47	<47	<47	<47	<50
4,6-Dinitro-2-methylphenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<3.0	<50	<50	<47	<47	<47	<47	<50
Pentachlorophenol (µg/l)	1*	---	---	<50	<50	<50	<5	<50	<2.2	<50	<50	<47	<47	<47	<47	<50

Table 2
Historical Groundwater Sampling Results
Carborundum - Abrasive Division Site
NYSDEC Site No. 932007
Wheatfield, New York

Parameter	Groundwater Standard	MH A-9														
		6/2/1989	9/13/1990	4/30/1991	4/15/1993	4/21/1995	4/4/1996	8/7/2001	11/21/2003	7/19/2005	7/18/2007	9/16/2009	7/20/2011	8/16/2013	7/10/2015	8/7/2017
pH (SU)		7.58	7.08	7.31	7.37	7.79	7.28	8.13	7.03	7.35	7.88	6.97	8.10	6.87	8.25	6.63
Conductivity (µmhos/cm)		---	---	453	313	346	676	84	606	779	990	476	622	664	498	614
Turbidity (NTU)		---	---	---	---	280	60	35	3	17	12	4.7	2.11	2.79	8.00	1.59
Total Phenolics (4AAP) (µg/l)	1*	10	70	---	---	---	---	---	---	---	---	---	---	---	---	---
Phenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.2	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2-Chlorophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<5.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2-Methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	--	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
4-Methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	--	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
2-Nitrophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.8	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dimethylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<3.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dichlorophenol (µg/l)	1*	---	---	<10	<10	<10	<10	<10	<2.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
4-Chloro-3-methylphenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.8	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4,6-Trichlorophenol (µg/l)	1*	---	---	<10	<10	<10	<5	<10	<2.4	<10	<5	<9.4	<9.4	<9.4	<9.4	<10
2,4,5-Trichlorophenol (µg/l)	1*	---	---	<50	<50	<50	<5	<10	<1.6	<10	<10	<9.4	<9.4	<9.4	<9.4	<10
2,4-Dinitrophenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<9.6	<50	<50	<47	<47	<47	<47	<50
4-Nitrophenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<2.8	<50	<50	<47	<47	<47	<47	<50
4,6-Dinitro-2-methylphenol (µg/l)	1*	---	---	<50	<50	<50	<10	<50	<3.0	<50	<50	<47	<47	<47	<47	<50
Pentachlorophenol (µg/l)	1*	---	---	<50	<50	<50	<5	<50	<2.2	<50	<50	<47	<47	<47	<47	<50

Notes:

- - Not provided/not analyzed
- SU - Standard unit
- µmhos/cm - Micro ohms per centimeter
- NTU - Nephelometric turbidity unit
- µg/L - Micrograms per liter
- * - Applies to the sum of phenolic compounds (total phenols)
- 10, 70 - Exceeds NYSDEC Class GA Groundwater Standard

Appendices

Appendix A

Site Inspection Form

Carborundum - Abrasive Division Site
 NYSDEC Site No. 932007
 Wheatfield, New York

Inspector's Name: _____
 Date: _____
 Weather: _____

1. Cap Inspection

Engineering Control	Condition	Maintenance Required or Comments
Clay Landfill Cap		
Monitoring Wells	See below.	See below.

2. Well Inspection

Inspection Items	Well			
	OW2-81	OW3-81	OW4-81	OW5-81
Depth to Water (ft. BTOR)				
Well Depth (ft. BTOR)				
Well Locked				
Lock Functioning				
Bailer and Rope OK				
Tubing OK				
Protective Casing OK				
Concrete Pad OK				
Heaving of Well or Casing				
Well Constricted				
Debris In Well				
Insects in Well				
Overall Condition				
Maintenance Needed				

Inspector's Signature: _____

Notes:

ft. BTOR = Feet Below Top of Riser

Appendix B

Groundwater Monitoring Forms

Sample Collection Data Sheet
Carborundum - Abrasive Division Site
NYSDEC Site No. 932007
Wheatfield, New York

Project Address: 6600 Walmore Road, Wheatfield, New York
Sampling Crew Member(s): _____
Date(s) of Sample Collection: _____
Weather: _____

Project No. 11212053 _____

Sample I.D. Number	Well Number	Date and Time Sampled	Top of Riser Elevation (ft. AMSL)	Water Depth (ft. BTOR)	Well Bottom Depth (ft. BTOR)	Field Temperature (°C)	Field pH	Field Conductivity (µS/cm)	Field Turbidity (NTU)	Sample Description (Color, Odor, Sheen, etc.)
	OW2-81		588.50							
	OW3-81		587.59							
	OW4-81		587.74							
	OW5-81		587.52							
	Catch Basin A-9		NA	NA	NA					

ft. AMSL = Feet Above Mean Sea Level
ft. BTOR = Feet Below Top of Riser
NA = Not Applicable
°C = Degrees Celsius
µS/cm = Microsiemens per centimeter
NTU = Nephelometric Turbidity Units

Additional Comments: _____

Field Data Record Form

Turbidity Meter-Hach

Page 1 of 1

Control number: _____
Date (mm/dd/yyyy): _____
User (print name): _____

Project number: _____
Project name: _____
Location: _____

Additional equipment control numbers and descriptions: _____

Field procedure before use:

<i>Do not calibrate in the field.</i>											
	Check when completed										
Check kit contents: <ul style="list-style-type: none">• Meter• STABLCAL standards (2100Q)• Low 0-10, medium 0-100, high standards (2100P)• Extra AA batteries• Sample vials	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>										
Test and record standards: <table><thead><tr><th><i>Gelex (2100P)/STABLCAL (2100Q) Standard</i></th><th><i>Meter Reading</i></th></tr></thead><tbody><tr><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td></tr></tbody></table>	<i>Gelex (2100P)/STABLCAL (2100Q) Standard</i>	<i>Meter Reading</i>	_____	_____	_____	_____	_____	_____	_____	_____	<input type="checkbox"/>
<i>Gelex (2100P)/STABLCAL (2100Q) Standard</i>	<i>Meter Reading</i>										
_____	_____										
_____	_____										
_____	_____										
_____	_____										
Note: Condensation on outside of sample bottles affects meter readings.											

Filing: Field file

Signature: _____

Field Data Record Form Water Quality Meter-YSI

Page 1 of 1

Control number: _____
 Date (mm/dd/yyyy): _____
 User (print name): _____

Project number: _____
 Project name: _____
 Location: _____

Additional equipment control numbers and descriptions: _____

Field procedure before use:

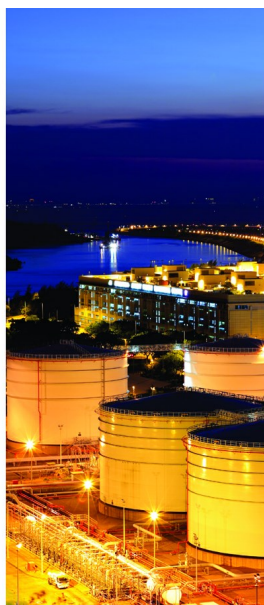
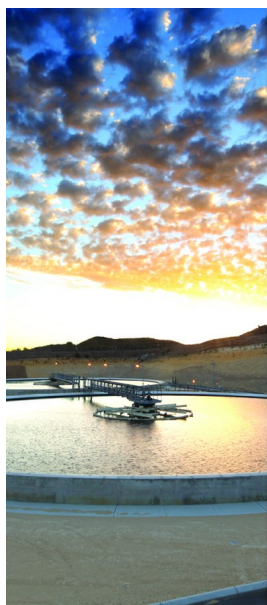
	Check when completed
<p>Dissolved Oxygen</p> <ul style="list-style-type: none"> • Quick DOCal can be enabled or disabled by using the up or down arrow keys to highlight Quick DOCal and pressing enter. An 'X' in the box next to Quick DOCal indicates it is enabled. <input type="checkbox"/> • Ensure the DOSensor has a good membrane with electrolyte installed. A good membrane is free of wrinkles, tears, fouling, and air bubbles. Install the sensor guard onto the probe. <input type="checkbox"/> • Moisten the sponge in the grey calibration/storage sleeve with a small amount of clean water and install it over the sensor guard. The sponge should only be moistened and the calibration/storage sleeve should not have excess water in it that could cause water droplets to get on the membrane. <input type="checkbox"/> • Power the instrument on and, if using a Polarographic sensor, wait approximately 5 to 15 minutes for the storage chamber to become completely saturated and for the sensor to stabilize. If using a Galvanic sensor, wait approximately 5 to 10 minutes for the chamber to become completely saturated. Auto Shutoff should be disabled or set to at least 20 minutes. <input type="checkbox"/> • Ensure the barometer is reading accurately. If necessary, perform a barometer calibration. <input type="checkbox"/> • Press and hold the Calibrate key for 3 seconds. Using the up or down arrow key, highlight Dissolved Oxygen and press enter. The Pro2030 will indicate 'Calibrating %DO' on the display. The instrument will automatically calibrate the sensor to the current barometric pressure. If DOLocal% is enabled, the sensor will calibrate to 100 percent. This may take up to 2 minutes depending on the age of the sensor and membrane. <input type="checkbox"/> • 'Calibration Successful' will display for a few seconds to indicate a 6. Successful calibration and then the instrument will return to the Run screen. <input type="checkbox"/> <p>Barometer</p> <ul style="list-style-type: none"> • If the barometer requires an adjustment, use the up or down arrow keys to highlight the barometer box along the bottom of the Run screen, then press enter. <input type="checkbox"/> • Next, use the up or down arrow keys to adjust the barometer reading to the local, true barometric pressure. Continually depress the up or down arrow key to change the barometer value more rapidly. <input type="checkbox"/> • Press enter to confirm and save the barometer adjustment. <input type="checkbox"/> <p>Conductivity or Specific (Sp.) Conductance</p> <ul style="list-style-type: none"> • Fill a clean container (i.e., plastic cup or glass beaker) with fresh, traceable conductivity calibration solution and place the sensor into the solution. The solution must cover the holes of the conductivity sensor that are closest to the cable. Ensure the entire conductivity sensor is submerged in the solution or the instrument will read approximately half the expected value. Gently move the probe up and down to remove any air bubbles from the conductivity sensor. <input type="checkbox"/> • Turn the instrument on and allow the conductivity and temperature readings to stabilize. Press the Cal key. Highlight Conductivity and press enter. Next, highlight the desired calibration method, Sp. Conductance or Conductivity, and press enter. <input type="checkbox"/> • Highlight the units you wish to calibrate, either uS/cm or mS/cm, and press enter. 1 mS = 1,000 uS. Next, use the up or down arrow key to adjust the value on the display to match the value of the conductivity calibration solution. If calibrating conductivity, it is necessary to look up the value of the solution at the current temperature and enter that value into the Pro2030. Most conductivity solutions are labeled with a value at 25°C. If calibrating specific conductance, enter the value listed for 25°C. Depressing either the up or down arrow key for 5 seconds will move the changing digit one place to the left. The Pro2030 will remember the entered calibration value and display it the next time a conductivity calibration is performed. <input type="checkbox"/> • Press enter to complete the calibration. Or, press Cal to cancel the calibration and return to the Run screen. <input type="checkbox"/> • 'Calibration Successful' will display for a few seconds to indicate a successful calibration and then the instrument will return to the Run screen. <input type="checkbox"/> <p>Salinity</p> <ul style="list-style-type: none"> • Fill a clean container (i.e., plastic cup or glass beaker) with fresh, traceable salinity calibration solution and place the sensor into the solution. The solution must cover the holes of the conductivity sensor that are closest to the cable. Ensure the entire conductivity sensor is submerged in the solution or the instrument will read approximately half the expected value. Gently move the probe up and down to remove any air bubbles from the conductivity sensor. <input type="checkbox"/> • Turn the instrument on and allow the conductivity and temperature readings to stabilize. Press the Cal key. Highlight Conductivity and press enter. Next, highlight Salinity and press enter. <input type="checkbox"/> • Use the up or down arrow key to adjust the value on the display to match the value of the salinity solution. Depressing either the up or down arrow key for 5 seconds will move the changing digit one place to the left. The Pro2030 will remember the entered calibration value and display it the next time a salinity calibration is performed. <input type="checkbox"/> • Press enter to complete the calibration. Or, press Cal to cancel the calibration and return to the Run screen. <input type="checkbox"/> • 'Calibration Successful' will display for a few seconds to indicate a successful calibration and then the instrument will return to the Run screen. <input type="checkbox"/> 	

Filing: Field file

Signature: _____

Appendix C

Health and Safety Plan



Site-Specific Health and Safety Plan

SGC Wheatfield - Environmental Services

Saint-Gobain Corporation

April 10 2020
11212053|02|--
Approval Date: 4-10-2020

HEALTH AND SAFETY PLAN

Signature page

This HASP was electronically signed by the Project Manager and Safety Group within the HASP Builder Software.
Fully approved HASP is printed without a DRAFT watermark.

Project Name: SGC Wheatfield - Environmental Services

Project Manager Approval Date: Margaret Popek, 4-10-2020

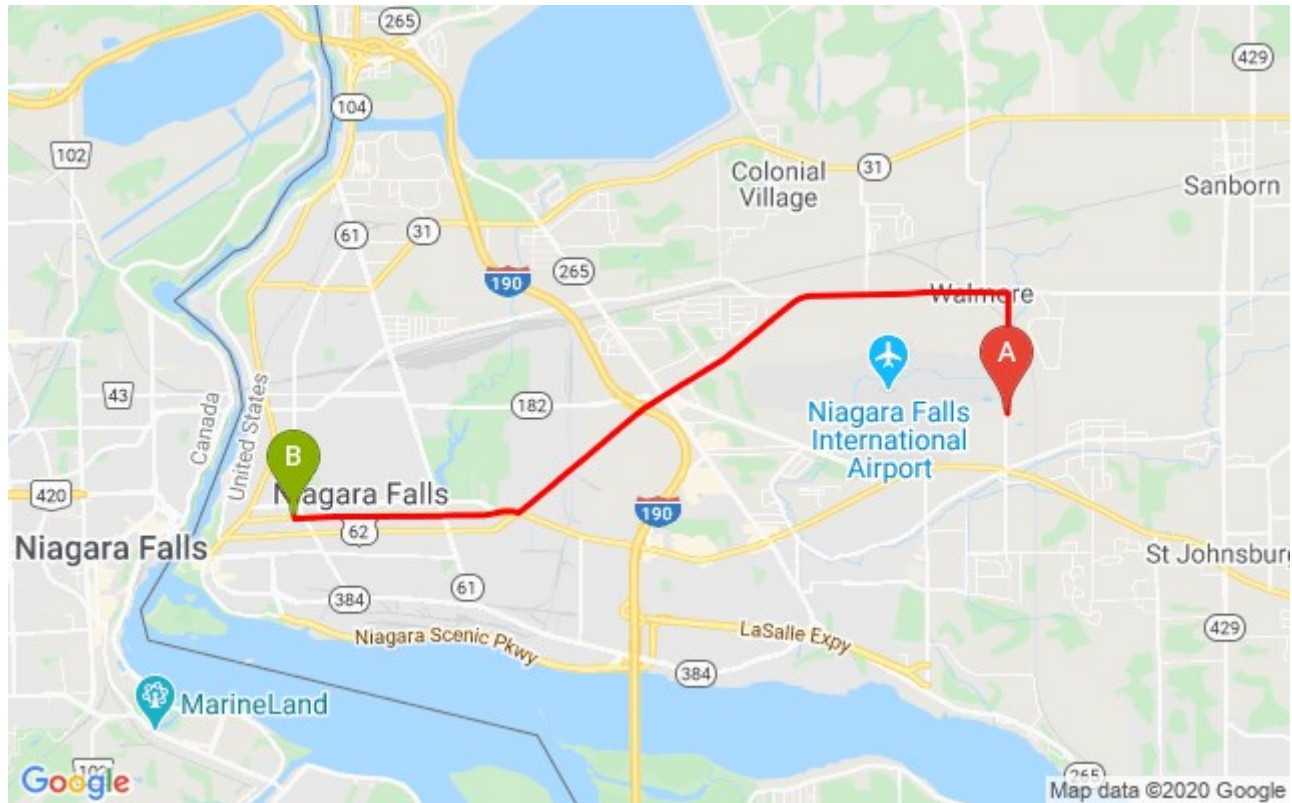
Safety Group Approval Date: John Maurer, 4-10-2020

Project Number: 11212053

Emergency Information

Contact	Phone Number	
Local Police Niagara Police Department 7105 Lockport Road Niagara Falls, New York United States	911 716-297-2150	Hospital Directions Directions: 1. Head north on Walmore Rd toward Utzig Dr 2. Turn left onto Lockport Rd 3. Continue onto Packard Rd 4. Continue straight to stay on Packard Rd 5. Turn right onto Pine Ave 6. Continue straight onto Walnut Ave 7. Turn right at Memorial Pkwy 8. Turn left Destination will be on the left
Fire Department Bergholz Fire Department 2470 Niagara Road Niagara Falls, New York United States	911 716-731-4848	
Ambulance	911	
Local Hospital Niagara Falls Memorial Medical Center 621 Tenth Street Niagara Falls, New York United States 14302	911 716-278-4395 (ER)	
National Poison Center	1-800-222-1222	Driving Time: 16 mins Driving Distance: 7.9 mi
Project Manager Margaret Popek	Work: 716-205-1973 Cell: 716-817-4887	GHD - HSE Help Line Please call (866) 529-4886 and provide: <ul style="list-style-type: none"> • Name and location of caller • Description of incident • Name of injured person(s) • Description of injuries • Phone number for return call
Site Supervisor Margaret Popek	Work: 716-205-1973 Cell: 716-817-4887	
GHD Regional S&H Manager John Maurer	Work: 716-297-6150 Cell: 716-545-0112	
Client Contact Jim Smith	610-893-5667	
Client Site Contact Jim Smith - Client Lyle Death (NFTA Contact) Chris Ciccarelli - Plant Site Contact	Work: 610-893-5667 Cell: Work: 716-308-5914 Cell: Work: 716-731-8200 Cell:	
Other Contact		
Site Health Officer	Phone:	
Person to verify hospital route:	Signature:	

Hospital Driving Directions



1. Head **north** on **Walmore Rd** toward **Utzig Dr**
2. Turn **left** onto **Lockport Rd**
3. Continue onto **Packard Rd**
4. Continue straight to stay on **Packard Rd**
5. Turn **right** onto **Pine Ave**
6. Continue straight onto **Walnut Ave**
7. Turn **right** at **Memorial Pkwy**
8. Turn **left**
Destination will be on the left

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Appendix

Chemical Table

Appendix A - GHD Mandatory Documents

- GHD COVID-19 Guidance Documents
- Tailgate Safety Meeting - Large
- Tailgate Safety Meeting - Small
- QSF-006 - Management of Change
- QSF-019 Underground Utilities Checklist
- HASP Amendment Form
- HASP Acknowledgement Sheet
- Site Plan.pdf

Appendix B - JSAs

- Environmental-Decontamination of Sampling Equipment and Personnel (PPE Level D)
- Motor Vehicle - Driving
- Mobilization-Demobilization
- Environmental- Monitoring Well Sampling
- Environmental-Site Recon and Walkthrough

Appendix C - Safety Data Sheets (SDS)

- Alconox SDS

Appendix D - Training Records
Record of Training Form

1. Introduction

1.1 GHD Values and Integrity Management Policy

At GHD, we commit to safe, ethical and respectful business behaviour in regard to both the internal conduct of our business and our engagement with external stakeholders and the public. The core values of Safety, Teamwork, Respect and Integrity will guide all of our activities. We will only seek work and participate in business transactions under high standards of corporate ethics and with complete integrity. Our projects will be undertaken in a manner that places safety as the top priority, with each of our employees empowered with Stop Work Authority throughout the execution of project work. GHD expects that all of its projects will be undertaken in an environment of teamwork and mutual respect, free from discrimination, harassment, bullying or other inappropriate behavior. We foster an open environment in which our people can report any improper practices or behaviour without fear of reprisal. All reported incidents will be investigated promptly with appropriate and equitable follow-up. GHD's integrity management policy and guidelines are available at <http://www.ghdcanada.com/global/about-us/integrity-management>.

1.2 Purpose

The purpose of this site specific health and safety plan (HASP) is to provide guidelines and establish procedures for reducing and controlling hazard exposure to the public, property, and personnel. The HASP is a living document and must continually evolve as site conditions and knowledge of the site activities develop.

This document has been developed to meet or exceed the requirements set forth by federal, state, and provincial legislation. If any procedure outlined in this plan conflicts with federal, state/provincial, and/or municipal law, prescribed standards, or client requirements, then the most stringent set of standards applies.

1.3 Stop Work Authority

All employees are empowered and expected to stop the work of coworkers, subcontractors, client employees, or other contractors if any person's safety or the environment are at risk. No repercussions will result from this action. Reporting of unsafe acts/condition (UA or UC) or Stop Work Authority (SWA) is completed with BWISE and/or the GHD HSE app. Unsafe acts, conditions, stop work authority are now reported via the GHD HSE app.

The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated results in the removal of site personnel from that area and re-evaluation of the hazard and the levels of protection.

1.4 Short Service Employee

The Employee is considered a Short Service Employee (SSE) if he/she has less than 6 months experience with his/her present employer, or in his/her present role. The individual is required to wear a fluorescent orange hardhat, as an obvious indicator of SSE status. Training and mentoring allows them to gain knowledge and experience in procedures and methods. In order for a new employee to work in the field, the following minimum training requirements must be met:

1. GHD New Employee Safety & Health Orientation training (on-line).
2. GHD HAZCOM (US)/WHIMIS (Canada)(on-line).
3. On-boarding completed with Human Resources.
4. Compliance training defined on the QSF-20 as it applies to field work to be conducted.
5. Client specific safety training.

A SSE's primary mentor is their direct Supervisor. GHD Supervisors are responsible for ensuring that a SSE completes the safety, field method, and quality training as appropriate to the work they are assigned. A SSE requires an On-site Mentor for all fieldwork. The On-site Mentor must have experience in the work they are mentoring and they are responsible for the close monitoring of the SSE.

Project team SSE make-up requirements are:

- A one-person project team cannot be a SSE.
- A two-person to four-person project team can have only one SSE.
- A five-person or more project team cannot have more than 20 percent SSE without a written variance from the GHD Corporate Manager of Safety & Health.

New hire employees that can provide sufficient documentation supporting previous experience in working under HSE program(s) similar to GHD's may be exempt from GHD's SSE program. These exemptions are handled on a case-by-case basis and must be authorized by one of the following staff: the Corporate Manager of Safety & Health or a Senior Regional Safety & Health Manager. Details of the exemptions are covered in the full SSE Policy.

Clients may define specific SSE requirements for work at their facility or on their project. It is the responsibility of the Project Manager to communicate a client's specific requirements to the appropriate staff within GHD and project subcontractors. Client-specific SSE standards shall be posted on the Safety & Health Portal SSE Folder.

1.5 Project Management And Safety Organization

Project Manager – GHD – Margaret Popek

The GHD Project Manager (PM) is responsible for the overall implementation, review, and approval of the HASP, and for ensuring that all safety and health (S&H) responsibilities are carried out. The PM will also ensure that appropriate resources are provided to support the project.

Site Supervisor – GHD – Margaret Popek

The Site Supervisor (SS) is responsible for:

- Ensuring that the HASP is reviewed, approved, and implemented.
- Communicating site requirements to site project personnel and subcontractors through site orientation.
- Consulting with the client/site representative regarding appropriate changes to the HASP.

- Conducting a daily tailgate safety meeting that communicates the site specific hazards. This meeting must be documented on the Tailgate Safety Meeting form in the appendix.
- Ensuring that all necessary cleanup and maintenance of safety equipment is conducted by project personnel.
- Verifying emergency phone numbers and services, including hospital and clinic locations.
- Completing, filing, and correctly submitting the forms attached to the HASP, including daily tailgate meetings, job safety analysis, and daily inspection checklists.
- Implementing risk-based safety procedures on all activities and enforcing safe work practices for project employees
- Observing ill effects on any crew member, especially those symptoms caused by cold/heat stress or chemical exposure.
- Overseeing the safety of visitors who enter the site.
- Maintaining communication with the client/site representative(s) and/or government inspectors/agencies.
- Providing and enforcing the use of safety equipment, personal protective equipment (PPE), and other items necessary for employee or community safety.
- Conducting job site inspections as a part of quality assurance for safety and health.
- Ordering the immediate shutdown of site activities in case of a medical emergency, unsafe condition, or unsafe practice.
- Reporting safety and health concerns to site and/or project management as necessary.

Regional HSE Manager GHD – John Maurer

The Regional HSE Manager is a full time GHD employee who is trained as a safety and health professional and serves in a consulting role to the PM and SS regarding potential safety and health issues. The HSE Manager or trained designee must review, coordinate required changes with PM and provide the final approval of the HASP prior to work beginning on site.

Site personnel

All employees have a role in GHD’s HSE program and a responsibility to implement the program. GHD personnel are responsible for:

- Engaging in all aspects of their tasks and jobs when they are prepared to do the job safely, well rested, and mentally prepared for work.
- Utilizing the STAR process before initiating work.
- Implementing Stop Work Authority for any operations that may cause injury, illness, or unsafe conditions to employees, subcontractors, or others.
- Assisting in the development and revision of Job Safety Analysis (JSA) forms that are appropriate to their current scope of work.
- Use, inspect and maintain PPE as required by JSA and site conditions.
- Preparing, submitting and reviewing safety observations using the GHD HSE app or appropriate forms
- Inspecting tools and other equipment before each use or as manufacturer dictates and documenting any defects.
- Correcting job site hazards when possible without endangering life or health.
- Reporting safety and health concerns to the SS, PM, HSE Manager, or SHO (if appointed).

Subcontractors

Subcontractors are responsible for:

- Developing and implementing their own HASP and complying with its contents.
- Attending an initial site orientation and subsequent safety meetings.
- Ensuring that their employees adhere to all site personnel requirements.
- Submitting required documentation to the SS regarding federal, state, or provincial requirements before beginning any work.

- Obtaining approval for the use of GHD's equipment.
- Observing and obeying all GHD/client requirements as well as any specific direction given by GHD's management team.
- Wearing any personal protective equipment required by their HASP and GHD at all times.
- Meeting all governing legislation/regulation/industry standards for equipment used on GHD projects.
- Verifying that all subcontractor employees have required training, medical clearance, and substance abuse testing as required by project.
- Not being in possession or under the influence of alcohol, incapacitating drugs, or medications.

In the event of conflicting safety procedures or requirements, personnel must implement those safety practices that afford the highest level of safety and protection. In addition, noncompliance with safety and health policies and procedures may subject the subcontractor to disciplinary action up to and including termination of their contract with GHD.

Equipment Operators

All equipment operators must meet all the requirements of site personnel listed above and are responsible for the safe operation of heavy equipment. Operators are responsible for conducting documented daily inspections on their equipment to ensure safe performance. Brakes, hydraulic lines, backup alarms, and fire extinguishers must be inspected routinely throughout the project. Equipment will be taken out of service if an unsafe condition occurs. Daily inspections must be provided to the GHD site supervisor prior to the equipment being used.

Authorized Visitors

Authorized visitors, as approved by **Margaret Popek**, are provided with all relevant information regarding site operations and hazards as applicable to the purpose of their visit. Visitors may be required to be accompanied by authorized personnel.

1.6 Site Safety And Health Officer

The site safety and health officer (SHO) is responsible for assisting in the communication of site requirements to site project personnel and subcontractors and for carrying out the health and safety responsibilities include the ones listed under the site supervisor. The SHO has prior experience in working at similar sites. The SHO operates under the supervision of the PM, SS, and HSE Manager.

1.7 Recordkeeping

The SS shall establish and maintain records of all necessary and prudent monitoring activities as described below:

- Name and job classification of the employees involved on specific tasks.
- Air monitoring/sampling results and instrument calibration logs.
- Records of training acknowledgment forms (site specific training, toolbox meetings, etc.).
- Documentation of site inspections, results of inspections, and corrective actions implemented.
- Emergency reports describing any incidents or accidents.

1.8 Site HASP Amendments

Any change to the scope of work must be evaluated for its impact on the overall health and safety of the project and associated personnel. A minor change is one that adjusts already-documented hazards within the HASP and does not expose site personnel to chemicals above exposure limits, such as the introduction of a new JSA, or PPE that does not involve a change in respiratory protection. Amendments must be documented on the Site Health and Safety Plan Amendment Form located in Appendix, in addition to notifications to key personnel.

Significant changes to the scope of work require a rewrite by the PM and review/approval of the HASP by a HSE Manager.

1.9 Training Requirements

All personnel conducting work at this site shall have completed the appropriate safety and health training, as applicable to their job/task duties as it relates to the GHD Tiered Training System. The required training is referenced throughout the HASP and identified on each JSA form

1.10 Site Specific Training

An initial site specific training session or briefing shall be conducted by the PM or SS prior to commencement of work activities. During this initial training session, employees shall be instructed on the following topics:

- Personnel responsibilities
- Content and implementation of the HASP
- Site hazards and controls
- Site specific hazardous procedures (e.g., drilling, excavations, etc.)
- Training requirements
- PPE requirements
- Emergency information, including local emergency response team phone numbers, route to nearest hospital, incident reporting procedures, and emergency response procedures
- Instruction in the completion of required inspections and forms
- Location of safety equipment, such as portable eyewash, first aid kit, fire extinguishers, etc.

The various components of the project HASP will be presented, followed by an opportunity to ask questions to ensure that each attendee understands the HASP. Personnel will not be permitted to enter or work in potentially contaminated areas of the site until they have completed the site specific training session. Personnel successfully completing the training session shall sign the HASP Acknowledgement Form, which is presented as an Appendix.

In addition to the initial site briefing conducted at the commencement of the project, supplemental brief safety meetings shall be conducted by the SS to discuss potential safety and health hazards associated with upcoming tasks and necessary precautions to be taken.

1.11 Safety Meeting/ HASP Review

"Tailgate" safety meetings will take place each day prior to beginning the day's work. All site personnel will attend these safety meetings conducted by the SS. The safety meetings will cover specific safety and health issues, including the appropriate JSAs, site activities, changes in site conditions, and a review of topics covered in the site specific pre-entry briefing. The safety meetings will be documented each day with written sign in sheets containing a list of topics discussed. To assist with the compliance of documentation of the Tailgate safety meetings, there is a Tailgate Safety Meeting form located in the Appendix.

1.12 Fatigue Management

GHD employees and subcontractors are responsible for ensuring they are both physically and mentally fit to perform their job functions safely as part of GHD's Fatigue Management Program. GHD will use the following control measures to minimize fatigue during the project:

- Alter the work schedule to reduce the overall time a worker will perform physically demanding work.
- Monitoring employee behaviors for signs of fatigue.
- Eliminate or reduce where practicable the need to work extended hours, night shifts, or overtime.
- Use work-rest patterns during repetitive tasks to control fatigue and increase mental fitness.

GHD's work/rest balance requirements are referenced based on weight of the vehicle. Less than 10,000 lbs/4536 kg (passenger cars, pickup trucks, SUV) will follow the following guidelines:

- Maximum working time and/or driving and working time within one work day: 14 hours (extendable up to 16 hours if drive time < 4 hours and/or airplane travel is involved; this approach can be taken three times in a 7 day period)
- Maximum continuous drive time: 3 hours followed by a 15 minute break
- Maximum drive time per day: 9 hours (extendable up to 10 hours twice in 7 day period)

Employees that drive vehicles greater than 10,000 lbs/4,536 kg must meet the requirements of the transportation agency for which they work and travel.

Management, as represented by an employee's manager, Project Manager or any Principal, may grant a documented variance to the standard work/rest balance for specific employees for a period covering no longer than one week. Additional variances can be issued after for each week. For further information see Fatigue Management Program on the portal.

1.13 Management Of Change

Safety incidents are known to occur when key changes are not communicated to all stakeholders related to a project. Management of Change is covered by the GHD Quality Manual Section 7.3.7 Control of Project Changes and is documented using QSF-006 Management of Change Form (see Appendix).

The types of changes that are to be documented and communicated are:

- Project management/Resources (key personnel)
- Equipment
- Safety – this would not include daily changes to JSA when dirtied in the field.
- Field Operations/SOP

Form QSF-006 is the tool to document and communicate the change. The completed QSF-006 is to be filed in the GHD field folder of the project file.

1.14 Field Notes

All activities undertaken in the field must be correctly and completely recorded in bound field books, Quality System Field Data Record forms (QSF 200, QSF 400 , and QSF 500 Series D), or in some other GHD approved format (i.e., electronically, loose paper). All records will be kept in the GHD approved format specified for the activities undertaken. The formats have been established to ensure completeness and to provide consistency amongst the field staff regardless of which office they are from. Refer to Section 7 - Control of Monitoring and Measuring Equipment of the GHD Quality System Manual and Section 3.4.1 – Field Notes of the GHD Field Training Manual for more information regarding field note content requirements.

These field notes may be called as evidence in a court of law.

In addition to the formal field notes, field personnel are expected to keep running tables that summarize the field activities so that when questioned at any time during the project, a detailed status of the work completed and that yet to be done can be provided. These lists also serve as checklists to confirm that the correct number and sequence of samples, wells, boreholes, etc. have been collected or completed.

Upon completion of each project, all of the field documentation is brought back and suitably stored at the GHD office in which the field staff who performed the field work are located.

GHD demands that all field note entries are factual and accurate. Everyone recognizes that errors and omissions will be made on occasion. While GHD does not condone a level of effort that is incomplete or inaccurate, it is recognized that it may happen and most of our clients will understand these situations. However, anyone who is caught falsifying any record, no matter how small, will be immediately dismissed.

2. History & Scope

2.1 Site History/Background

The Site is located at 6600 Walmore Road in the Town of Wheatfield, Niagara County, New York, and encompasses approximately one acre of land on a greater 54.52-acre parcel identified as Section-Block-Lot (SBL) number 146.00-1-9.2. The greater parcel is owned by Patriot Wheatfield Associates, LP. The remainder of the parcel is occupied by the Saint-Gobain Abrasives facility. The Site is listed in the State Superfund Program with a classification of 4, indicating that the Site has been properly closed but requires continued site management consisting of operation, maintenance, and/or monitoring.

The Site consists of a clay-capped landfill, and is bordered by the Niagara Falls Air Reserve Station and Cayuga Creek to the north; light industrial complexes or undeveloped areas to the east and south; and the Niagara Falls International Airport to the west. Four monitoring wells are associated with the Site. Two of the wells, identified as OW2-81 and OW3-81, are located west of the landfilled area on the NFIA property, which is owned by the Niagara Frontier Transportation Authority (NFTA). The two remaining wells, identified as OW4-81 and OW5-81, are located east of the landfilled area in a concrete area suspected to have historically been utilized as a taxiway or parking area for aircraft manufactured at Bell Aircraft Co. during World War II. The “A” sewer line (West Branch) is located east of the Site. Catch basin A-9 along this sewer line drains the surface runoff and subsurface drainage from the landfill area.

The former Carborundum – Abrasives Company landfill (Site) was identified by the Inter-Agency Task Force on Hazardous Wastes in a March 1979 report titled *Draft Report on Hazardous Waste Disposal in Erie and Niagara County, New York*. The Site was used from 1968 to 1976 to dispose of wastes generated at the adjacent Carborundum – Abrasives Division plant. The wastes were described in the report as “partially solidified and solidified resins, floor sweepings, waste fillers including calcium carbonate, clays and animal glue (estimated 400 tons total) with free phenols (resins) (estimated 800 to 1,600 pounds total).” The wastes were disposed by excavation of a long, narrow trench estimated to be approximately 450 feet long, 20 feet wide, and 12 feet deep. As the wastes were deposited into the trench, a soil cover comprised of the excavated soil (glacio-lacustrine clays) was placed over the waste.

The Carborundum – Abrasives Division ceased operations in 2003. A hydrogeological investigation of the Site was conducted in 1981. Monitoring wells confirmed the presence of phenols in the groundwater. In late summer of 1982, a remedial program was implemented which consisted of the installation of an improved clay cap over the landfill area. Groundwater monitoring results indicate that the cap and containment are effective, and there does not appear to be any migration of materials after 38 years of monitoring. Phenols have not been detected in groundwater samples collected from the Site monitoring wells since 1993.

2.2 Scope of Work Tasks

Site management requirements for the Site currently consist of an annual Site inspection, which includes a cap inspection and an inspection and purging of four monitoring wells; biennial groundwater monitoring; and cap maintenance. GHD performs the annual Site inspection and biennial groundwater monitoring on behalf of Saint-Gobain. Cap maintenance is managed entirely by Saint-Gobain. Purge water from groundwater monitoring activities is discharged directly to the on-site sewer system.

Two of the monitoring wells in the monitoring/inspection program are located on the west-adjointing NFTA property (Niagara Falls International Airport). The NFTA is contacted ahead of time and an arrangement is made for GHD to access these two wells, accompanied by an escort from the NFTA.

This HASP covers the specific site activities that will be conducted by GHD personnel and their subcontractors. These activities listed here, and in the attached JSAs cover the tasks being performed onsite.

Driving, Site Reconnaissance and Walk through Activities, Mob/Demob of personnel, material, and equipment, Monitoring Well Sampling, Decontamination of Sampling Equipment and Personnel

If site operations are altered or if additional tasks are assigned, an addendum to this HASP shall be developed to address the specific hazards associated with these changes.

All addendums will be required to be developed in conjunction with project management and a GHD safety professional.

3. Chemical Hazards

3.1 Introduction To Chemical Hazards

This section identifies and evaluates the potential chemical hazards that may be encountered during the completion of this project. These hazards and the anticipated initial exposure levels are based on client data, historical data, etc.

Chemical exposures occur via four major routes of entry: absorption, inhalation, ingestion, and injection. A listing of the chemical contaminants of concern is found in the **Chemical Table** (Table 1) and The **Safety Data Sheets (SDSs)**, for chemical products used on site, are also included in the Appendices. Both the Chemical Table and SDSs include exposure limits, signs and symptoms of exposure, chemical properties, and physical characteristics.

3.2 Control Measures

Before the proper control(s) can be selected, GHD personnel conduct a hazard evaluation of the process, activity, or material. A hazard evaluation may include reviewing information from a chemical container label, SDS, manufacturer, National Institute for Occupational Safety and Health (NIOSH) website, and other resources as needed; identifying route(s) of exposure; and evaluating the process/activity to determine if an exposure evaluation is needed. If necessary, a HSE Manager conducts and documents exposure evaluations.

Exposure to potential on site contaminants/chemicals, such as those listed in Table 1.0 and SDSs, include the following methods:

- Engineering controls such as wetting methods, ventilation, elimination, or substitution.
- Administrative controls such as work rotation, training, or proper hygiene practices (washing facilities).
- Monitoring air concentrations with appropriate equipment in the breathing zone.
- Selecting and using personal protective equipment (PPE) such as gloves or respiratory protection.

JSAs are developed and revised to list the associated hazard controls on a task-specific basis.

3.3 Safety Data Sheets

SDSs are documents created by the chemical manufacturer that describe the substance. Some information found on an SDS includes: hazardous and physical characteristics, handling requirements, storage and disposal information, and signs and symptoms of exposure.

When working with hazardous chemicals, readily available and up-to-date SDSs are required for each chemical. GHD personnel and its subcontractors are responsible for obtaining and maintaining SDSs for their controlled products and for products that they are bringing onto site. All projects maintain an inventory of SDS and are made readily available to all employees and visitors.

3.4 Container Labels

All hazardous materials, hazardous waste, chemical containers, and chemical storage areas are appropriately labeled indicating the chemical identity, hazards present, and any relevant regulatory requirements. Labeling of all chemical containers assists emergency personnel and others in identifying hazards if a spill occurs or emergency situation arises.

Chemical container labeling is the responsibility of the individual who fills and/or uses the chemicals. All containers into which chemicals are transferred are legibly labeled in the language that can be understood by the employees who work with or in proximity (English, French, Spanish, etc.) and include the name of the chemical and appropriate hazard warnings.

3.5 Workers Training

All employees who may work in proximity to controlled products has and maintains current applicable training as appropriate to client, state, provincial or federal requirements, which may include: HAZCOM, WHMIS, TDG, or DOT. Records of training are readily available upon request.

4. Physical Hazards

4.1 Introduction To Physical Hazards

Physical Hazards are factors within the environment that can harm the body without necessarily touching it. Vibration and noise are examples of physical hazards. Physical hazards for this site have been identified in the following section. If the hazards change due to site conditions or additions to the scope of work, a Stop Work must be implemented and the conditions identified to the PM and RHSM.

In addition, personnel must be aware that the protective equipment identified in the JSA may limit dexterity and visibility and may increase the difficulty of performing some tasks.

4.2 Utility Clearances - OSHA

Extreme caution is needed when working around electrical power lines. Electricity flows through metal, wood, and many other conducting materials, including human beings. Elevated equipment such as drill rigs, backhoes, scaffolding, ladders, etc must remain the required distance away according to the local/state/provincial regulations.

These minimum requirements are:

Occupational safety and health act 1926.550(a)(15)

Operating voltage of overhead power	Operating voltage of overhead power safe limit of approach distance for persons and equipment
<50 kv	10 feet
>50 kv	20 feet

For lines rated over 50 kv, minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kv, over 50 kv, or twice the length of the line insulator, but never less than 10 feet.

- If any part of a machine may encroach these parameters, SWA is implemented, a review of the SOW is conducted with the PM and RHSM, and a spotter is used.
- If the client has requirements that exceed the above minimums, then the client requirements are used.

Underground Utilities

Underground utilities, if present, are to be clearly marked and identified prior to commencement of work. Follow applicable regulations and client requirements with regards to utility-locating requirements (e.g., One Call).

Personnel involved in intrusive work will:

- Confirm proposed excavation(s) and heavy truck routes are not in the area of subsurface utilities. This meeting is to be documented.
- Review and adhere to GHD's Subsurface Utility Clearance Protocol SOP at a minimum. Use air knifing or vacuum truck digging techniques inside 5 feet of the outside edge of an underground facility.
- Pre-clear holes to 120% of the drill diameter to a minimum depth of 5 feet below ground surface. Consider pre-clearing to greater depths in close proximity to process piping such as loading racks
- Locate boreholes a minimum distances of 5 feet perpendicular from utility mark-out lines
- **Complete the Property Access/Utility Clearance Data Sheet (QSF 019) prior to initiating excavation activities.**
- On private property, request that the owner of the service, locate and mark the service.
- If a service may pose a hazard and cannot be shut off or disconnected, request that the owner of the service supervise the uncovering of the service during the work.
- Identify the work that can be conducted with the assistance of the locator line service, coordinate document/drawing review, and inspect the site for manholes, catch basins, valve boxes, etc. that may indicate the direction/depth of underground installations. Marking indicates only the approximate location of buried lines.

The following are the Uniform Color Codes for utility locates

white proposed excavation

pink temporary survey marking

red electrical power lines,cables, conduit and lighting cables

yellow gas,oil, steam,petroleum or gaseous material

orange communication, alarm or signal lines,cables or conduit

blue potable water

purple reclaimed water, irrigation and slurry lines

green sewers and drain lines

4.3 Material Handling

Material handling and storage practices are conducted at the project site. Proper lifting reduces the hazard out of moving objects. No one person should handle, lift, or move 50 pounds or more by themselves. Even if the object weighs less than 50 pounds, the configuration or shape of the object should be evaluated to see if two people should be used to lift the object.

Manual Lifting

Consider the following prior to a lift.

- Establish that you can lift the load safely.
- Inspect route to be travelled, confirming sufficient clearance.
- Look for any obstructions or spills.
- Inspect the object to determine how it should be grasped.
- Select and use containers with handles where practical.
- Look for any sharp edges, slivers, or other things that may cause personal injury.
- Do not move any object that will obstruct your field of vision when transporting the load.
- When lifting objects, use proper lifting techniques. Position the body so that the weight of the body is centered over the feet, which provides a more powerful line of thrust and ensures better balance. Start the lift with a thrust of the rear foot. Do not twist.

General Storage Practices

Storage of materials and supplies must not create a hazard. General storage area practices include the following:

- Bags, containers, bundles, etc. stored in tiers must be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapse.
- All stacked materials, cargo, etc. must be examined for sharp edges, protrusions, signs of damage, or other factors likely to cause injury to persons handling these objects. Defects are to be corrected as they are detected.
- Storage areas must be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest haborage.
- Storage areas have provisions to minimize manual lifting and carrying. Aisles and passageways provide for the movement of mechanical lifting and conveyance devices.
- Stored materials do not block or obstruct access to emergency exits, fire extinguishers, alarm boxes, first aid equipment, lights, electrical control panels, or other control boxes.
- Hazardous materials are stored in accordance with the details outlined in the MSDS, or accepted guidelines from reputable agencies. Guidelines include details about the materials reactivity, corrosivity, flammability, etc., as well as appropriate signage.

4.4 Noise

Hearing protection is required for project activities when working in close proximity to machinery, drilling operations, or impact/power tools where noise levels may exceed the decibel range of 85 dBA.

When hearing a coworker at normal conversation distance is difficult or the noise level is approaching or exceeding 85 dBA, hearing protection such as earplugs or muffs must be available/worn by all site personnel and visitors that may be exposed to elevated levels of noise. Individuals who wear hearing protection are to be adequately trained in the safe use and handling of hearing PPE.

GHD employees who have the potential to be exposed to noise exceeding 85dba in the work environment will be enrolled in the GHD Hearing Conservation Program.

4.5 Electrical Safety

Employees do not accept unnecessary exposure to hazards, such as working on energized electrical installations. When possible, circuits are de - energized according to the GHD Lockout/Tagout program and client requirements to achieve safe working conditions. When it is not possible to de - energize circuits, the Workplace Electrical Safety Program (WESP) requirements ensure that safe conditions and work practices are implemented.

The WESP is the electrical safety program that covers all electrical work performed at GHD facilities and work performed by GHD at client facilities. It also provides mandatory program requirements and is used in conjunction with all other procedures and practices on the site to ensure that electrical work is accomplished safely.

To protect employees from shock and/or arc flash hazards, only individuals who are "qualified" in accordance with the NFPA 70E or CSA Z462 Standards will be allowed to perform Arc Flash Hazards Analysis, LOTO, diagnostic testing, work on live electrical circuits or perform electrical work on equipment. The term "qualified" does not relate to a job title or job assignment, but rather to the activity being performed. Employees who perform electrical work must successfully complete the "Electrical Safety for Qualified Persons" training to be authorized as "qualified". Only persons who have received this training and are knowledgeable in the construction and operation of equipment or a specific work method, and are trained to recognize and avoid the electrical hazards that may be present with respect to that equipment or work practice are allowed to perform this type of work. Consult the GHD Workplace Electrical Safety Program for additional program requirements and permits.

4.6 Control Of Hazardous Energy (Loto)

Hazardous energy sources may be encountered during the servicing and maintenance of machines and equipment, in which the unexpected energization or start-up of the machines or equipment could cause injury to employees.

The minimum performance requirements to control hazardous energy requires that employers develop and implement an energy control program. The elements of an energy control program are as follows:

- Lockout/tagout
- Employee protection
- Energy control procedure
- Protective materials and hardware
- Periodic inspections
- Training and communication
- Energy isolation
- Employee notification

Project personnel who are required to conduct operations and maintenance activities that will require the isolation of an energy hazard through the use of a lockout/tagout device shall follow the GHD program requirements and written procedures for that operation. The program requirements can be located in the Appendix.

Employee Training

Employees authorized to attach and remove lockout/tagout devices shall be provided with initial training regarding the safe application, usage, and removal of such devices. Each authorized employee will receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the associated energy, and the methods necessary for energy isolation and control.

All authorized employees will be provided with refresher training annually, or at more frequent intervals whenever the following conditions apply:

- A job assignment change.
- A change in machinery or equipment, or a process change that presents new hazards.
- A change in the energy control procedures.
- Possible deficiencies in the employee's understanding of the following:
 - ◊ The hazards associated with the energy that controls the machinery or equipment in the employee's work area.
 - ◊ Application and removal procedures for lockout/tagout devices.

Employees who work in areas where lockout/tagout procedures are used shall receive initial and annual refresher training in the purpose and use of lockout/tagout devices and principles behind their use.

4.7 Heat Stress

Heat stress is one of the most common illnesses faced by project personnel when working in elevated temperatures and/or humidity.

Prevention

The following procedures will be carried out to reduce heat stress:

- Heat stress monitoring.
- Acclimatization.
- Sun exposures.
- Work/rest regimes (schedule of breaks) in accordance with Occupational Health Clinics for Ontario Workers (OHCOW).
- Humidex Heat Stress Response Plan – mandatory breaks scheduled in summer months or during high risk activities for heat stress (based on ACGIH)
- Heat stress safety PPE (e.g., cool vests, bandanas)
- Cool potable water available
- Use of buddy system
- Seek shade - Shade is a good source of protection, but keep in mind that shade structures (e.g., trees, umbrellas, canopies) do not offer complete sun protection.

OHCOW Humidex Heat Stress Response Plan		
°F	°C	Response
77-84°F	25-29°C	•supply water to workers on an "as needed" basis
86-91°F	30-33°C	•post "heat stress alert" notice •encourage workers to drink extra water •start recording hourly temperature and relative humidity
93-98°F	34 37°C	•post "heat stress warning" notice •notify workers that they are drinking extra water •ensure workers are trained to recognize symptoms
100-102°F	38 39°C	•provide 15 minutes relief per hour •provide adequate cool (10 15°C) water, at least 1 cup (240 ml) of water every 20 minutes •workers with symptoms should seek medical attention
104-107°F	40 42°C	•provide 30 minutes relief per hour in addition to the provisions listed previously
109-111°F	43 44°C	•if feasible provide 45 minutes relief per hour in addition to the provisions listed above •if a 75% relief period is not feasible then stop work until the humidex is 42°C or less
113°F	45°C or over	•stop work until the humidex is 44°C or less
Note: Humidex plan is a simplified way of protecting workers from heat stress which is based on the 2007 ACGIH heat stress TLV® (threshold limit value®) which uses wet bulb globe temperatures (WBGT) to estimate heat strain. These WBGT's were translated into humidex		

Sun Exposure

Overexposure to sunlight is a common concern when field activities occur during warm weather

conditions. Overexposure can occur on clear, sunny days, as well as on overcast and cloudy days. The following steps should be taken to protect against overexposure to sunlight:

- Always use sunscreen on exposed body parts.
- Cover up.
- Wear safety rated sunglasses.
- Limit time in the midday sun.

4.8 Hand And Power Tools

Hand Tools

- Hand tools must meet the manufacturer's safety standards.
- Hand tools are not to be altered in any way.
- At a minimum, appropriate eye and face protection that meets current applicable standards (ANSI/CSA) must be used.
- Wrenches, including adjustable, pipe, end, and socket wrenches, are not used when jaws are sprung to the point that slippage occurs.
- Impact tools such as drift pins, wedges, and chisels are kept free of mushroom heads.
- Wooden handles are free of splinters or cracks and secured tightly to the tool.
- Any damaged or defective tools are immediately removed from service and tagged for destruction.

Power Tools

- All power tools must be inspected regularly and used in accordance with the manufacturer's instructions and the tool's capabilities.
- Electric tools are not used in areas subject to fire or explosion hazards, unless they are approved for that purpose.
- Corded portable electric tools are connected to a ground fault circuit interrupter (GFCI) when working in wet areas.
- Coiled cords/extension cords are uncoiled when plugged in to allow for dissipation of heat.
- Cords/extension cords rated appropriately for the temperature are used.
- Appropriate eye and face protection that meets current applicable standards (ANSI/CSA) are used.
- Personnel are trained in the proper use of the tool.
- Any damaged or defective power tools must be immediately tagged and removed from service.
- Repairs to hand or power tools are only made by qualified individuals and in accordance with the manufacturer's standards.
- Field or shop modifications to tools or equipment are only made by qualified individuals and in accordance with either manufacturer or engineer-approved specifications.

4.9 Slip, Trip, Hit, Fall

Slip/trip/hit/fall injuries are the most frequent of all injuries to workers. They occur for a wide variety of reasons, but can be minimized by the following prudent practices:

- Spot-check the work area to identify hazards and communicate hazards to on site personnel.
- Update/dirty the JSA to reflect changes.
- Keep work areas clean and free of clutter, especially in storage areas and walkways.
- Secure all loose clothing and ties, and remove jewelry that may pose an entanglement hazard.
- Establish, maintain, and utilize walkways that are free of slip and trip hazards.
- Utilize/install appropriate lighting for walking paths and working areas.
- Beware of slip/trip hazards such as wet floors, slippery floors, and uneven surfaces or terrain.
- Carry only loads you can see over (Refer to Material Handling for additional information).
- Refrain from the use of portable communication devices (cell phones, two-way radios) while traversing the site.
- Keep a safe buffer zone between workers using equipment and tools.

4.10 Aggressive Or Menacing Behavior

When confronted by an individual whose behavior becomes aggressive or menacing, remain as calm as possible. Avoid arguing with or physically confronting the individual. Attempt to distance yourself from the individual. Advise others in the area to leave the scene and request police assistance by having someone call the emergency number listed on the Emergency Contact Sheet. Use the team approach. A staff member who is physically unable to break away from an attacker should shout for help.

The use of physical force is justified when a person believes that such force is necessary to protect himself or herself against the use or imminent use of unlawful physical force by another person.

Should an aggressor only be interested in the taking or damaging of property, do not interfere. Obtain a description of the individual to provide to local authorities, including height, weight, race, sex, clothing, accent, unusual markings such as tattoos, piercings, scars, hair color, and weapon, if any.

Contact the HSE Help Line and file an incident report with your immediate supervisor as soon as it's safe to do so.

4.11 Adverse Weather Conditions

Adverse weather is the existence of or impending weather conditions such as heavy rain, freezing rain, sleet, snow, high winds (50km/30mph), dust storms, tornadoes, hurricanes, lightning, or any combination of weather that is either not reasonable or not safe for employee exposure. Stop Work Authority (SWA) is executed prior to these conditions as reasonably possible. The site is evacuated according to the emergency plan developed and listed in this Health and Safety Plan.

Based on their expertise and knowledge of manufacturer's recommendations for the equipment being operated, heavy equipment operators such as crane and drill rigs are responsible for advising the site supervisor whether it is safe to continue operations.

The site supervisor decides on the continuation or discontinuation of work based on current and pending weather conditions, the equipment manufacturer recommendations, and the equipment operator's recommendations.

5. Biological Hazards

5.1 Introduction To Biological Hazards

GHD employees conduct numerous project activities where they may encounter biological hazards such as listed in the following table. This section identifies the problems associated with these biological hazards and the precautions to be taken if these hazards are encountered.

The biological hazards identified are applicable to this site. If you are bitten, stung, or attacked by any of the listed hazards, contact the GHD HSE Help Line at 1-866-529-4886

5.2 Wildlife

<p>Tick and Chiggers</p>	<ul style="list-style-type: none"> •Wear light colored clothing •Keep clothing buttoned or zipped •Keep socks tucked in •Apply repellent containing DEET or Permethrin to clothing and exposed skin •Check hair and clothing periodically using buddy system 	<ul style="list-style-type: none"> •Remove tick with tweezers or fingers and tissue •Grab tick as close as possible to attachment site and pull firmly •Inspect tick to ensure that no parts remain in attachment site •Apply AfterBite containing antiseptic to affected areas •Call GHD HSE Help Line
<p>Flying, Stinging, Biting Insects: Bees, Wasps</p>	<ul style="list-style-type: none"> •Avoid wearing perfume, hairspray, cologne, and scented deodorant while working outside •If eating outside, keep all food and drinks covered; sweet foods and strong scents attract stinging insects •Never swat or swing at the insect; wait for it to leave, softly blow it away, or gently brush it aside •Inspect areas carefully as bees, wasps, and hornets can nest both in the ground and above ground •If the nests pose a threat, have them professionally removed 	<ul style="list-style-type: none"> •Apply AfterBite containing antiseptic to affected areas or place an ice cube or ice pack over the sting to reduce pain •Remove the stinger with tweezers or scratch with a credit card (catch barbs with card and pull out) •Seek medical attention when the reaction to a sting includes swelling, itching, dizziness, and shortness of breath •Call GHD HSE Help Line
<p>Mosquitoes</p>	<ul style="list-style-type: none"> •Wear light colored clothing •Keep your body covered as much as possible; wear a hat or mosquito screen •Apply repellent containing DEET or Permethrin to clothing and exposed skin 	<ul style="list-style-type: none"> •Apply AfterBite containing antiseptic to affected areas •If moderate to extreme itchiness is experienced, use over the counter antihistamines

Rodents/Rats	<ul style="list-style-type: none"> •Inspect work area for rodent droppings •For low amounts of droppings, use Level C with N95 disposable respiratory protection •For heavy accumulation, use Level C Full Face PAPR with P100 cartridge or, in severe cases, Level B •Soak dead mice, nests, and droppings thoroughly with a 1:10 solution of sodium hypochlorite (household bleach); bleach kills the virus and reduces the chance of further transmission •Place contaminated material in a plastic bag and seal for disposal •Disinfect by wet wiping all reusable respirator surfaces, gloves, rubber boots, and goggles with bleach solution •Place all disposable protective clothing, gloves, and respirators in plastic bags and seal for disposal •Thoroughly wash hands with soap and water after removing gloves 	<ul style="list-style-type: none"> •If bitten by a rodent, clean with antiseptic •Cover the wound •Retain specimen if possible and seek medical attention •Notify Supervisor/PM •Call GHD HSE Help Line
Pigeons	<ul style="list-style-type: none"> •Urine and droppings cause the health issue •Droppings carry Histoplasmosis, a respiratory disease 	<ul style="list-style-type: none"> •Wear protective clothing such as disposable coveralls, boots, gloves, and respirators •Use dust control measures such as containing the area with plastic sheeting •Remove people with compromised immune system
Canadian Geese	<ul style="list-style-type: none"> •Easily recognized by black head and grey breasts •Weigh up to 13 lbs and territorial and aggressive •Be aware of nesting areas •Bird and dropping carry several diseases that affect humans 	<ul style="list-style-type: none"> •Remain calm and do not act aggressive or afraid •Gradually back away while keeping eye contact •Wear appropriate PPE when handling nests or dead animals •Wash hands with soap and warm running water •Disinfect hands with sanitizer •If attacked and injured, call GHD HSE Help Line

5.3 Poisonous Plants

Poison Ivy/Poison Oak	<ul style="list-style-type: none"> •Learn to identify poison ivy and poison oak (leaves of three, let them be) •Urushiol oil is in the wood portion of the plant and is active all year long •Wear proper PPE in known areas (gloves, long sleeves, long pants, safety glasses) •Proper hygiene extremely important to prevent ingestion and eye contact 	<ul style="list-style-type: none"> •You may only have 30 minutes to get the oil off skin before it absorbs, and less time in hotter climates •Rinse with cold water, as hot water will open your pores •Apply alcohol to dissolve oils •Watch for an itchy red skin rash, which is the most common reaction; over time, large blisters may form •Use topical cream to assist with the itching (consult your pharmacy) •In severe cases, contact your doctor •Call GHD HSE Help Line
Vegetation Overgrowth	<ul style="list-style-type: none"> •common weeds and tall grasses •increase in trip hazard, and entanglement •risk of fire during summer season •wear proper PPE, long pants, eye protection •increase in rodent, snake, stinging insect hazards 	<ul style="list-style-type: none"> •discuss clearing area with management to reduce risks •use extra caution when walking due to unseen holes or trip hazards •watch for grass cuts on arms, contact GHD HSE Help Line if reaction occurs

5.4 Biological

Histoplasmosis	<p>Look for evidence of bird or bat colonies.</p> <ul style="list-style-type: none"> • Before you work in or dig soil that's likely to harbor the fungus that causes histoplasmosis, spray it thoroughly with water. • Wear appropriate PPE for the task. • Clean footwear before leaving the site to prevent spore dissemination in cars, the office, at home, and elsewhere 	<ul style="list-style-type: none"> • Wash hands with soap and warm water after removing your gloves. • If you have persistent flu like symptoms, see your doctor. Tell them if you have been around a bird or bat colony. • Call GHD HSE Help Line
Hantavirus	<ul style="list-style-type: none"> • Inspect work area for rodent droppings • For low amounts of droppings, use Level C with N95 disposable respiratory protection • For heavy accumulation, use Level C Full Face PAPR with P100 cartridge or, in severe cases, Level B • Soak dead mice, nests, and droppings thoroughly with a 1:10 solution of sodium hypochlorite (household bleach); bleach kills the virus and reduces the chance of further transmission • Place contaminated material in a plastic bag and seal for disposal • Disinfect all equipment 	<ul style="list-style-type: none"> • Wash gloved hands with soap and water or spray a disinfectant or bleach solution on gloves before taking them off. • Wash hands with soap and warm water after removing your gloves. • If you have been around rodents and have symptoms of fever, deep muscle aches, and severe shortness of breath, see your doctor immediately • Call GHD HSE Help Line
Blood-borne Pathogens	<ul style="list-style-type: none"> • Exposure comes through work activities such as landfill, sewage treatment, sewers, contaminated medical waste • Virus, Bacteria, Fungus, and Parasites are considered blood-borne • Proper hygiene is extremely important to prevent ingestion • Wear proper PPE in known areas (gloves, long sleeves, long pants, safety glasses) 	<ul style="list-style-type: none"> • All human blood and human body fluids treated as infectious • Cover all nicks and cuts to prevent cross-contamination. • Disinfect hands with sanitizer • Proper hygiene extremely important to prevent ingestion and eye contact • More information review GHD blood-borne policy • Call GHD HSE Help Line if exposed.
Psitticosis - Bird Droppings	<ul style="list-style-type: none"> • Breathing in the organism when the urine, respiratory secretion, or dried feces • Other sources of exposure include mouth-to-beak contact, a bite from an infected bird. • Bacteria starts an infection that varies in severity from a mild flu-like illness to severe pneumonia • PPE may include gloves, protective clothing, boots, and where appropriate, a respirator 	<ul style="list-style-type: none"> • Adequate ventilation systems including the use of high efficiency particulate air (HEPA) filters to reduce the spread of contaminated air. • Disinfectants area with ammonium compounds, isopropyl alcohol, 70% ethanol, household bleach (diluted to 1%) • Wetting the wastes before removal decreases aerosolization • Call GHD HSE Help Line if exposed

Legionella	<ul style="list-style-type: none">•Minimize water misting, stagnant water, and dead zones•Manage water temperature•Implement a preventative maintenance and inspection program to monitor equipment•Conduct Legionella testing of water systems and equipment	<ul style="list-style-type: none">•If you are suffering a respiratory ailment, notify your supervisor and contact the GHD HSE Help Line
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6. Personal Protective Equipment

6.1 Introduction To PPE

Controlling a hazard at the source is the best way to protect employees. When engineering, work practice, and administrative controls are not able to protect our employees, GHD provides personal protective equipment (PPE) to its employees and ensures that the PPE is used appropriately. PPE is equipment worn as a barrier to minimize exposure to a variety of hazards.

This section covers applicable PPE requirements, which include eye, face, hand, head, foot, and respiratory protection.

6.2 Types of Personal Protective Equipment (PPE)

The type of PPE required for work varies based on the task being performed. The specific PPE required for each individual task is documented in the appropriate task-specific JSA. The recommended minimum PPE for GHD site work is as follows:

- Shirts with a minimum 6-inch sleeve.
- Long pants made from suitable sturdy material .
- Grade 1 protective footwear meeting CSA Z195 M92 (Canada)/ ANSI Z41.1 (US), green patched (triangle), steel-toed/puncture-resistant and electric shock-resistant sole with a 6-inch cuff, fully laced and secured, in material appropriate for weather and task.
- Safety glasses or goggles (based on the type of hazard – dust, splash, etc.), meeting CSA Z94.3 (Canada) or ANSI Z87.1 (US) standards.
- Hand protection such as gloves meeting standards EN 388 and ANSI 105-2000 as appropriate for the task as per JSA, with selection based on the hazards (abrasion, blade cut, tearing, puncture, and impact) associated with the task being performed.
- Reflective garment meeting CSA Z96 02 or ANSI 107 (as required).
- Type 1 Class E hardhat, meeting either CSA Z94.1 05, Z94.1 92, ANSI Z89.1, or Z89.1.
- Hearing protection meeting CSA/ANSI approved NRR of at least 20 dBA if noise levels exceed 85 dBA.

Additional minimum requirements for PPE include:

- All PPE are maintained in good condition with no rips, tears, or damage that compromise integrity.
- PPE is not loose fitting as to avoid entanglement issues.
- All PPE is disposed of and/or decontaminated at the conclusion of each workday. The most contaminated PPE is decontaminated first.
- All disposable equipment is removed before meal breaks and at the conclusion of the workday, and replaced with new equipment prior to commencing work.
- Reusable equipment (safety glasses, hard hats, goggles, etc.) is cleaned and sanitized according to GHD and/or manufacturer guidelines.
- Eating, drinking, chewing gum or tobacco, and smoking are prohibited while working in areas where the potential for chemical and/or explosive hazards may be present. Personnel must wash thoroughly before initiating any of the aforementioned activities.

6.3 Types Of Protective Material

No universal protective material exists. All materials will decompose, be permeated, or otherwise fail to protect under certain circumstances. Protective clothing can be constructed from a variety of materials for protection against exposure to specific physical, chemical, or biological hazards.

Fortunately, most manufacturers list guidelines for the use of their products. These guidelines usually concern gloves or coveralls and generally only measure rate of degradation, which is failure to maintain structure. A protective material may not necessarily degrade, but may allow a particular chemical to permeate its surface. For this reason, guidelines must be used with caution. When permeation tables are available, they are used in conjunction with degradation tables.

To obtain optimum usage from PPE, the following procedures are followed by all site personnel using PPE:

- When using disposable coveralls, don a clean, new garment after each rest break or at the beginning of each shift
- Inspect all clothing, gloves, and boots both prior to and during use for:
 - ◊ Imperfect seams
 - ◊ Non uniform coatings
 - ◊ Tears
 - ◊ Poorly functioning closures
- Inspect reusable garments, boots, and gloves both prior to and during use for:
 - ◊ Visible signs of chemical permeation
 - ◊ Swelling
 - ◊ Discoloration
 - ◊ Stiffness
 - ◊ Brittleness
 - ◊ Cracks
 - ◊ Any sign of puncture
 - ◊ Any sign of abrasion

Reusable gloves, boots, or coveralls exhibiting any of the characteristics listed above are discarded. PPE used in areas known or suspected to exhibit elevated concentrations of chemicals are not reused.

6.4 Respiratory Protection

Respiratory protection is sometimes required for personnel during project activities when action levels exceed the occupational exposure levels. When respirators are required, personnel identify and select the appropriate air purifying respirator and supporting cartridge medium, and follow the procedures and guidelines in their respective written Respiratory Protection program.

At a minimum, all personnel required to use this equipment are:

- Instructed in how to properly fit a respirator to achieve the required face piece to face seal for respiratory protective purposes.
- Medically cleared for the use of respiratory protection.
- Appropriately fitted for the selected respirator through established recognized fit testing methods (quantitative/qualitative), and documentation of fit is readily available.
- Free of beards, sideburns, eyeglasses, and upper or lower dentures that could affect the face seal.

Further regulations for the use of respiratory protection include:

- Cartridges are changed prior to breakthrough, daily, or when personnel begin to experience increased inhalation resistance or breakthrough of a chemical warning property.
- Respiratory equipment and other non disposable equipment are fully decontaminated.
- Appropriate action levels are established and documented based on the applicable occupational exposure limits.

NOTE: This HASP is not intended for the use of supplied air operations. For supplied air operations, the project manager and a GHD safety professional conduct a review of the scope of work.

GHD identifies the type of respirator and cartridge and documents on the applicable JSA for the affected tasks and on Table 2.

6.5 Respirator Cleaning

Respirator decontamination is conducted once daily at a minimum. Face pieces are disassembled, the cartridges are thrown away, and all other parts are placed in a cleansing solution. After an appropriate amount of time in the solution, the parts are removed and re seated with tap water.

Face pieces are allowed to air dry before being placed in sanitized bags and stored in a clean area.

6.6 Levels Of Protection

Protection levels provided by PPE selection are upgraded or downgraded based upon a change in site conditions or the review of the results of air monitoring or the initial exposure assessment monitoring program, if one was conducted.

When a significant change occurs, the hazards are reassessed. Some indicators of the need for reassessment are:

- Commencement of a new work phase.
- Change in job tasks during a work phase.
- Change of season/weather.
- Temperature extremes or individual medical considerations limiting the effectiveness of PPE.
- Chemicals other than those expected to be encountered are identified.
- Change in ambient levels of chemicals.
- Change in work scope that affects the degree of contact with areas of potentially elevated chemical presence MUST be re-evaluated.

All proposed changes to protection levels and PPE requirements are reviewed and approved prior to implementation by the SS.

7. Site Control

7.1 Introduction To Site Control

The purpose of site control is to minimize potential contamination of workers and protect the public from hazards found on site. Site control also includes site security for the protection of GHD employee and subcontractor when working in public areas. Site Control is especially important in emergency situations.

Site control, work area demarcation, and site security will be achieved through posting of signage and placement of barricades and or personnel. All controlled areas will have the appropriate signage posted. Barricades and warning signs will be placed to warn personnel of potential hazards. A standby person (spotter) may be utilized in place of barricades, where appropriate. The following materials may be used to barricade the work area and protect both public and GHD:

Approved pedestrian and vehicle traffic paths will be determined during Tailgate Safety Meetings based upon current site conditions and work locations. When applicable, one pathway should be established for heavy equipment and one for personnel decontamination.

The majority of site operations, as well as access to the site, could be controlled from the support zone. The support zone will provide for team communications, emergency response, and sanitary facilities. Appropriate safety and support equipment also will be located in this zone.

The support zone will be located upwind of site operations if possible, and would be used as a potential evacuation point if appropriate. No potentially contaminated personnel or materials are allowed in this zone.

7.2 Two-Person Crew/Buddy System

A Two-Person Crew or Buddy System shall be implemented to protect the employees and public when conducting high risk activities such as:

- Working near traffic
- Working ON or NEAR water
- Excessive noise to which hearing traffic or communication is difficult
- Confined or restricted spaces
- In an isolated area such as landfills or wooded areas
- Areas with high crime rates

When using the buddy system, visual contact must be maintained between crew members at all times, and crew members must observe each other for signs of chemical exposure, heat, or cold stress. Indications of adverse effects include, but are not limited to:

- Changes in complexion and skin coloration
- Changes in coordination
- Excessive salivation and pupillary response
- Changes in speech pattern.

Project personnel must also be aware of potential exposure to possible safety hazards, unsafe acts, or noncompliance with safety procedures. Individuals must inform their partners or fellow team members of non visible effects of exposure to toxic materials. The symptoms of such exposure may include:

- Headaches
- Dizziness
- Nausea
- Blurred vision
- Cramps
- Irritation of eyes, skin, or respiratory tract.

If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

7.3 Communication

Each member of the project team will be able to communicate with other team members at all times. Communications will be by way of:

- Cell Phones/Smart Phones
- Hand Signals

The primary means for external communication are telephones and radio. If telephone lines are not installed at a site, all team members should:

- Know the location of the nearest telephone
- Have the necessary telephone numbers readily available

Note: The authorized use of cellular phones must be cleared by the client prior to entering site.

The following procedures will be followed by all site workers when using a cell phone on site:

- No cell phone use while driving or operating equipment.
- No cell phone use while in the Exclusion Zone.
- If using a cell phone on site, find a location where you can safely use the phone. Do not walk around the site while using a cell phone.

Understanding of the following standard hand signals will be mandatory for all employees, regardless of other means of communication:

- Hand gripping throat — Cannot breathe
- Hands on top of head — Need assistance
- Thumbs up — OK, I'm alright, I understand
- Thumbs down — No, negative
- Gripping partner's wrist, or gripping both of your own hands on wrist (if partner is out of reach) – Leave area immediately

7.4 Decontamination And Hygiene

Decontamination

In general, everything that enters the site must either be decontaminated or properly discarded upon exit from the site. Prior to demobilization, potentially contaminated equipment will be decontaminated on a wash pad (decontamination pad), drum, or containment pad which then will be placed into appropriate container and labeled as hazardous waste and will be stored in a designated area until disposal arrangements are made.

The type of decontamination solution to be used is dependent on the type of chemical hazards.

The decontamination solution for heavy equipment and for any reusable PPE is Alconox/Liqui nox soap. The MSDSs for Alconox/Liquinox will be located in the Appendix.

Personnel Decontamination Procedures

Personnel decontamination will be completed in accordance with the GHD Safety and Health Program for personnel decontamination. Wash water and sediments will be collected and stored with any runoff water collected for subsequent treatment/disposal. PPE, trash, etc. will be sent

off-Site for disposal. It will be kept separate from trash generated in clean areas of the Site.

All disposable equipment shall be doffed before meal breaks and at the conclusion of the workday and replaced with new equipment prior to commencing work.

Procedures for decontamination must be followed to prevent the spread of contamination and to eliminate the potential for chemical exposure.

Personnel - Decontamination will take place prior to exiting the contaminated work area.

Decontamination procedures are as follows:

Step 1 Remove all visible contamination and loose debris by washing with clean water.

Step 2 Remove all outer clothing that came in contact with the contamination (i.e., boot covers and outer gloves) and either dispose of in disposable container or wash in detergent solution and rinse.

Step 3 Remove protective clothing; dispose of in disposable container.

Step 4 Remove respirator, sanitize prior to reuse.

Step 5 Remove inner gloves, dispose of in disposable container.

Step 6 Wash and rinse hands.

General Safety and Personnel Hygiene

1. Eating at the site is prohibited, except in specifically designated areas. Designation of eating areas will be identified to each employee. The location of these areas may change over the duration of the project to maintain adequate separation from the active work area(s).
2. Smoking at the site is prohibited.
3. Individuals getting wet to the skin with effluent from the washing operation must wash the affected area immediately. If clothes in contact with skin are wet, then these must be changed.
4. Hands, face, neck, and other exposed areas must be washed with soap and water before eating, drinking, smoking, before using toilets, and before leaving the site.
5. All disposable coveralls and soiled gloves will be placed in covered containers at the end of every shift or sooner, if deemed necessary by the SHO. Wastes will be stored until proper disposal arrangements have been made.
6. Personnel working on site will not be permitted to wear facial hair that interferes with the mask to face seal on air purifying respirators.
7. All personnel performing or supervising work within the EZ must wear appropriate PPE, observe, and adhere to the personal hygiene related provisions of this section.
8. Personnel found to be disregarding the personal hygiene related provisions of this HASP will, at the discretion of the SHO, be barred from the site.

7.5 Social Protection

Security Measures

A site assessment should be made prior to performing work in high risk areas for violent crime. Additionally, it may be important to gather as much information as possible from the client, describing the location and social conditions of the area where work will be performed.

In the event it has been determined that this work will occur in an area of high risk, consideration

shall be given to providing on site security for the protection of the employee. This option may include services from a security agency, local law enforcement (if available), or the services of an off duty law enforcement officer. The Project Manager and/or Project Coordinator shall be contacted and provide authorization prior to making these arrangements.

Anti-social behavior means different things to different people – noisy neighbors who ruin the lives of those around them, 'crack houses' run by drug dealers, loitering by drunkards, people begging by cash points, abandoned cars, litter and graffiti, young people using airguns to threaten and intimidate or people using fireworks as weapons.

When in this situation, there is no single strategy that always works. Remember these tips when faced with work conditions in volatile neighborhoods:

Street Precautions

When walking to and from your vehicle, or in and around the work site:

- Be alert to your surroundings and the people around you, especially if you are alone or it is dark
- Whenever possible, travel with a colleague
- Stay in well lighted areas as much as possible
- Walk close to the curb; avoid doorways, bushes, and alleys where someone could hide
- Walk confidently, and at a steady pace; make eye contact with people when walking
- Do not respond to conversation from strangers on the street, continue walking

Harm Reduction

Do as much as you can to avoid a confrontation "anticipation and avoidance" are the key words.

- If you get caught up in a situation, try to talk to an aggressor without provoking them.
- Practice relaxation, as appearing fearful or stressed can actually provoke an attack.
- Remember that body language is important in aggressive situations, so maintain a comfortable distance between you and the aggressor.
- It may be more advisable to submit than to resist and risk severe injury or death. You will have to make this decision based on the circumstances. Be especially careful, if your attacker has a weapon.
- Avoid arguing with or physically confronting the individual. Attempt to distance yourself from the individual. Advise others in the area to leave the scene and request police assistance by having someone call the emergency number listed on the Emergency Contact Sheet. Use the team approach. A staff member who is physically unable to break away from an attacker should shout for help.
- Steady yourself if danger threatens. Panic can disable you, so again it's useful to learn how to keep control in a difficult situation.
- If you must fight back, adopt what police term the "bash and dash" approach. Primary targets are the eyes, nose, mouth, ears, throat, groin, knees, or shins; choose whichever is easiest to get to.
- Be aware that your attacker might be stronger than you, or may take what you are using in self defense and use it against you. It is often better just to shout loudly and run away.
- When confronted by an individual whose behavior becomes aggressive or menacing, remain as calm as possible. Avoid arguing with or physically confronting the individual. Attempt to distance yourself from the individual. Advise others in the area to leave the scene and request police assistance by having someone call the emergency number listed on the Emergency Contact Sheet. Use the team approach. If you are physically unable to break away from an attacker, shout for help.
- The use of physical force is justified when a person believes that such force is necessary to protect him or herself against the use or imminent use of unlawful physical force by another person. The use of physical force is also justified in the defense of another party, such as a co worker, who is being subjected to unlawful physical force. You can use any technique of legal self defense in order to halt or distract an attacker until law officers arrive on the scene.

- Should an aggressor only be interested in taking or damaging property, do not interfere. Obtain a description of the individual to provide to local authorities, including height, weight, race, sex, clothing, accent, unusual markings such as tattoos, facial piercing, scars, hair color, and weapon, if any.
- Shout 'fire' rather than 'help' – it can get more results.
- Stay alert and observant so that you can better describe your attacker and the assault to the police.
- Report the incident to the GHD Help Line and BWISE and work with your PM and HSE Manager to complete the investigation

Drug Activity

The safe retrieval and disposal of used hypodermic needles and syringes:

- GHD employees must not handle or remove any hypodermic needles or syringes. You should contact the local Police Department, Fire Department, or Health Department for removal from the job site.
- If you are injured by a discarded needle you can receive a vaccination against Hepatitis B within 48 hours of the incident. Notify the GHD Help Line and seek medical attention, call 911 if necessary.
- If an accident occurs where a needle or other sharp object has punctured the skin, then the injured person should:
 - Encourage the wound to bleed gently
 - Wash well with soap under cold running water
 - Cover the wound with a waterproof dressing
 - Seek medical attention as soon as possible
 - Inform the SS and/or PM
 - Complete a GHD Incident Reporting Form

Car Jacking

You can help prevent yourself being a victim of car jacking by:

- Keeping your doors locked in built up areas, and trying to keep the windows wound up, especially at traffic lights
- Being aware of what people are doing around you
- Using the middle lane, if there is one, when waiting at junctions or lights, so that your car is harder to get to from the pavement
- Not stopping to help someone who has broken down (if you really want to help, pull over at the next garage or police station and call for help)
- Driving to the next garage or police station and reporting them if someone tries to pull you over for no reason

A car jacker may 'accidentally' bump into your car, aiming to get you out of the car so they can steal it. If this happens, you may choose not to get out of the car – especially if you do not think it is a genuine accident. Wind the window down a little bit to talk to them if you want to.

Aggressive or Menacing Behavior

Report to the GHD HSE Help Line, BWISE and work with your PM and HSE Manager to complete the investigation.

7.6 Site Security

Site security is necessary to prevent the exposure of unauthorized, unprotected people to site hazards and to avoid interference with safe working procedures. Security shall be maintained outside of the actual work area(s) so as to prevent unauthorized entry into the work area(s). Members of the general public are to be protected from site hazards.

8. Emergency Procedures

8.1 Introduction Emergency Procedures

Emergencies can range from minor to serious conditions. Various procedures for responding to site emergencies are listed in this section. The PM or SS is responsible for contacting local emergency services, if necessary, for specific emergency situations. Various individual site characteristics will determine preliminary action to ensure that these entry procedures are successfully implemented in the event of an emergency. The project team will address necessary facility/client emergency protocols to ensure compatibility between this document and facility/client programs and expectations.

Field employees will identify the primary (on site) and secondary (off site) evacuation routes to muster locations prior to initiating work. A site map is provided in the Appendix.

At client facilities, site emergencies may be indicated by a fog horn or other loud audible sound. If an adjacent facility's alarm is activated, work will stop immediately, equipment will be de-energized and/or secured as necessary for safety reasons and personnel will go immediately to the secondary evacuation location as indicated in pre-start and tailgate meetings.

Emergency evacuation drills will be conducted as deemed necessary by the SS, and documentation of the drills will be maintained by the SS in project file.

An Emergency Information Sheet containing the hospital location, directions, government agency phone numbers, emergency phone numbers, and a map with directions to the hospital is located in the Appendix.

8.2 Incident, Injury, Illness Reporting And Investigation

Any work related incident, injury, illness, exposure, vehicle accident, property loss and or security issues must be reported to your supervisor, the SS immediately. Stop Work Authority will be implemented. Provide care for any injured persons and secure the scene.

GHD will call the GHD PM and the GHD HSE Help Line. Personnel on site should maintain the work area as it was at the time of the incident until further directions are given by the GHD PM, a GHD Safety Professional. No GHD person on site has the authority to call a regulatory agency (environmental or OSHA); this shall be completed by GHD Leadership Team in conjunction with the client. Emergency medical care or support of fire departments is not a restricted call if immediately necessary to protect life and property.

The GHD PM and HSE Manager will coordinate with on site personnel to gather critical information. The GHD PM is responsible (or their designee) to enter the information into BWISE within a 24 period from time of incident. The GHD PM is also responsible to contact the client, which a positive verbal contact is required. The GHD staff listed above will coordinate the completion of the investigation and placement of information into BWISE. This same group of GHD staff will manage further communications with the client.

The report must be filed for the following circumstances:

- Incident, injury, illness, or exposure of an employee.
- Injury of a subcontractor.
- Damage, loss, or theft of property.
- Any motor vehicle accident, regardless of fault, which involves a company vehicle, rental vehicle, or personal vehicle while the employee is acting in the course of employment.
- Any sting, involving a puncture of the skin must immediately be reported to Work Care and follow all GHD reporting requirements
- Security Issues
- Environmental releases or loss of containment.

Occupational incidents resulting in employee injury or illness will be investigated by the SS. This investigation will focus on determining the cause of the incident and modifying future work activities to eliminate the hazard.

All employees have the right and obligation to report unsafe work conditions, previously unrecognized safety hazards, or safety violations of others. If you wish to make such a report, it may be made orally to your supervisor or other member of management, or you may submit your concern in writing, either signed or anonymously.

8.3 Emergency Equipment/First Aid

Safety equipment will be available for use by site personnel, located within 30 feet of the work area(s), and maintained at the site.

- First Aid kit(s), compliant with local jurisdictional requirements according to number of workers present
- Automated External Defibrillators (AEDs) are optional first aid response equipment for conditions related to heart stoppage. If a unit is on site, designated personnel must be trained in the specific AED unit in addition to First Aid and CPR certification, conduct monthly inspections, and contact listed AED Unit coordinator.
- Emergency eyewash bottles and/or an eyewash station lasting 15 minutes.
- Emergency alarms as a means to alert all personnel instantaneously for an emergency.
- Fire extinguisher (at a minimum, a 2A/10BC will be on site).

8.4 Emergency Procedures For Contaminated Personnel

Whenever possible, personnel should be decontaminated in the contamination reduction zone before administering first aid, without causing further harm to the patient.

- Skin Contact: Remove contaminated clothing, wash immediately with water, and use soap, if available.
- Inhalation: Remove victim from contaminated atmosphere. Remove any respiratory protection equipment. Initiate artificial respiration, if necessary. Transport to the hospital.
- Ingestion: Remove from contaminated atmosphere. Do not induce vomiting if victim is unconscious. Never induce vomiting when acids, alkalis, or petroleum products are suspected. Transport to the hospital, if necessary.

Any person transporting an injured/exposed person to a clinic or hospital for treatment should take with them directions to the hospital and a listing of the contaminants of concern to which they may have been exposed.

Any vehicle used to transport contaminated personnel will be cleaned or decontaminated, as necessary.

8.5 Site Evacuations

In the event of an emergency situation such as fire, explosion, or significant release of toxic gases, project personnel in the field will be notified by established communications to evacuate the area.

In the event of an emergency, GHD personnel will gather at their primary mustering point for a head count. The SS will determine a primary and secondary muster point to be used as an assembly area in the event of an emergency. The secondary muster point will be located at least 90 degrees from the primary. These locations will be communicated to the work crew(s) during the Tailgate Safety Meeting (TGSM) as part of the site specific training prior to commencement of work activities, weekly thereafter, and prior to the advent of potentially threatening weather.

Muster points will be identified in the site map attached to the HASP.

8.6 Spill And Release Contingencies

If a spill has occurred, the first step is personal safety, then controlling the spread of contamination, if possible. GHD personnel will immediately contact site management to inform them of the spill and activate emergency spill procedures.

9. Environmental Control Program

9.1 Introduction

This section of the HASP outlines measures to be implemented at the site to prevent hazards associated with environmental conditions.

9.2 Weather Monitoring

The SS will be responsible for checking weather forecasts for the next day and week of work to provide advance notification of any severe weather conditions. Severe weather conditions (e.g., heavy rains) may cause unsafe conditions at the site and in some situations work may have to be stopped.

9.3 Tornado Safety Policy And Procedures

Tornadoes occur most frequently between April and October from 3:00 to 7:00 p.m. but can occur any time. In most cases, tornadoes move from a west/southwest direction. A typical tornado is a swirling storm of short duration with winds up to 300 miles per hour and a near vacuum at its center. It appears as a rotating funnel shaped cloud, from gray to black in color, extending towards the ground from the base of a thundercloud.

Tornadoes usually only cover a limited geographical area and give off a roaring sound. A tornado is the most concentrated and destructive potential weather event at the Site. Tornadoes are usually the result of the interaction of a warm, moist air mass with a cool or cold air mass. Secondary effects of tornadoes include flash flooding, electric power outages, transportation system and communication system disruption, and fires.

Whenever weather conditions develop that indicate tornadoes are expected, the National Weather Service will issue a tornado watch to alert people in a designated area for a specific time period (normally 6 hours) to remain alert for approaching storms. The tornado watch is upgraded to a tornado warning when a funnel cloud (tornado) is actually sighted or indicated by weather radar.

When a tornado is approaching, Site personnel will only have a short time to react. Therefore, Site personnel must be prepared to react during periods of severe weather. Memorize the following tornado danger signs:

- i) Approaching clouds of debris can mark the location of a tornado even if a funnel cloud is not visible
- ii) Before a tornado hits, the wind may die down and the air can become very still/calm
- iii) It is not uncommon to see clear, sunlit skies behind a tornado as they usually occur at/near the trailing edge of thunderstorms.

Tornado Evacuation Procedures

GHD and contractor personnel monitor weather related information provided by National Weather Service. If the National Weather Service issues a tornado warning, Site supervisor will activate the emergency response plan.

The "take shelter" warning signal is a "slow wail" of the alarm system. GHD Site personnel will evacuate the work zone(s) when a tornado watch has been issued by the National Weather Service. Personnel will contact the Project Management team to inform them they are leaving the site and provide them a location of the muster point (shelter) they are going. The Site Supervisor are responsible for work areas, they will check remote areas of the work zone(s) to ensure personnel have reacted to the alert. Personnel must proceed to the Site mustering point (shelter) and wait for further instructions. If a tornado watch is upgraded to a tornado warning, personnel will proceed to the designated tornado shelters. Once inside the shelter, conduct a head count to ensure that personnel are accounted for. In general, stay away from all windows and doors that lead to the outside. Remain in the shelter until the "all clear" signal is given by the Site Supervisor.

The tornado shelter most accessible to GHD personnel should be noted on the site map attached to this HASP

Directions to the shelter are to be communicated to Site personnel during initial Site safety orientation and throughout the tornado season during subsequent safety meetings.

If unable to reach the designated shelter, the best protection in a tornado is usually an underground area. If an underground area is not available, consider small interior rooms on the lowest floor without windows, hallways on the lowest floor away from doors and windows, rooms constructed with reinforced concrete/brick/block with a heavy concrete floor and roof, and protected areas away from doors and windows.

9.4 Rain And Snow

Excessive amounts of precipitation may cause potential safety hazards for work tasks. The hazards that would be most commonly associated are slipping, tripping, or falling due to slippery surfaces.

Severe weather conditions will result in work stoppage and the implementation of further emergency measures.

9.5 Temperature

Site activities are expected to be conducted year round. Temperature extremes may be experienced which require measures to be implemented to prevent health and safety hazards from occurring. Potential hazards arising from temperature extremes are heat stress and cold exposure.

9.6 Wind

High winds may be encountered at the site and these can cause hazards that may affect site personnel health and safety. Preventative measures that will be implemented if necessary are as follows:

- i) Restrict site activities.
- ii) Batten down light equipment or building materials.
- iii) Partially enclose work areas.
- iv) Reduce or Stop Work activities.

9.7 Lightning & Thunder

Light travels at a faster speed than sound, you can see a lightning bolt before the sound of thunder reaches you.

To judge how close lightning is, count the seconds between the flash and the thunder clap. Each second represents about 328 yards/300 meters. If you can count less than 30 seconds between the lightning strike and the thunder, the storm is less than 6.2 miles/10 km away and there is an 80 percent chance the next strike will happen within that 6.2 miles/10 kilometers.

Lightning may strike several miles/kilometers away from the parent cloud and therefore precautions should be taken even if the thunderstorm is not directly overhead.

If you hear thunder or see lightning, stop work immediately and seek safe shelter.

Remain sheltered for 30 minutes after hearing the last thunder before returning to work.

9.8 Outdoor Precautions During Severe Weather

- Keep a safe distance from tall objects, such as trees, hilltops, and telephone poles.
- Avoid projecting above the surrounding landscape. Seek shelter in low lying areas such as valleys, ditches, and depressions, but also be aware of flooding.
- Stay away from water. Don't go boating if a storm threatens. Move to land as quickly as possible if you are on the water. Lightning can strike the water and travel some distance from its point of contact. Don't stand in puddles even if you are wearing rubber boots.
- Stay away from objects that conduct electricity, such as tractors, metal fences, motorcycles, lawnmowers, and tall metal objects.
- Avoid being the highest point in an open area. Holding a conductive tool, holding an umbrella, can make you the tallest object and a target for lightning.
- You are safe inside a car during lightning, but don't park near or under trees or other tall objects, which may topple over during a storm. Be aware of downed power lines, which may be touching your car.
- In a forest, seek shelter in a low lying area under a thick growth of small trees or bushes.
- Be alert for flash floods, which are sometimes caused by heavy rainfall, if seeking shelter in a ditch or low lying area.
- If caught in a level field far from shelter and you feel your hair stand on end, lightning may be about to hit you. Kneel on the ground immediately, with feet together, place your hands on your knees and bend forward. Don't lie flat.
- If you are in a group in the open, spread out, keeping people several yards/meters apart.

9.9 Indoor Precautions During Severe Weather

- Before the storm hits, disconnect electrical appliances including radios and television sets. Do not touch them during the storm.
- Don't go outside unless absolutely necessary.
- Stay away from doors, windows, fireplaces, and anything that will conduct electricity, such as radiators, stoves, sinks, and metal pipes. Keep as many walls as possible between you and the outside.
- Don't handle electrical equipment or telephones. Use battery operated appliances only.

9.10 Flash Flooding

Floods are one of the most common hazards in low lying areas, however not all floods are alike. Some floods develop slowly, while others such a flash floods, can develop in just a few minutes and without visible signs of rain. Additionally, floods can be local, impacting a neighborhood or community, or very large, affecting entire river basins and multiple states.

Flash floods can occur within a few minutes or hours of excessive rainfall, a dam or levee failure, or a sudden release of water held by an ice jam. Flash floods often have a dangerous wall of roaring water carrying rocks, mud and other debris.

Be aware of flood hazards no matter where you live or work, but especially if you are in low-lying areas, near water, behind a levee or downstream from a dam. Even very small streams, gullies, creeks, culverts, dry streambeds or low-lying ground that appear harmless in dry weather can flood.

During the flood

- If any possibility of a flash flood, move immediately to higher ground. Do not wait for instructions to move.
- Be aware of stream, drainage channels, canyons and other areas known to flood suddenly.

If you must prepare to evacuate, you should do the following:

- Do not walk through moving water. Six inches of moving water can make you fall.
- If you have to walk in water, walk where the water is not moving. Use a stick to check the firmness or depth of the ground in front of you.
- Do not drive into flooded areas. If floodwaters rise around your car, abandon the car and move to higher ground if you can do so safely.
- Observe weather in the distance, rain in the hills can cause flooding in the valleys..Do not park your vehicle along streams, rivers or creeks, particularly during threatening conditions.

APPENDIX DOCUMENTS

Chemical Table

Chemical/CAS #	Chemical Name (Synonyms)	Exposure Limits	Routes Of Entry	Symptoms/Health Effects	Chemical Properties	Physical Characteristics	Concentration at Site
Phenol CAS-108-95-2	Phenol Hydroxybenzene Carbolic acid CAS-108-95-2	TLV: 5 ppm [skin] PEL: 5 ppm [skin] STEL: 5 ppm [skin] NE IDLH: 250 ppm	Inhalation Absorption Ingestion	ACUTE: CORROSIVE to eyes, skin and respiratory tract. May cause lung edema, affects CNS, heart, and kidneys, resulting in convulsions, coma, cardiac disorders and respiratory failure. CHRONIC: Dermatitis. May damage liver and kidneys.	(FP) 175°F (VP) 0.4 mm (IP) 8.50 eV (UEL) 8.6% (LEL) 1.8%	Colorless to yellow or light pink, crystalline solid with a sweet, acrid odor.	<10 ppb



COVID-19 Guidance for GHD Field Personnel

As you are aware, the COVID-19 outbreak is affecting our people, our clients, and all organizations across the globe. GHD has implemented a comprehensive business continuity plan to keep our employees safe while we continue to support our clients through this difficult time.

We are in the early days of the outbreak in North America, and elements of this plan will be monitored and adjusted as new information becomes available. GHD will be maintaining regular communication with field staff and clients to gather information and work with our health and safety team to assess and modify our standard operating procedures as needed.

Symptoms COVID-19 range from mild to severe flu and other common respiratory infections, and can include:

- Fever
- Cough
- Difficulty breathing
- Muscle aches
- Fatigue
- Headache
- Sore Throat
- Runny Nose

GHD is taking steps to minimize any potential impact of COVID-19 on all its project sites and during fieldwork.

The coronavirus is, like any other safety concern, a hazard that needs to be managed. Given that there is no current method to eliminate the hazard, we are left with best practices and the use of PPE as our line of defense. There is no one size fits all approach however; these guidelines provide sufficient information to adequately protect our employees participating in field activities. The hierarchy of controls requires that we attempt to eliminate the hazard, and secondly, engineer out the hazard. Given that these controls are not feasible, we need to rely on administrative controls such as enhanced hand washing/sanitizing, social distancing and eliminating face-to-face meetings. The last resort is wearing PPE. By wearing gloves, we can further reduce the risk of dermal contact with COVID-19 and other viruses.

Prior to commencing work, field staff must identify all anticipated hazards (i.e., biological, chemical, physical). Before staff begin any task, we must utilize the STAR (Stop, Think, Act, and Review) process. The identified hazards must be evaluated to ensure that proper controls are implemented to complete the task safely. When evaluating the risk associated with a hazard, if the appropriate controls are not in place, we must exercise SWA, implement corrective measures, and then proceed.

Guidance for All NA Field Personnel

Outlined below are guidelines for GHD field staff to mitigate exposure to COVID-19 when engaged in fieldwork in North America.

For all employee mobilization and project site work, the following mitigation measures must be implemented:

Travel

- Check local area restrictions to determine if work can be initiated or continued.
- Check with the GHD Project Manager to ensure the project site work is continuing. Ensure to follow all client guidelines and policies.
- All travel via land, air, or water requires RGM approval.



- Where more than one staff member is travelling to a project site, staff members must travel in separate vehicles to ensure social distancing is maintained. This includes on-site vehicle use to complete work tasks.
- The interior (cab) vehicle surfaces (i.e., steering wheel, dash, gearshift, door handles, etc.) of all GHD fleet, leased or privately owned vehicles must be disinfected daily.
- When traveling by vehicle, ensure to wear gloves when refuelling and sanitize hands once complete.
- Make as few stops as possible during travels to limit exposure to public spaces; and adhere to Journey Management Plan requirements.
- Avoid close contact with anyone experiencing flu like symptoms during your rest/fuel stops
- When traveling by air, print and carry a boarding pass rather than electronic boarding pass to prevent airport staff from handling a personal phone
- When traveling by plane, disinfect the trays and arm rests prior to use

Site Operations

- Maintain a distance of 2 m (6 ft.) between on-site workers whether in the field or in a meeting setting (video meetings and conference calls are preferable) – also when travelling and in public spaces.
- Discontinue face-to-face Site Meetings.
- In-person meetings should be limited to key individuals who absolutely need to attend as long as social distancing is maintained.
- Alternate meeting methods must be used in place of face-to-face meetings, such as conference calls, WebEx, Skype or MS Teams.
- Discontinue entering contractor's project site office/trailer.
- Practice social distancing between GHD field staff, GHD subcontractors, client and client contractors. In-person meetings will be eliminated where possible.
- If site meetings are required, request they be conducted outdoors while maintaining social/physical distance.
- Communicate with onsite personnel via text messages, emails, phone calls or two-way radio
- Avoid social greetings (e.g. shaking hands).
- Avoid touching your face. The mucus membranes in your eyes nose and mouth are the primary pathways for the virus to gain entry into your body.
- Cover your mouth and nose with a tissue when you cough, sneeze, or use the inside of your elbow.
- Carry a supply of facial tissues and properly dispose in a receptacle after use.
- Avoid close contact with anyone experiencing flu-like symptoms.
- Sites with stairway access to work task locations, establish one-way staircases where practicable to minimize worker's contact.
- Where workers cannot maintain physical distance (2 meters/6 feet) to conduct a work task; in addition to nitrile gloves; a half face respirator with N95 cartridges and safety glasses must be worn.
- The on-site trailer/facilities (at GHD controlled sites) shall be cleaned on a daily basis with surfaces disinfected several times a day on an ongoing basis. Personal sanitation and cleaning supplies shall be made available on site (i.e. hand sanitizer and sanitizing wipes) and used frequently to wipe down surfaces such as handles on doors, desks, fridges, microwaves, light switches, thermostats, surfaces in and on portable bathrooms and other equipment that they come in contact with.
- Mobile and stationary equipment interior (cab) surfaces shall be disinfected prior to entering the cab and when exiting the cab.
- GHD employees must wear gloves while on site and wash and or/sanitize their hands upon removing them.
- Do not touch your face with gloved hands. Take care when removing gloves.
- Clean and disinfect frequently touched surfaces daily, for example, cell phones, computer equipment, headsets, tables, doorknobs, light switches, countertops, handles, railings, desks, toilets, faucets, sinks, and/or other frequent contact surfaces. Do not share personal items such as pen/pencils, phones, notebooks or other equipment between project personnel unless they have been disinfected
- Tools and equipment shall be disinfected often and at the end of use.



- Upon completion of work ensure all PPE has been either cleaned/decontaminated or properly disposed of
- Project manager must ensure staff have access to washroom facilities with soap and water or alcohol based hand sanitizer for good hygiene
- To the extent possible, do not interact with the public during work tasks. If it is necessary, politely explain you are practicing social distance and request they stay at least 2m/ 6 feet away and they do not attempt to pass objects to you. Ensure work zone demarcation is in place to avoid them entering your work space
- Practice social distancing when conducting Daily Tailgate Safety Meetings/Pre-Work Assessments.
- HASPs and JSEAs shall include this guideline and JSA – COVID-19 Field Precautions.
- Where required by local jurisdiction, post the current version of the “COVID-19 Guidance for GHD Field Personnel” or where no trailer is available maintain a copy in the HASP or JSEA.
- Teams working under a HASP must not circulate the daily tailgate sign in sheets. Designate one person to document those in attendance on the sheet.
- Teams working under a JSEA must not circulate the pre-work assessment sheet. Designate one person to document those in attendance on the sheet. As an alternate, staff may document their pre-work assessment using the HSE SMART App (pre-work assessment button).
- Due to N-95 respirators being in short supply and social distancing, if an employee requires First-Aid treatment, the injured employee is to self-administer. If they are unable to self-administer and if the injury is substantial, then Emergency Services may be required.
- The latest information and updates to company operating procedures and precautions regarding COVID - 19 shall be discussed at all safety meetings/pre-work assessments and incorporated into the HASP JSAs and Job Safety Analysis (JSEA's)

Reporting

- All GHD employees are to self-monitor for flu-like symptoms (cough and shortness of breath) and an increase in their temperature.
- If you or a GHD subcontractor, client or client contractor feel unwell or develop flu-like symptoms, contact your supervisor immediately and email using the Contact Table below to notify your assigned contact persons **for your Region**. Once notified, an HSE or PT member will then conduct a risk assessment and recommend appropriate preventative measures. **Recommend seeking medical evaluation guided by Public Health.**
- **Notify your Supervisor and Regional GM (using the Contact Table below) if you have had close contact with an individual who tested positive for COVID-19. Once notified, an HSE or PT member will conduct a risk assessment and recommend appropriate preventative measures.**

Meals/Breaks

- Bring water, meals and snacks with you to avoid stopping at a store or restaurant (**where possible**). Dine in your vehicle or outside alone. Avoid using the project trailer or site facilities.
- **Clean your hands frequently with soap and water for at least 20 seconds especially after you have been in a public place, or after blowing your nose, coughing, sneezing, or using the rest room, or eating.**
- Meals shall be eaten alone or at a minimum distance of approximately 2 m (6 ft.) and not in groups.
- **Project teams should consider staggering break and lunch schedules to minimize the number of people in close proximity to one another.**

Hotel/Accommodations

- Project managers and staff shall avoid independent hotels (**where possible**) and alternative accommodations and book rooms at reputable hotel chains and should verify with the hotel that appropriate protocols are in place to limit the potential exposure and spread of the virus.
- If an overnight stay is required in a hotel, disinfectant shall be available to clean common contact surfaces in the hotel room (i.e. light switches, remote control, doorknobs, thermostat, toilet handle etc.).



Return to Personal Residence

- Upon return to personal residence remove clothing and launder; and wash/shower to practice good hygiene.

Canada: Additional Requirements

If fieldwork requires travel between other Provinces and Territories, verify with your RHSEM if the Province/Territory has imposed a mandatory 14-day isolation requirement. If so, this may impede fieldwork.

Contact Table

Canada Regions

Region	e-mail Group	HSE Contact	Regional People Leader
Quebec (Francais)	GMQAR@ghd.com	martin.abran@ghd.com	teresa.mambro@ghd.com
QAR (English)	GMQAR@ghd.com	wayne.stdenis@ghd.com	teresa.mambro@ghd.com
Ontario	GMOntario@ghd.com	sandy.serena@ghd.com	alison.bondy@ghd.com mirella.perri@ghd.com
Northwest	jennifer.price@ghd.com	wayne.stdenis@ghd.com	alison.bondy@ghd.com

US Regions

	e-mail Group	HSE Contact	Regional People Leader
Mid-Con	midcongmdirect@ghd.com	vicky.picard@ghd.com	nikki.mcghee@ghd.com
Mid-West	ihsan.alfayyomi@ghd.com	craig.gebhardt@ghd.com	janell.goskey@ghd.com
South East	steven.davie@ghd.com	alan.gallaway@ghd.com	sandra.mcjilton@ghd.com
North East	tom.klin@ghd.com	john.maurer@ghd.com	jennifer@carney@ghd.com
West	ted.whiton@ghd.com	ken.chavez@ghd.com	jim.klein@ghd.com



Job Safety Analysis (JSA)

COVID-19 Precautions – Field Work

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**.

Date issued/revised:	March 27, 2020	Client:	
Project number:		Created by	Micheal Dixon
Project address:		Sim OPS	Yes/No
Specific task	Field Work	SSE on site?	Yes/No
Key equipment:	Alcohol-Based Hand sanitizer >60% Alcohol, Disinfectant (e.g. spray bottle/paper towels, wipes, etc.) Nitrile gloves.		
Task-specific training:			

Hard hat	Gloves (ANSI/EN 388)	Eye protections	Fall protection	APR	Vest	PPE clothing
<input type="checkbox"/> Type I (top impact)	<input checked="" type="checkbox"/> Chemical protective (i.e. nitrile)	<input checked="" type="checkbox"/> ANSI/CSA safety glasses	<input type="checkbox"/> Harness	<input type="checkbox"/> Full face mask	<input checked="" type="checkbox"/> Class II	<input type="checkbox"/> Coveralls
<input type="checkbox"/> Type II (side impact)	<input type="checkbox"/> Level 1 light duty	<input type="checkbox"/> Goggles/spoggles	<input type="checkbox"/> Shock absorb lanyard	<input type="checkbox"/> Half face mask	<input type="checkbox"/> Class III	<input type="checkbox"/> Fire retardant clothing (FRC)
<input checked="" type="checkbox"/> Class E (standard)	<input type="checkbox"/> Level 2 light duty with protection	<input type="checkbox"/> Face shield	<input type="checkbox"/> Lifeline		<input type="checkbox"/> Anti-static	<input type="checkbox"/> High viz clothing
<input type="checkbox"/> Class G	<input type="checkbox"/> Level 3 medium duty	<input type="checkbox"/> Other*		Cartridges	<input type="checkbox"/> FRC	<input checked="" type="checkbox"/> Long pants
	<input type="checkbox"/> Level 4 heavy duty			<input type="checkbox"/> N95		<input checked="" type="checkbox"/> Long sleeve shirts
Foot protection	<input type="checkbox"/> High viz	Hearing protection	Arc flash	<input type="checkbox"/> P100		<input type="checkbox"/> Paper tyvek
<input checked="" type="checkbox"/> Industrial grade safety boot	<input type="checkbox"/> Other*	<input type="checkbox"/> NOT Required	<input type="checkbox"/> Haz.cat 2	<input type="checkbox"/> P95		<input type="checkbox"/> Polyethylene tyvek
<input type="checkbox"/> Rubber boots (industrial grade)		<input type="checkbox"/> Required	<input type="checkbox"/> Haz cat 4	<input type="checkbox"/> R95		<input type="checkbox"/> Other *
<input type="checkbox"/> Hip waders				<input type="checkbox"/> Organic vapor		
	see key equipment			<input type="checkbox"/> Specialty/other		

Project development team		Modified by	Reviewed by	Date
Name	Signature			
Sandy Serena	[[[[Wayne St. Denis	3-26-2020
[[[[Sandy Serena	Wayne St. Denis	4-06-2020
[[[[[[[[[[
[[[[[[[[[[

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
1	Travel to GHD Jobsite	<ul style="list-style-type: none"> • Transmission/exposure on client site • Transmission/exposure across provinces and territories • Transmittal/exposure of COVID-19 between passengers • Transmittal/exposure of COVID-19 from previous occupants (rental and fleet vehicles) • Transmittal/exposure of COVID-19 while refueling/rest stop 	<ul style="list-style-type: none"> • Check with the GHD Project Manager to ensure the project site work is continuing. Ensure to follow all client guidelines and policies. • All travel via land, air, or water requires RGM approval. • Canada - If fieldwork requires travel between other Provinces and Territories, verify if the Province/Territory has imposed a mandatory 14-day isolation requirement. If so, this may impede fieldwork. • Where more than one staff member is travelling to a project site, staff members must travel in separate vehicles to ensure social distancing is maintained. This includes on-site vehicle use to complete work tasks. • The interior (cab) vehicle surfaces (i.e., steering wheel, dash, gearshift, door handles, etc.) of all GHD fleet, leased or owned vehicles must be disinfected prior to each entry into the cab and upon return. • When traveling by vehicle, ensure to wear gloves when refueling and sanitize hands once complete. • Make as few stops as possible during travels to limit exposure to public spaces; and adhere to Journey Management Plan requirements. • Avoid close contact with anyone experiencing flu like symptoms during your rest/fuel stops. 	Field personnel
2	Conduct Tailgate Safety Meeting/Pre-work assessment & Complete H&S Paperwork	<ul style="list-style-type: none"> • Transmittal/exposure of COVID-19 between meeting participants 	<ul style="list-style-type: none"> • Practice social distancing, maintaining at least 2 metres/6 feet of distance between yourself and others. • Hold meetings outside and keep in mind wind direction. To the extent possible, remain cross-wind from other people. • Do not circulate the daily tailgate/pre-work assessment sign in sheet. Designate one person to document those in attendance on the sheet. • The latest information and updates to company operating procedures and precautions regarding COVID - 19 shall be discussed at all tailgate meetings and incorporated into the HASP JSAs 	Field personnel
3	All Activities	<ul style="list-style-type: none"> • Transmittal/exposure of COVID-19 	<ul style="list-style-type: none"> • Ask yourself and your Project Managers – is this work essential? Can this be done remotely? Can it be rescheduled? • Ensure project team follow all client guidelines and policies • Where required by local jurisdiction, post the current version of the “COVID-19 Guidance for GHD Field Personnel” or where no trailer is available maintain a copy in the HASP or JSEA. • Project manager must ensure staff have access to washroom facilities with soap and water or 	Field personnel

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
			<p>alcohol based hand sanitizer for good hygiene</p> <ul style="list-style-type: none"> • Carry nitrile gloves, alcohol-based hand sanitizer, and disinfectant wipes/spray during fieldwork. • Carry a supply of facial tissues and properly dispose in a receptacle after use • Avoid social greetings (e.g. shaking hands). • Avoid touching your face. The mucus membranes in your eyes nose and mouth are the primary pathways for the virus to gain entry into your body. • Know the symptoms of COVID-19 (Symptoms include fever, cough, and difficulty breathing). • Stay home from work if sick or presenting flu like symptoms or symptoms of COVID-19 • Practice social distancing, maintaining at least 2 metres/ 6 feet of distance between yourself and others. • Clean your hands frequently with soap and water for at least 20 seconds especially after you have been in a public place, or after blowing your nose, coughing, sneezing, or using the rest room or eating. • If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. Cover all surfaces of your hands and rub them together until they feel dry. • Cover your mouth and nose with a tissue when you cough, sneeze or use the inside of your elbow. • Clean and disinfect frequently touched surfaces daily, for example, cell phones, computer equipment, headsets, tables, doorknobs, light switches, countertops, handles, railings, desks, toilets, faucets, sinks, and/or other frequent contact surfaces. 	
4	Conduct Site Work	<ul style="list-style-type: none"> • Transmittal/exposure of COVID-19 between site workers and public. 	<ul style="list-style-type: none"> • Avoid close contact with anyone experiencing flu like symptoms. • Wear gloves while on site and wash and or/sanitize their hands upon removing them. Properly dispose of gloves. • Do not touch your face with gloved hands. Take care when removing gloves. • Carry a supply of facial tissues and properly dispose in a receptacle after use. • Discontinue face-to-face Site Meetings. Alternate meeting methods must be used in place of face-to-face meetings, such as conference calls, WebEx, Skype or MS Teams. • Practice social distancing between GHD field staff, GHD subcontractors, client and client contractors. In-person meetings will be eliminated where possible. • Where workers cannot maintain physical distance (2 meters/6 feet) to conduct a work task; in addition to nitrile gloves; a half face respirator with N95 cartridges and safety glasses must be worn. • Sites with stairway access to work task locations, establish one-way staircases where practicable to minimize worker's contact. • Communicate with onsite personnel via text messages, emails, phone calls or two-way radio • If site meetings are required, request they be conducted outdoors. • Mobile and stationary equipment interior (cab) surfaces shall be disinfected prior to entering the cab and when exiting the cab. • Tools and equipment shall be disinfected often and at the end of use. • Upon return to personal residence remove clothing and launder; and wash/shower to practice good hygiene. 	Field personnel

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
			<ul style="list-style-type: none"> To the extent possible, do not interact with the public. If it is necessary, politely explain you are practicing social distance and request they stay at least 2m/ 6 feet away and they do not attempt to pass objects to you. Ensure work zone demarcation is in place to avoid them entering your work space Do not share personal items such as pen/pencils, phones, notebooks or other equipment between project personnel unless they have been disinfected Tools and equipment shall be disinfected often and at the end of use. Teams working under a HASP must not circulate the daily tailgate sign in sheets. Designate one person to document those in attendance on the sheet. Teams working under a JSEA must not circulate the pre-work assessment sheet. Designate one person to document those in attendance on the sheet. As an alternate, staff may document their pre-work assessment using the HSE SMART App (pre-work assessment button). Due to N-95 respirators being in short supply and social distancing, if an employee requires First Aid treatment, the injured employee should self-administer. If they are unable to self-administer and if the injury is substantial, then Emergency Services may be required.] 	
5	Use of Construction Trailers/site office]	<ul style="list-style-type: none"> Transmittal/exposure of COVID-19 between site workers and others.] 	<ul style="list-style-type: none"> Discontinue entering contractor's project site office/trailer. All meetings/discussions are to be completed by telephone or teleconference/videoconference. If in-person meetings are required, request they be conducted outdoors. Discontinue face-to-face Site Meetings. Alternate meeting methods must be used in place of face-to-face meetings, such as conference calls, WebEx, Skype or MS Teams. Practice social distancing between GHD field staff, GHD subcontractors, client and client contractors. In-person meetings will be eliminated where possible. Where onsite meeting are required they are to be held outdoors while maintaining social distance. The on-site trailer/facilities (at GHD controlled sites) shall be cleaned on a daily basis with surfaces disinfected several times a day on an ongoing basis. Personal sanitation and cleaning supplies shall be made available on site (i.e. hand sanitizer and sanitizing wipes) and used frequently to wipe down surfaces such as handles on doors, desks, fridges, microwaves, light switches, thermostats, surfaces in and on portable bathrooms and other equipment that they come in contact with.] 	Field personnel]
6	Meals and Breaks]	<ul style="list-style-type: none"> Transmittal/exposure of COVID-19 from food establishment, customers, staff, surfaces.] 	<ul style="list-style-type: none"> Bring water, meals and snacks with you to avoid stopping at a store or restaurant. Dine in your vehicle or outside alone. Avoid using the project trailer or site facilities. Wash hands and sanitize, before and after eating. Meals shall be eaten alone or at a minimum distance of approximately 2 m (6 ft.) and not in groups. Project teams should consider staggering break and lunch schedules to minimize the number of people in close proximity to one another. If you must visit a restaurant, call ahead for take-out or "contactless delivery". Do not dine in. Use drive-through when this is an option] 	Field personnel]
7	Return to personal residence	<ul style="list-style-type: none"> Transmittal/exposure of COVID-19 at personal residence 	<ul style="list-style-type: none"> Upon return to personal residence remove clothing and launder; and wash/shower to practice good hygiene. 	

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
8	Hotel Stay	<ul style="list-style-type: none"> Transmittal/exposure of COVID-19 from occupants, previous occupants, hotel staff, common areas. 	<ul style="list-style-type: none"> Avoid independent hotels and alternative accommodations and book rooms at reputable hotel chains and should verify with the hotel that appropriate protocols are in place to limit the potential exposure and spread of the virus. Verify the hotel chain/brand has modified cleaning procedures to reflect risk of COVID-19. Most hotel companies have issued statements on their websites and in email blasts reflecting these new procedures. Use the front door, and not peripheral entrances. Front doors of hotels are generally automatic. Request ground floor room to avoid elevator use. If elevator use is required, do not directly touch elevator buttons with your hands. Do not ride elevators with other people, to the extent possible. Bring disinfecting wipes or sanitizing spray. Upon arrival, disinfect high "hand-traffic" areas of the hotel room: Door handles, light switches, shower/sink faucet handles, TV remote, curtain/blind handles or other surfaces. Clean these surfaces daily. Place the "Do Not Disturb" Sign on your door to prevent people (housekeeping) from entering your room. Practice social distancing. Maintain a distance of 2 m or 6 ft. Avoid common spaces and hotel sponsored events where crowds will be present. Confirm hotel cleaning procedures have been modified to address COVID-19. Confirm no COVID-19 cases have occurred in hotel Avoid close contact with anyone experiencing flu like symptoms. Upon return to hotel at end of shift, remove clothing and launder; and wash/shower to practice good hygiene. 	Field personnel
9	Reporting	<ul style="list-style-type: none"> Illness Exposure to COVID-19 	<ul style="list-style-type: none"> All GHD employees are to self-monitor for flu-like symptoms (cough and shortness of breath) and an increase in their temperature. If you or a GHD subcontractor, client or client contractor feel unwell or develop flu-like symptoms, contact your supervisor immediately and email using the Contact Table below to notify your assigned contact persons for your Region. Once notified, an HSE or PT member will then conduct a risk assessment and recommend appropriate preventative measures. Recommend seeking medical evaluation guided by Public Health. Notify your Supervisor and Regional GM (using the Contact Table below) if you have had close contact with an individual who tested positive for COVID-19. Once notified, an HSE or PT member will conduct a risk assessment and recommend appropriate preventative measures. 	

- (1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.
- (2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
- (3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site personnel participating in JSA review:

I have participated in the review and discussion of the Job Safety Analysis (JSA) listed on this document and understand the duties I am responsible to fulfill. As part of my work, I know I have the responsibility and obligation to STOP work with a **Stop Work Authority (SWA)** if conditions change and/or potential hazards have been identified.

Name/Company	Sign	Date

SSE(s) on job: _____ **Assigned mentor:** _____

Presenter signature: _____ Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor signature: _____ Date/Time: _____

Location of mustering point: _____ Wind direction (current): _____

GHD emergency contact (Name and verified phone number): _____

Supervisor signature documenting daily debrief has been completed: _____





GHD

Standard Operating Procedure - HSE
Infection Control
HSE339

March 2020

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1. Introduction

The intent of the Infection Control SOP (procedure) is to decrease the spread and impact of infection (e.g. epidemic or pandemic virus) within GHD. This document identifies key objectives, including reducing potential transmission among our people, clients and the communities we operate and maintaining business operations.

During an infectious outbreak (e.g. epidemic or pandemic virus), all persons experiencing flu-like symptoms should stay home and away from the workplace to protect others. Persons, who believe they have been exposed to a person illustrating symptoms, should contact their manager, People Manager or HSE Manager for advice.

Over time, communities will be tested by infectious outbreaks and will likely affect GHD's operations. This procedure aims to address actions to be taken by GHD to minimise further spread within our population and the effect on our business operations.

2. References

World Health Organization COVID-19 page

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

US Center for Disease Control COVID-19 page

<https://www.cdc.gov/coronavirus/2019-ncov/index.html>

GHD COVID-19 iConnect page

<https://iconnect.ghd.com/en/BusinessServices/HSE/incident-management/Pages/Coronavirus.aspx>

US Department of Labor COVID-19 Resource page

<https://www.osha.gov/SLTC/covid-19/standards.html>

CDC Interim Guidance for Risk Assessment and Public Health Management of Persons with Potential COVID-19 Exposure

<https://www.cdc.gov/coronavirus/2019-ncov/php/risk-assessment.html>

3. Scope and application

This SOP is applicable to all operations of GHD, Joint Venture and Alliance partners and other key business relationships where GHD maintains control of the work processes and should influence discussion and decisions where GHD is a general partner. This procedure also has application in the activities of our vendors and visitors, as they provide a means of contact with our business.

As GHD has more than one business location, local Regional General Managers, HSE Managers and People Managers will provide the appropriate authority, necessary resources and support to implement this procedure and the other GHD-issued informational materials based on the condition in each locality.

Note: The intensity of an outbreak may differ according to geographic location. Local health officials will be issuing guidance specific to their communities.

Items to consider as part of the application of this procedure are:

- Infection severity (i.e., number of people who are experiencing related symptoms, hospitalisation and death rates) in the community where the office is located;
- Impact of infection on employees that are vulnerable and may be at higher risk of infection and adverse health complications. For example:
 - people 60 and older
 - people with underlying health conditions including heart disease, lung disease, or diabetes
 - people who have weakened immune systems
 - people who are pregnant
- Prepare for possible increased numbers of employee absences due to illness in employees and their family members, closures of early childhood programs and schools due to high levels of absenteeism, illness or quarantine policies:
 - Regional Leadership Teams should monitor and respond to absenteeism at the workplace in order to implement plans to continue essential business functions in case of higher than usual absenteeism.
 - When possible, plan to cross-train personnel to perform essential functions so that the workplace is able to operate even if key staff members are absent.
 - Prepare for alternative working arrangements. Review employees ability to work from home, the equipment required and the processes for accessing GHD systems remotely.
 - Assess essential functions and the reliance that others (e.g., clients, vendors, etc.) and the community have on our services. Be prepared to change our business practices if needed to maintain critical operations (e.g., identify alternative suppliers, prioritize customers, or temporarily suspend some of our local/Regional operations if needed).

4. Risk management

As part of our overall Enterprise risk management strategies, certain key infection control strategies will be put in place to protect our people. These key infection control strategies are obtained from reputable sources such as World Health Organization (WHO) and US Center for Disease Control (CDC) and are to be implemented at the Business, Region and office level as needed to protect GHD employees. If local jurisdictional regulations and orders require the use of additional controls then GHD will implement those additional control measures at the local level.

As a starting point, during a significant infectious outbreak, all persons experiencing related symptoms will be encouraged to stay home and away from the workplace to protect others. In addition, based on a risk assessment GHD will deploy key strategies to minimise the risk of transmission of contagious viruses or similar.

If the measures in this procedure/SOP differ from any of the control measures referenced by a local jurisdiction or government body then the more stringent requirement will be followed.

4.1 Seasonal Flu Vaccine program

- Each Region (managed by the People and HSE Team) will implement an annual Flu vaccination program delivered as close to the date the vaccine becomes available as possible.
- Typically, the flu vaccine process is delivered towards the onset of winter in each hemisphere.
- Measures to track who has been immunised, who missed out due to being out of office (and making alternative arrangements for these people) and who chose not to take up the immunization opportunity will be implemented by the People Manager and in keeping with jurisdictional privacy laws.

4.2 In the event of infectious outbreak in the community

4.2.1 GHD

- GHD will encourage employees to:
 - Not to attend work if they have related symptoms.
 - Sneeze and cough into their sleeve or a tissue which is then disposed of.
 - Wash their hands with soap and water for at least 20 seconds. Soap and water should be used preferentially if hands are visibly dirty.
 - Use tissues and dispose of in no-touch receptacles for use by employees.
 - Supplement hand washing with use of an alcohol-based hand sanitizer that contains greater than 60% alcohol (placed in multiple locations and foyers and in conference rooms). Should a shortage of hand sanitizer occur, additional focus on soap and water washing should be communicated.
- Communicate key infection control measures via email, iConnect and Safety Shares.
- Each office will post informational posters that encourage staying home when experiencing related symptoms, [cough and sneeze etiquette](#), and hand hygiene at key locations within our offices and in other workplace areas where they are likely to be seen.
- Communications via email will be sent to GHD staff from the relevant executive member of GHD management or designee. Email notifications are to be reviewed and approved by GHD Group Manager HSE, Business HSE Leader or designee prior to sending to GHD staff.
- Business Group Leaders will ensure that adequate supplies are maintained and consider the potential future difficulties to obtain items in the future.
- Perform routine environmental cleaning - Each office will frequently clean and disinfect high use areas such as kitchen and bathroom surfaces, workstations and printers and eating areas. Dishwashers must be run on hot water.
 - Use the cleaning agents that are usually used in these areas and follow the directions on the label.
 - No additional disinfection beyond routine cleaning is recommended at this time.
- Provide disposable cleaning disinfecting wipes and encourage employees to wipe down commonly used surfaces (for example, counter tops doorknobs, keyboards, remote controls, desks) on a regular basis.

4.2.2 Employees

- Follow all reasonable instruction of GHD in its efforts to minimise the transfer of the infection amongst our people, clients and communities.
- Should not attend GHD offices or workplaces if illustrating symptoms. Preference for staff to work from home if able to work and if appropriate for role. See [Global Flexible Work Policy](#).
- In the situation of a 'seconded/embedded' employee working in a client's office, the person must follow the conditions established by the client and notify their GHD manager if illustrating symptoms. Further action may be required if the client does not have established protocols in place.
- If outside their home country, experiencing related symptoms employees should:
 - [With permanent operations](#) – contact the local People Team Manager and follow GHD policy for obtaining medical care. In the event of emergency, GHD employee will immediately contact an emergency healthcare provider to receive emergency and/or critical care treatment.
 - [Without permanent operations](#) – contact Chubb Assist for advice and also your manager.
- In the event of a family member being exposed or school shutdown as a result of exposure etc., and a GHD employee is required to take care of said family members, GHD will maintain flexible procedures such as permitting employees to work from home etc., to care for a family member experiencing flu-like symptoms.
- Persons travelling on annual/PTO leave may inadvertently return from leave and either be illustrating symptoms on return or soon after return. People returning from leave:
 - Are encouraged to illustrate common-sense and not attend work until symptom free.
 - May in certain circumstances, be required to undertake additional measures prior to returning to work (e.g. 'self-isolate').
 - If returning from overseas travel then GHD employees will be required to self-isolate for a period of 14 days upon arrival in country (home or abroad). See [Global Flexible Work Policy](#) and [GHD's coronavirus \(COVID-19\) iConnect page](#) for more information.

If late onset of symptoms are experienced (post return into work), employees should immediately leave the workplace and then contact their manager, People Manager or HSE Manager for advice.

4.2.3 Employees travelling

- Check GHD Travel Insurance provisions to confirm if travel is insured.
- Attempt to minimize contact with members of the public and try and maintain at least one metre (three feet) of personal space.
- Follow hygiene and handwashing guidance listed above.
- Check GHD source material (e.g. [GHD's coronavirus \(COVID-19\) iConnect page](#)) for information as self-isolation may be required.
- Check GHD's [Riskline portal](#) and [GHD's coronavirus \(COVID-19\) iConnect page](#) for the latest guidance and follow all travel advisories of GHD and governmental recommendations for each country of travel.
- Check themselves for symptoms before starting travel. GHD employees are responsible for notifying their Manager and staying home if they are experiencing flu-like symptoms.
- Employees who experience flu-like symptoms while traveling or on temporary assignment understand that they should immediately self-isolate, notify their Manager and should promptly call a Chubb Assist for advice if needed. See next section for more details.

4.2.4 Sharing of personal details

Personal Information will be treated in accordance with local privacy laws and the GHD Privacy Policy. For further information, please contact local legal counsel. Personal information will be treated confidentially, however details may be shared to prevent risk to the health and safety of other employees.

In the event a person is being tested for or illustrating symptoms a contact tree will be developed (based on set criteria listed below) and identified employees, clients or other personnel who meet these criteria will be advised of the potential exposure.

Only information relating to the health risk should be shared, and only shared with people impacted by the risk. Employee names should not be included in any written correspondence to people not directly impacted by the health breach.

Employees with concerns around the release of information should advise their Manager, who will escalate this to the Region GM.

4.2.5 Employees exposed to confirmed COVID-19 cases – outside the workplace

Employees may be exposed to persons who are either known or later confirmed as being COVID-19 positive. People who have been in 'first degree' contact with confirmed COVID-19 cases should be isolated in their home for 14 days after exposure.

As this is a known 'first degree' exposure of a GHD employee, a contact tree (see 4.2.6 below) of those close to or working in direct vicinity to the affected person is created, those on the list informed and asked to work from home for 14 days after exposure.

If the person exposed or any one on the contact tree illustrates symptoms while in isolation, they must immediately seek medical attention and notify the People of HSE Manager, so others on the contact tree may be contacted and do the same.

4.2.6 Employees illustrating "related" symptoms

- Employees who have flu-like symptoms are recommended to stay home and not return to work until they are free of fever (100.4° F/37.8° C or greater using an oral thermometer), signs of a fever, and any other symptoms for at least 24 hours, without the use of fever reducing or other symptom-altering medicines (e.g. cough suppressants). Consult with the Regional People Team as to whether medical clearance is required prior to returning to work.
- When an employee is first identified in the workplace to be illustrating related symptoms (i.e. have not "self-isolated):
 - If available, an appropriate N95/P2 respirator mask will be issued to people experiencing flu-like symptoms immediately upon identification.
 - Will be asked to move to an isolated area of the office (e.g. meeting room) and implement international hygiene practices (cover their noses and mouths with a tissue when coughing or sneezing or an elbow or shoulder if no tissue is available), regular hand washing etc., until work from home arrangements are made.
 - Employees will be required to work from home (i.e., a lower risk environment) until they are free of symptoms (asymptomatic) if they are well enough to work.
 - All leave associated with symptomatic individuals will be taken in accordance with People policies (e.g., sick leave). Protocols regarding return to the office prior will be based upon local People policy (e.g., supply of medical certificate).
 - Where there is likelihood of epi/pandemic (i.e., announced by peak health authority) in accordance with GHD's Pandemic Trigger Action Plan, Region GMs will be required to ensure that staff have the ability to, and are trained/familiar with working from home, in advance of any potential outbreak.

- Persons illustrating related symptoms to seek medical attention and be screened for testing.
- GHD Project Directors that use contract or temporary employees will contact the employment company or agency to discuss the importance of persons experiencing flu-like symptoms staying home and encourage the employment agency to develop non-punitive leave policies.

If the affected person satisfies the Medical Authority COVID-19 screening criteria and is tested for COVID-19 this must be made known to the People Manager or HSE Manager immediately.

A contact tree of those close to or working in direct vicinity to the affected person is created, those on the list informed and asked to work from home pending results (if results come back as positive, see 4.2.7 Employee confirmed as COVID-19 positive protocols below).

Close Contact

The definition of close contact (1)(2) is as follows:

- *greater than 15 minutes face-to-face contact in any setting with a suspected / confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, and/or*
- *sharing of a closed space with a suspected/confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case*

In a non-office setting, a close contact includes a person meeting any of the following criteria:

1. *Living in the same household or household-like setting (e.g. in a boarding school or hostel).*
2. *A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility).*
3. *A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.*
4. *Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case.*
5. *Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.*

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts.

Relevant references:

- *New South Wales Government Fact Sheet for Close Contacts (updated 15 March 2020) – <https://www.health.nsw.gov.au/Infectious/factsheets/Pages/novel-coronavirus-close-contact.aspx>*
- *The Communicable Diseases Network Australia (CDNA) Coronavirus Disease 2019 National Guidelines for Public Health Units (Version 2.0, date 13 March 2020) - [https://www1.health.gov.au/internet/main/publishing.nsf/Content/7A8654A8CB144F5FCA2584F8001F91E2/\\$File/interim-COVID-19-SoNG-v2.0.pdf](https://www1.health.gov.au/internet/main/publishing.nsf/Content/7A8654A8CB144F5FCA2584F8001F91E2/$File/interim-COVID-19-SoNG-v2.0.pdf)*

The RGM will inform the rest of the Region's office that is affected (along with other offices if the person had travelled), using the template communications provided and the Privacy conditions listed in section 4.2.4 above.

Full clean of all high use areas that the person may have contacted by professional cleaners.

Once the results are known:

- Negative - all return to work (once symptom free)
- Positive - refer to Positive Result protocols below

4.2.7 Employee confirmed as COVID-19 positive

- If a person is diagnosed as COVID-19 positive, they must immediately report this to their Manager, People Manager or HSE Manager, leave the office and self-isolate.
- The People Manager will ensure that employees with a positive COVID-19 diagnosis have access to flexible leave policies which are flexible and consistent with public health guidance.
- The People Manager and HSE Manager will inform other employees who may have come into contact with the infected person of their potential exposure to COVID-19 and commence development of an "exposure tree".
- Confidentiality must be maintained as per jurisdictional legislation and GHD policy.
- Asymptomatic employees potentially exposed to COVID-19 will undergo a risk assessment using either local Health Department provided risk assessment or the CDC guidance for [how to conduct a risk assessment](#). However, local government policies may take precedence in determining whether employees remain in an office and what medical consultation is required.
 - Designated member(s) of the HSE and People Teams will perform the exposure risk assessment and determine any protective measures and safeguards. Based upon the results of the risk assessment, high-risk employee(s) will be asked to seek medical consult and asked to work from home for 14 days after their last potential exposure.
 - Region GMs may determine that all potentially exposed persons quarantine themselves for the 14-day period.
- All absences as a result of 'home isolation' will be documented and maintained by the relevant HSE Manager in the Infection Control Personnel Register. Protocols regarding return to the office following will be based upon local People Policy (e.g. supply of medical certificate).
- It is appreciated that confirmed diagnosis may trigger anxiety and unrest. The People Manager will remind affected persons of GHD's EAP program provisions.
- All surfaces that a confirmed COVID-19 case may have come into contact with require a 'deep clean', prior to employees re-entering. A professional cleaner using the appropriate products and practices must undertake this.

A 'deep clean' is a standard term used for an elevated cleaning scope and includes disinfecting and sanitising of the following (including screens and keyboards):

- High dusting or all vents and light fixtures.
- Vacuum all blinds, drapes, windowsills, tracks, etc.
- Dust all walls and clean all light switches.

- Dust all doors and clean all doorknobs.
- Dust all baseboards.
- Move all furniture and thoroughly vacuum all carpets or scrub all floors. (Make sure to clean all baseboards behind furniture that is usually not cleaned on a regular basis).
- Dust and wipe down all surfaces (as employees to remove everything from their desks).
- Clean and sanitize all computer keyboards and screen.
- Clean all kitchen cabinets, appliances, refrigerator, etc.
- Clean all restroom walls, toilets, urinals, sinks.
- Do a machine scrub on restrooms floors. This will help eliminate urine smell.
- Inspect caulk around the toilets and sinks and address as appropriate.
- Window cleaning.
- Carpet cleaning.
- High ceiling dusting (especially if you have a warehouse).
- Strip and wax

4.2.8 Visitors to GHD offices

- Screening questions appropriate to the nature of the outbreak, local Health advisories and also GHD’s local condition will be asked of all visitors at reception prior to being permitted to entering the office.

4.3 Office reduction

The condition facing a GHD office, the isolation measures considered and the public health orders will vary by jurisdiction. However, the decision to reduce operations in an office may be the result of key considerations:

- **Directed** - Local or national authorities have issued a public health order that prohibits people from gathering in public places where close contact may occur, also known as congregate settings. Congregate settings include settings such as shopping centres, movie theatres, stadiums, workplaces, and schools and classroom settings.
- **Based on risk** - If multiple office staff are symptomatic then there is a risk that the office may have widespread dispersion of the virus and thus require large scale disinfection. The office operations should be reduced to an appropriate level (e.g., to increase social distancing). However, specific essential personnel may be provided access based upon Regional GM and HSE approval. A risk assessment and control measures must be in place prior to allowing essential staff to remain in a potentially contaminated building.

In the event of a decision (or requirement) to reduce office operations:

- Refer to GHD Crisis Management Plan:
 - Incident Classification Matrix
 - Office Out of Commission Specific Incident Guide
 - Pandemic Specific Incident Guide

In the case where GHD has determined to reduce based on risk, the Region GM will notify other building occupants and clients of this decision, including the potential impacts.

In all cases, the Crisis Management Team Leader is responsible for determining the frequency of review of the decision to “reduce”.

- The Region will have made the necessary arrangements to enable our people to work from home. Persons working from home during this period will be provided with a laptop **only for** this purpose unless other arrangements are agreed by the Region GM.
- It must be noted that during this period IS Support will be restricted to internet and phone enquiries only.
- Switchboards will be diverted to the closest GHD office.

The intensity of a localised or regional outbreak may differ. There may be an opportunity for GHD employees affected by an office closure to work at other GHD office locations. In order for an office reassignment to occur an exposure risk assessment must occur and the office reassignment be approved by the Executive GM. Any affected employee must possess a No Risk or Low Risk exposure assessment result prior to any office reassignment.

5. Communication and training resources

GHD Coronavirus (COVID-19) iConnect page

<https://iconnect.ghd.com/en/BusinessServices/HSE/incident-management/Pages/Coronavirus.aspx>

GHD Infection Control Safety Share

https://iconnect.ghd.com/en/BusinessServices/HSE/building-capability/_layouts/15/WopiFrame.aspx?sourcedoc=/en/BusinessServices/HSE/building-capability/Documents/Safety%20Share%20-%20Infection%20Control%20Feb%202020.pptx&action=default

GHD Coronavirus (2019-nCoV) Safety Share

https://iconnect.ghd.com/en/BusinessServices/HSE/building-capability/_layouts/15/WopiFrame.aspx?sourcedoc=/en/BusinessServices/HSE/building-capability/Documents/Safety%20Share%20-%20Coronavirus%20Feb%202020.pptx&action=default

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Document Status

Rev	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	C Harrison	J Maranciak		C Harrison		Mar 2020



COVID-19 Social Distancing

Office guidelines

The recent [Safety Share: Pandemic](#) highlights the Social Distancing as a key initiative for implementation. This Guideline unpacks the practical measures to be implemented to reduce exposure within our operations (outside of existing measures to voluntarily isolate):

Working from Home

- Refer to relevant Governmental initiatives regarding social distancing (e.g. mass gatherings)
- Laptops stored for recycling are retrofitted with up to date software – ready for loan
- Staff with laptops instructed to take home every day (including peripherals – charger cords, mouse)
- Where available, excess laptops will be retrofitted and made available as necessary
- Until bandwidth capacity initiatives are complete RGMs to enforce the following:
 - Until an office / floor is required to close please constrain the number of people working from home.
 - If an office or floor within the Region needs to close then prioritize those who require VPN access to meet client obligations.
 - Practices that support the economical use of the VPN – i.e. people do not need to remain on the VPN all of the time. Employees should connect, download (etc. to laptop), and then disconnect.

Minimising movements in our buildings

- Reduce non-essential movements between floors in multi-story buildings
- Greater utilisation of phones and WebEx for in-office meetings and discussions
- Limiting face-to-face meetings to critical project meetings only – limited to 8 people
- Antibacterial cleaning of high use surfaces 3 times a day, including elevator buttons and door handles (may involve disinfectant wipes and sprays)
- Reception Screening Guidelines enforced
- No 'personal' parcel deliveries to GHD buildings
- Discuss and agree on communication methodologies with Clients – as they are concerned about the same things we are.

Cancellation of mass gatherings

- Face-to-face Business School activities cancelled – replacing with virtual medium as necessary
- Face-to-face Region activities above 8 people cancelled or re-organised
- International Travel conditions remain per current conditions
- Domestic Travel conditions to be restricted to “essential travel only” and Regional GM approval required.

Thank you for your cooperation and understanding on this matter.



COVID-19 Visitor Screening

Office access guidelines

Dear visitor,

With the rise in the number of confirmed cases of COVID-19 (coronavirus), we have implemented a number of measures in GHD offices to help prevent and slow the spread of the virus and to protect the health of our employees and anyone else visiting our offices.

These measures include advice on increased hygiene in the offices and at home, restricting overseas travel to business critical visits, requesting staff who have visited high-risk areas to work from home.

We are also asking all visitors (clients, vendors and GHD visitors) to our offices, to read and answer the questions below:

Please read the following questions:

1. Have you travelled internationally or been in close contact with, anyone who has travelled internationally in the past 14 days?
2. Have you, in the last 14 days, had contact with anyone who has confirmed or suspected symptoms of COVID-19 (fever, dry cough, body aches, headache, sore throat, runny nose, tiredness, shortness of breath)?
3. Do you have any of the following symptoms? Fever, dry cough, body aches, headache, sore throat, runny nose, tiredness, shortness of breath.

If you answer YES to any of the questions above, we ask you respectfully to postpone your visit, and to inform your GHD contact.

Thank you for your cooperation and understanding on this matter.



Tailgate Safety Meeting Form Large Group Format - Single Day

Date:		Time:		Project No.:	
Presenter:			Project Name:		

Safety topics/items discussed:

Emergency preparedness:

First Aid Provider(s):		Muster Point:	
		Method of Communication:	
AED Responder:		Fire Extinguisher Location:	
First Aid Kit Location:		Eye Wash Location:	

Site personnel in attendance:

Print Name:	Signature:	Company:



Tailgate Safety Meeting Form Small Group Format - Multiple Days

Date:		Time:		Project No.:	
Presenter:		Project Name:			

Safety topics/items discussed:

Emergency preparedness:

First Aid Provider(s):		Muster Point:	
		Method of Communication:	
AED Responder:		Fire Extinguisher Location:	
First Aid Kit Location:		Eye Wash Location:	

Print Name	Signature	Company

Date:		Time:		Project No.:	
Presenter:		Project Name:			

Safety topics/items discussed:

Emergency preparedness:

First Aid Provider(s):		Muster Point:	
		Emergency Communication:	
AED Responder:		Fire Extinguisher Location:	
First Aid Kit Location:		Eye Wash Location:	

Print Name	Signature	Company

Form initiated by: _____ Date initiated: _____

Initiator's role/responsibility: _____ Project number: _____

Affected location(s): _____

Client's management of change documentation attached, if required or applicable: Yes N/A

Type of change:	Duration of change:
<input type="checkbox"/> Field operations/SOPs	<input type="checkbox"/> Permanent
<input type="checkbox"/> Equipment	<input type="checkbox"/> Temporary (specify how long change will be in place): _____
<input type="checkbox"/> Safety	
<input type="checkbox"/> Project management/resources	<input type="checkbox"/> Emergency

Describe the change:

Describe the procedure/task(s) required to complete the change:

Who needs to know about the change and how will you communicate this to them?

Is additional training for GHD people required as a result of this change? Yes No

If yes, please describe training needs and those who require it:

Coordination with Business School Learning Centre underway: Yes No

Identify any associated risks/hazards/impacts as a result of this change:

Does the change need to be approved by a client? Yes No

If Yes, state client's name: _____

Client role/responsibility: _____

Date authorized by client: _____
(mm/dd/yyyy)

Change approved by project manager: _____
(please print)

(signature) _____ (approval date – mm/dd/yyyy)

Summary:

Item	Completion date	Confirmed by
1. Task(s) to execute change have been completed	_____	_____
2. Those who need to know have been notified	_____	_____
3. Additional training has been completed	_____	_____
4. Risk(s) have been mitigated	_____	_____
5. Change has been approved by all required parties	_____	_____

Notes:

Scope: GHD may use the Management of Change Form (QSF-006) to identify and record project additions, revisions, changes, or updates regarding field operations, field SOPs, equipment, safety, resources, or project management.

Detail: The level of detail to a documented project change is ultimately determined by the project manager and/or any client expectations.

File location: Correspondence folder of the project file.

Underground Utilities Checklist

(QSF-019)

Pre-Drilling/Excavation Checklist and Utility Clearance Log

Project number:	Project name:
Date:	Project location:
Public utility locator:	Public utility locator phone number:
Date of public utility locator request:	Public locator call reference number:
Private utility locator (If applicable):	Private utility locator phone number:

Utilities (indicate that location/utility presence was checked)

Borehole/ Excavation location	Date (mm/dd/yyyy)	Telephone	Water	Storm sewer	Sanitary sewer	Process sewer	Gas	Electrical	Cable	Overhead utilities	Other	Comments/Warnings
Utility owner												

Instructions: This checklist is to be completed by GHD personnel prior to initiation of field activities as a safety measure, to ensure that all underground utility lines, other underground structures, and above-ground power lines are clearly marked in the area selected for boring or excavation.

Notes: _____

Client: _____ **Client representative:** _____ **Phone number:** _____

Client or property owner acknowledgement of utility clearance: _____ **(Client, property owner, or authorized agent signature)**

Subcontractor acknowledgement of utility clearance: _____ **(Subcontractor or subcontractor representative signature)**

GHD field representative name: _____ **Signature:** _____

GHD project manager's review/confirmation of locate completion: _____

In the event that client or property owner acknowledgement cannot be obtained, all boreholes shall be hydro vacuumed and the costs passed on to the client. Attach any clearance documentation from utility owner/operator to this document.

Underground Utilities Checklist for GHD Personnel

Pre-Drilling/Excavation Checklist and Utility Clearance Log

Drilling or excavation work may not proceed if any of the questions answered below are answered "No." Implement stop work authority and contact the GHD project manager to discuss and resolve any concerns or issues. Document the reason for a "No" answer in the comments section below.

Yes	No	N/A	Pre-Mobilization
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Has a utility locator request been completed within the last 30 days (verify time limit with state or provincial law)? If no, stop work and comment below.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Is a scaled site plan, map or drawing showing the proposed borehole locations attached to this form?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Does each borehole and excavation location allow for clear entry and exit, adequate workspace, and a clear path for raising the mast (or boom) and operating the drill rig and all support equipment? Ensure that the minimum OSHA/state/provincial utility clearance requirements between the mast or boom and the power line(s) are met. For instance, OSHA requires a minimum approach distance of 10 feet for systems below 50 kV and an increase of 4" for every 10 kV over 50 kV. Confirm if additional permits are required if the boom or mast will be working 5 meters (15 feet) or less from the electrical lines.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Are all of the proposed borehole and excavation locations at least 1.0 meters (3 feet) from any subsurface or above-ground utilities shown on client's building plans? Check here <input type="checkbox"/> if plans not provided by client (therefore not applicable to this job).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Are all of the proposed borehole and excavation locations at least 1.0 meters (3 feet) from any subsurface or above-ground utilities shown on public right-of-way street improvement or other public property plan or site map?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Has the site representative, familiar with the site, indicated no knowledge of any subsurface or above-ground utilities within 3 metres (10 feet) of the proposed borehole and excavation locations? (Review locations with site representative)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Are all of the proposed borehole and excavation locations at least 1.0 meters (3 feet) from any subsurface utilities identified during a geophysical survey? Check here <input type="checkbox"/> if no geophysical survey has been completed (therefore not applicable to this job).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Have all utility locating service providers, notified by the public line locator, marked out their facilities in the vicinity of the borehole and excavation locations or otherwise notified us that they do not have any facilities near the proposed locations? (Attached confirmation and utility locate sheets from public locator)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. Are all proposed borehole and excavation locations at least 1.5 meters (5 feet) from a visual line connecting two similar looking manhole covers?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Are all proposed borehole and excavation locations at least 1.5 meters (5 feet) from a visual line perpendicular to the street from the water, gas, and electrical meters?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Are all proposed boring and excavation locations clear of pavement joints, curbs, crash posts, or other engineered structures?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Does the ground surface/pavement lack signs of previous excavation (e.g., no pavement subsidence, no differences in pavement texture or relief, no pavement patching)?
Pre-Drilling and Excavation			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13. Has it been verified that the proposed drilling or excavation work will not affect any work currently in progress?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14. Has the drill rig or heavy equipment been inspected prior to use and documented? (See Drill Rig Inspection Checklist or Mobile Equipment Safety Inspection Checklist)
			15. Have barricades been erected to prevent unauthorized access, where applicable?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. Have all known live electrical or product lines within 3 meters (10 feet) of the dig path been visually verified? If no, comment below.
			17. For boreholes that have not been cleared or are within 3 meters of a utility:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	a. Before drilling have you cleared a hole to 2.4 meters (8 feet) below grade using an air-knife, or equivalent, before drilling and is the diameter of this hole greater than the final outside diameter of the boring? If not required comment below.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	b. Does the soil you encountered in the hand-dug hole appear to be native material (i.e., free of clean gravel, clean sand, aggregate base [gravelly sand ~ 10% fines] or other non-native looking material)? If not required comment below.

- | | | | |
|--|------------------------------|-----------------------------|---|
| Have the above concerns been discussed with the GHD project manager? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not Applicable |
| Has the start of subsurface work been communicated to the GHD project manager? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not Applicable |
| Have the above concerns been discussed with the client? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not Applicable |
| Has the scope of work been approved by the client? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not Applicable |

Comments: _____

GHD field representative name: _____ **Date:** _____



Site Health and Safety Plan Amendment Form

This document is to be completed for ANY changes that occur within the Site Health and Safety Plan (HASp). This document is to be sent to the Regional Safety & Health Manager (RSHM) for review, verification and sign off of the HASp.

Amendment #	
Site Name/Project ID	
Date	
Client Contact (same/change)	
Reason for Amendment (SOW change, JSA addition, Chemical, etc.)	
Alternate or Additional Safeguard Procedures	
Required changes in PPE	
Additional Comments:	

Project Manager Notified	<input type="checkbox"/>
RSHM Notified	<input type="checkbox"/>
Client PM Notified (if necessary)	<input type="checkbox"/>

Site HSE Officer (sign above)	Date
-------------------------------	------

The Project Manager is ultimately responsible for the accuracy of the information on this amendment and ensuring any changes to the original HASp is discussed with all affected site personnel prior to commencing work

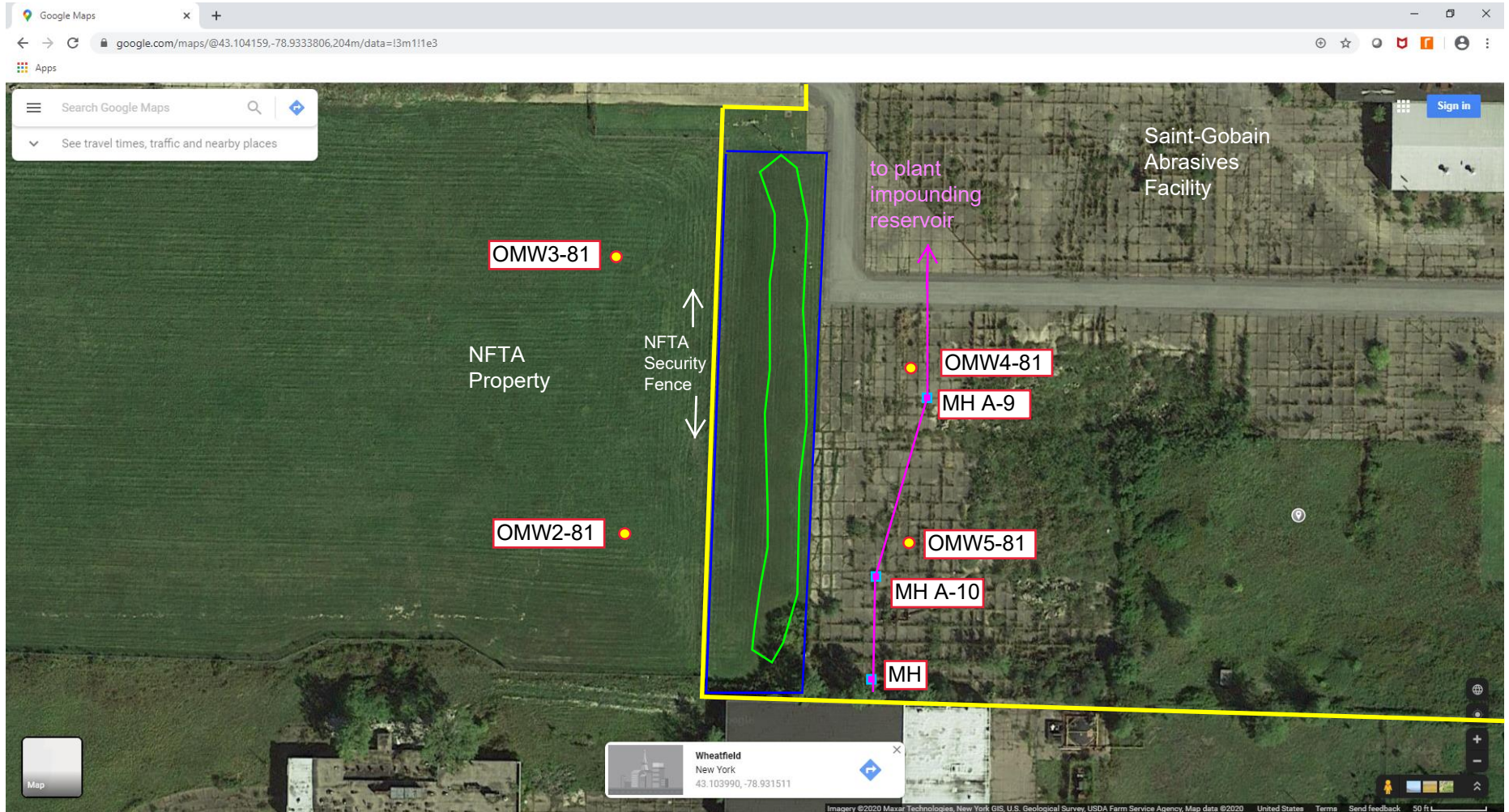
This original form must be placed in the project file and a copy needs to be attached to the Site Health and Safety Plan (HASp).

HASP Acknowledgment Sheet

Project Name: _____ Project Number: _____

This is to certify that I have received a pre-entry briefing regarding this HASP, and I understand its contents. My failure to follow and comply with the requirements contained in this plan may result in disciplinary action and/or termination.

Print Name	Signature	Date



Site Plan
 Carborundum - Abrasive Division Site
 NYSDEC Site No. 932007
 6600 Walmore Road
 Wheatfield, New York

- Approximate Site Boundary
- Approximate Area of Landfilled Waste
- Approximate Parcel Boundary
- Overburden Monitoring Well
- Manhole/Catch Basin
- Approximate Location of Storm Sewer



Job Safety Analysis (JSA)

Insert Name : Environmental-
Decontamination of Sampling
Equipment and Personnel
(PPE Level D)

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	04/10/2020 15:02:06	Client:	Saint-Gobain Corporation		
Project Number:	11212053	Created By:	crampopek	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	6600 Walmore Road Wheatfield				
Key Equipment:	Alconox/Liquinox, brushes				
Task-specific Training:	Decontamination/Site Control; Quality Control/Sampling Plan				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
<input type="checkbox"/> Type 1 (Top Impact)	<input checked="" type="checkbox"/> Chemical Protective (ie.Nitrile)	<input checked="" type="checkbox"/> ANSI/CSA Safety Glasses	<input type="checkbox"/> Harness	<input type="checkbox"/> Full Face Mask	<input checked="" type="checkbox"/> Class II (standard)	<input type="checkbox"/> Coveralls
<input type="checkbox"/> Type 2 (Side Impact)	<input type="checkbox"/> Level 1 - Light Duty	<input type="checkbox"/> Goggles/Spoggles	<input type="checkbox"/> Shock Absorbing Lanyard	<input type="checkbox"/> Half Face Mask	<input type="checkbox"/> Class III (Night or Highway Traffic)	<input type="checkbox"/> Fire Retardent Clothing (FRC)
<input checked="" type="checkbox"/> Class E (standard)	<input type="checkbox"/> Level 2 - Light Duty with Protection	<input type="checkbox"/> Face Shields	<input type="checkbox"/> Lifeline		<input type="checkbox"/> Anti-Static	<input type="checkbox"/> High Viz Clothing
<input type="checkbox"/> Class G	<input type="checkbox"/> Level 3 - Medium Duty	<input type="checkbox"/> Other*		Cartridges	<input type="checkbox"/> FRC	<input checked="" type="checkbox"/> Long Pants
	<input type="checkbox"/> Level 4 - Heavy Duty			<input type="checkbox"/> N95	<input type="checkbox"/> PFD	<input checked="" type="checkbox"/> Long Sleeve Shirts
Foot Protection	<input type="checkbox"/> High Viz	Hearing Protection	Arc Flash/Shock Protection	<input type="checkbox"/> P100		<input type="checkbox"/> Paper Tyvek (disposable)

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
<input checked="" type="checkbox"/> Industrial Grade Safety Boot	<input type="checkbox"/> Other*	<input checked="" type="checkbox"/> NOT Required for this task	<input type="checkbox"/> Hazard Category 2	<input type="checkbox"/> P95		<input type="checkbox"/> Polyethylene Tyvek
<input type="checkbox"/> Rubber Boots (industrial grade)		<input type="checkbox"/> Required	<input type="checkbox"/> Hazard Category 4	<input type="checkbox"/> R95		<input type="checkbox"/> Other*
<input type="checkbox"/> Hip Waders				<input type="checkbox"/> Organic Vapour		
	* see key equipment			<input type="checkbox"/> Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Margaret Popek				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Decontamination of sampling equipment (including pumps, bailers, tubing, etc.)	<ul style="list-style-type: none"> ● Contaminant exposure ● Pinch points ● Slip/trip/hit/fall hazards ● Lifting hazards ● Back injury ● Manual material handling 	<ul style="list-style-type: none"> ● Set up decon station to capture any spills to avoid cross contamination and manage wastes ● Wear appropriate PPE ● Scrub equipment clean then rinse and verify it is clean and free of contamination ● Avoid putting hands in or near pinch points ● Maintain good housekeeping and be aware of surroundings ● Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical means, such as a dolly, cart, or a buddy lift) will be required ● Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position ● Refer to the HASP for additional lifting techniques 	Sampling Personnel
2	Decontamination of personnel	<ul style="list-style-type: none"> ● Contaminant exposure ● Slip/trip/hit/fall hazards 	<ul style="list-style-type: none"> ● Refer to the HASP for specific procedures but in general start with most contaminated article and remove until inner gloves are the last item left ● Dispose of used PPE in accordance with site requirements ● Wash hands and face before eating, drinking, or using tobacco products ● Take care when removing PPE (boots, gloves, etc.); sit down to remove/change boots as necessary 	Sampling personnel
3	Management of waste derived from decontamination activities	<ul style="list-style-type: none"> ● Contaminant exposure ● Lifting hazards ● Back injury ● Manual material handling 	<ul style="list-style-type: none"> ● Containerize decon waste (e.g., water, used PPE) as required ● Properly dispose of decon fluids (e.g., sediments) ● Refer to step 1 and the HASP for additional lifting information 	Sampling personnel

1. Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.
2. A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

I have participated in the review and discussion of the Job Safety Analysis (JSA) listed on this document and understand the duties I am responsible to fulfill. As part of my work, I know I have the responsibility and obligation to STOP work with a Stop Work Authority (SWA) if conditions change and/or potential hazards have been identified.

Name/Company	Sign	Date



SSE(s) on job: _____ **Assigned mentor:** _____

Presenter Signature: _____ **Date/Time:** _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____ **Date/Time:** _____

Location of Mustering Point: _____ **Wind direction (current):** _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Motor Vehicle - Driving

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	04/10/2020 15:02:07	Client:	Saint-Gobain Corporation		
Project Number:	11212053	Created By:	cra\mpopek	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	6600 Walmore Road Wheatfield				
Key Equipment:	Vehicle, valid driver's license, 360-degree topper; seatbelt				
Task-specific Training:	Defensive Driving				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
<input type="checkbox"/> Type 1 (Top Impact)	<input type="checkbox"/> Chemical Protective (ie.Nitrile)	<input type="checkbox"/> ANSI/CSA Safety Glasses	<input type="checkbox"/> Harness	<input type="checkbox"/> Full Face Mask	<input type="checkbox"/> Class II (standard)	<input type="checkbox"/> Coveralls
<input type="checkbox"/> Type 2 (Side Impact)	<input type="checkbox"/> Level 1 - Light Duty	<input type="checkbox"/> Goggles/Spoggles	<input type="checkbox"/> Shock Absorbing Lanyard	<input type="checkbox"/> Half Face Mask	<input type="checkbox"/> Class III (Night or Highway Traffic)	<input type="checkbox"/> Fire Retardent Clothing (FRC)
<input type="checkbox"/> Class E (standard)	<input type="checkbox"/> Level 2 - Light Duty with Protection	<input type="checkbox"/> Face Shields	<input type="checkbox"/> Lifeline		<input type="checkbox"/> Anti-Static	<input type="checkbox"/> High Viz Clothing
<input type="checkbox"/> Class G	<input type="checkbox"/> Level 3 - Medium Duty	<input type="checkbox"/> Other*		Cartridges	<input type="checkbox"/> FRC	<input type="checkbox"/> Long Pants
	<input type="checkbox"/> Level 4 - Heavy Duty			<input type="checkbox"/> N95	<input type="checkbox"/> PFD	<input type="checkbox"/> Long Sleeve Shirts
Foot Protection	<input type="checkbox"/> High Viz	Hearing Protection	Arc Flash/Shock Protection	<input type="checkbox"/> P100		<input type="checkbox"/> Paper Tyvek (disposable)
<input type="checkbox"/> Industrial Grade Safety Boot	<input type="checkbox"/> Other*	<input type="checkbox"/> NOT Required for this task	<input type="checkbox"/> Hazard Category 2	<input type="checkbox"/> P95		<input type="checkbox"/> Polyethylene Tyvek
<input type="checkbox"/> Rubber Boots (industrial grade)		<input type="checkbox"/> Required	<input type="checkbox"/> Hazard Category 4	<input type="checkbox"/> R95		<input type="checkbox"/> Other*

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
<input type="checkbox"/> Hip Waders				<input type="checkbox"/> Organic Vapour		
	* see key equipment			<input type="checkbox"/> Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Margaret Popek				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Discuss STAR and SWA	Site personnel not aware of STAR and SWA	<ul style="list-style-type: none"> ● Project team (GHD) discusses importance of and documentation procedures for SWA during pre-job safety meeting ● Discuss route, concerns, and alternate routes with passenger and drivers of other vehicles ● Use SWA to stop any work that is unsafe ● Ensure proper vehicle selected for travel (use a truck if going to construction site or area with rough conditions that would damage a small vehicle?) 	Driver and passenger
2	Check weather	<ul style="list-style-type: none"> ● Unexpected storm ● Fog; rain; snow; lightning/thunder ● Heat/cold stress 	<ul style="list-style-type: none"> ● Check local weather forecast ● Discuss weather issues and precautions to take while driving and on site during the pre-job safety meeting ● If weather conditions (e.g., fog, rain, snow, etc.) impair the ability/vision of the driver, exit at nearest safe location and assess the situation ● While on site, at first sign of lightning/thunder utilize SWA and assess weather conditions ● In extreme temperatures, ensure all personnel have proper clothing, hydration, and heat/cold protection (e.g., canopy, fan, glove warmers) 	Driver or Passenger

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
3	Complete GHD Daily Operator Vehicle Checklist	<ul style="list-style-type: none"> ● Damaged vehicle lights, tires, windows, mirrors, horn ● Inadequate vehicle documents and/or safety items 	<ul style="list-style-type: none"> ● Check for fluid leaks under vehicle ● Test operation of headlights, front/rear turn signals, backup lights, brake lights, and emergency flashers ● Visually check the pressure/wear of tires ● Ensure the vehicle has a properly inflated spare tire and associated tools to install ● Assure windshield and window glass is clean and free from obstructions ● Assure all fluids are topped off (e.g., windshield wiper fluid) and scheduled routine maintenance has occurred (e.g., oil changes). ● Test the windshield wipers and horn ● Verify vehicle registration, insurance card, and inspection sticker is present and valid ● If the vehicle contains a first aid kit, fire extinguisher, and road hazard kit, verify that all items with expiration dates are current and that fire extinguisher has had documented monthly check ● Do not use vehicle if any safety device is found not functioning 	Driver or Passenger
4	Check and adjust seat, steering wheel, headrest, and mirrors	<ul style="list-style-type: none"> ● Back/body strain ● Blind spot ● Impaired vision 	<ul style="list-style-type: none"> ● Adjust seat, headrest, and steering wheel height so body is fully supported/comfortable and pedals are within easy reach ● Ensure mirrors are properly adjusted 	Driver or Passenger
5	Fasten seat belt(s) and ensure passengers' seat belts are fastened	<ul style="list-style-type: none"> ● Serious injury, ejection, or death from collision and/or traffic citation 	Verify driver and passenger(s) seat belts are in good condition and properly latched	Driver or Passenger

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
6	Ensure vehicle doors are locked	<ul style="list-style-type: none"> ● Serious injury, ejection, or death from collision ● Unwanted intrusion ● Lost equipment 	Manually lock all doors to vehicle prior to starting the vehicle	Driver
7	Start engine and check gauges and warning lights	<ul style="list-style-type: none"> ● Vehicle breakdown 	Verify sufficient fuel and other hazard lamps (e.g., battery, oil, and temperature) are not lit	Driver
8	Driving – Use defensive driving techniques and stay alert	<ul style="list-style-type: none"> ● Arriving late ● Collision ● Blind spots of other vehicles ● Injury or death to occupants or other parties 	<ul style="list-style-type: none"> ● Acknowledge and comply with all traffic regulations, laws, and ordinances ● Do not use two-way communicating devices or perform other distracting activities while vehicle is in motion ● Constantly scan intersections, move eyes, check mirrors, and assess traffic lights (fresh vs. stale) ● Recognize other vehicle's blind spots and minimize time spent within these zones ● Maintain safety cushion around vehicle (front, sides, and rear) and 4-second following distance (add an extra second for each hazardous condition, triple following distance in poor weather conditions) ● Signal well in advance before changing lanes or turning ● Utilize all driving defensive techniques 	Driver
9	Arrive at site	<ul style="list-style-type: none"> ● Pedestrian injury ● Collision 	<ul style="list-style-type: none"> ● Maintain awareness of pedestrian/vehicular traffic when entering site and traveling to work zone 	Driver

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
10	Park vehicle – assign a spotter if necessary (when in doubt use a spotter)	<ul style="list-style-type: none"> ● Pedestrian injury ● Collision ● Property damage 	<ul style="list-style-type: none"> ● Maintain awareness of pedestrian/vehicular traffic ● Park vehicle in pull-through parking space or facing the exit ● Parking in a parking space that is not a designated parking space will require the placement of the 360-degree topper on the hood of the vehicle ● Use a spotter when backing up a vehicle ● If no spotter available when backing up a vehicle, complete a 360-degree walk around vehicle. Ensure there are no hidden obstacles (e.g. pot holes, rocks, stumps, broken tree branches hidden by vegetation/foilage, etc.) that could be struck – look up and down. Stop, park and exit vehicle to check rear clearance as necessary when backing up to ensure travel pathway remains clear ● Use caution and mirrors/spotter when backing vehicle ● Set parking brake 	Driver
11	Demobilization – conduct a vehicle walk around inspection paying particular attention to path(s) of travel	<ul style="list-style-type: none"> ● Collision ● Injury or death to occupants or other parties 	<ul style="list-style-type: none"> ● Perform perimeter vehicle check ● Maintain awareness of pedestrian/vehicular traffic when exiting site ● Utilize defensive driving techniques ● Complete post-departure checklist and report vehicle problems to company vehicle maintenance manager or rental car agency 	Driver or Passenger
12	Report maintenance or mechanical problems upon returning vehicle	<ul style="list-style-type: none"> ● Conditions worsen leading to mechanical failure resulting in collision and injury 	<ul style="list-style-type: none"> ● Report vehicle problems immediately to company representative or rental car agency ● Schedule and/or perform repairs as soon as possible 	Driver

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2. A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

I have participated in the review and discussion of the Job Safety Analysis (JSA) listed on this document and understand the duties I am responsible to fulfill. As part of my work, I know I have the responsibility and obligation to STOP work with a Stop Work Authority (SWA) if conditions change and/or potential hazards have been identified.

Name/Company	Sign	Date



SSE(s) on job: _____ **Assigned mentor:** _____

Presenter Signature: _____ Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____ Date/Time: _____

Location of Mustering Point: _____ Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Mobilization-Demobilization

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	04/10/2020 15:02:07	Client:	Saint-Gobain Corporation		
Project Number:	11212053	Created By:	cra\mpopek	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	6600 Walmore Road Wheatfield				
Key Equipment:	#360 degree topper				
Task-specific Training:	#				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
<input type="checkbox"/> Type 1 (Top Impact)	<input type="checkbox"/> Chemical Protective (ie.Nitrile)	<input type="checkbox"/> ANSI/CSA Safety Glasses	<input type="checkbox"/> Harness	<input type="checkbox"/> Full Face Mask	<input type="checkbox"/> Class II (standard)	<input type="checkbox"/> Coveralls
<input type="checkbox"/> Type 2 (Side Impact)	<input checked="" type="checkbox"/> Level 1 - Light Duty	<input type="checkbox"/> Goggles/Spoggles	<input type="checkbox"/> Shock Absorbing Lanyard	<input type="checkbox"/> Half Face Mask	<input type="checkbox"/> Class III (Night or Highway Traffic)	<input type="checkbox"/> Fire Retardent Clothing (FRC)
<input type="checkbox"/> Class E (standard)	<input type="checkbox"/> Level 2 - Light Duty with Protection	<input type="checkbox"/> Face Shields	<input type="checkbox"/> Lifeline		<input type="checkbox"/> Anti-Static	<input type="checkbox"/> High Viz Clothing
<input type="checkbox"/> Class G	<input type="checkbox"/> Level 3 - Medium Duty	<input type="checkbox"/> Other*		Cartridges	<input type="checkbox"/> FRC	<input type="checkbox"/> Long Pants
	<input type="checkbox"/> Level 4 - Heavy Duty			<input type="checkbox"/> N95	<input type="checkbox"/> PFD	<input type="checkbox"/> Long Sleeve Shirts
Foot Protection	<input type="checkbox"/> High Viz	Hearing Protection	Arc Flash/Shock Protection	<input type="checkbox"/> P100		<input type="checkbox"/> Paper Tyvek (disposable)
<input checked="" type="checkbox"/> Industrial Grade Safety Boot	<input type="checkbox"/> Other*	<input type="checkbox"/> NOT Required for this task	<input type="checkbox"/> Hazard Category 2	<input type="checkbox"/> P95		<input type="checkbox"/> Polyethylene Tyvek
<input type="checkbox"/> Rubber Boots (industrial grade)		<input type="checkbox"/> Required	<input type="checkbox"/> Hazard Category 4	<input type="checkbox"/> R95		<input type="checkbox"/> Other*

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
<input type="checkbox"/> Hip Waders				<input type="checkbox"/> Organic Vapour		
	* see key equipment			<input type="checkbox"/> Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Margaret Popek				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Discuss STAR and SWA	<ul style="list-style-type: none"> ● Site personnel not aware of STAR and SWA 	<ul style="list-style-type: none"> ● Project team (GHD) discusses importance of and documentation procedures for SWA during pre job safety meeting ● Use SWA to stop any work that is unsafe 	
2	Check weather	<ul style="list-style-type: none"> ● Unexpected storm ● Fog, rain, snow; lightening/thunder ● Heat/cold stress 	<ul style="list-style-type: none"> ● Check local weather forecast ● If adverse weather conditions are likely, prepare a contingency plan for lodging, etc. with project manager ● Discuss weather issues and precautions to take while driving and on site during the pre job safety meeting ● If weather conditions (e.g., fog, rain, snow, etc.) impair the ability/vision of the driver, exit at nearest safe location and assess the situation ● While on site, at first sign of lightening/thunder utilize SWA and assess weather conditions ● In extreme temperatures, ensure all personnel have proper clothing, hydration, and heat/cold protection (e.g., canopy, fan, glove warmers) 	
3	Load equipment into vehicle	<ul style="list-style-type: none"> ● Lifting hazards ● Manual material handling ● Back injury ● Cuts ● Pinch points ● Hand/foot injury ● Forgotten or damaged equipment 	<ul style="list-style-type: none"> ● Reduce travel distance when there is a need to carry/lift materials ● Make sure grip is adequate; wear leather/cotton gloves ● Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required ● Maintain neutral back posture - Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and make sure to shift with the feet rather than twisting at the back ● Maintain neutral wrist posture when lifting, carrying, pushing or pulling. The wrist is the strongest and most stable when it is straight. ● Avoid one handed carrying if possible; maintain awareness of footing ● Avoid placing hands/fingers in pinch point locations ● Wear safety toed boots ● Verify requested equipment against warehouse form ● Load equipment in an organized manner to prevent shifting during transport or use cargo netting 	

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
4	Complete GHD Daily Operator Vehicle Checklist	<ul style="list-style-type: none"> ● Damaged vehicle lights, tires, windows, mirrors, horn ● Inadequate vehicle documents and/or safety items 	<ul style="list-style-type: none"> ● Check for fluid leaks under vehicle ● Test operation of headlights, front/rear turn signals, backup lights, brake lights, and emergency flashers ● Visually check the pressure/wear of tires ● Ensure the vehicle has a spare tire ● Assure windshield and window glass is clean and free from obstructions ● Test the windshield wipers and horn ● Verify vehicle registration, insurance card, and inspection sticker is present and valid ● Ensure the vehicle contains a first aid kit, fire extinguisher, and road hazard kit ● Check immediate vehicle perimeter and initial path of travel for obstructions 	
5	Check and adjust seat, steering wheel, headrest, and mirrors	<ul style="list-style-type: none"> ● Back/body strain ● Blind spot ● Impaired vision 	<ul style="list-style-type: none"> ● Adjust seat, headrest, and steering wheel height so body is fully supported/comfortable and pedals are within easy reach ● Ensure mirrors are properly adjusted 	
6	Fasten seat belt(s) and ensure passenger(s) seat belts are fastened	<ul style="list-style-type: none"> ● Serious injury, ejection, or death from collision and/or traffic citation 	<ul style="list-style-type: none"> ● Verify driver and passenger(s) seat belts are in good condition and properly latched 	
7	Ensure vehicle doors are locked	<ul style="list-style-type: none"> ● Serious injury, ejection, or death from collision ● Unwanted intrusion ● Lost equipment 	<ul style="list-style-type: none"> ● Manually lock all doors to vehicle 	
8	Start engine and check gauges and warning lights	<ul style="list-style-type: none"> ● Vehicle breakdown 	<ul style="list-style-type: none"> ● Verify sufficient fuel and other hazard lamps (e.g., battery, oil, and temperature) are not lit 	
9	Mobilize to site	<ul style="list-style-type: none"> ● Arriving late ● Collision ● Injury or death to occupants or other parties 	<ul style="list-style-type: none"> ● Do not use cell phones or perform other distracting activities while vehicle is in motion ● Constantly scan intersections, move eyes, check mirrors, and assess traffic lights (fresh vs. stale) ● Maintain safety cushion around vehicle (front, sides, and rear) and 4 second following distance ● Utilize all driving defensive techniques 	
10	Arrive at site	<ul style="list-style-type: none"> ● Pedestrian injury ● Collision 	<ul style="list-style-type: none"> ● Maintain awareness of pedestrian/vehicular traffic when entering site and traveling to work zone 	

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
11	Park vehicle	<ul style="list-style-type: none"> ● Pedestrian injury ● Collision ● Property damage 	<ul style="list-style-type: none"> ● Maintain awareness of pedestrian/vehicular traffic ● Park vehicle in pull through parking space or facing the exit ● Parking in a parking space that is not a designated parking space will require the placement of the 360 degree topper on the hood of the vehicle ● Use caution and mirrors/spotter when backing vehicle ● Set parking brake 	
12	Demobilization	<ul style="list-style-type: none"> ● Collision ● Injury or death to occupants or other parties 	<ul style="list-style-type: none"> ● Check immediate vehicle perimeter and initial path of travel for obstructions ● Maintain awareness of pedestrian/vehicular traffic when exiting site ● Utilize defensive driving techniques 	

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2. A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

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Name/Company	Sign	Date



SSE(s) on job: _____ **Assigned mentor:** _____

Presenter Signature: _____ Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____ Date/Time: _____

Location of Mustering Point: _____ Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Environmental- Monitoring Well Sampling

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	04/10/2020 15:02:08	Client:	Saint-Gobain Corporation		
Project Number:	11212053	Created By:	cralmpopek	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	6600 Walmore Road Wheatfield				
Key Equipment:					
Task-specific Training:					

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
<input type="checkbox"/> Type 1 (Top Impact)	<input checked="" type="checkbox"/> Chemical Protective (ie.Nitrile)	<input type="checkbox"/> ANSI/CSA Safety Glasses	<input type="checkbox"/> Harness	<input type="checkbox"/> Full Face Mask	<input type="checkbox"/> Class II (standard)	<input type="checkbox"/> Coveralls
<input type="checkbox"/> Type 2 (Side Impact)	<input type="checkbox"/> Level 1 - Light Duty	<input type="checkbox"/> Goggles/Spoggles	<input type="checkbox"/> Shock Absorbing Lanyard	<input type="checkbox"/> Half Face Mask	<input type="checkbox"/> Class III (Night or Highway Traffic)	<input type="checkbox"/> Fire Retardent Clothing (FRC)
<input type="checkbox"/> Class E (standard)	<input type="checkbox"/> Level 2 - Light Duty with Protection	<input type="checkbox"/> Face Shields	<input type="checkbox"/> Lifeline		<input type="checkbox"/> Anti-Static	<input type="checkbox"/> High Viz Clothing
<input type="checkbox"/> Class G	<input type="checkbox"/> Level 3 - Medium Duty	<input type="checkbox"/> Other*		Cartridges	<input type="checkbox"/> FRC	<input type="checkbox"/> Long Pants
	<input type="checkbox"/> Level 4 - Heavy Duty			<input type="checkbox"/> N95	<input type="checkbox"/> PFD	<input type="checkbox"/> Long Sleeve Shirts
Foot Protection	<input type="checkbox"/> High Viz	Hearing Protection	Arc Flash/Shock Protection	<input type="checkbox"/> P100		<input type="checkbox"/> Paper Tyvek (disposable)
<input type="checkbox"/> Industrial Grade Safety Boot	<input type="checkbox"/> Other*	<input type="checkbox"/> NOT Required for this task	<input type="checkbox"/> Hazard Category 2	<input type="checkbox"/> P95		<input type="checkbox"/> Polyethylene Tyvek
<input type="checkbox"/> Rubber Boots (industrial grade)		<input type="checkbox"/> Required	<input type="checkbox"/> Hazard Category 4	<input type="checkbox"/> R95		<input type="checkbox"/> Other*
<input type="checkbox"/> Hip Waders				<input type="checkbox"/> Organic Vapour		
	* see key equipment			<input type="checkbox"/> Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Margaret Popek				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Coordinate site access	<ul style="list-style-type: none"> Delays or added work 	<ul style="list-style-type: none"> Notify Station Manager of schedule Notify other required personnel if applicable (city, regulators, private property owners, etc.) 	
2	Mobilize with proper equipment/ supplies for sampling	<ul style="list-style-type: none"> Delay or improper/unsafe performance of work due to improper equipment on site Cross contamination of wells 	<ul style="list-style-type: none"> Review work plan to determine equipment/supply needs Make sure all sampling/gauging equipment is decontaminated Bring ice for sample storage Review THE HASP and gather necessary PPE 	
3	Notify other personnel on site	<ul style="list-style-type: none"> Unknown traffic or other work hazards Lack of communication between all interested parties 	<ul style="list-style-type: none"> Meet with station attendant or other site personnel and explain planned activities 	
4	Determine sampling order	<ul style="list-style-type: none"> Cross contamination of samples and wells due to incomplete decontamination of sampling equipment 	<ul style="list-style-type: none"> Review prior analytical results and set sampling order from lowest to highest concentration wells 	
5	Perform STAR and tailgate safety meeting upon arrival at site	<ul style="list-style-type: none"> Consider worst case scenario (including weather conditions) 	<ul style="list-style-type: none"> Review HASP with co workers Highlight aspects identified by HASP and, if necessary, add to HASP Get signature of all co workers on HASP 	
6	Set up exclusion zone(s)	<ul style="list-style-type: none"> Injury or exposure to public or other on site personnel Slip/trip/fall hazards 	<ul style="list-style-type: none"> Implement exclusion zone setup instructions of THE HASP (barricades, caution tape, cones, etc.) Set up work area free of trip hazards 	
7	Gauge water levels and product thickness (where applicable) in wells	<ul style="list-style-type: none"> Back strain Inhalation or dermal exposure to chemical hazards 	<ul style="list-style-type: none"> Don any additional PPE and initiate air quality monitoring in accordance with the HASP Maintain safe distance from well head Bend at knees, not waist 	

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
8	Purge well(s) and collect purge water	<ul style="list-style-type: none"> ● Cross contamination ● Lifting hazards ● Back injury ● Manual material handling ● Inhalation or dermal exposure to chemicals ● Slip/trip/fall hazards ● Spilling contaminated water 	<ul style="list-style-type: none"> ● Decontaminate purging equipment between each sampling location ● Reduce travel distance when there is a need to carry/lift materials ● Make sure grip is adequate; wear leather/cotton gloves ● Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required ● Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position ● Avoid one handed carrying if possible; maintain awareness of footing ● Use PPE and monitoring in accordance with the HASP ● Keep work area clear of tripping or slipping hazards ● Store purge water in appropriate containers 	
9	Collect samples in accordance with sampling plan	<ul style="list-style-type: none"> ● Cross contamination ● Lifting hazards ● Back injury ● Manual material handling ● Inhalation or dermal exposure to chemical hazards ● Slip/trip/fall hazards ● Improper labeling or storage ● Injury due to acid burn (unsealed or leaking sample bottle) ● Injury from broken sample bottle (cuts or acid burn) 	<ul style="list-style-type: none"> ● Use PPE in accordance with the HASP ● Use PPE whenever handling or labeling samples ● Decontaminate sampling equipment between each well (unless disposable) ● Refer to step 9 and the HASP for additional lifting methods ● Label samples in accordance with sampling plan ● Keep samples stored in proper containers, at correct temperature, and away from work area ● Wear nitrile gloves when handling bottles ● Handle bottles carefully 	
10	Dispose or store purge water onsite	<ul style="list-style-type: none"> ● Lifting hazards ● Back injury ● Manual material handling ● Exposure to chemicals ● If disposing through on site treatment system, damage or injury from improper use of equipment ● Improper storage or disposal 	<ul style="list-style-type: none"> ● Use proper equipment to transport water (pumps, drum dollies, etc.) ● Refer to step 9 and the HASP for additional lifting methods ● Where PPE in accordance with the HASP ● Review any necessary instructions for use of on site treatment systems ● Label storage containers properly and locate in isolated area away from traffic and other site functions ● Coordinate off site disposal (where applicable) 	
11	Clean site/demobilize	<ul style="list-style-type: none"> ● Traffic ● Nuisance or safety hazard left on site ● Back strain 	<ul style="list-style-type: none"> ● Use buddy system as necessary to remove traffic control ● Leave site clean of refuse and debris ● Notify station personnel of departure, and note any purge water left on site ● Exercise caution when lifting coolers out of the trunk of a car; use the buddy system if justified 	

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
12	Package and deliver samples to lab	<ul style="list-style-type: none"> ● Bottle breakage ● Improper temperature ● Exceeding hold times ● Improper completion of Chain of Custody (COC) 	<ul style="list-style-type: none"> ● Pack samples in ice, use bubble wrap/bags for sample bottles ● Use standard COC forms and labels ● Submit samples to lab as soon as possible (no more than 3 days, but check sampling plan for any special requirements such as rush turnaround or special hold time restrictions) 	

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Name/Company	Sign	Date



SSE(s) on job: _____ **Assigned mentor:** _____

Presenter Signature: _____ **Date/Time:** _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____ **Date/Time:** _____

Location of Mustering Point: _____ **Wind direction (current):** _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Environmental-Site Recon and Walkthrough

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	04/10/2020 15:02:08	Client:	Saint-Gobain Corporation		
Project Number:	11212053	Created By:	cra\mpopek	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	6600 Walmore Road Wheatfield				
Key Equipment:	<p>Basic PPE, hand/power tools based on site condition, site inspection checklist or notebook, JSA forms, pens, flashlight.</p> <p>Additional PPE: Insect repellent. Coveralls may be necessary based on type of brush/plants/insects in work area(s) being inspected. Leather gloves if overgrown vegetation or rundown buildings.</p>				
Task-specific Training:	SMART Safety training (STAR), JSA development, Poison Plant Identification				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
<input type="checkbox"/> Type 1 (Top Impact)	<input type="checkbox"/> Chemical Protective (ie.Nitrile)	<input checked="" type="checkbox"/> ANSI/CSA Safety Glasses	<input type="checkbox"/> Harness	<input type="checkbox"/> Full Face Mask	<input checked="" type="checkbox"/> Class II (standard)	<input checked="" type="checkbox"/> Coveralls
<input type="checkbox"/> Type 2 (Side Impact)	<input checked="" type="checkbox"/> Level 1 - Light Duty	<input type="checkbox"/> Goggles/Spoggles	<input type="checkbox"/> Shock Absorbing Lanyard	<input type="checkbox"/> Half Face Mask	<input type="checkbox"/> Class III (Night or Highway Traffic)	<input type="checkbox"/> Fire Retardent Clothing (FRC)
<input checked="" type="checkbox"/> Class E (standard)	<input type="checkbox"/> Level 2 - Light Duty with Protection	<input type="checkbox"/> Face Shields	<input type="checkbox"/> Lifeline		<input type="checkbox"/> Anti-Static	<input type="checkbox"/> High Viz Clothing
<input type="checkbox"/> Class G	<input type="checkbox"/> Level 3 - Medium Duty	<input type="checkbox"/> Other*		Cartridges	<input type="checkbox"/> FRC	<input type="checkbox"/> Long Pants
	<input type="checkbox"/> Level 4 - Heavy Duty			<input type="checkbox"/> N95	<input type="checkbox"/> PFD	<input type="checkbox"/> Long Sleeve Shirts
Foot Protection	<input type="checkbox"/> High Viz	Hearing Protection	Arc Flash/Shock Protection	<input type="checkbox"/> P100		<input type="checkbox"/> Paper Tyvek (disposable)

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
<input checked="" type="checkbox"/> Industrial Grade Safety Boot	<input type="checkbox"/> Other*	<input checked="" type="checkbox"/> NOT Required for this task	<input type="checkbox"/> Hazard Category 2	<input type="checkbox"/> P95		<input type="checkbox"/> Polyethylene Tyvek
<input type="checkbox"/> Rubber Boots (industrial grade)		<input type="checkbox"/> Required	<input type="checkbox"/> Hazard Category 4	<input type="checkbox"/> R95		<input checked="" type="checkbox"/> Other*
<input type="checkbox"/> Hip Waders				<input type="checkbox"/> Organic Vapour		
	* see key equipment			<input type="checkbox"/> Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Margaret Popek				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Discuss STAR and SWA	<ul style="list-style-type: none"> ● Site personnel not aware of STAR and SWA 	<ul style="list-style-type: none"> ● Project team discusses importance of and documentation procedures for SWA during pre-job safety meeting ● Use SWA to stop any work that is unsafe 	All persons on project team
2	Check weather	<ul style="list-style-type: none"> ● Unexpected storm, fog; rain; snow; lightening, thunder ● Heat/cold stress, including frostbite and sunburn 	<ul style="list-style-type: none"> ● Check local weather forecast ● Discuss weather issues and precautions to take while driving and on site during the pre job safety meeting ● If weather conditions (e.g., fog, rain, snow) impair the ability/vision of the driver, exit at nearest safe location and assess the situation ● While on site, at first sign of lightning/thunder utilize SWA and assess weather conditions ● In extreme temperatures, ensure all personnel have proper clothing, which includes either a helmet liner or hat/mask that will cover exposed skin on one's face and ears, hydration, and heat/cold protection (e.g., canopy, fan, glove warmers) ● Implement the "Buddy System." The site supervisor shall also keep close tabs on all project personnel working in extreme temperatures. 	Assessor
3	Sign in	<ul style="list-style-type: none"> ● Site Manager and Operator not aware of GHD staff presence in facility or on grounds 	<ul style="list-style-type: none"> ● Sign in at front desk ● Ask to speak to Site Manager or alternate designate 	
4	Don necessary GHD and client required PPE	<ul style="list-style-type: none"> ● Contact with recyclable material or equipment 	<ul style="list-style-type: none"> ● Wear all required PPE (hard hat, vest, boots, and glasses) at all times while in the facility 	
5	Unload equipment from vehicle	<ul style="list-style-type: none"> ● Lifting hazards ● Back injury ● Manual material handling ● Cuts ● Pinch points ● Hand/foot injury ● Forgotten equipment ● Damaged equipment 	<ul style="list-style-type: none"> ● Reduce travel distance when there is a need to carry/lift materials ● Make sure grip is adequate; wear leather/cotton gloves ● Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required ● Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position ● Avoid one handed carrying if possible; maintain awareness of footing ● Wear leather/cotton gloves and avoid placing hands/fingers in pinch point locations ● Wear steel toed boots ● Verify requested equipment against warehouse form ● Load equipment in an organized manner to prevent shifting during transport or use cargo netting 	Assessor

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
6	Complete site inspection and walkover of the property and work areas – Note any hazards that will impact site personnel and/or their operations	<ul style="list-style-type: none"> ● Slip/trip/fall hazards ● Insects/reptiles ● Pedestrian injury ● Poison plants 	<ul style="list-style-type: none"> ● Check in with site personnel and sign appropriate visitor or safety log (may require watching safety video [i.e., plant]) ● Check with site contact to determine safely accessible areas and areas where PPE are required ● Wear PPE as directed by site personnel or dependent upon your evaluation of conditions ● If building(s) looks dilapidated or in poor condition, do not enter ● Watch for vehicles or other mobile equipment moving around ● Make sure areas are well lit and you are accompanied by a site representative (if applicable) ● Watch where you step on pavement (potholes, dips, or obstructions) and in vegetated/wooded areas (dips, holes, branches, vines, etc.) ● Do not take photographs while walking ● Do not talk on cell phone while walking ● If in vegetated or wooded areas, watch for beehives, wear insect repellent (if area and season dictate) as needed, be mindful of gopher holes/tunnels, small animal dens, snakes, stray dogs/cats, transient/homeless individuals, poison ivy/oak/sumac, etc. 	Assessor
7	Sign out	<ul style="list-style-type: none"> ● Site Manager and Operator not aware that GHD staff have left facility 	<ul style="list-style-type: none"> ● Sign out at front desk ● Ask to speak to Site Manager or alternate designate 	
8	Demobilization	<ul style="list-style-type: none"> ● Collision ● Injury or death to vehicle occupants or other parties 	<ul style="list-style-type: none"> ● Perform perimeter vehicle check ● Maintain awareness of pedestrian/vehicular traffic when exiting the site ● Utilize defensive driving techniques ● Complete post departure checklist and report vehicle problems to company vehicle maintenance manager or rental car agency 	Assessor

1. Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.
2. A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

I have participated in the review and discussion of the Job Safety Analysis (JSA) listed on this document and understand the duties I am responsible to fulfill. As part of my work, I know I have the responsibility and obligation to STOP work with a Stop Work Authority (SWA) if conditions change and/or potential hazards have been identified.

Name/Company	Sign	Date



SSE(s) on job: _____ **Assigned mentor:** _____

Presenter Signature: _____ Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____ Date/Time: _____

Location of Mustering Point: _____ Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____

SAFETY DATA SHEET

Version 5.5
 Revision Date 03/31/2016
 Print Date 11/14/2016

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	: Alconox® detergent		
Product Number	: 242985		
Brand	: Aldrich		
Product Use	: For laboratory research purposes.		
Supplier	: Sigma-Aldrich Canada Co. 2149 Winston Park Drive OAKVILLE ON L6H 6J8 CANADA	Manufacturer	: Sigma-Aldrich Corporation 3050 Spruce St. St. Louis, Missouri 63103 USA
Telephone	: +1 9058299500		
Fax	: +1 9058299292		
Emergency Phone # (For both supplier and manufacturer)	: +1-703-527-3887 (CHEMTREC)		
Preparation Information	: Sigma-Aldrich Corporation Product Safety - Americas Region 1-800-521-8956		

2. HAZARDS IDENTIFICATION

Emergency Overview

WHMIS Classification

D1B	Toxic Material Causing Immediate and Serious Toxic Effects	Toxic by ingestion
D2B	Toxic Material Causing Other Toxic Effects	Moderate skin irritant Severe eye irritant

GHS Classification

Acute toxicity, Oral (Category 4)
 Skin corrosion/irritation (Category 2)
 Serious eye damage/eye irritation (Category 1)
 Acute aquatic toxicity (Category 2)

GHS Label elements, including precautionary statements

Pictogram



Signal word: Danger

Hazard statement(s)

H302	Harmful if swallowed.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H401	Toxic to aquatic life.

Precautionary statement(s)

P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P302 + P352	IF ON SKIN: Wash with plenty of water.

P305 + P351 + P338 +
P310
P332 + P313
P362 + P364
P501

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
If skin irritation occurs: Get medical advice/ attention.
Take off contaminated clothing and wash it before reuse.
Dispose of contents/ container to an approved waste disposal plant.

HMIS Classification

Health hazard: 2
Flammability: 0
Physical hazards: 0

Potential Health Effects

Inhalation May be harmful if inhaled. Causes respiratory tract irritation.
Skin May be harmful if absorbed through skin. Causes skin irritation.
Eyes Causes eye irritation.
Ingestion Toxic if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS-No.	EC-No.	Index-No.	Concentration
Tetrasodium pyrophosphate			
7722-88-5	231-767-1	-	>= 10 - <= 30 %
Sodium dodecylbenzenesulfonate			
25155-30-0	246-680-4	-	>= 10 - <= 30 %
Sodium carbonate			
497-19-8	207-838-8	011-005-00-2	>= 7 - <= 13 %
Pentasodium triphosphate			
7758-29-4	231-838-7	-	>= 10 - <= 30 %

4. FIRST AID MEASURES

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

Hazardous combustion products

Explosion data - sensitivity to mechanical impact

No data available

Explosion data - sensitivity to static discharge

No data available

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE**Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.

Conditions for safe storage

Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters**

Components	CAS-No.	Value	Control parameters	Basis
Tetrasodium pyrophosphate	7722-88-5	TWA	5.000000 mg/m3	Canada. British Columbia OEL
		TWAEV	5.000000 mg/m3	Canada. Ontario OELs
		TWA	5.000000 mg/m3	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
Remarks	Occupational exposure limit is based on irritation effects and its adjustment to compensate for unusual work schedules is not required			
		TWAEV	5.000000 mg/m3	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
		TWA	5.000000 mg/m3	Ontario Table of Occupational Exposure Limits made under the Occupational Health and Safety Act.
		TWA	5 mg/m3	Ontario Table of Occupational Exposure Limits made under the Occupational Health and Safety Act.

Personal protective equipment**Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min
Material tested: Dermatrill® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: Dermatrill® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Eye protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Specific engineering controls

Use mechanical exhaust or laboratory fumehood to avoid exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	granular, powder
Colour	white

Safety data

pH	9.5 at 10 g/l
Melting point/freezing point	No data available
Boiling point	No data available
Flash point	No data available
Ignition temperature	No data available
Auto-ignition temperature	No data available
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapour pressure	No data available
Density	No data available
Water solubility	soluble
Partition coefficient: n-octanol/water	No data available
Relative vapour density	No data available
Odour	odourless
Odour Threshold	No data available
Evaporation rate	No data available

10. STABILITY AND REACTIVITY

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

No data available

Conditions to avoid

No data available

Materials to avoid

No data available

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Sulphur oxides, Oxides of phosphorus, Sodium oxides

Other decomposition products - No data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50

No data available

Inhalation LC50

No data available

Dermal LD50

No data available

Other information on acute toxicity

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

Eyes: No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity

No data available

Teratogenicity

No data available

Specific target organ toxicity - single exposure (Globally Harmonized System)

No data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)

No data available

Aspiration hazard

No data available

Potential health effects

Inhalation	May be harmful if inhaled. Causes respiratory tract irritation.
Ingestion	Toxic if swallowed.
Skin	May be harmful if absorbed through skin. Causes skin irritation.
Eyes	Causes eye irritation.

Signs and Symptoms of Exposure

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Synergistic effects

No data available

Additional Information

RTECS: Not available

12. ECOLOGICAL INFORMATION**Toxicity**

No data available

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

PBT and vPvB assessment

No data available

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS**Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION**DOT (US)**

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION**WHMIS Classification**

D1B	Toxic Material Causing Immediate and Serious Toxic Effects	Toxic by ingestion
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D2B

Toxic Material Causing Other Toxic Effects

Moderate skin irritant
Severe eye irritant

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

16. OTHER INFORMATION

Text of H-code(s) and R-phrase(s) mentioned in Section 3

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.



Records of Training

Date: _____ Project Name: _____ Project Number: _____

Project Location: _____

Project Description _____

The Project Manager is ultimately responsible for the accuracy of the information on this Record of Training and ensuring GHD Employees and Subcontractors are familiar with the site and have the required training to do the task

Employee's Name:	Confined Space Entry	Excavation Safety	Fall Protection	GHS (HazCom/WHMIS)	Lock Out Tag Out (LOTO)	Motor Vehicle Safety	Aerial Lift	Other -	Other -	Other -	Other -	
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Appendix D

Site Contact List

Appendix D

Site Contact List

Name	Phone/Email Address
Saint-Gobain Abrasives, Inc. (Site Operator and Remedial Party) James J. Smith, Manager of Environmental Programs, Saint-Gobain Corporation	(610) 893-5667 james.j.smith@saint-gobain.com
Chris Ciccarelli, Site Operations Manager	(716) 731-8200 chris.ciccarelli@saint-gobain.com
Niagara Frontier Transportation Authority (Adjoining Property Owner) James Celeste, Assistant Air Terminal Superintendent, Niagara Falls International Airport	(716) 855-6436 james.celeste@nfta.com
GHD (Licensed Professional Engineering Company) Margaret Popek, Geologist/Project Manager Richard Snyder, P.E., Associate/Professional Engineer	(716) 297-6150 margaret.popek@ghd.com richard.snyder@ghd.com
Brian Sadowski, P.E. (NYSDEC DER Project Manager)	(716) 851-7201 brian.sadowski@dec.ny.gov
Chad Staniszewski, P.E. (NYSDEC Regional HW Engineer)	(716) 851-7220 chad.staniszewski@dec.ny.gov
NYSDEC Site Control	(518) 402-9553
Notes:	
NYSDEC - New York State Department of Environmental Conservation	



about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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