

30 June 2023

Mr. Matt Dunham  
New York State Department of Environmental Conservation  
Division of Environmental Remediation  
625 Broadway  
Albany, New York 12233

RE: Remedial Investigation Operable Unit 2 Phase I Work Plan – Final  
Admiral Cleaners (Site No. 401075)  
Watervliet, New York, Albany County  
Contract/Work Assignment No. D009806-04

Dear Mr. Dunham:

This Letter Work Plan describes the proposed activities for a remedial investigation (RI) of OU-2, which includes potential offsite soil and groundwater impacts associated with historical site-related volatile organic compounds (VOCs) at the Admiral Cleaners Site (Site No. 401075) in Watervliet, Albany County, New York (**Figure 1**). EA Engineering, P.C. and its affiliate EA Science and Technology (EA) is proposing a multi-phase approach in executing OU-2 investigation activities. All activities will be completed in accordance with the Generic Field Activities Plan (EA 2023).<sup>1</sup>

## **SITE DESCRIPTION AND HISTORY**

Admiral Cleaners is located at 617 19<sup>th</sup> street, Watervliet, Albany County, New York (**Figure 1**). The site was previously operated as a dry-cleaners and dry-cleaning drop shop until 2017. EA was tasked with performing a RI and feasibility study (FS) for the site in 2017. In May 2021, the Admiral Cleaners site was divided into two operable units (OUs). OU-1 encompasses onsite media including surface and subsurface soil, overburden groundwater, and bedrock groundwater. OU-2 includes offsite soil and offsite groundwater (overburden and bedrock). Offsite overburden groundwater has historically been sampled as part of the OU-1 RI and will continue under this scope for OU-2. Separate RI and FS reports have been developed for OU-1. The focus of this Letter Work Plan is OU-2.

## **CONCEPTUAL SITE MODEL**

The following conceptual site model includes an abbreviated description of findings from the OU-1 investigation. A full conceptual site model is presented in the OU-1 RI Report.<sup>2</sup> This conceptual site model will be updated throughout the OU-2 investigation phases.

### ***Site Geology and Hydrogeology***

The Admiral Cleaners site has two primary geologic units at the site, overburden, and bedrock. Overburden thickness ranges from approximately 5 to 15 ft. The near-surface materials generally

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<sup>1</sup> EA. 2023. *Generic Field Activities Plan for Work Assignments, NYSDEC Standby Contract No. D009806*. February.

<sup>2</sup> EA. 2022. *Remedial Investigation Report; Operable Unit 1 – On-site Area*. October

consist of a layer of anthropogenic fill (a mixture of gravel, sand, silt, clay, and concrete or brick fragments) and/or Hudson River Valley alluvium (fine- and coarse-grained) ranging from 2 to 5 ft thick. The uppermost unit overlies an intermediate interval of brown to gray clay and/or silt with the occasional lenses of sand and traces of angular gravel. The intermediate unit ranges from approximately 2 to 10 ft thick and is interpreted as re-deposited glacio-lacustrine sediments from former glacial Lake Albany. At some boring locations completed during the OU-1 RI, the fine-grained sediments extended to bedrock; at others, it was underlain by up to 2 ft of silty sand and gravel deposits, which may represent glacial till or weathered bedrock.

Bedrock is comprised of fractured shale from the Normanskill Formation, which has been observed at depths ranging from 5 to 15 ft below ground surface (bgs), with depth to bedrock across most of the site occurring between 8 and 12 ft bgs. The shale observed in the rock core at the site contains thin dark gray interbeds and lenses of sandstone or siltstone with calcite veins throughout and occasional pyrite precipitates. The unit has been intensely folded and slightly metamorphosed to slate in some areas. Bedrock at the site is highly fractured at steep angles, typically between 40-50 degrees from horizontal with occasional higher angle fractures.

Based on the topography of the bedrock surface, the site appears to overlie an incised bedrock trough, oriented from southwest to northeast. This feature may represent the subsurface extent of the scoured bedrock channel or channel network associated with Dry River and/or Gas House Creek, tributaries to the Hudson River. These tributaries were diverted to storm sewers through the City of Watervliet. Although site-specific borings logs indicate that the trough is not a buried channel aquifer (due to absence of continuous lens of coarse-grained material), its orientation may influence groundwater flow direction within the sediments that comprise the water table aquifer.

The water table onsite is approximately 4 to 6 ft bgs. The overburden aquifer primarily resides within the coarse-grained / glacial sediment deposits. The hydraulic conductivity and permeability of the aquifer materials is highly variable due to the lithologic heterogeneity (variable grain sizes and degrees of compaction). Overburden groundwater flow paths inferred during the OU-1 RI were variable, however, the predominant flow path is from southwest to northeast, towards the Hudson River.

The depth to water in the bedrock was measured between 5 to 7 ft bgs during OU-1 RI events. The observed bedrock groundwater flow direction inferred during the OU-1 RI was toward the south-southeast, which differs from the overburden and regional groundwater flow directions (**Figures 3 and 4**). It should be noted that site-specific groundwater elevation contours for the bedrock aquifer are based on a limited dataset and could vary based on temporal precipitation-related influences or the discrete fracture network outside of the site monitoring well network. Vertical gradients were estimated between bedrock monitoring wells and nearest overburden monitoring wells. As a general trend, a downward vertical gradient was observed between overburden and bedrock monitoring wells, suggesting overburden groundwater conditions can influence bedrock. The existing monitoring well network is presented on **Figure 2**.

### ***Surface Water Hydrology***

The nearest surface water feature is the Hudson River, located approximately 0.5-mile east of the site. Any surface water runoff not captured by the City of Watervliet stormwater system infiltrates through overburden into the shallow aquifer.

## *Contaminants of Concern*

Based on the analytical data collected during previous investigations, contaminants of concern include chlorinated VOCs with significant detections of PCE and daughter products in the overburden and bedrock groundwater, BTEX compounds in overburden groundwater, chlorinated VOCs and BTEX compounds in subsurface soil, and metals in surface soil.

## **OBJECTIVE**

EA is proposing a multi-phase approach for the OU-2 investigation activities, which will include the installation of offsite bedrock wells installed at various depths, collection of geophysical data, groundwater sampling, and soil sampling (as needed). Proposed bedrock well locations are shown in **Figure 5**.

Phase I of the OU-2 investigation includes the installation of two bedrock well couplets targeting shallow and intermediate bedrock depths. Grab groundwater samples will be collected at conductive water bearing zones via packers during borehole advancement to be analyzed for VOCs. Borehole geophysical will be performed on the four boreholes to determine fracture locations/frequency, orientation, and areas of potential contamination. Results of geophysical analysis and analytical results of the grab groundwater samples will inform depth of well screen placement for both shallow and intermediate bedrock wells. Once wells are completed, a round of low-flow sampling will be performed on the newly installed wells and existing wells. Groundwater samples will be collected and analyzed for VOCs via EPA Method 8260C. A subset of onsite and offsite overburden monitoring wells will be sampled for PFAS via EPA Method 1633, and 1,4-Dioxane via EPA Method 8270 SIM. Further discussion of the individual work tasks is provided in the following section.

Phase II of the investigation will include installation of three additional downgradient bedrock well couplets (one shallow and one intermediate depth in each couplet for a total of six wells). The locations and depth of the boreholes will be informed by data collected during Phase I. Packers will be used to collect grab groundwater samples from conductive water bearing zones at the two intermediate depth boreholes. Groundwater samples will be analyzed for VOCs via EPA Method 8260C. Results from the grab groundwater samples collected will inform well screen placement for both the shallow and intermediate bedrock well construction. A replacement overburden monitoring well will be installed offsite in proximity to MW-13 since MW-13 has historically been dry. Another round of low-flow groundwater sampling is planned for Phase II. All bedrock wells (13 total wells) will be sampled and analyzed for VOCs and geochemical parameters. It is anticipated that select bedrock wells will be sampled for PFAS and 1,4-dioxane in Phase II. A separate workplan will be submitted for the Phase II work.

Following the completion and data interpretation of Phase II activities, EA has budgeted for a third phase (Phase III) if necessary. Budget for Phase III includes the installation of two deep bedrock wells and associated groundwater sampling. If Phase III is performed, EA will author and submit a separate work plan for Phase III.

General work tasks for Phase I include the following:

- Screen drill cuttings with PID and collection of surface and subsurface soil exhibiting gross contamination.
- Monitoring of onsite and offsite impacts of overburden groundwater and bedrock groundwater using preexisting wells to collect additional data (**Figure 2**). Pre-existing bedrock monitoring well construction details are included in **Table 1**.
- Installation of four bedrock wells in nested pairs. Installation will include one cluster upgradient, to the east of OU-1 and one cluster downgradient, to the west of OU-1. Upgradient and downgradient locations will use the open parking lot areas in the hardware store lot (west) and undeveloped parcel near Price Chopper (east). These will be installed as open bedrock holes with shallow and intermediate interval wells. The shallow well will be approximately 20-35 ft bgs, and the intermediate depth wells will be approximately 35-50 ft bgs, assuming that depth to bedrock is 10-15 ft bgs.
- Use borehole geophysics to determine fractures and orientation on four intermediate depth boreholes, as well as to characterize the bedrock.
- Collection of grab groundwater samples using packers at conductive areas during advancement of boring for analyzation of VOCs via EPA Method 8260C with 72-hour turn-around-time.
- Conduct a round of low flow groundwater sampling for VOCs via EPA method 8260C at four new bedrock wells, as well as the three existing onsite bedrock wells. Low-flow sampling will also be conducted at onsite and offsite overburden monitoring wells for VOCs via EPA Method 8260C. Select offsite overburden monitoring wells and select onsite wells will also be sampled for PFAS via EPA Method 1633 and 1-4-Dioxane via EPA Method 8270 SIM.
- Development of plume maps of CVOC and PFAS impacts, and groundwater elevation maps.

## **SITE CHARACTERIZATION: PHASE I FIELD ACTIVITIES**

### ***Geophysical Subsurface Survey & Soft Dig Utility Clearances***

The geophysical subcontractor, Enviroprobe Services, Inc. of Mount Laurel, New Jersey (Enviroprobe), will be responsible for performing a geophysical subsurface survey prior to the initiation of “soft dig” activities. The geophysical survey will include electromagnetic and magnetic geophysical methods, which are appropriate for detecting and locating areas of buried metal to depths approximately 10 ft bgs. The anticipated methods will include time domain electromagnetic induction (EM61), frequency domain electromagnetic induction (EM31), and magnetics. The approximate 22,000 SF (inclusive of surface obstructions) area for this portion of the work will encompass areas associated with Phase I and Phase II drilling activities.

The geophysical survey will aid in the selection of the boring locations. The drilling contractor will be responsible for identifying and avoiding all underground and overhead utilities in the areas where borings are to be advanced. Prior to drilling at each monitoring well location, the drilling contractor will be required to call in a Dig Safely NY ticket and to “soft dig” at each location to a



depth of 5-ft bgs. For monitoring wells that need to be installed through asphalt or concrete, areas will either be saw cut or cored prior to soft digging. EA anticipates the “soft digging” crew will begin a minimum of one day prior to the arrival of the drill rig. The drilling contractor will be required to backfill or cover and cone off the area of the soft dig hole to ensure no tripping hazard is present prior to well installation. This may require a construction plate or temporarily asphaltting the location.

### ***Borehole Installation & Well Installation***

The drilling contractor will install two, 2-inch bedrock monitoring wells to a depth of up to 50 ft bgs, and two 2-inch bedrock monitoring wells to a depth of 35 ft bgs, using air rotary techniques. Overburden and rock chip material will be screened with a PID and logged by an onsite EA geologist at the surface. Should subsurface material exhibit gross contamination, EA will collect soil/rock samples for analysis of VOCs by EPA Method 8260C. Specifics regarding installation of shallow depth and intermediate depth monitoring wells are detailed below.

#### ***Shallow Groundwater Monitoring Wells:***

1. Overburden materials will be isolated from the bedrock formation by drilling through the overburden and advancing approximately 3 ft into competent bedrock (estimated depth of 15 ft bgs). An 8-inch outer diameter (OD) borehole will be created via drilling using air-rotary methods.
2. The drilling contractor will then set a 4-inch steel drill casing to the pre-determined depth (approximately 15 ft bgs) and grout into place.
3. After the grout around the 4-inch steel drill casing has cured for a minimum of 24 hours, the remaining depth of the borehole will be advanced through the bottom of the grouted steel drill casing and into the bedrock to a depth of approximately 35 ft bgs using a 3 7/8-inch OD air-hammer.
4. Once the pre-determined depth is encountered, the drilling contractor will then place packers at intervals determined by EA field staff to collect groundwater samples from top of bedrock to pre-determined depth (35 ft bgs). Packers will be set every 5 ft interval and it is estimated that approximately 4 groundwater intervals will be sampled. It is estimated that each groundwater sample interval will take an average of three hours to complete. An EA geologist will be responsible for collection of the groundwater sample once the packer system is set.
5. A groundwater monitoring well will then be installed somewhere between 15 to 35 ft bgs at the direction of EA, once sampling results are received. The monitoring wells will be constructed using schedule 40 polyvinyl chloride (PVC) with 5-ft sections of 0.010-inch slot PVC screen.
6. A gravel pack design consisting of medium sand (or equivalent) will be installed from the base of the well to 2 ft above the top of the screen. A minimum 2-ft bentonite seal will be installed above the sand pack. The remaining borehole annulus will be tremie grouted with a bentonite/cement grout mix to within 2 ft of the surface and completed with concrete (2 ft by 2 ft pad) as a bolt- down flush mount curb box.



### ***Intermediate Groundwater Monitoring Wells:***

1. Overburden materials will be isolated from the bedrock formation by drilling through the overburden and advancing approximately 3 ft into competent bedrock (estimated depth of 15 ft bgs). An 8-inch OD borehole will be created via drilling. It is at the contractor's discretion how to advance within and isolate the overburden material.
2. Advancement into the bedrock will then be completed using a 5 7/8-inch OD air-hammer to a pre-determined depth (approximately 35 ft bgs).
3. The drilling contractor will then set a 4-inch steel drill casing to the pre-determined depth (35 ft bgs) and grout into place.
4. After the grout around the 4-inch steel drill casing has cured for a minimum of 24 hours, the remaining depth of the borehole will be advanced through the bottom of the grouted steel drill casing and into the bedrock to a depth of approximately 50 ft bgs using a 3 7/8-inch OD air-hammer.
5. Once the pre-determined depth is encountered, the driller will then place packers at intervals determined by EA field staff to collect groundwater samples from top of bedrock to pre-determined depth (50 ft bgs). Packers will be set every 5 ft interval and it is estimated that approximately 3 groundwater intervals will be sampled. It is estimated that each groundwater sample interval will take an average of three hours to complete. An EA geologist will be responsible for collection of the groundwater sample once the packer system is set.
6. A groundwater monitoring well will then be installed somewhere between the 35 to 50 ft bgs at the direction of EA, once sampling results are received. The monitoring wells will be constructed using schedule 40 PVC with 5-ft sections of 0.010-inch slot PVC screen.
7. A gravel pack design consisting of medium sand (or equivalent) will be installed from the base of the well to 2 ft above the top of the screen. A minimum 2-ft bentonite seal will be installed above the sand pack. The remaining borehole annulus will be tremie grouted with a bentonite/cement grout mix to within 2 ft of the surface and completed with concrete (2 ft by 2 ft pad) as a bolt- down flush mount curb box.

### ***Grab Groundwater Sample Collection***

During borehole advancement, packers will be used to collect grab groundwater samples from the shallow and intermediate boreholes. Packer tests will be used to isolate discreet locations at 5 foot intervals of borehole at a time. A 2-inch diameter whale pump will be used to remove three volumes of the sample interval and grab groundwater samples will be collected using a bailer. Groundwater quality parameters will be measured by a Horiba U-52 (or equivalent) at the time of sample collected. Groundwater samples will be submitted to the laboratory for a 72-hour turnaround time and analyzed for VOCs via EPA Method 8260C.

Included in this scope is the collection of up to four groundwater samples from each of the two shallow bedrock boreholes and three groundwater samples from each of the two intermediate bedrock boreholes, for a total of 14 samples. Purge water will be collected, labeled, and containerized in

drums provided by the drilling contractor.

### ***Borehole Geophysical Evaluation***

Once boreholes are installed and before well installation, Enviroprobe will collect, interpret, and provide reports pertaining to geophysical data from within the proposed bedrock monitoring wells (**Figure 5**). Downhole geophysical data collection will occur in both the shallow and intermediate boreholes and data will be used to determine well screen intervals.

The data collection and analyses will include:

- ***Fluid Temperature and Fluid Conductivity***—Assesses fluid temperature and temperature gradients, electrical conductivity/resistivity of downhole fluid, delineate water-bearing zones, identify vertical flow of fluid in boreholes.
- ***Optical Televiewer***—Produces 360-degree color image of the borehole wall faces to view fracture orientation, lithological characterization, and bedding dip.
- ***Heat Pulse Flow Meter***—Obtain directions and rates of vertical fluid flow.
- ***Caliper Logs (3-arm)***—Record borehole diameter in three directions to aid in the interpretation of borehole changes as a result of fracturing, caving, and well construction.
- ***Acoustic Televiewer Logs***—Uses acoustic reflectivity of the borehole walls to infer the strike and dip of fractures and lithologic contacts.

### ***Monitoring Well Development***

The monitoring wells will be developed no sooner than 48 hours but no longer than 7 calendar days following installation. The monitoring wells will be developed using surging and pumping techniques as specified in the EA Generic Field Activities Plan (EA 2023).<sup>1</sup> At a minimum, development will remove 3-5 well volumes of water. One development volume is defined as (1) equivalent volume, plus (2) the amount of fluid lost during drilling (if applicable to bedrock drilling method used). Monitoring well development will be considered complete when water quality parameters have stabilized.

Development water will be containerized, handled, and disposed of as described below in the Investigation Derived Waste section and as detailed in Section 3.4 of the site-specific Health and Safety Plan (HASP) Addendum (Attachment A).

### ***Groundwater Sampling and Analysis***

During Phase I, all existing bedrock monitoring wells, both onsite and offsite, will be sampled for VOCs via EPA Method 8260C using low-flow sampling techniques following well development. Overburden onsite and offsite overburden wells will also be sampled for VOCs via EPA Method 8260C using low-flow sampling. Select onsite and offsite overburden monitoring wells will also be sampled for PFAS via EPA Method 1633 and 1,4-dioxane via EPA Method 8270 SIM. Offsite wells to be sampled for PFAS and 1,4-dioxane include: MW-09, MW-12, MW-15, and MW-16. Monitoring wells MW-13 and MW-01 are excluded from this list as they are historically dry or

have insufficient water for sample collection. Onsite overburden monitoring wells to be sampled for PFAS and 1,4-dioxane include MW-04R, MW-05R, MW-06R, MW-07R, MW-21.

### ***Decontamination Procedures and Investigation Derived Waste***

Non-dedicated equipment and tools will be decontaminated prior to each drilling location, and prior to departure from site using steam cleaning methods, oralconox wash and rinse with potable water. A temporary decontamination pad will be constructed onsite (e.g., plastic sheeting and hale bales). Investigation derived waste including personal protective equipment, solids and liquids generated during the well drilling, well development, decontamination, and well sampling activities, will be stored, handled, and disposed of in accordance with the Letter Work Plan.<sup>3</sup> The drilling contractor will also be required to contain and manage any liquids used for drilling to the extent practicable to prevent offsite runoff of IDW.

### **HEALTH AND SAFETY CONSIDERATIONS**

A copy of the updated HASP addendum for the site is provided in Attachment A. For work adjacent to public right-of-way on 19<sup>th</sup> Street, parking lots associated with DeLollo's Hardware Store and Price Chopper, traffic control will be performed in accordance with the Public Right of Way Management Plan Memorandum included as Attachment B.

Additionally, EA will perform perimeter dust and vapor monitoring in accordance with the Community Air Monitoring Plan.

### **PHASE I SITE CHARACTERIZATION REPORT AND PHASE II WORK PLAN**

EA will prepare a Phase I Technical Memorandum summarizing field activities and analytical results following the Work Plan. The memorandum will include at a minimum:

- Summary of field activities, including daily reports and boring logs. Groundwater analytical results in the form of laboratory report summaries, and figures depicting current groundwater contours.
- Summary and interpretation of downhole geophysics.
- Updates to the conceptual site model.
- Conclusions and recommendations for Phase II.

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<sup>3</sup> EA. 2018. *Remedial Investigation/Feasibility Study Letter Work Plan*. March



Analytical data will be uploaded to the EQUIS database system. Please feel free to contact me if you have any questions or concerns at 860-309-3837.

Sincerely yours,

EA SCIENCE AND TECHNOLOGY



Emily Cummings  
Project Manager

EA ENGINEERING, P.C.



Donald Conan, P.E., P.G.  
Program Manager

## Figures

- 1 General Site Location
- 2 Site Map and Existing Well Network
- 3 Bedrock Groundwater Elevations October 2021
- 4 Bedrock Groundwater Elevations January 2022
- 5 Proposed Well Locations

## Tables

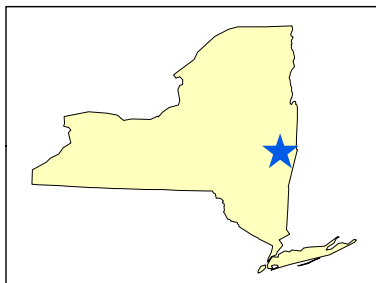
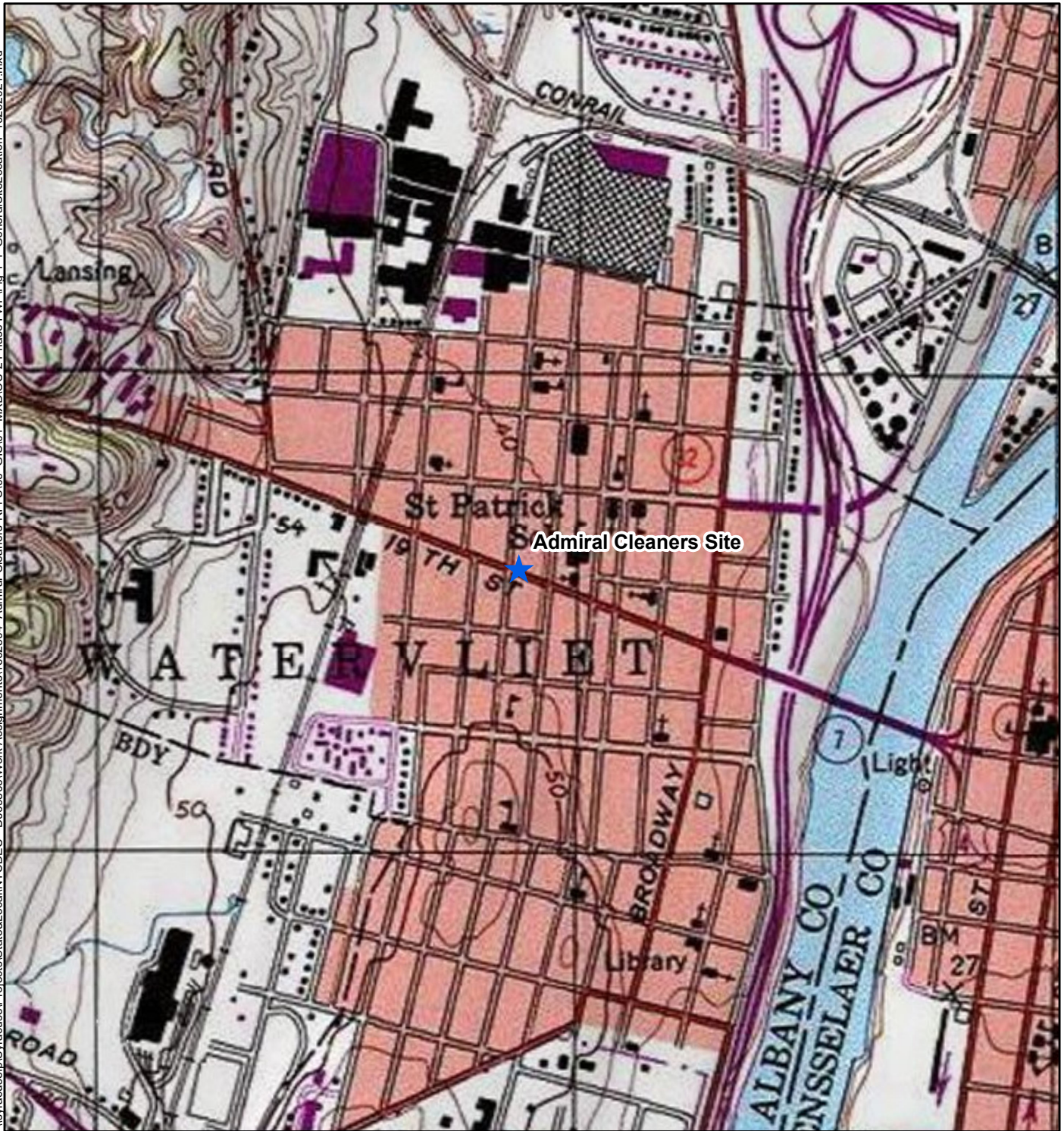
- 1 Bedrock Monitoring Well Construction Details

## Attachments

- A Health and Safety Plan Addendum
- B OU-2 RI Public Right-of-Way Management Plan

## **Figures**

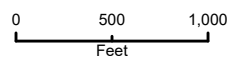
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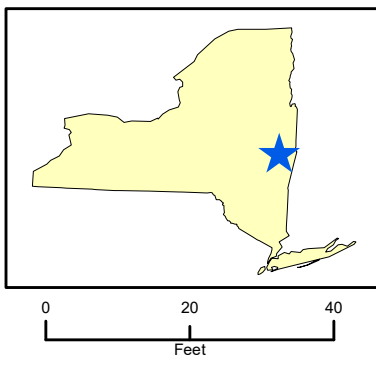
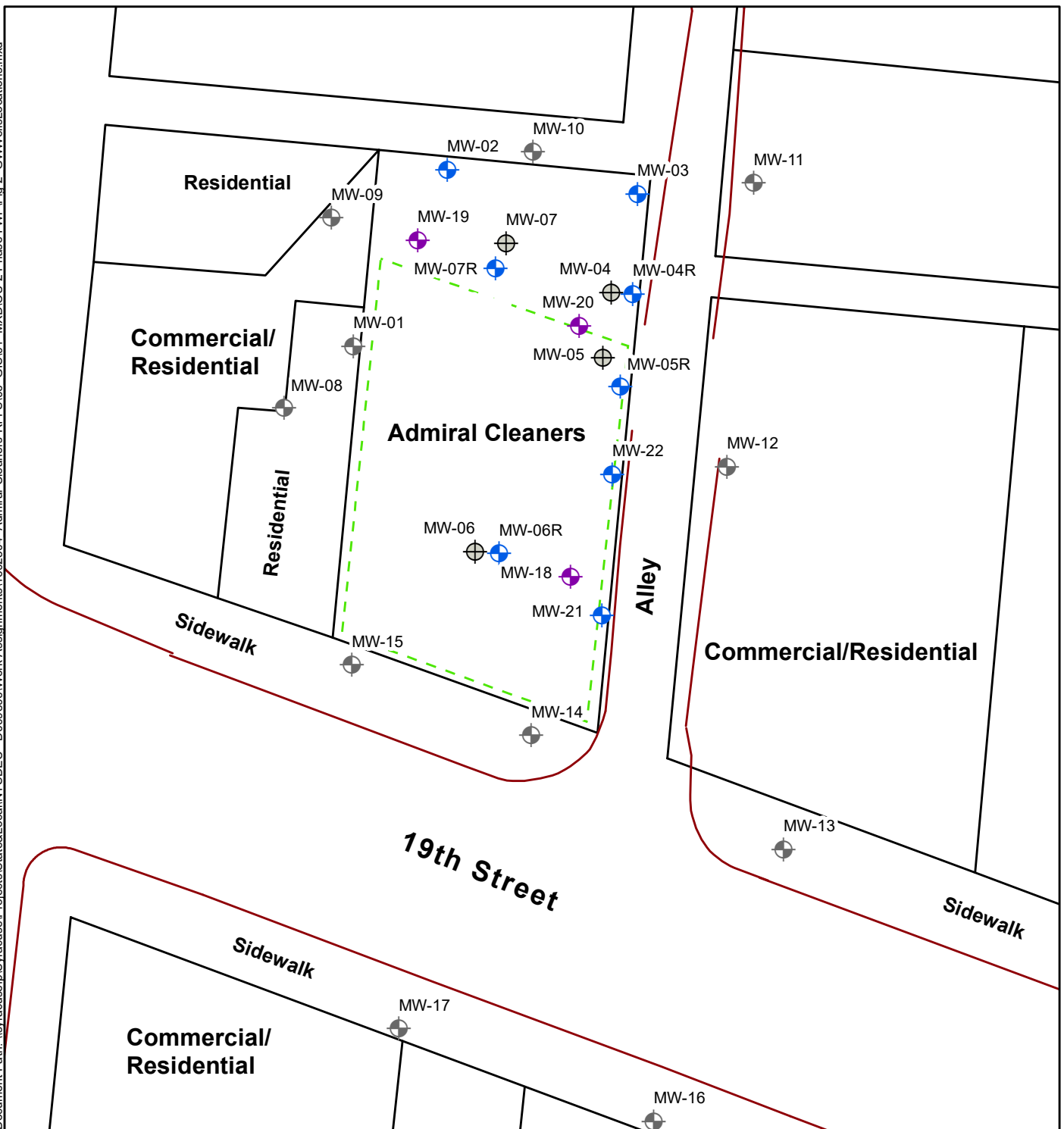


**Legend**  
★ Site Location

**Figure 1**  
**General Site Location**  
OU-2 Phase I Work Plan  
Admiral Cleaners  
Watervliet, Albany County, NY

Map Date: 4/19/2023  
Projection: NAD 1983 State Plane New York  
East FIPS 3101 Feet





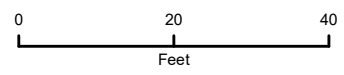
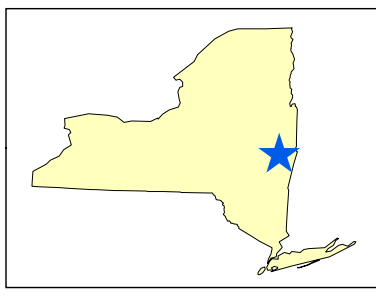
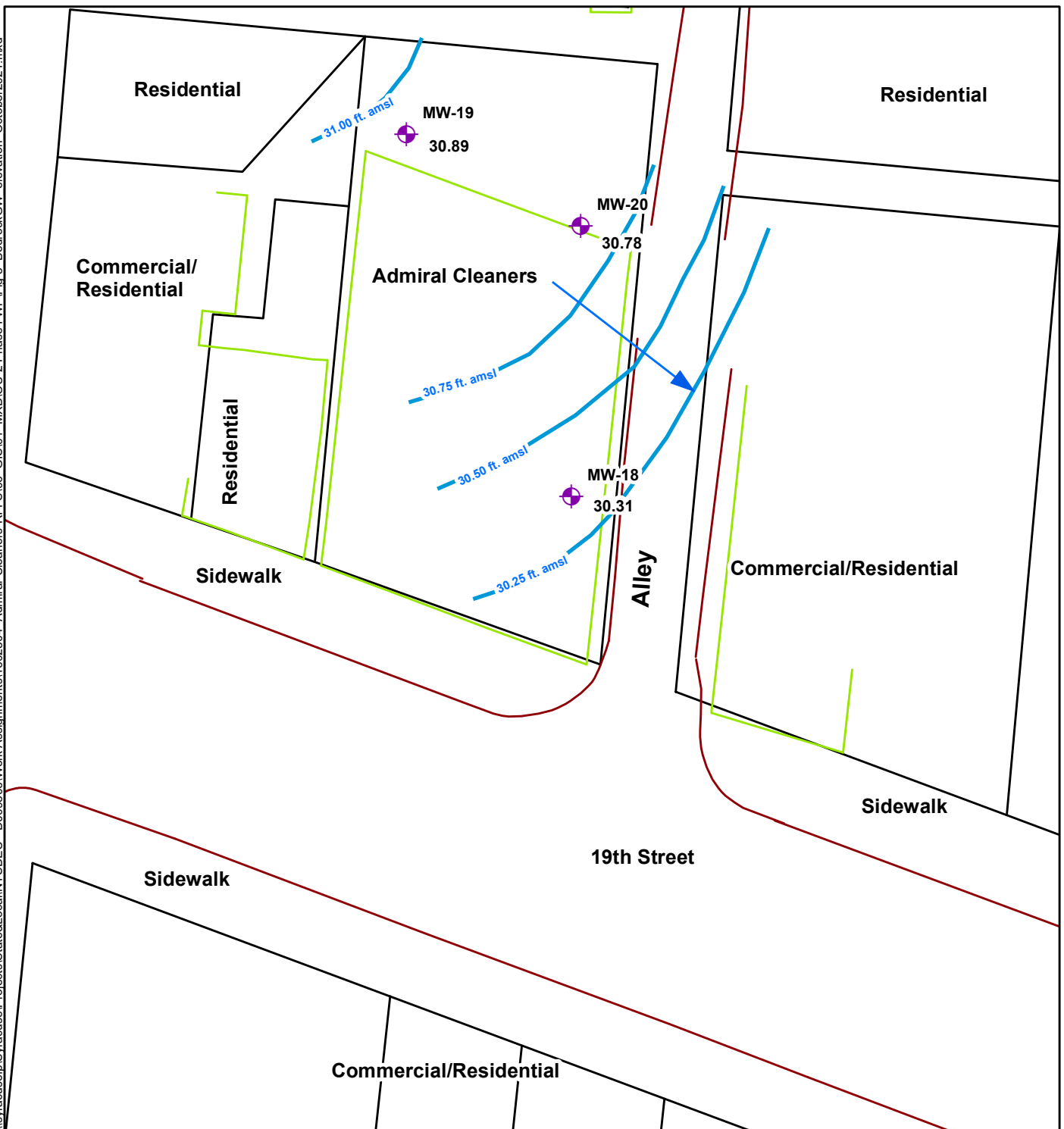
- Legend**
- Bedrock Monitoring Well
  - OU-1 Overburden Monitoring Wells
  - OU-2 Overburden Monitoring Wells
  - Abandoned Wells
  - Concrete Slab Outline
  - Edge of Pavement
  - Property Boundaries
  - Site Location

**Figure 2**  
**Site Map and Existing Well Network**  
 OU-2 Phase I Work Plan  
 Admiral Cleaners  
 Watervliet, Albany County, NY

Map Date: 4/19/2023  
 Projection: NAD 1983 State Plane New York  
 East FIPS 3101 Feet



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- Legend**
- Bedrock Monitoring Well
  - October 2021 Bedrock Contours
  - Slab Outline
  - Edge of Pavement
  - Property Boundaries
  - Site Location
  - Inferred Flow Direction

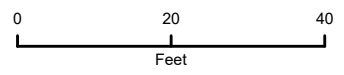
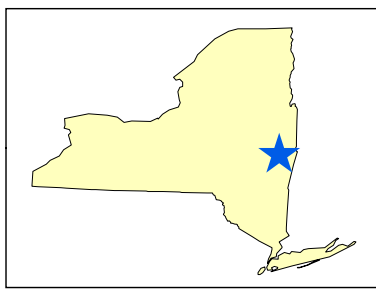
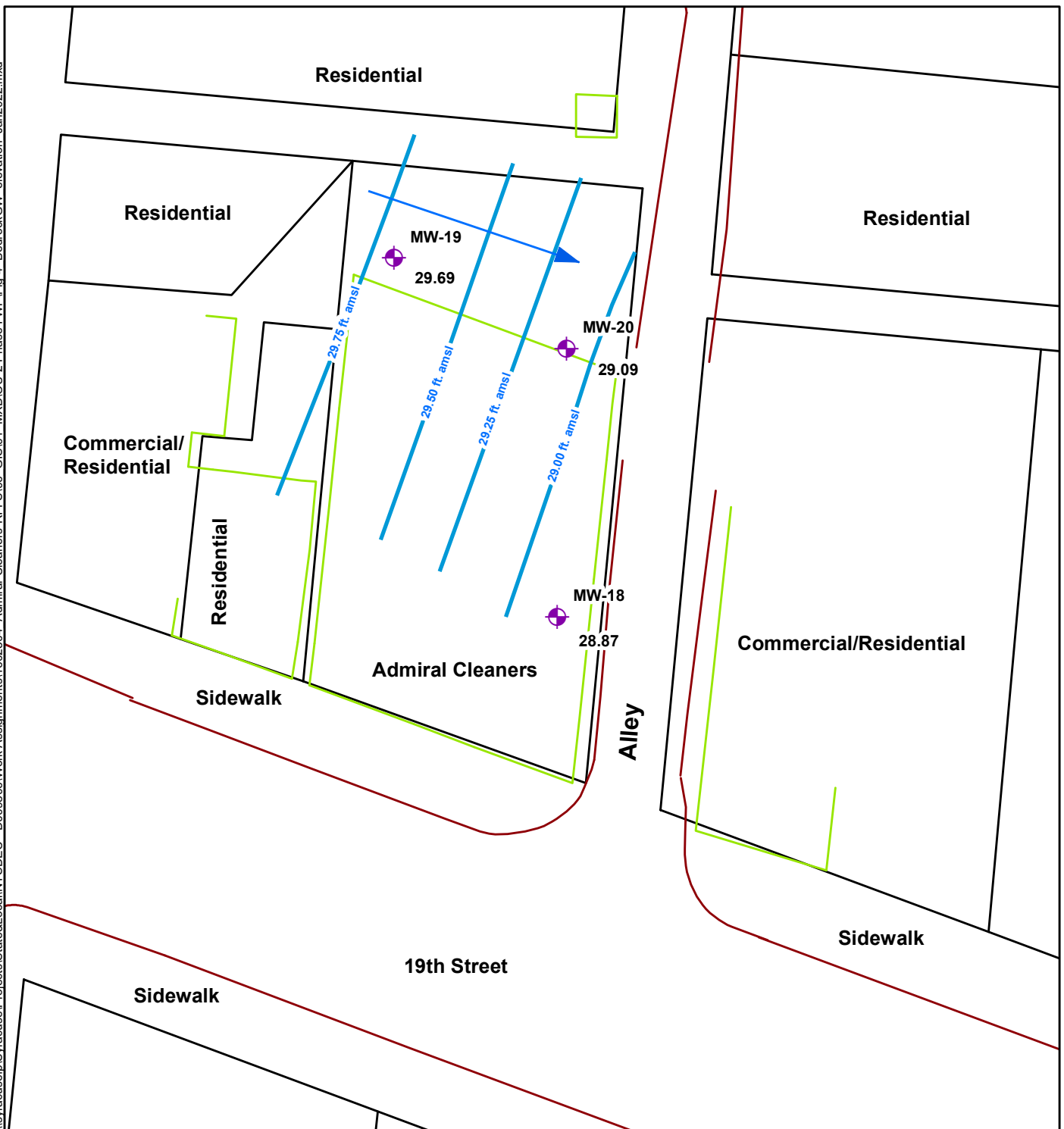
Groundwater Elevations shown in ft. amsl  
 ft. = feet  
 amsl = above mean sea level

**Figure 3**  
**Bedrock Groundwater Elevations**  
**October 2021**  
 OU-2 Phase I Work Plan  
 Admiral Cleaners  
 Watervliet, Albany County, NY

Map Date: 4/19/2023  
 Projection: NAD 1983 State Plane New York  
 East FIPS 3101 Feet



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- Legend**
- Bedrock Monitoring Well
  - January 2022 Bedrock Contours
  - Slab Outline
  - Edge of Pavement
  - Property Boundaries
  - Site Location
  - Inferred Flow Direction

Groundwater Elevations shown in ft. amsl  
 ft. = feet  
 amsl = above mean sea level

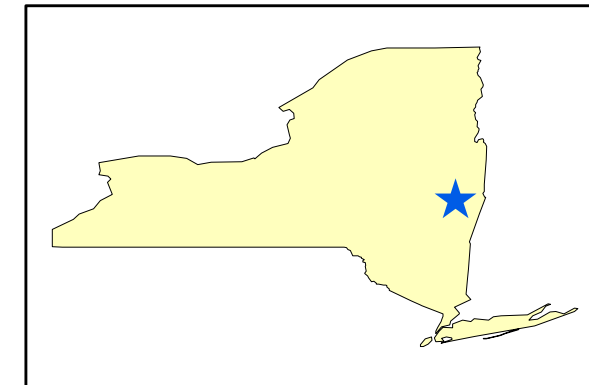
**Figure 4**  
**Bedrock Groundwater Elevations**  
**January 2022**  
 OU-2 Phase I Work Plan  
 Admiral Cleaners  
 Watervliet, Albany County, NY

Map Date: 4/19/2023  
 Projection: NAD 1983 State Plane New York  
 East FIPS 3101 Feet










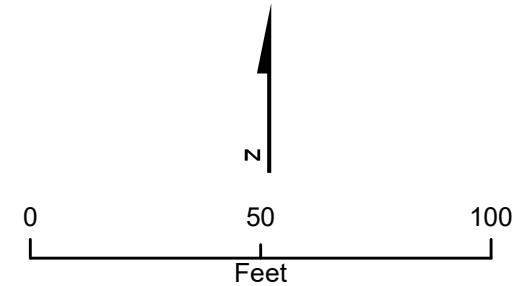
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**Legend**

-  Admiral Cleaners Site Boundary
-  Bedrock Monitoring Well
-  Proposed Shallow Well
-  Proposed Intermediate Well
-  Site Location

**NOTE:**  
 Two bedrock well pairs to be installed in Phase I.  
 Location of wells installed during Phase II dependent upon results of Phase I investigation. Location of deep bedrock wells (to 80 ft bgs) are to be determined and not shown on this map.  
 Map Date: 4/19/2023  
 Projection: NAD 1983 State Plane New York East FIPS 3101 Feet



**Figure 5**  
**Proposed Bedrock Well Locations**  
 OU-2 Phase I Work Plan  
 Admiral Cleaners  
 Watervliet, Albany County, New York

Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community

## **Tables**

**Table 1 Bedrock Monitoring Well Construction Details**

	Location ID	MW-18	MW-19	MW-20
	Location Type	Bedrock Monitoring Well	Bedrock Monitoring Well	Bedrock Monitoring Well
	Install Date	12/2/2020	12/2/2020	12/2/2020
	Phase	OU-1 Phase III	OU-1 Phase III	OU-1 Phase III
<b>Soil Boring Details</b>				
Depth to Refusal	ft bgs	11	11.5	11.5
Surface Conditions		Concrete	Concrete	Concrete
Maximum PID reading	ppm	0	0	0
PID reading	ft bgs	--	--	--
Sample Interval	ft bgs	11-24	11.5-24.5	13.5-25.5
Primary Soil Types (top to bottom of soil boring)		Dark, gray shale, some calcite/gypsum, un-ox pyrite at 12'; some calcite, thickly bedded	Dark, gray shale, silt stone, calcite	Black/dark gray siltstone, very hard, some calcite fractures, some very smooth; shale, some calcite, less rubble; significant pyrite
<b>Monitoring Well Construction Details</b>				
Monitoring Well Diameter	inch	2	2	2
PVC Casing	ft bgs	10-12.5	10-12.5	12-13.5
PVC Screen	ft bgs	14.5-24.5	14.5-24.5	15.5-25.5
Stick up of Flush Mount	--	Flush	Flush	Flush
Grout Interval	ft bgs	0.5-10	0.5-10	0.5-12
Bentonite Seal Interval	ft bgs	10-12.5	10-12.5	12-13.5
Sand Pack Interval	ft bgs	12.5-24.5	12.5-24.5	13.5-25.5
DTW at Well Development	ft bgs	6.78	7.29	8.11
DTB at Well Development	ft bgs	23.72	23.85	24.84
<p>NOTES:</p> <p>DTW = Depth-to-water</p> <p>DTB = Depth-to-bottom</p> <p>ft bgs = Foot (feet) below ground surface</p> <p>ID = Identification</p> <p>MW = Monitoring Well</p>				

**Attachment A**  
**Health and Safety Plan**  
**Addendum**



# Health and Safety Plan Addendum Admiral Cleaners (401075) Watervliet, New York

*Prepared for*

New York State Department of Environmental Conservation  
625 Broadway  
Albany, New York 12233



*Prepared by*

EA Engineering, P.C., and Its Affiliate  
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6712 Brooklawn Parkway, Suite 104  
Syracuse, New York 13211  
(315) 431-4610

## Revisions to Health and Safety Plan Addendum:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date
00	March 2018	Original Submittal	March 2018
01	April 2023	Revised to include OU-2 RI Activities	June 2023

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# Health and Safety Plan Addendum Admiral Cleaners (401075) Watervliet, New York

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A handwritten signature in black ink that reads "Donald F. Conan".

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Donald F. Conan, P.E., Contract Manager  
EA Engineering, P.C.

26 June 2023

Date

A handwritten signature in black ink that reads "Emily Cummings".

---

Emily Cummings, Project Manager  
EA Science and Technology

26 June 2023

Date

June 2023  
Revision 01  
EA Project No. 1602504

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APPENDIX E: EMERGENCY TELEPHONE NUMBERS AND HOSPITAL  
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APPENDIX H: MATERIAL SAFETY DATA SHEETS

## LIST OF ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CSP	Certified Safety Professional
dba	Decibel(s)
DER	Division of Environmental Remediation
DOW	Department of Water
EA	EA Engineering, P.C. and Its Affiliate EA Science and Technology
ft	Foot (feet)
HASP	Health and Safety Plan
IDW	Investigative-derived waste
MOU	Memorandum of Use
No.	Number
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health Administration
PCE	Tetrachloroethene
P.E.	Professional Engineer
P.G.	Professional Geologist
PPE	Personal protective equipment
ppm	Parts per million
RI	Remedial investigation
SSHO	Site Health and Safety Officer
SVI	Soil vapor intrusion

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## 1. INTRODUCTION

### 1.1 GENERAL

A Generic Health and Safety Plan (HASP) (EA Engineering, P.C. and Its Affiliate EA Science and Technology [EA] 2020a) was developed for field activities performed under the New York State Department of Environmental Conservation (NYSDEC) Standby Contract Number (No.) D009806. This HASP Addendum is to supplement the Generic HASP with site-specific information to protect the health and safety of personnel while performing field investigation activities to complete a Remedial Investigation (RI) for Operable Units (OU) 1 and 2 of the Admiral Cleaners Site (Site), Watervliet, Albany County, New York (NYSDEC Site No. 401075).

This HASP Addendum describes the safety organization, procedures, and protective equipment that have been established based on an analysis of potential physical, chemical, and biological hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential for accidents or injuries to occur. One copy of the Generic HASP (EA 2020a) and this HASP Addendum will be maintained for use during the scheduled field investigation activities. The copies will be made available for site use and employee review at all times.

This HASP Addendum addresses regulations and guidance practices set forth in the Occupational Safety and Health Administration (OSHA) Standards for Construction Industry, 29 Code of Federal Regulations (CFR) 1926, including 29 CFR 1926.65, Hazardous Waste Operations and Emergency Response and 29 CFR 1926.59, Hazardous Communications.

The following are provided as appendixes:

- **Appendix A:** Worker Training and Physical Examination Record
- **Appendix B:** Health and Safety Plan Addendum Review Record
- **Appendix C:** Site Entry and Exit Log
- **Appendix D:** Accident/Loss Report
- **Appendix E:** Emergency Telephone Numbers and Hospital Directions
- **Appendix F:** Emergency Equipment Available Onsite
- **Appendix G:** Personal Protective Equipment Activity Record
- **Appendix H:** Safety Data Sheets.

*Note:* This site-specific HASP Addendum should be left open to display Appendix E (Emergency Telephone Numbers and Hospital Directions) and made available to all site personnel in a conspicuous location for the duration of field investigation activities in the event of an emergency.

### 1.2 SITE DESCRIPTION

The site (OU-1) is comprised of a rectangular parcel totaling 0.17 acres located at 617 19<sup>th</sup> Street, Watervliet, Albany County, New York (Figures 1 and 2), between 6<sup>th</sup> Avenue and 7<sup>th</sup> Avenue. The parcel has approximately 45 feet (ft) of frontage on 19<sup>th</sup> Street and a depth of about 100 ft.

It previously included a vacant brick and concrete block commercial building. The on-site building was demolished during an interim remedial measure (IRM) and a chain-link fence was installed around the perimeter of the site in May 2020. The site is located in an urban area with mixed commercial and residential use. The site is bordered by an unoccupied residential building to the west, a mixed-use building containing a commercial day care and residences to the east, and residences to the north.

In May 2021, the Admiral Cleaners site was divided into two OUs. OU-1 encompasses on-site media including surface and subsurface soil, overburden groundwater, and bedrock groundwater. On-site media is considered the media within the 617 19<sup>th</sup> Street Watervliet, New York property boundary, tax parcel number 32.50 4 28.0000. OU-1 also includes directly adjacent off-site soil. OU-2 includes off-site soil and off-site groundwater (overburden and bedrock).

### **1.3 SITE HISTORY**

The Admiral Cleaners building was constructed in 1950 and was used as a dry-cleaning facility until 2013. During its operation, the facility used PCE as a cleaning solvent. In 2007, the NYSDEC issued a Consent Order, ordering the facility to obtain required owner/manager and operator dry-cleaning certifications. In November 2008, a third-party inspection indicated that the PCE concentration in the facility's dry-cleaning machine was 845 parts per million, more than double the limit of 300 parts per million published in 6 NYCRR 232.2-4 (a)(5). The NYSDEC performed a follow-up inspection in February 2009, discovering that the facility had failed to comply with the 2007 Consent Order and had not performed the mandatory remedy within the required timeframe following the 2008 inspection. The NYSDEC also found evidence of improper disposal of PCE-contaminated wastes. A second Consent Order was issued in April 2009 to address the violations noted in the 2009 inspection. Dry-cleaning operations ceased in 2013 due to continued violations of environmental regulations.

The site was then operated as a dry-cleaning drop shop, where garments were brought in and sent to be dry cleaned at another local facility until 2017. A limited investigation was performed in April 2016 as part of a potential real estate transaction. The investigation identified gasoline-related volatile organic compounds (VOC) and chlorinated VOCs (CVOC) in soil, groundwater, and sub-slab soil vapor at the site. The NYSDEC was notified of the findings and the site was listed in the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites as a Class 2 site in August 2017.

NYSDEC issued a Work Assignment (WA) to EA to perform a Remedial Investigation (RI) and Feasibility Study (FS) at the site. The WA was originally issued under NYSDEC State Superfund Standby Contract WA Number (No.) D007624-38 and is being continued under WA No. D009806-04. The WA was amended to include an RI/FS for OU-2 (offsite).

## 1.4 POLICY STATEMENT

EA will take every reasonable step to provide a safe and healthy work environment, and to eliminate or control hazards in order to minimize the possibility of injuries, illnesses, or accidents to site personnel. EA and EA subcontractor employees will be familiar with this HASP Addendum for the project activities that they are involved in. Prior to entering the Site, the HASP Addendum will be reviewed and an agreement to comply with the requirements will be signed by EA personnel, subcontractors, and visitors (**Appendix B**).

Operational changes that could affect the health and safety of site personnel, the community, or the environment will not be made without approval from the Project Manager and the Program Health and Safety Officer. This document will be periodically reviewed to ensure that it is current and technically correct. Any changes in site conditions and/or the scope of work will require a review and modification to the HASP Addendum. Such changes will be documented in the form of a revision to this Addendum.

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## 2. KEY PERSONNEL

The following table contains information on key project personnel:

<b>Title</b>	<b>Name</b>	<b>Telephone No.</b>
NYSDEC Project Manager	Matthew Dunham	P: 518-357-2396
Program Health and Safety Officer	Robert Marcuse, CIH, CSP, CHMM	P: 410-329-5192
Program Manager	Donald Conan, P.E.	M: 315- 877-7403
Quality Assurance/Quality Control Officer	Frank Barranco	P: 410-584-7000
Project Manager	Emily Cummings	P: 315-565-6553 M: 860-309-3837
Site Manager/Site Health and Safety Officer	Edward Ashton, P.G.	P: 315-565-6560 M: 315-551-1161
Site Geologist	Patrick Gannon, G.I.T.	P: 315-234-0547 M: 845-238-8203
Note: CIH = Certified Industrial Hygienist CSP = Certified Safety Professional CHMM = Certified Hazardous Material Manager G.I.T. = Geologist in Training P.E. = Professional Engineer P.G. = Professional Geologist		

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### **3. SCOPE OF WORK**

This HASP Addendum was developed to designate and define site-specific health and safety protocols applicable to project activities to be implemented and followed during field activities and consulting work at the Site. The scope of work covered by this HASP Addendum includes the following:

- Geophysical evaluation/Ground-penetrating radar survey,
- Evaluation of surface soil
- Evaluation of subsurface soil
- Evaluation of overburden and bedrock groundwater
- Evaluation of soil vapor
- Bedrock well installation
- Waste storage and disposal.

Each of these activities is summarized below and additional detail for each activity is provided in the Letter Work Plan (EA 2018), and the Phase I OU-2 Letter Work Plan (EA 2023).

#### **3.1 SOIL VAPOR INTRUSION EVALUATION**

EA will conduct an SVI evaluation of the Admiral Cleaner building and nearby structures/residences, including the collection of sub-slab soil vapor samples, indoor ambient air samples, and outdoor ambient air samples, as described in the letter Work Plan (EA 2018). The purpose of the SVI evaluation is to evaluate the migration of vapors into onsite and offsite residential and commercial structures.

#### **3.2 GEOPHYSICAL EVALUATION**

EA will subcontract a geophysical survey using ground-penetrating radar technology across the entire site (0.17 acre) and in offsite areas of OU-2 to identify and/or locate any potential areas of concern (e.g., buried drums and debris) that may be present as a result of historical operations at the Site and identify any utilities that may impact soil boring and well installation activities.

A subcontractor will also collect downhole geophysical data in select bedrock boreholes including fluid temperature/conductivity, optical televiewer, heat pulse flow meter, acoustic televiewer logs, and caliper logs.

#### **3.3 EVALUATION OF SUBSURFACE SOIL**

EA will implement an onsite subsurface soil sampling program using direct-push methodologies as described in the Letter Work Plan (EA 2018). The purpose of the subsurface soil evaluation is to evaluate the potential for the presence of onsite materials and evaluate the nature of potential toxicity of the onsite soil through laboratory analysis. A total of 30 soil borings will be completed and each soil boring location will be based on the geophysical evaluation, which will determine

the potential presence of areas of concern. One subsurface soil sample will be collected from each soil boring.

An additional 20 soil borings will be completed in the northern portion of the property to further refine the UST and source area. Soil borings will be installed in accordance with the Pre-Design Investigation Work Plan Addendum (EA 2020c)

### **3.4 EVALUATION OF OVERBURDEN AND BEDROCK GROUNDWATER**

EA will install temporary and permanent overburden monitoring wells using direct-push methodologies as described in the Letter Work Plan (EA 2018). Each monitoring well will be completed as a flush mount with a curb box. A total of 11 temporary and 5 permanent monitoring wells will be installed and sampled. Three onsite bedrock monitoring wells will be installed in accordance with the Letter Work Plan addendum for the Phase III Field Investigation of the RI (EA 2020d).

Permanent bedrock monitoring wells will also be installed offsite in OU-2 and sampled as described in the Phase I OU-2 Letter Work Plan (EA 2023). Each bedrock monitoring well will be completed as a flush mount with curb box. A total of 4 monitoring wells (2 couplets) will be installed during Phase I of the OU-2 RI. An additional 6 monitoring wells (3 couplets) will be installed during Phase II. Two deeper bedrock wells may be installed during a Phase III investigation pending results of the first two phases. Groundwater grab samples will be collected with packers during bedrock well borehole advancement.

All monitoring wells will be installed in accordance with the Division of Environmental Remediation (DER-10) Technical Guidance for Site Investigation and Remediation (NYSDEC 2010). Overburden and bedrock monitoring wells will be sampled in multiple monitoring events throughout the OU-1 RI/FS and OU-2 RI/FS.

### **3.5 EVALUATION OF SOIL VAPOR**

EA will install a total of 6 soil vapor monitoring points and complete 2 soil vapor sampling events at the Site as described in the Letter Work Plan (EA 2018). Each soil vapor monitoring point will be installed using direct-push methods to approximately 6 to 8 ft below grade. Soil vapor samples will be collected to characterize soil vapor contamination within the vadose zone. Subsequent to the sampling event, sample tubing will be removed, and the soil vapor monitoring point will be backfilled with bentonite. Soil vapor monitoring points installed in paved or concrete areas will be backfilled and refinished at the ground surface with concrete or cold patch.

### **3.6 WASTE STORAGE AND DISPOSAL**

EA is responsible for the proper storage, handling, and disposal of investigative-derived waste (IDW) including personal protective equipment (PPE); solids and liquids generated during soil boring, soil sampling, monitoring well installation, well development, well sampling, soil vapor point installation, and soil vapor sampling activities.



IDW; including PPE, solids and liquids generated during the well drilling, well development, and well sampling activities, will be stored, handled, and disposed of in accordance with the EA's Generic Field Activities Plan (EA 2020b), the NYSDEC and Department of Water (DOW) Memorandum of Use (MOU) on short-term discharge limits, and the Letter Work Plan (EA 2018). Drummed materials will be clearly labeled as to their contents and origin. Drill cuttings and purge water will be stored onsite and managed in accordance with NYSDEC DER-10, pending analytical results from the RI.

Accordingly, handling and disposal will be as follows:

- Liquids generated from contaminated equipment decontamination that exhibit visual staining, sheen, or discernable odors will be collected in drums or other containers at the point of generation. They will be stored in the staging area. A licensed waste subcontractor will then remove the drums and dispose of them at an offsite location.
- Liquid generated during well purging or a decontamination activity that does not exhibit visible staining, sheen, or discernable odors will be containerized and staged onsite until an appropriate treatment/disposal procedure has been determined based on the short-term discharge limits described in the MOU (NYSDEC/DOW), after the completion of the RI investigation.
- Soil and rock cuttings from drilling operations will be containerized and staged onsite until an appropriate treatment/disposal procedure has been determined after the completion of the RI investigation.
- Used protective clothing and equipment that is suspected to be contaminated with hazardous waste will be placed in plastic bags, packed in 55-gallon ring-top drums, and transported to the drum staging area.
- Non-contaminated trash and debris will be placed in a trash dumpster and disposed of by a local garbage hauler.

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#### 4. POTENTIAL HAZARD ANALYSIS

Based on the field activities detailed in Section 3, the following potential hazard conditions may be anticipated. Further details regarding each hazard are present in Section 3 of the Generic HASP (EA 2020a)

- Chemical Hazards: chemicals of concern present at the site include, but are not limited to, VOCs and SVOCs.
- Heavy Equipment Hazards
- Vehicle and Pedestrian Hazards
- Electrical Hazards, including High Voltage Hazards
- Underground Utilities
- Fire/Explosion
- Heat/Cold Stress
- Biological Hazards
- Noise Hazards
- Entry into a confined space in support of this project is not anticipated and is forbidden.
- Safety data sheets for chemicals that may be used on-site are provided in Appendix H.

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## **5. GENERAL SAFETY PRACTICES**

### **5.1 SAFE WORK PRACTICES**

Safe work practices that will be followed by site workers include, but are not limited to, the following rules:

- Adherence to the COVID-19 Crisis Responses and Working Protocol (Appendix I).
- Working before or after daylight hours without special permission is prohibited.
- Do not enter restricted or posted areas without permission from the SSHO.
- Smoking on-site is prohibited.
- Possessing, using, purchasing, distributing, or having controlled substances in their system throughout the day or during meal breaks is prohibited.
- Consuming or possessing alcoholic beverages is prohibited.
- Good housekeeping: employees will be instructed about housekeeping throughout field activities.
- Sitting or kneeling in areas of obvious contamination is prohibited.
- Avoid overgrown vegetation and tall grass areas.

### **5.2 DAILY STARTUP AND SHUTDOWN PROCEDURES**

The following protocols will be followed daily prior to start of work activities:

- The SSHO will review site conditions to determine if modification of work and safety plans is needed.
- Personnel will be briefed and updated on new safety procedures as appropriate.
- Safety equipment will be checked for proper function.
- The SSHO will ensure that the first aid kit is adequately stocked and readily available.
- On-site equipment and supplies will be locked and secure.

### **5.3 TRAFFIC SAFETY AND PEDESTRIAN PROTECTION MEASURES**

The following protocols will be followed to protect the public while field activities are occurring:

- Cones and caution tape will be used around the drill rig, open boreholes/well vaults and adjacent work areas to prevent pedestrians from entering the work area.
- Drilling and sampling activities will avoid blocking pedestrian walkways, if a walkway is partially blocked due to sampling activities an alternate pathway will be provided.
- When mobilizing the drill rig to drilling locations, an individual not operating the rig will be directing pedestrian and vehicular traffic as needed.

Further details regarding traffic safety and pedestrian safety are presented in the OU-2 Public Right-of-Way Management Plan Memorandum (EA 2023).

## 6. PERSONAL PROTECTIVE EQUIPMENT

Based upon currently available information, it is anticipated that Level D PPE will be required for currently anticipated conditions and activities.

The PPE components for use during this project are detailed in the Generic HASP (EA 2020a)<sup>1</sup>. The components of Level D PPE are summarized below. Level D will be worn for initial entry onsite and for all activities and will consist of the following:

- Coveralls or appropriate work clothing
- Steel toe, steel shank safety boots/shoes
- Hard hats (when overhead hazards are present or as required by the SSHO)
- Chemical resistant gloves (nitrile/neoprene) when contact with potentially contaminated soil or water is expected
- Safety glasses with side shields
- Hearing protectors (during operations producing excessive noise).

Insulated clothing, hats, etc. must be worn when temperatures or wind chill fall below 40 degrees Fahrenheit.

### 6.1 UPGRADE OR DOWNGRADE PERSONAL PROTECTIVE EQUIPMENT LEVEL

Procedures and levels for upgrades or downgrades to the PPE level required at the site are outlined in the Generic HASP (EA 2020a). Changes in PPE levels must be documented in the PPE Activity Report provided in Attachment G of this HASP Addendum.

If, at any time, the sustained level of total organic vapors in the worker breathing zone exceeds 5 parts per million above background, site workers will evacuate the area and the condition will be brought to the attention of the SSHO. Efforts will be undertaken to mitigate the source of the vapors. Once the sustained level of total organic vapors decreases to below 5 parts per million above background, site workers will be allowed to continue activities at the direction of the SSHO. If dust levels exceed the OSHA permissible exposure limit, dust masks will be worn by all on-site personnel until dust suppression using water methods reduce the levels.

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## **7. SITE CONTROL AND SECURITY**

Only authorized personnel will be permitted to conduct field activities. Authorized personnel include those who have completed hazardous waste operations initial training, as defined under OSHA 29 CFR 1910.120/29 CFR 1926.65, have completed their training or refresher training within the past 12 months, and have been certified by a physician as fit for hazardous waste operations. A list of staff and training is provided in Attachment A.

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## 8. SITE MONITORING

### 8.1 WORK AREA MONITORING

Specific compounds of concern for the Admiral Cleaners Site include VOCs and SVOCs. Permissible exposure limits applicable for site related contaminants are presented in Table 1 of the Generic HASP. For intrusive work (i.e., during installation of soil borings), the work area will be monitored continuously with a photoionization detector (PID) and combustible gas indicator. Action levels and response actions are defined in Section 6.1 of this HASP addendum.

### 8.2 COMMUNITY AIR MONITORING PLAN

Community air monitoring activities will consist of a combination of continuous and periodic monitoring, which will be performed dependent upon the type of activity conducted at the site, as discussed in the following section. VOC monitoring will be performed using a MiniRAE 3000 or equivalent, which is capable of calculating instantaneous concentrations, 15-minute time-weighted averages, and an average of the previous running time period. These levels will be compared to the levels specified in Section 8.3.

#### 8.2.1 Continuous Air Monitoring

Continuous monitoring for VOCs and particulates will be required for ground intrusive activities including soil boring, soil vapor point, and well installation (e.g., boring installation, construction, development, and completion) and management of investigation-derived waste (IDW). Monitoring will take place at the perimeter of the exclusion zone and should include upwind and downwind concentrations at the start of each workday and as-needed thereafter (i.e., wind direction changes, change in work location, modification of exclusion zone, etc.). Weather conditions, including prevailing wind direction, will be observed and recorded for each day of activities.

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the work area at temporary particulate monitoring stations. Locations will be dependent on prevailing winds. The particulate monitoring will be performed using a Thermo MIE pDR-1000 DataRam or equivalent. The Thermo MIE pDR-1000 DataRam is real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes for comparison to the airborne particulate action level. The Thermo MIE pDR is equipped with an audible alarm to indicate exceedance of the action level. In addition to using the Thermo MIE pDR-1000 DataRam, fugitive dust migration will be visually assessed during all work activities. If particulate concentrations are recorded at higher or equivalent concentrations at the upwind station during investigation activities then continuous air monitoring will be discontinued, as approved by NYSDEC representative.

## 8.2.2 Periodic Air Monitoring

Periodic monitoring for VOCs will be required during non-intrusive activities. Non-intrusive activities are anticipated to include the collection of groundwater and soil vapor samples and IDW management. Periodic monitoring during sample collection will consist of taking a reading as follows—upon arrival at a sample location, opening a well cap, during IDW management, and prior to leaving a sample location.

## 8.3 ACTION LEVELS AND RESPONSE

This subsection identifies the action levels and corresponding responses for concentrations of VOCs and particulates detected during the field activities.

### 8.3.1 Volatile Organic Compounds

VOCs and SVOCs were identified in soil and groundwater, and sub-slab soil vapor samples including MTBE, benzene, ethylbenzene, and xylenes. VOC action levels are as follows:

- If ambient air concentrations of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background conditions (upwind concentrations), work activities will resume with continued monitoring.
- If the total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist in excess of 5 ppm over background but less than 25 ppm, work activities will be stopped, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 ft downwind of the work zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less (but in no case less than 20 ft), is below 5 ppm over background for the 15-minute average.
- If the total organic vapor level is above 25 ppm at the perimeter of the work area, work activities will be shut down.

All 15-minute readings will be recorded and be available for NYSDEC and New York State Department of Health personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

### 8.3.2 Particulates

If the downwind PM-10 particulate level is 100 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with

dust suppression techniques provided that downwind PM-10 particulate levels do not exceed  $150 \mu\text{g}/\text{m}^3$  above the upwind level and provided that no visible dust is migrating from the work area.

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than  $150 \mu\text{g}/\text{m}^3$  above the upwind level, work will be stopped, and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within  $150 \mu\text{g}/\text{m}^3$  of the upwind level and in preventing visible dust migration.

Similar to the VOC readings, all particulate readings will be recorded and be available for NYSDEC and New York State Department of Health personnel to review.

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## 9. REFERENCES

- EA Engineering, P.C. and its affiliate EA Science and Technology (EA). 2020a. Generic HASP for Work Assignments under NYSDEC Contract No. D009806. March.
- . 2018. Remedial Investigation/Feasibility Study Letter Work Plan. Admiral Cleaners (401075). March.
- . 2020b. Generic Field Activities Plan for Work Assignments under NYSDEC Contract D0009806. March.
- . 2020c. Pre-Design Investigation Letter Work Plan Addendum. May.
- . 2020d. Remedial Investigation/Feasibility Study Letter Work Plan Addendum; Phase III Investigations. December
- . 2023. OU-2 RI Public Right-of-Way Management Plan Memorandum. June
- NYSDEC. 2009. Order on Consent File No. R4-2009-0219-25. April.
- . 2010. DER-10 Technical Guidance for Site Investigation and Remediation. May.

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## **Appendix A**

### **Worker Training and Physical Examination Record**

**Worker Training and Physical Examination Record**

<b>SITE: Admiral Cleaners, Watervliet, New York</b>						
<b>Name</b>	<b>OSHA 40-hour Hazardous Waste Operations Training</b>		<b>OSHA Hazardous Waste Supervisor Training</b>	<b>CPR (date of expiration)</b>	<b>First Aid (date of expiration)</b>	<b>Date of Last Physical Examination</b>
	<b>Initial</b>	<b>Annual</b>				
<b>EA PERSONNEL</b>						
Emily Cummings	1/15/2014	12/14/22	—	1/4/2024	1/4/2024	9/8/2022
Megan Miller	7/12/2007	7/9/2022	5/6/2021	1/4/2024	1/4/2024	2/13/2019
Edward Ashton	4/10/1992	10/20/2022	—	5/17/2023	5/17/2023	10/03/2022
Patrick Gannon	9/11/2020	12/14/2022	4/5/2021	12/11/2024	12/11/2024	9/22/2022
Mike Wright	7/2/2018	12/30/2022	12/30/2019	6/29/2023	6/29/2023	11/03/2022
<b>SUBCONTRACTOR OR ADDITIONAL PERSONNEL</b>						
To be determined	—	—	—	—	—	—
<p>Prior to performing work at the site, this Health and Safety Plan Addendum must be reviewed and an agreement to comply with the requirements must be signed by all personnel, including contractors, subcontractors, and visitors. Contractors and subcontractors are ultimately responsible for ensuring that their own personnel are adequately protected. In signing this agreement, the contractors and subcontractors acknowledge their responsibility for the implementation of the Health and Safety Plan Addendum requirements. All personnel onsite shall be informed of the site emergency response procedures and any potential safety or health hazards of the operations.</p> <p>Note: CPR = Cardiopulmonary resuscitation EA = EA Engineering, P.C. and Its Affiliate EA Science and Technology OSHA = Occupational Safety and Health Administration</p>						

## **Appendix B**

### **Health and Safety Plan Addendum Review Record**

**HEALTH AND SAFETY PLAN ADDENDUM REVIEW RECORD**

I have read the Health and Safety Plan Addendum for this site and have been briefed on the nature, level, and degree of exposure likely as a result of participation in this project. I agree to conform to all the requirements of this Plan.

<b>SITE: Admiral Cleaners, Watervliet, New York</b>			
<b>Name</b>	<b>Signature</b>	<b>Affiliation</b>	<b>Date</b>

## **Appendix C**

### **Site Entry and Exit Log**

**SITE ENTRY AND EXIT LOG**

<b>SITE: Admiral Cleaners, Watervliet, New York</b>				
<b>Name</b>	<b>Date</b>	<b>Time of Entry</b>	<b>Time of Exit</b>	<b>Initials</b>

**Appendix D**  
**Accident/Loss Report**



## ACCIDENT/LOSS REPORT

This report must be completed by the injured employee or supervisor and faxed to EA corporate headquarters within 24 hours of any accident. **Fax number: (410) 771-1780.**

**Note:** Whenever an employee is sent for medical treatment for a work related injury or illness, **page 4 of this report** must accompany that individual to ensure that all invoices, bills, and correspondence are sent to Human Resources for a timely response.

<b>A. DEMOGRAPHIC INFORMATION</b>	
Name of injured employee:	
Home address:	
Home telephone:	
Date of birth:	Age: Sex: M F
Marital status:	Name of spouse (if applicable):
Social security number:	Date of hire:
Number of dependents:	
Employee job title:	Department regularly employed:
Was employee injured on the job: yes or no	
Primary language of employee:	

<b>B. ACCIDENT/INCIDENT INFORMATION</b>	
Date of accident:	Time of accident:
Reported to whom:	Name of supervisor:
Exact location where accident occurred (include street, city, state, and county):	
Explain what happened (include what the employee was doing at the time of the accident and how it occurred):	
Describe the injury and the specific part of the body affected (i.e., laceration, right hand, third finger):	
Object or substance that directly injured the employee:	
Number of days and hours employee usually works per week:	
Is the employee expected to lose at least one full day of work?	
Does the employee have a previous claim? yes or no	If yes, status? open or closed
Was the employee assigned to restricted duty? yes or no	If yes, describe:





## ACCIDENT/LOSS REPORT

<b>C. ACCIDENT INVESTIGATION INFORMATION</b>
Was safety equipment provided? yes or no If yes, was it used? yes or no
Was an unsafe act being formed? yes or no If yes, describe:
Was a machine part involved? yes or no If yes, in what way?
Was the machine part defective? yes or no If yes, in what way?
Was a third party responsible for the accident/incident: yes or no If yes, list name, address, and telephone number.
Was the accident/incident witnessed? yes or no If yes, list name, address, and telephone number.

<b>D. PROVIDER INFORMATION</b>
Was first aid given onsite? yes or no
If yes, what type of medical treatment given?
Physician information (if medical attention was administered): Name: Address (include city, state, and zip): Telephone:
Hospital address (include name, address, city, state, zip code, and telephone number):
Was the employee hospitalized? yes or no If yes, on what date?
Was the employee treated as an outpatient, receive emergency treatment or ambulance service? yes or no
<b>Please attach the physician's written return to work slip.</b>
<b>Note: A physician's return to work slip is required prior to allowing the worker to return to work.</b>

<b>E. AUTOMOBILE ACCIDENT INFORMATION (complete if applicable)</b>
Authority contacted and report number:
EA employee's vehicle year, make, and model:
V.I.N. <span style="float: right;">Plate/tag number:</span>
<b>Owner's</b> name and address:
<b>Driver's</b> name and address:
Relationship to insured?
Driver's license number?



## ACCIDENT/LOSS REPORT

<b>E. AUTOMOBILE ACCIDENT INFORMATION (continued)</b>
Describe damage to <i>your</i> property:
Describe damage to <i>other</i> vehicle or property:
<i>Other</i> driver's name, address, and telephone:
<i>Other</i> driver's insurance company (include name, address and telephone number):
Location of other vehicle?
Name, address, and telephone of other injured parties:
Witness (include name, address, and telephone number):
Witness's statement:
Witness (include name, address, and telephone number):
Witness's statement:

## F. ACKNOWLEDGEMENT

Name of supervisor:
Date of this report:
Report prepared by:
I have read this report and the contents as to how the accident/loss occurred are accurate to the best of my knowledge.
Signature (injured employee): _____ Date: _____



**ACCIDENT/LOSS REPORT**

I am seeking medical treatment for a work related injury/illness.  
Please forward all bills/invoices/correspondence to:

**EA Engineering, Science, and Technology, Inc., PBC  
225 Schilling Circle  
Suite 400  
Hunt Valley, Maryland 21031**

**Attention: Michele Bailey**

**Human Resources**

**(410) 584-7000**

## **Appendix E**

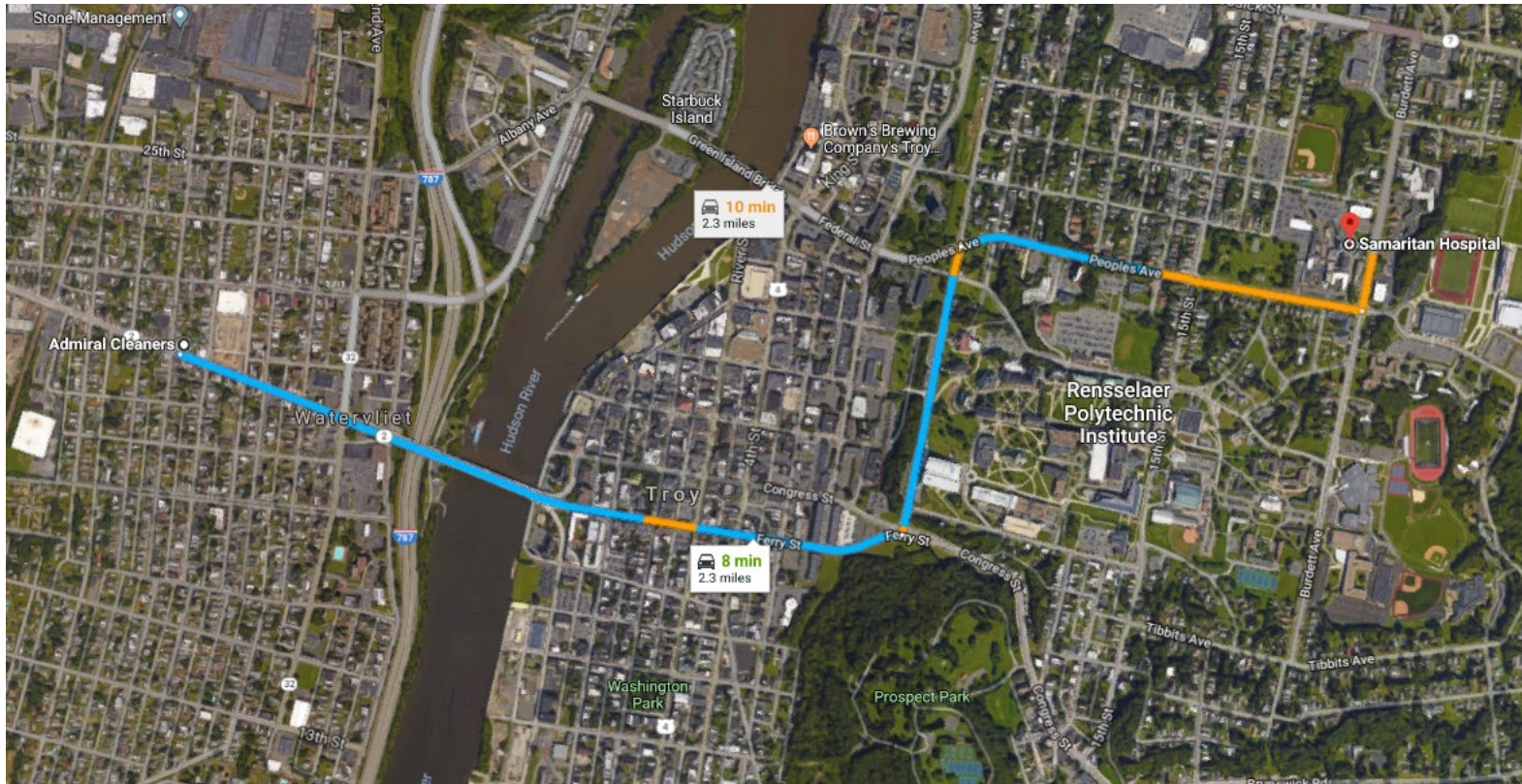
### **Emergency Telephone Numbers and Hospital Directions**

## EMERGENCY TELEPHONE NUMBERS AND HOSPITAL DIRECTIONS

### Emergency Telephone Numbers

<b>SITE:</b> Admiral Cleaners, Watervliet, New York	
<b>Police</b>	9-1-1 (518) 270-3833
<b>Fire</b>	9-1-1
<b>Ambulance</b>	9-1-1
<b>Hospital:</b> Samaritan Hospital	(518) 271-3300
<b>Poison Control</b>	(800) 222-1222
Program Safety and Health Officer: <b>Robert Marcase, CIH, CSP, CHMM</b>	(410) 329-5192
Program Manager: <b>Donald Conan, P.E., P.G.</b>	(315) 877-7403
EA Project Manager <b>Emily Cummings</b>	(315) 565-6553 Office (860) 309-3837 Cell
In case of spill, contact <b>James Hayward, P.E.</b>	(315) 565-6555
EA Medical Services (Physician) <b>All One Health Services</b>	(800) 229-3674
Site Manager/Site Health and Safety Officer: <b>Edward Ashton</b>	(315) 565-6560 Office (315) 551-1161 Cell
Site Geologist: <b>Patrick Gannon</b>	(916) 604-4366 Office (845) 238-8203 Cell
In case of accident or exposure incident, contact Corporate Health and Safety Officer <b>Robert Marcase, CIH, CSP, CHMM</b>	(410) 329-5192

## Hospital Directions



1. Head East on NY-2 (Ferry St). Continue for 1.1 miles, crossing over the bridge into Troy, NY.
2. Turn Left onto 8<sup>th</sup> St., continue for 0.4 miles.
3. Turn right onto Peoples Ave., continue for 0.6 miles.
4. Turn left onto Burdett Ave, continue for 0.1 miles.
5. Samaritan Hospital will be on the left.

## **Appendix F**

### **Emergency Equipment Available Onsite**

**EMERGENCY EQUIPMENT AVAILABLE ONSITE**

<b>Type of Equipment</b>	<b>Location</b>
<b>Communications Equipment</b>	
Mobile Telephone	On Person
<b>Medical Support Equipment</b>	
First Aid Kits	In EA vehicle
Eye Wash Station	In EA vehicle
<b>Firefighting Equipment</b>	
Fire Extinguishers	In EA vehicle



## **Appendix G**

### **Personal Protective Equipment Activity Record**

**PERSONAL PROTECTIVE EQUIPMENT ACTIVITY RECORD**

<b>SITE:</b> Admiral Cleaners, Watervliet, New York		
Weather Condition:		Onsite Hours: From To
Changes in Personal Protective Equipment Levels <sup>(a)</sup>	Work Operations	Reasons for Change
Observations and Comments:		
Completed by:		
_____		_____
Site Health and Safety Officer		Date
(a) Only the Site Health and Safety Officer may change personal protective equipment levels, using only criteria specified in the Health and Safety Plan Addendum.		

**Appendix H**  
**Safety Data Sheets**

## SAFETY DATA SHEET BENTONITE

### 1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

**PRODUCT NAME** BENTONITE  
**APPLICATION** Viscosifier.  
**SUPPLIER** M-I Drilling Fluids UK Ltd,  
 Pocra Quay,  
 Footdee,  
 Aberdeen. AB11 5DQ  
 T -44 (0)1224-584336  
 F -44 (0)1224-576119  
**EMERGENCY TELEPHONE** +44(0)208 762 8322

### 2 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content	Classification
BENTONITE	215-108-5	1302-78-9	80 - 95%	-
QUARTZ, CRYSTALLINE SILICA	238-878-4	14808-60-7	2 - 15%	Xn;R20.

The Full Text for all R-Phrases are Displayed in Section 16

#### COMPOSITION COMMENTS

This material is a naturally occurring mineral. The Data Shown is in accordance with the latest EC Directives. This product contains a small quantity of quartz, crystalline silica. Prolonged and repeated exposure to concentrations of crystalline silica exceeding the maximum exposure limit may lead to chronic lung disease such as silicosis.

### 3 HAZARDS IDENTIFICATION

Not regarded as a health or environmental hazard under current legislation.

#### HUMAN HEALTH

This product contains a small quantity of quartz. IARC Monographs, Vol.68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

### 4 FIRST-AID MEASURES

#### INHALATION

Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.

#### INGESTION

First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.

#### SKIN CONTACT

Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

#### EYE CONTACT

Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

### 5 FIRE-FIGHTING MEASURES

#### EXTINGUISHING MEDIA

The product is non-combustible. Use fire-extinguishing media appropriate for surrounding materials.

#### UNUSUAL FIRE & EXPLOSION HAZARDS

No unusual fire or explosion hazards noted.

#### PROTECTIVE MEASURES IN FIRE

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

### 6 ACCIDENTAL RELEASE MEASURES

#### PERSONAL PRECAUTIONS

Wear protective clothing as described in Section 8 of this safety data sheet.

#### ENVIRONMENTAL PRECAUTIONS

Do not allow to enter drains, sewers or watercourses.

**BENTONITE****SPILL CLEAN UP METHODS**

Shovel into dry containers. Cover and move the containers. Flush the area with water. May be slippery when wet.

**7 HANDLING AND STORAGE****USAGE PRECAUTIONS**

Avoid handling which leads to dust formation. Provide good ventilation. Mechanical ventilation or local exhaust ventilation may be required.

**STORAGE PRECAUTIONS**

Store at moderate temperatures in dry, well ventilated area.

**8 EXPOSURE CONTROLS/PERSONAL PROTECTION**

Name	Std	LT - ppm	LT - mg/m3	ST - ppm	ST - mg/m3
QUARTZ, CRYSTALLINE SILICA	WEL		0.3 mg/m3 resp. dust		
BENTONITE			4 mg/m3 resp. dust		

**INGREDIENT COMMENTS**

WEL = Workplace Exposure Limits \* OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m3 / (%SiO<sub>2</sub>+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite. NUI = Nuisance Dust. WEL TWA 4mg/m3 respirable dust, 10mg/m3 total dust.

**PROTECTIVE EQUIPMENT****ENGINEERING MEASURES**

Provide adequate general and local exhaust ventilation.

**RESPIRATORY EQUIPMENT**

Respiratory protection must be used if air contamination exceeds acceptable level. Dust filter P3 (for especially fine dust/powder).

**HAND PROTECTION**

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

**EYE PROTECTION**

Wear dust resistant safety goggles where there is danger of eye contact.

**OTHER PROTECTION**

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

**9 PHYSICAL AND CHEMICAL PROPERTIES**

APPEARANCE	Powder, dust		
COLOUR	Cream to Grey		
ODOUR	Odourless		
SOLUBILITY	Insoluble in water		
RELATIVE DENSITY	2.3 - 2.6 20	BULK DENSITY	769 - 833 kg/m3
pH-VALUE, CONC. SOLUTION	9 - 10		

**10 STABILITY AND REACTIVITY****STABILITY**

Stable under normal temperature conditions.

**CONDITIONS TO AVOID**

Avoid wet and humid conditions.

**MATERIALS TO AVOID**

No incompatible materials noted.

**HAZARDOUS DECOMPOSITION PRODUCTS**

No specific hazardous decomposition products noted.

**11 TOXICOLOGICAL INFORMATION****INHALATION**

Dust may irritate respiratory system or lungs. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

**INGESTION**

May cause discomfort if swallowed.

**BENTONITE****SKIN CONTACT**

Powder may irritate skin.

**EYE CONTACT**

Particles in the eyes may cause irritation and smarting.

**HEALTH WARNINGS**

This product contains small quantities of quartz. Prolonged inhalation of high concentrations may damage respiratory system. Because of quantity and composition, the health hazard is small.

**12 ECOLOGICAL INFORMATION****ECOTOXICITY**

Not regarded as dangerous for the environment. Contact M-I Swaco's QHSE Department for ecological information.

**13 DISPOSAL CONSIDERATIONS****DISPOSAL METHODS**

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

**14 TRANSPORT INFORMATION****GENERAL**

The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

**15 REGULATORY INFORMATION****RISK PHRASES**

NC Not classified.

**SAFETY PHRASES**

NC Not classified.

**UK REGULATORY REFERENCES**

The Control of Substances Hazardous to Health Regulations 1988. Chemicals (Hazard Information & Packaging) Regulations. IARC Monographs, Vol.68, 1997.

**EU DIRECTIVES**

Dangerous Substance Directive 67/548/EEC. Dangerous Preparations Directive 1999/45/EEC.

**GUIDANCE NOTES**

Workplace Exposure Limits EH40.

**16 OTHER INFORMATION****GENERAL INFORMATION**

HMIS Health - 1 HMIS Flammability - 1 HMIS Physical Hazard - 0 E - Safety glasses, Gloves, Dust Respirator

**INFORMATION SOURCES**

Material Safety Data Sheet, Misc. manufacturers. Transport of Dangerous Goods, Model Regulations, Tenth Revised Edition, United Nations.

**REVISION COMMENTS**

The following sections have been revised: 5, 6, 7, 8, 13, 14, 15 and 16. Revised by Bill Cameron

**ISSUED BY**

Sam Hoskin

REVISION DATE 23-09-05

REV. NO./REPL. SDS GENERATED 2

SDS NO. 10609

**RISK PHRASES IN FULL**

R20 Harmful by inhalation.

**DISCLAIMER**

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.



# SAFETY DATA SHEET

SDS ID NO.: 0290MAR019  
Revision Date: 06/01/2016

## 1. IDENTIFICATION

**Product Name:** Marathon Petroleum No. 2 Ultra Low Sulfur Diesel

**Synonym:** #2 Diesel; No. 2 Ultra Low Sulfur Diesel 15 ppm Sulfur Max; Ultra Low Sulfur Diesel No. 2 15 ppm Sulfur Max; Ultra Low Sulfur Diesel No. 2 15 ppm Sulfur Max with Polar Plus; No. 2 Diesel, Motor Vehicle Use, Undyed; No. 2 Diesel, Motor Vehicle Use, Undyed, with Polar Plus; ULSD No. 2 Diesel 15 ppm Sulfur Max; ULSD No. 2 Diesel 15 ppm Sulfur Max with Polar Plus; No. 2 MV 15 Diesel; No. 2 MV 15 Diesel with Polar Plus; No. 2 Ultra Low Sulfur Diesel Dyed 15 ppm Sulfur Max; Ultra Low Sulfur Diesel No. 2 Dyed 15 ppm Sulfur Max; Ultra Low Sulfur Diesel No. 2 Dyed 15 ppm Sulfur Max with Polar Plus; No. 2 Diesel, Tax Exempt-Motor Vehicle Use, Dyed; No. 2 Diesel, Tax Exempt-Motor Vehicle Use, Dyed, with Polar Plus; ULSD No. 2 Diesel Dyed 15 ppm Sulfur Max; ULSD No. 2 Diesel Dyed 15 ppm Sulfur Max, with Polar Plus; No. 2 MV 15 Diesel Dyed; #2 MV 15 CFI Diesel; #2 MV 15 CFI Diesel Dyed; No. 2 Low Sulfur Diesel (TxLED); No. 2 MV 15 Diesel Dyed, with Polar Plus; No. 2 NRLM 15 Diesel Dyed; No.2 NRLM Diesel Dyed; No. 2 MV 500 ppm TxLED; No.2 Low Emission Low Sulfur Diesel; No. 2 Low Sulfur Diesel (TxLED) 500 ppm Sulfur Max; No. 2 Heating Oil 5000 NMA Unmarked; NEMA No. 2 Heating Oil; Heating Oil, No. 2 Low Sulfur 5000 ppm; No. 2 Ultra Low Sulfur Diesel Dyed with <6% Renewable Diesel Fuel; Ultra Low Sulfur No. 2 Diesel Dyed with <6% Renewable Diesel Fuel; No. 2 Diesel Dyed with <6% Renewable Diesel Fuel 15 ppm Sulfur Max; No. 2 Ultra Low Sulfur Diesel with <6% Renewable Diesel Fuel; Ultra Low Sulfur No. 2 Diesel with <6% Renewable Diesel Fuel; No. 2 Diesel with <6% Renewable Diesel Fuel 15 ppm Sulfur Max; Garyville Export Diesel; Export Diesel, Garyville; Diesel Fuel, Export Garyville; #2 Motor Vehicle ULSD 15 ppm with 0-5% Renewable Diesel; Marathon No. 2 ULSD with 0-5% Renewable Fuel with R100; Marathon No. 2 ULSD with 0-5% Renewable Fuel with R99; No. 2 Heating Oil 2000 ppm Sulfur Max, Clear (Undyed) Unmarked; Ultra Low Sulfur Heating Oil 15 ppm Sulfur Max, Clear (Undyed) Unmarked; ULS Heating Oil 15 ppm Clear (Undyed) Unmarked; ULS HO 15 ppm CLR; Ultra-Low Sulfur Heating Oil (<= 15ppm, Undyed); No. 2 Heating Oil 2000 ppm Sulfur Max, Dyed Unmarked; No. 2 Heating Oil 2000 ppm Sulfur Max, Dyed Marked; Ultra Low Sulfur Heating Oil 15 ppm Sulfur Max, Dyed Unmarked; Ultra Low Sulfur Heating Oil 15 ppm Sulfur Max, Dyed Marked; 15 ppm Sulfur Heating Oil Grade 67; 15 PPM Heating Oil; 15 PPM Dyed Heating Oil; 0291MAR019; 0306MAR019; 0308MAR019; 0334MAR019; 0335MAR019; 0336MAR019; 0337MAR019; 0340MAR019;

**Chemical Family:** Complex Hydrocarbon Substance

**Recommended Use:** Fuel.  
**Restrictions on Use:** All others.

**Manufacturer, Importer, or Responsible Party Name and Address:**  
**MARATHON PETROLEUM COMPANY LP**  
**539 South Main Street**  
**Findlay, OH 45840**

**SDS information:** 1-419-421-3070

**Emergency Telephone:** 1-877-627-5463

## 2. HAZARD IDENTIFICATION

**Classification**

**OSHA Regulatory Status**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 3
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Skin corrosion/irritation	Category 2
Carcinogenicity	Category 2
Specific target organ toxicity (single exposure)	Category 3
Specific target organ toxicity (repeated exposure)	Category 2
Aspiration toxicity	Category 1
Acute aquatic toxicity	Category 2
Chronic aquatic toxicity	Category 2

**Hazards Not Otherwise Classified (HNOC)**


Static accumulating flammable liquid

**Label elements**

**EMERGENCY OVERVIEW**

**Danger**

FLAMMABLE LIQUID AND VAPOR  
 May accumulate electrostatic charge and ignite or explode  
 May be fatal if swallowed and enters airways  
 Harmful if inhaled  
 Causes skin irritation  
 May cause respiratory irritation  
 May cause drowsiness or dizziness  
 Suspected of causing cancer  
 May cause damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure  
 Toxic to aquatic life with long lasting effects



**Appearance** Yellow to Red Liquid                      **Physical State** Liquid                      **Odor** Hydrocarbon

**Precautionary Statements - Prevention**

- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Keep away from heat/sparks/open flames/hot surfaces. - No smoking
- Keep container tightly closed
- Ground/bond container and receiving equipment
- Use only non-sparking tools.
- Use explosion-proof electrical/ventilating/lighting/equipment
- Take precautionary measures against static discharge
- Do not breathe mist/vapors/spray
- Use only outdoors or in a well-ventilated area
- Wear protective gloves/protective clothing/eye protection/face protection



Wash hands and any possibly exposed skin thoroughly after handling  
Avoid release to the environment

**Precautionary Statements - Response**

IF exposed or concerned: Get medical attention  
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower  
If skin irritation occurs: Get medical attention  
Wash contaminated clothing before reuse  
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing  
Call a POISON CENTER or doctor if you feel unwell  
IF SWALLOWED: Immediately call a POISON CENTER or doctor  
Do NOT induce vomiting  
In case of fire: Use water spray, fog or regular foam for extinction  
Collect spillage

**Precautionary Statements - Storage**

Store in a well-ventilated place. Keep container tightly closed  
Keep cool  
Store locked up

**Precautionary Statements - Disposal**

Dispose of contents/container at an approved waste disposal plant

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

No. 2 Ultra Low Sulfur Diesel is a complex mixture of paraffins, cycloparaffins, olefins and aromatic hydrocarbon chain lengths predominantly in the range of eleven to twenty carbons. May contain up to 5% Renewable Diesel. May contain small amounts of dye and other additives (<0.15%) which are not considered hazardous at the concentration(s) used. May contain a trace amount of benzene (<0.01%). Contains a trace amount of sulfur (<0.0015%)

**Composition Information:**

Name	CAS Number	% Concentration
No. 2 Diesel Fuel	68476-34-6	50-100
Kerosine, Petroleum	8008-20-6	0-50
Alkanes, C10-C20 branched and linear	928771-01-1	0-5
Naphthalene	91-20-3	0.3-2.6

All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

**4. FIRST AID MEASURES**

**First Aid Measures**

**General Advice:** In case of accident or if you feel unwell, seek medical advice immediately (show directions for use or safety data sheet if possible).

**Inhalation:** Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear, give oxygen and continue to monitor. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

**Skin Contact:** Immediately wash exposed skin with plenty of soap and water while removing contaminated clothing and shoes. May be absorbed through the skin in harmful amounts. Get medical attention if irritation persists. Any injection injury from high pressure equipment should be evaluated immediately by a physician as potentially serious (See NOTES TO PHYSICIAN).

Place contaminated clothing in closed container until cleaned or discarded. If clothing is to be laundered, inform the person performing the operation of contaminant's hazardous properties. Destroy contaminated, non-chemical resistant footwear.

**Eye Contact:** Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Gently remove contacts while flushing. Get medical attention if irritation persists.

**Ingestion:** Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs, keep head below hips, or if patient is lying down, turn body and head to side to prevent aspiration and monitor for breathing difficulty. Never give anything by mouth to an unconscious person. Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

**Most important signs and symptoms, both short-term and delayed with overexposure**

**Adverse Effects:** Irritating to the skin and mucous membranes. Symptoms may include redness, itching, and inflammation. May cause nausea, vomiting, diarrhea, and signs of nervous system depression: headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Aspiration hazard. May cause coughing, chest pains, shortness of breath, pulmonary edema and/or chemical pneumonitis. Repeated or prolonged skin contact may cause drying, reddening, itching and cracking. Prolonged or repeated exposure may cause adverse effects to the thymus, liver, and bone marrow.

**Indication of any immediate medical attention and special treatment needed**

**Notes To Physician:** INHALATION: This material (or a component) sensitizes the myocardium to the effects of sympathomimetic amines. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in individuals exposed to this material. Administration of sympathomimetic drugs should be avoided.

SKIN: Leaks or accidents involving high-pressure equipment may inject a stream of material through the skin and initially produce an injury that may not appear serious. Only a small puncture wound may appear on the skin surface but, without proper treatment and depending on the nature, original pressure, volume, and location of the injected material, can compromise blood supply to an affected body part. Prompt surgical debridement of the wound may be necessary to prevent irreversible loss of function and/or the affected body part. High pressure injection injuries may be SERIOUS SURGICAL EMERGENCIES.

INGESTION: This material represents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended.

## 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media**

For small fires, Class B fire extinguishing media such as CO<sub>2</sub>, dry chemical, foam (AFFF/ATC) or water spray can be used. For large fires, water spray, fog or foam (AFFF/ATC) can be used. Firefighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

**Unsuitable extinguishing media**

Do not use straight water streams to avoid spreading fire.

**Specific hazards arising from the chemical**

This product has been determined to be a flammable liquid per the OSHA Hazard Communication Standard and should be handled accordingly. May accumulate electrostatic charge and ignite or explode. Vapors may travel along the ground or be moved by ventilation and ignited by many sources such as pilot lights, sparks, electric motors, static discharge, or other ignition sources at locations distant from material handling. Flashback can occur along vapor trail. For additional fire related information, see NFPA 30 or the Emergency Response Guidebook 128.

**Hazardous combustion products**

Smoke, carbon monoxide, and other products of incomplete combustion.

**Explosion data**

Sensitivity to Mechanical Impact No.

Sensitivity to Static Discharge Yes.

**Special protective equipment and precautions for firefighters**

Firefighters should wear full protective clothing and positive-pressure self-contained breathing apparatus (SCBA) with a full face-piece, as appropriate. Avoid using straight water streams. Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and from as far a distance as possible. Avoid excessive water spray application. Keep surrounding area cool with water spray from a distance and prevent further ignition of combustible material. Keep run-off water out of sewers and water sources.

**Additional firefighting tactics**

FIRES INVOLVING TANKS OR CAR/TRAILER LOADS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after the fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles: if this is impossible, withdraw from area and let fire burn.

EVACUATION: Consider initial downwind evacuation for at least 1000 feet. If tank, rail car or tank truck is involved in a fire, ISOLATE for 5280 feet (1 mile) in all directions; also, consider initial evacuation of 5280 feet (1 mile) in all directions.

**NFPA** Health 1 Flammability 2 Instability 0 Special Hazard -

**6. ACCIDENTAL RELEASE MEASURES**

- Personal precautions:** Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Eliminate all ignition sources. All contaminated surfaces will be slippery.
- Protective equipment:** Use personal protection measures as recommended in Section 8.
- Emergency procedures:** Advise authorities and National Response Center (800-424-8802) if the product has entered a water course or sewer. Notify local health and pollution control agencies, if appropriate.
- Environmental precautions:** Avoid release to the environment. Avoid subsoil penetration.
- Methods and materials for containment:** Contain liquid with sand or soil. Prevent spilled material from entering storm drains, sewers, and open waterways.
- Methods and materials for cleaning up:** Use suitable absorbent materials such as vermiculite, sand, or clay to clean up residual liquids. Recover and return free product to proper containers. When recovering free liquids ensure all equipment is grounded and bonded. Use only non-sparking tools.

**7. HANDLING AND STORAGE**

**Safe Handling Precautions:** NEVER SIPHON THIS PRODUCT BY MOUTH. Use appropriate grounding and bonding practices. Static accumulating flammable liquid. Bonding and grounding may be insufficient to eliminate the hazard from static electricity. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. Vapors may travel along the ground or be moved by ventilation. Flashback may occur along vapor trails. No smoking. Use only non-sparking tools. Avoid breathing fumes, gas, or vapors. Use only with adequate ventilation. Avoid repeated and prolonged skin contact. Use personal protection measures as recommended in Section 8. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water. Do not cut, drill, grind or weld on empty containers since explosive residues may remain. Refer to applicable EPA, OSHA, NFPA and consistent state and local requirements.

Hydrocarbons are basically non-conductors of electricity and can become electrostatically charged during mixing, filtering, pumping at high flow rates or loading and transfer operations. If this charge reaches a sufficiently high level, sparks can form that may ignite the vapors of flammable liquids. Sudden release of hot organic chemical vapors or mists

from process equipment operating under elevated temperature and pressure, or sudden ingress of air into vacuum equipment may result in ignition of vapors or mists without the presence of obvious ignition sources. Nozzle spouts must be kept in contact with the containers or tank during the entire filling operation.

Portable containers should never be filled while in or on a motor vehicle or marine craft. Containers should be placed on the ground. Static electric discharge can ignite fuel vapors when filling non-grounded containers or vehicles on trailers. The nozzle spout must be kept in contact with the container before and during the entire filling operation. Use only approved containers.

A buildup of static electricity can occur upon re-entry into a vehicle during fueling especially in cold or dry climate conditions. The charge is generated by the action of dissimilar fabrics (i.e., clothing and upholstery) rubbing across each other as a person enters/exits the vehicle. A flash fire can result from this discharge if sufficient flammable vapors are present. Therefore, do not get back in your vehicle while refueling.

Cellular phones and other electronic devices may have the potential to emit electrical charges (sparks). Sparks in potentially explosive atmospheres (including fueling areas such as gas stations) could cause an explosion if sufficient flammable vapors are present. Therefore, turn off cellular phones and other electronic devices when working in potentially explosive atmospheres or keep devices inside your vehicle during refueling.

High-pressure injection of any material through the skin is a serious medical emergency even though the small entrance wound at the injection site may not initially appear serious. These injection injuries can occur from high-pressure equipment such as paint spray or grease or guns, fuel injectors, or pinhole leaks in hoses or hydraulic lines and should all be considered serious. High pressure injection injuries may be SERIOUS SURGICAL EMERGENCIES (See First Aid Section 4).

**Storage Conditions:**

Store in properly closed containers that are appropriately labeled and in a cool, well-ventilated area. Do not store near an open flame, heat or other sources of ignition.

**Incompatible Materials**

Strong oxidizing agents.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Name	ACGIH TLV	OSHA PELs:	OSHA - Vacated PELs	NIOSH IDLH
No. 2 Diesel Fuel 68476-34-6	100 mg/m <sup>3</sup> TWA Skin - potential significant contribution to overall exposure by the cutaneous route	-	-	-
Kerosine, Petroleum 8008-20-6	200 mg/m <sup>3</sup> TWA Skin - potential significant contribution to overall exposure by the cutaneous route	-	-	-
Alkanes, C10-C20 branched and linear 928771-01-1	-	-	-	-
Naphthalene 91-20-3	10 ppm TWA Skin - potential significant contribution to overall exposure by the cutaneous route	TWA: 10 ppm TWA: 50 mg/m <sup>3</sup>	10 ppm TWA 50 mg/m <sup>3</sup> TWA 15 ppm STEL 75 mg/m <sup>3</sup> STEL	250 ppm

**Notes:**

The manufacturer has voluntarily elected to provide exposure limits contained in OSHA's 1989 air contaminants standard in its SDSs, even though certain of those exposure limits were vacated in 1992.

**Engineering measures:**

Local or general exhaust required in an enclosed area or with inadequate ventilation. Use mechanical ventilation equipment that is explosion-proof.

**Personal protective equipment**

- Eye protection:** Use goggles or face-shield if the potential for splashing exists.
- Skin and body protection:** Wear neoprene, nitrile or PVA gloves to prevent skin contact. Glove suitability is based on workplace conditions and usage. Contact the glove manufacturer for specific advice on glove selection and breakthrough times.
- Respiratory protection:** Use a NIOSH approved organic vapor chemical cartridge or supplied air respirators when there is the potential for airborne exposures to exceed permissible exposure limits or if excessive vapors are generated. Observe respirator assigned protection factors (APFs) criteria cited in federal OSHA 29 CFR 1910.134. Self-contained breathing apparatus should be used for fire fighting.
- Hygiene measures:** Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Information on basic physical and chemical properties**

<b>Physical State</b>	Liquid
<b>Appearance</b>	Yellow to Red Liquid
<b>Color</b>	Yellow to Red
<b>Odor</b>	Hydrocarbon
<b>Odor Threshold</b>	No data available.

<b><u>Property</u></b>	<b><u>Values (Method)</u></b>
<b>Melting Point / Freezing Point</b>	No data available.
<b>Initial Boiling Point / Boiling Range</b>	154-366 °C / 310-691 °F (ASTM D86)
<b>Flash Point</b>	58-76 °C / 136-168 °F (ASTM D93)
<b>Evaporation Rate</b>	No data available.
<b>Flammability (solid, gas)</b>	Not applicable.
<b>Flammability Limit in Air (%):</b>	
<b>Upper Flammability Limit:</b>	No data available.
<b>Lower Flammability Limit:</b>	No data available.
<b>Explosion limits:</b>	No data available.
<b>Vapor Pressure</b>	No data available.
<b>Vapor Density</b>	No data available.
<b>Specific Gravity / Relative Density</b>	0.82-0.86 (ASTM D4052)
<b>Water Solubility</b>	No data available.
<b>Solubility in other solvents</b>	No data available.
<b>Partition Coefficient</b>	No data available.
<b>Decomposition temperature</b>	No data available.
<b>pH:</b>	Not applicable
<b>Autoignition Temperature</b>	No data available.
<b>Kinematic Viscosity</b>	1.90-3.32 cSt @ 40°C (ASTM D445)
<b>Dynamic Viscosity</b>	No data available.
<b>Explosive Properties</b>	No data available.
<b>VOC Content (%)</b>	No data available.
<b>Density</b>	No data available.
<b>Bulk Density</b>	Not applicable.

**10. STABILITY AND REACTIVITY**

- Reactivity** The product is non-reactive under normal conditions.
- Chemical stability** The material is stable at 70°F, 760 mmHg pressure.

<b><u>Possibility of hazardous reactions</u></b>	None under normal processing.
<b><u>Hazardous polymerization</u></b>	Will not occur.
<b><u>Conditions to avoid</u></b>	Excessive heat, sources of ignition, open flame.
<b><u>Incompatible Materials</u></b>	Strong oxidizing agents.
<b><u>Hazardous decomposition products</u></b>	None known under normal conditions of use.

## 11. TOXICOLOGICAL INFORMATION

### **Potential short-term adverse effects from overexposures**

<b>Inhalation</b>	Harmful if inhaled. May cause irritation of respiratory tract. May cause drowsiness or dizziness. Breathing high concentrations of this material in a confined space or by intentional abuse can cause irregular heartbeats which can cause death.
<b>Eye contact</b>	Exposure to vapor or contact with liquid may cause mild eye irritation, including tearing, stinging, and redness.
<b>Skin contact</b>	Causes skin irritation. Effects may become more serious with repeated or prolonged contact. May be absorbed through the skin in harmful amounts.
<b>Ingestion</b>	May be fatal if swallowed or vomited and enters airways. May cause irritation of the mouth, throat and gastrointestinal tract.

### **Acute toxicological data**

Name	Oral LD50	Dermal LD50	Inhalation LC50
No. 2 Diesel Fuel 68476-34-6	> 5000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	>1 - <5 mg/L (Rat) 4 h
Kerosine, Petroleum 8008-20-6	> 5000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 5.28 mg/L (Rat) 4 h
Alkanes, C10-C20 branched and linear 928771-01-1	-	-	>1 - <5 mg/l (Rat) 4 h
Naphthalene 91-20-3	490 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 340 mg/m <sup>3</sup> (Rat) 1 h

### **Delayed and immediate effects as well as chronic effects from short and long-term exposure**

MIDDLE DISTILLATES, PETROLEUM: Long-term repeated (lifetime) skin exposure to similar materials has been reported to result in an increase in skin tumors in laboratory rodents. The relevance of these findings to humans is not clear at this time. Altered mental state, drowsiness, peripheral motor neuropathy, irreversible brain damage (so-called Petrol Sniffer's Encephalopathy), delirium, seizures, and sudden death have been reported from repeated overexposure to some hydrocarbon solvents, naphthas, and gasoline.

MIDDLE DISTILLATES WITH CRACKED STOCKS: Light cracked distillates have been shown to be carcinogenic in animal tests and have tested positive with in vitro genotoxicity tests. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and reduction in lung function.

ISOPARAFFINS: Studies in laboratory animals have shown that long-term exposure to similar materials (isoparaffins) can cause kidney damage and kidney cancer in male laboratory rats. However, in-depth research indicates that these findings are unique to the male rat, and that these effects are not relevant to humans.

**NAPHTHALENE:** Severe jaundice, neurotoxicity (kernicterus) and fatalities have been reported in young children and infants as a result of hemolytic anemia from overexposure to naphthalene. Persons with glucose 6-phosphate dehydrogenase (G6PD) deficiency are more prone to the hemolytic effects of naphthalene. Adverse effects on the kidney have been reported in persons overexposed to naphthalene but these effects are believed to be a consequence of hemolytic anemia, and not a direct effect. Hemolytic anemia has been observed in laboratory animals exposed to naphthalene. Laboratory rodents exposed to naphthalene vapor for 2 years (lifetime studies) developed non-neoplastic and neoplastic tumors and inflammatory lesions of the nasal and respiratory tract. Cataracts and other adverse effects on the eye have been observed in laboratory animals exposed to high levels of naphthalene. Findings from a large number of bacterial and mammalian cell mutation assays have been negative. A few studies have shown chromosomal effects (elevated levels of Sister Chromatid Exchange or chromosomal aberrations) in vitro. Naphthalene has been classified as Possibly Carcinogenic to Humans (2B) by IARC, based on findings from studies in laboratory animals.

**DIESEL EXHAUST:** The combustion of diesel fuels produces gases including carbon monoxide, carbon dioxide, oxides of nitrogen and/or sulfur, and hydrocarbons that can be irritating and hazardous with overexposure. Long-term occupational overexposure to diesel exhaust and diesel exhaust particulate matter has been associated with an increased risk of respiratory disease, including lung cancer, and is characterized as a “known human carcinogen” by the International Agency for Research on Cancer (IARC), as “a reasonably anticipated human carcinogen” by the National Toxicology Program, and as “likely to be carcinogenic to humans” by the EPA, based upon animal and occupational exposure studies. However, uncertainty exists with these classifications because of deficiencies in the supporting occupational exposure/epidemiology studies, including reliable exposure estimates. Lifetime animal inhalation studies with pulmonary overloading exposure concentrations of diesel exhaust emissions have produced tumors and other adverse health effects. However, in more recent long-term animal inhalation studies of diesel exhaust emissions, no increase in tumor incidence and in fact a substantial reduction in adverse health effects along with significant reductions in the levels of hazardous material emissions were observed and are associated with fuel composition alterations coupled with new technology diesel engines.

**Adverse effects related to the physical, chemical and toxicological characteristics**

**Signs and Symptoms** Irritating to the skin and mucous membranes. Symptoms may include redness, itching, and inflammation. May cause nausea, vomiting, diarrhea, and signs of nervous system depression: headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Aspiration hazard. May cause coughing, chest pains, shortness of breath, pulmonary edema and/or chemical pneumonitis. Repeated or prolonged skin contact may cause drying, reddening, itching and cracking. Prolonged or repeated exposure may cause damage to organs.

**Sensitization** Not expected to be a skin or respiratory sensitizer.

**Mutagenic effects** None known.

**Carcinogenicity** Suspected of causing cancer.

Cancer designations are listed in the table below

Name	ACGIH (Class)	IARC (Class)	NTP	OSHA
No. 2 Diesel Fuel 68476-34-6	Confirmed animal carcinogen (A3)	Not Classifiable (3)	Not Listed	Not Listed
Kerosine, Petroleum 8008-20-6	Confirmed animal carcinogen (A3)	Not Classifiable (3)	Not Listed	Not Listed
Alkanes, C10-C20 branched and linear 928771-01-1	Not Listed	Not Listed	Not Listed	Not Listed
Naphthalene	Confirmed animal	Possible human carcinogen	Reasonably anticipated to	Not Listed



91-20-3	carcinogen (A3)	(2B)	be a human carcinogen
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**Reproductive toxicity** None known.

**Specific Target Organ Toxicity (STOT) - single exposure** Respiratory system. Central nervous system.

**Specific Target Organ Toxicity (STOT) - repeated exposure** Thymus. Liver. Bone marrow.

**Aspiration hazard** May be fatal if swallowed or vomited and enters airways.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity** This product should be considered toxic to aquatic organisms, with the potential to cause long lasting adverse effects in the aquatic environment.

Name	Algae/aquatic plants	Fish	Toxicity to Microorganisms	Crustacea
No. 2 Diesel Fuel 68476-34-6	-	96-hr LC50 = 35 mg/l Fathead minnow (flow-through)	-	48-hr EL50 = 6.4 mg/l Daphnia magna
Kerosine, Petroleum 8008-20-6	72-hr EL50 = 5.0-11 mg/l Algae	96-hr LL50 = 18-25 mg/l Fish	-	48-hr EL50 = 1.4-21 mg/l Invertebrates
Alkanes, C10-C20 branched and linear 928771-01-1	-	-	-	-
Naphthalene 91-20-3	-	96-hr LC50 = 0.91-2.82 mg/l Rainbow trout (static) 96-hr LC50 = 1.99 mg/l Fathead minnow (static)	-	48-hr LC50 = 1.6 mg/l Daphnia magna

**Persistence and degradability** Expected to be inherently biodegradable.

**Bioaccumulation** Has the potential to bioaccumulate.

**Mobility in soil** May partition into air, soil and water.

**Other adverse effects** No information available.

## 13. DISPOSAL CONSIDERATIONS

**Description of Waste Residues**  
This material may be a flammable liquid waste.

**Safe Handling of Wastes**  
Handle in accordance with applicable local, state, and federal regulations. Use personal protection measures as required. Use appropriate grounding and bonding practices. Use only non-sparking tools. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. No smoking.

**Disposal of Wastes / Methods of Disposal**  
The user is responsible for determining if any discarded material is a hazardous waste (40 CFR 262.11). Dispose of in accordance with federal, state and local regulations.

**Methods of Contaminated Packaging Disposal**  
Empty containers should be completely drained and then discarded or recycled, if possible. Do not cut, drill, grind or weld on empty containers since explosive residues may be present. Dispose of in accordance with federal, state and local regulations.

## 14. TRANSPORT INFORMATION



**DOT (49 CFR 172.101):**

**UN Proper Shipping Name:** Fuel Oil, No. 2  
**UN/Identification No:** NA 1993  
**Transport Hazard Class(es):** 3  
**Packing Group:** III

**TDG (Canada):**

**UN Proper Shipping Name:** Diesel Fuel  
**UN/Identification No:** UN 1202  
**Transport Hazard Class(es):** 3  
**Packing Group:** III

**15. REGULATORY INFORMATION**

**US Federal Regulatory Information:**

US TSCA Chemical Inventory Section 8(b): This product and/or its components are listed on the TSCA Chemical Inventory.

**EPA Superfund Amendment & Reauthorization Act (SARA):**

**SARA Section 302:** This product does not contain any component(s) included on EPA's Extremely Hazardous Substance (EHS) List.

Name	CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs
No. 2 Diesel Fuel	NA
Kerosine, Petroleum	NA
Alkanes, C10-C20 branched and linear	NA
Naphthalene	NA

**SARA Section 304:** This product may contain component(s) identified either as an EHS or a CERCLA Hazardous substance which in case of a spill or release may be subject to SARA reporting requirements:

Name	Hazardous Substances RQs
No. 2 Diesel Fuel	NA
Kerosine, Petroleum	NA
Alkanes, C10-C20 branched and linear	NA
Naphthalene	100 lb final RQ 45.4 kg final RQ

**SARA:** The following EPA hazard categories apply to this product:

- Acute Health Hazard
- Fire Hazard
- Chronic Health Hazard

**SARA Section 313:** This product may contain component(s), which if in exceedance of the de minimus threshold, may be subject to the reporting requirements of SARA Title III Section 313 Toxic Release Reporting (Form R).

Name	CERCLA/SARA 313 Emission reporting:
No. 2 Diesel Fuel	None
Kerosine, Petroleum	None
Alkanes, C10-C20 branched and linear	None
Naphthalene	0.1 % de minimis concentration

**State and Community Right-To-Know Regulations:**

The following component(s) of this material are identified on the regulatory lists below:

No. 2 Diesel Fuel

Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	SN 2444
Pennsylvania Right-To-Know:	Not Listed
Massachusetts Right-To Know:	Not Listed
Florida Substance List:	Not Listed
Rhode Island Right-To-Know:	Not Listed
Michigan Critical Materials Register List:	Not Listed
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Not Listed
New Jersey - Environmental Hazardous Substances List:	SN 2444 TPQ: 10000 lb (Under N.J.A.C. 7:1G, environmental hazardous substances in mixtures such as gasoline or new and used petroleum oil may be reported under these categories)
Illinois - Toxic Air Contaminants:	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed
<b>Kerosine, Petroleum</b>	
Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	SN 1091
Pennsylvania Right-To-Know:	Present
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed
Rhode Island Right-To-Know:	Not Listed
Michigan Critical Materials Register List:	Not Listed
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Not Listed
New Jersey - Environmental Hazardous Substances List:	SN 1091 TPQ: 10000 lb (Under N.J.A.C. 7:1G, environmental hazardous substances in mixtures such as gasoline or new and used petroleum oil may be reported under these categories)
Illinois - Toxic Air Contaminants:	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed
<b>Alkanes, C10-C20 branched and linear</b>	
Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	Not Listed
Pennsylvania Right-To-Know:	Not Listed
Massachusetts Right-To Know:	Not Listed
Florida Substance List:	Not Listed
Rhode Island Right-To-Know:	Not Listed
Michigan Critical Materials Register List:	Not Listed
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Not Listed
New Jersey - Environmental Hazardous Substances List:	Not Listed
Illinois - Toxic Air Contaminants:	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed
<b>Naphthalene</b>	
Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Carcinogen, initial date 4/19/02

New Jersey Right-To-Know:	SN 1322 SN 3758
Pennsylvania Right-To-Know:	Environmental hazard Present (particulate)
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed
Rhode Island Right-To-Know:	Toxic; Flammable
Michigan Critical Materials Register List:	Not Listed
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Carcinogen
New Jersey - Environmental Hazardous Substances List:	SN 1322 TPQ: 500 lb (Reportable at the de minimis quantity of >0.1%)
Illinois - Toxic Air Contaminants:	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	100 lb RQ (air); 1 lb RQ (land/water)

**Canada DSL/NDL Inventory:** This product and/or its components are listed either on the Domestic Substances List (DSL) or are exempt.

**Canadian Regulatory Information:** This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the (M)SDS contains all the information required by the Controlled Products Regulations.

Name	Canada - WHMIS: Classifications of Substances:	Canada - WHMIS: Ingredient Disclosure:
No. 2 Diesel Fuel	B3,D2A,D2B	0.1%
Kerosine, Petroleum	B3,D2B	1%
Alkanes, C10-C20 branched and linear	B3,D2A,D2B	0.1%
Naphthalene	B4,D2A	0.1%



**Note:** Not applicable.

## 16. OTHER INFORMATION

**Prepared By** Toxicology and Product Safety

**Revision Date:** 06/01/2016

**Revision Note:**

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is intended as guidance for safe handling, use, processing, storage, transportation, accidental release, clean-up and disposal and is not considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.



# SAFETY DATA SHEET

SDS ID NO.: 0130MAR019  
Revision Date: 05/14/2015

## 1. IDENTIFICATION

**Product Name:** Marathon Petroleum Regular Unleaded Gasoline With Ethanol  
**Synonym:** Regular Unleaded Gasoline With Alcohol  
**Chemical Family:** Complex Hydrocarbon Substance  
**Recommended Use:** Fuel.  
**Use Restrictions:** All others.

**Supplier Name and Address:**  
**MARATHON PETROLEUM COMPANY LP**  
**539 South Main Street**  
**Findlay, OH 45840**

**SDS information:** 1-419-421-3070

**Emergency Telephone:** 1-877-627-5463

## 2. HAZARD IDENTIFICATION

### Classification

#### **OSHA Regulatory Status**

This chemical is considered hazardous according to the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 1
Skin corrosion/irritation	Category 2
Germ cell mutagenicity	Category 1B
Carcinogenicity	Category 1B
Reproductive toxicity	Category 2
Specific target organ toxicity (single exposure)	Category 3
Aspiration toxicity	Category 1
Acute aquatic toxicity	Category 2
Chronic aquatic toxicity	Category 2

#### **Hazards Not Otherwise Classified (HNOC)**

Static accumulating flammable liquid

### Label elements

#### **EMERGENCY OVERVIEW**

#### **Danger**

EXTREMELY FLAMMABLE LIQUID AND VAPOR  
May accumulate electrostatic charge and ignite or explode

May be fatal if swallowed and enters airways  
Causes skin irritation  
May cause respiratory irritation  
May cause drowsiness or dizziness  
May cause genetic defects  
May cause cancer  
Suspected of damaging fertility or the unborn child  
Toxic to aquatic life with long lasting effects



**Appearance** Clear or Colored Liquid

**Physical State** Liquid

**Odor** Strong Hydrocarbon

**Precautionary Statements - Prevention**

Keep away from heat/sparks/open flames/hot surfaces. — No smoking  
Keep container tightly closed  
Ground/bond container and receiving equipment  
Use explosion-proof electrical/ventilating/lighting/equipment  
Use only non-sparking tools  
Take precautionary measures against static discharge  
Obtain special instructions before use  
Do not handle until all safety precautions have been read and understood  
Wear protective gloves/protective clothing/eye protection/face protection  
Do not eat, drink or smoke when using this product  
Do not breathe mist/vapors/spray  
Use only outdoors or in a well-ventilated area  
Wash hands thoroughly after handling  
Avoid release to the environment

**Precautionary Statements - Response**

IF exposed or concerned: Get medical attention  
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower  
If skin irritation occurs: Get medical attention  
Wash contaminated clothing before reuse  
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing  
Call a POISON CENTER or doctor if you feel unwell  
IF SWALLOWED: Immediately call a POISON CENTER or doctor  
Do NOT induce vomiting  
In case of fire: Use water spray, fog or regular foam for extinction  
Collect spillage

**Precautionary Statements - Storage**

Store in a well-ventilated place. Keep container tightly closed  
Keep cool  
Store locked up

**Precautionary Statements - Disposal**

Dispose of contents/container at an approved waste disposal plant

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Gasoline is a complex combination of hydrocarbons consisting of paraffins, cycloparaffins, aromatic and olefinic hydrocarbons having molecular chains ranging in length from four to ten carbons. May contain small amounts of dye and other additives (>0.02%) which are not considered hazardous at the concentrations used.

**Composition Information:**

Name	CAS Number	Weight %
Gasoline	86290-81-5	100
Toluene	108-88-3	0.9-13.5
Ethyl Alcohol	64-17-5	5.7-10
Xylene (mixed isomers)	1330-20-7	1.8-9
1,2,4 Trimethylbenzene	95-63-6	0.9-4.5
Benzene	71-43-2	0.45-3.2
n-Hexane	110-54-3	0-2.7
Ethylbenzene	100-41-4	0.45-1.8
Naphthalene	91-20-3	0.1-0.5

**4. FIRST AID MEASURES**

**First Aid Measures**

- General advice** In case of accident or if you feel unwell, seek medical advice immediately (show directions for use or safety data sheet if possible).
- Inhalation:** Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear, give oxygen and continue to monitor. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.
- Skin Contact:** Immediately wash exposed skin with plenty of soap and water while removing contaminated clothing and shoes. May be absorbed through the skin in harmful amounts. Get medical attention if irritation persists. Any injection injury from high pressure equipment should be evaluated immediately by a physician as potentially serious (See NOTES TO PHYSICIAN).  
  
Place contaminated clothing in closed container until cleaned or discarded. If clothing is to be laundered, inform the person performing the operation of contaminant's hazardous properties. Destroy contaminated, non-chemical resistant footwear.
- Eye Contact:** Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Gently remove contacts while flushing. Get medical attention if irritation persists.
- Ingestion:** Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs, keep head below hips, or if patient is lying down, turn body and head to side to prevent aspiration and monitor for breathing difficulty. Never give anything by mouth to an unconscious person. Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

**Most important signs and symptoms, both short-term and delayed with overexposure**

- Adverse Effects:** Acute: Headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Delayed: Dry skin and possible irritation with repeated or prolonged exposure.

**Indication of any immediate medical attention and special treatment needed**

**NOTES TO PHYSICIAN:**

**INHALATION:** This material (or a component) sensitizes the myocardium to the effects of sympathomimetic amines. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in individuals exposed to this material. Administration of sympathomimetic drugs should be avoided.

**SKIN:** Leaks or accidents involving high-pressure equipment may inject a stream of material through the skin and initially produce an injury that may not appear serious. Only a small puncture wound may appear on the skin surface but, without proper treatment and depending on the nature, original pressure, volume, and location of the injected material, can compromise blood supply to an affected body part. Prompt surgical debridement of the wound may be necessary to prevent irreversible loss of function and/or the affected body part. High pressure injection injuries may be **SERIOUS SURGICAL EMERGENCIES**.

**INGESTION:** This material represents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended.

**5. FIRE-FIGHTING MEASURES**

**Suitable extinguishing media**

For small fires, Class B fire extinguishing media such as CO2, dry chemical, foam (AFFF/ATC) or water spray can be used. For large fires, water spray, fog or foam (AFFF/ATC) can be used. Firefighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

**Unsuitable extinguishing media**

Do not use straight water streams to avoid spreading fire.

**Specific hazards arising from the chemical**

This product has been determined to be an extremely flammable liquid per the OSHA Hazard Communication Standard and should be handled accordingly. May accumulate electrostatic charge and ignite or explode. Vapors may travel along the ground or be moved by ventilation and ignited by many sources such as pilot lights, sparks, electric motors, static discharge, or other ignition sources at locations distant from material handling. Flashback can occur along vapor trail. For additional fire related information, see NFPA 30 or the North American Emergency Response Guide 128.

**Hazardous combustion products**

Smoke, carbon monoxide, and other products of incomplete combustion.

**Explosion data**

**Sensitivity to Mechanical Impact** No.

**Sensitivity to Static Discharge** Yes.

**Special protective equipment and precautions for firefighters**

Firefighters should wear full protective clothing and positive-pressure self-contained breathing apparatus (SCBA) with a full face-piece, as appropriate. Avoid using straight water streams. Water may be ineffective in extinguishing low flash point fires, but can be used to cool exposed surfaces. Avoid excessive water spray application. Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and from as far a distance as possible. Keep run-off water out of sewers and water sources.

**NFPA:** Health 1 Flammability 3 Instability 0 Special Hazards -

**6. ACCIDENTAL RELEASE MEASURES**

**Personal Precautions:**

Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Eliminate all ignition sources.

**Protective Equipment:**

Use personal protection measures as recommended in Section 8.

**Emergency Procedures:**

Advise authorities and National Response Center (800-424-8802) if the product has entered a water course or sewer. Notify local health and pollution control agencies, if appropriate.

<b>Environmental precautions:</b>	Ethanol in gasoline phase separates in contact with water. Monitor downstream for dissolved ethanol or other appropriate indicators. Avoid release to the environment. Avoid subsoil penetration.
<b>Methods and materials for containment:</b>	Contain liquid with sand or soil.
<b>Methods and materials for cleaning up:</b>	Use suitable absorbent materials such as vermiculite, sand, or clay to clean up residual liquids. Recover and return free product to proper containers. When recovering free liquids ensure all equipment is grounded and bonded. Use only non-sparking tools.

## 7. HANDLING AND STORAGE

**Safe Handling Precautions:** NEVER SIPHON THIS PRODUCT BY MOUTH. Use appropriate grounding and bonding practices. Static accumulating flammable liquid. Bonding and grounding may be insufficient to eliminate the hazard from static electricity. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. No smoking. Avoid repeated and prolonged skin contact. Use personal protection measures as recommended in Section 8. Use only non-sparking tools. Do not cut, drill, grind or weld on empty containers since explosive residues may remain. Refer to applicable EPA, OSHA, NFPA and consistent state and local requirements.

Hydrocarbons are basically non-conductors of electricity and can become electrostatically charged during mixing, filtering, pumping at high flow rates or loading and transfer operations. If this charge reaches a sufficiently high level, sparks can form that may ignite the vapors of flammable liquids. Sudden release of hot organic chemical vapors or mists from process equipment operating under elevated temperature and pressure, or sudden ingress of air into vacuum equipment may result in ignition of vapors or mists without the presence of obvious ignition sources. Nozzle spouts must be kept in contact with the containers or tank during the entire filling operation.

Portable containers should never be filled while in or on a motor vehicle or marine craft. Containers should be placed on the ground. Static electric discharge can ignite fuel vapors when filling non-grounded containers or vehicles on trailers. The nozzle spout must be kept in contact with the container before and during the entire filling operation. Use only approved containers.

A buildup of static electricity can occur upon re-entry into a vehicle during fueling especially in cold or dry climate conditions. The charge is generated by the action of dissimilar fabrics (i.e., clothing and upholstery) rubbing across each other as a person enters/exits the vehicle. A flash fire can result from this discharge if sufficient flammable vapors are present. Therefore, do not get back in your vehicle while refueling.

Cellular phones and other electronic devices may have the potential to emit electrical charges (sparks). Sparks in potentially explosive atmospheres (including fueling areas such as gas stations) could cause an explosion if sufficient flammable vapors are present. Therefore, turn off cellular phones and other electronic devices when working in potentially explosive atmospheres or keep devices inside your vehicle during refueling.

High-pressure injection of any material through the skin is a serious medical emergency even though the small entrance wound at the injection site may not initially appear serious. These injection injuries can occur from high-pressure equipment such as paint spray or grease or guns, fuel injectors, or pinhole leaks in hoses or hydraulic lines and should all be considered serious. High pressure injection injuries may be SERIOUS SURGICAL EMERGENCIES (See First Aid Section 4).

**Storage Conditions:** Store in properly closed containers that are appropriately labeled and in a cool, well-ventilated area.

**Incompatible materials** Strong oxidizing agents.



## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	ACGIH TLV	OSHA PELs:	OSHA - Vacated PELs	NIOSH IDLH
Gasoline 86290-81-5	300 ppm TWA 500 ppm STEL	-	300 ppm TWA 900 mg/m <sup>3</sup> TWA 500 ppm STEL 1500 mg/m <sup>3</sup> STEL	-
Toluene 108-88-3	20 ppm TWA	TWA: 200 ppm Ceiling: 300 ppm	100 ppm TWA 375 mg/m <sup>3</sup> TWA 150 ppm STEL 560 mg/m <sup>3</sup> STEL	500 ppm
Ethyl Alcohol 64-17-5	1000 ppm STEL	TWA: 1000 ppm TWA: 1900 mg/m <sup>3</sup>	1000 ppm TWA 1900 mg/m <sup>3</sup> TWA	3300 ppm
Xylene (mixed isomers) 1330-20-7	100 ppm TWA 150 ppm STEL	TWA: 100 ppm TWA: 435 mg/m <sup>3</sup>	100 ppm TWA 435 mg/m <sup>3</sup> TWA 150 ppm STEL 655 mg/m <sup>3</sup> STEL	900 ppm
1,2,4 Trimethylbenzene 95-63-6	25 ppm TWA	-	25 ppm TWA 125 mg/m <sup>3</sup> TWA	-
Benzene 71-43-2	0.5 ppm TWA 2.5 ppm STEL Skin - potential significant contribution to overall exposure by the cutaneous route	TWA: 10 ppm (applies to industry segments exempt from the benzene standard at 29 CFR 1910.1028) TWA: 1 ppm STEL: 5 ppm (see 29 CFR 1910.1028)	25 ppm Ceiling 1 ppm TWA 5 ppm STEL	500 ppm
n-Hexane 110-54-3	50 ppm TWA Skin - potential significant contribution to overall exposure by the cutaneous route	TWA: 500 ppm TWA: 1800 mg/m <sup>3</sup>	50 ppm TWA 180 mg/m <sup>3</sup> TWA	1100 ppm
Ethylbenzene 100-41-4	20 ppm TWA	TWA: 100 ppm TWA: 435 mg/m <sup>3</sup>	100 ppm TWA 435 mg/m <sup>3</sup> TWA 125 ppm STEL 545 mg/m <sup>3</sup> STEL	800 ppm
Naphthalene 91-20-3	10 ppm TWA Skin - potential significant contribution to overall exposure by the cutaneous route	TWA: 10 ppm TWA: 50 mg/m <sup>3</sup>	10 ppm TWA 50 mg/m <sup>3</sup> TWA 15 ppm STEL 75 mg/m <sup>3</sup> STEL	250 ppm

**Notes:** The manufacturer has voluntarily elected to provide exposure limits contained in OSHA's 1989 air contaminants standard in its SDSs, even though certain of those exposure limits were vacated in 1992.

**Engineering measures:** Local or general exhaust required in an enclosed area or when there is inadequate ventilation. Use mechanical ventilation equipment that is explosion-proof.

**Personal protective equipment**

**Eye protection:** Use goggles or face-shield if the potential for splashing exists.

**Skin and body protection:** Use nitrile rubber, viton or PVA gloves for repeated or prolonged skin exposure. Glove suitability is based on workplace conditions and usage. Contact the glove manufacturer for specific advice on glove selection and breakthrough times.

**Respiratory protection:** Approved organic vapor chemical cartridge or supplied air respirators should be worn for exposures to any components exceeding the established exposure limits. Observe respirator assigned protection factors (APFs) criteria cited in federal OSHA 29 CFR 1910.134. Self-contained breathing apparatus should be used for fire fighting.

**Hygiene measures:** Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

<b>Physical State</b>	Liquid
<b>Appearance</b>	Clear or Colored Liquid
<b>Color</b>	Clear or Colored
<b>Odor</b>	Strong Hydrocarbon
<b>Odor Threshold</b>	No available data.

<u>Property</u>	<u>Values (Method)</u>
<b>Melting Point / Freezing Point</b>	No available data.
<b>Initial Boiling Point / Boiling Range</b>	32-225 °C / 90-437 °F
<b>Flash Point</b>	-45.5 °C / -50 °F
<b>Evaporation Rate</b>	No available data.
<b>Flammability (solid, gas)</b>	Not applicable.
<b>Flammability Limit in Air (%)</b>	
Upper Flammability Limit:	7.6
Lower Flammability Limit:	1.4
<b>Vapor Pressure</b>	403-776 mm Hg@ 100°F
<b>Vapor Density</b>	3-4
<b>Specific Gravity / Relative Density</b>	0.70-0.77
<b>Water Solubility</b>	Negligible
<b>Solubility in other solvents</b>	No available data.
<b>Partition Coefficient</b>	2.13-4.5
<b>Decomposition temperature:</b>	No available data.
<b>pH:</b>	Not applicable
<b>Autoignition Temperature</b>	C.A. 257 °C / 495 °F
<b>Kinematic Viscosity</b>	No available data.
<b>Dynamic Viscosity</b>	No available data.
<b>Explosive Properties</b>	No available data.
<b>Softening Point</b>	No available data.
<b>VOC Content (%)</b>	100%
<b>Density</b>	5.9-6.3 lbs/gal
<b>Bulk Density</b>	Not applicable.

## 10. STABILITY AND REACTIVITY

<b><u>Reactivity</u></b>	The product is non-reactive under normal conditions.
<b><u>Chemical stability</u></b>	The material is stable at 70°F, 760 mmHg pressure.
<b><u>Possibility of hazardous reactions</u></b>	None under normal processing.
<b><u>Hazardous polymerization</u></b>	Will not occur.
<b><u>Conditions to avoid</u></b>	Excessive heat, sources of ignition, open flame.
<b><u>Incompatible materials</u></b>	Strong oxidizing agents.
<b><u>Hazardous decomposition products</u></b>	None known under normal conditions of use.

## 11. TOXICOLOGICAL INFORMATION

### Potential short-term adverse effects from overexposures

<b>Inhalation</b>	Irritating to the respiratory system. May cause drowsiness or dizziness. Breathing high concentrations of this material in a confined space or by intentional abuse can cause irregular heartbeats which can cause death.
<b>Eye contact</b>	Causes mild eye irritation.
<b>Skin contact</b>	Causes skin irritation. Effects may become more serious with repeated or prolonged contact. May be absorbed through the skin in harmful amounts.
<b>Ingestion</b>	May be fatal if swallowed or vomited and enters airways. May cause irritation of the mouth, throat and gastrointestinal tract.

**Acute Toxicological data**

Name	Oral LD50	Dermal LD50	Inhalation LC50
Gasoline 86290-81-5	14000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 5.2 mg/L (Rat) 4 h
Toluene 108-88-3	> 2000 mg/kg (Rat)	8390 mg/kg (Rabbit)	12.5 mg/L (Rat) 4 h
Ethyl Alcohol 64-17-5	> 5000 mg/kg (Rat)	-	124.7 mg/L (Rat) 4 h
Xylene (mixed isomers) 1330-20-7	> 2000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 5.04 mg/L (Rat) 4 h
1,2,4 Trimethylbenzene 95-63-6	3280 mg/kg (Rat)	> 3160 mg/kg (Rabbit)	18,000 mg/m <sup>3</sup> (Rat) 4 h
Benzene 71-43-2	> 2000 mg/kg (Rat)	> 5000 mg/kg (Rabbit)	> 20 mg/l (Rat) 4 h
n-Hexane 110-54-3	15000 mg/kg (Rat)	3000 mg/kg (Rabbit)	48000 ppm (Rat) 4 h
Ethylbenzene 100-41-4	> 2000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	17.2 mg/L (Rat) 4 h
Naphthalene 91-20-3	490 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 340 mg/m <sup>3</sup> (Rat) 1 h

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**BENZENE:** Studies of workers exposed to benzene show clear evidence that overexposure can cause cancer and other diseases of the blood forming organs including Acute Myelogenous Leukemia (AML), and Aplastic Anemia (AA), an often fatal disease. Some studies suggest overexposure to benzene may also be associated with Myelodysplastic Syndrome (MDS). Findings from a case control study of workers exposed to benzene was reported during the 2009 Benzene Symposium in Munich included an increase in Acute Myeloid Leukemias and Non-Hodgkins Lymphoid Neoplasms (NHLN) of the subtype follicular lymphoma (FL) in some occupational categories. Some studies of workers exposed to benzene have shown an association with increased rates of chromosome aberrations in circulating lymphocytes. One study of women workers exposed to benzene suggested a weak association with irregular menstruation. However, other studies of workers exposed to benzene have not demonstrated clear evidence of an effect on fertility or reproductive outcome in humans. Benzene can cross the placenta and affect the developing fetus. Cases of AA have been reported in the offspring of persons severely overexposed to benzene. Studies in laboratory animals indicate that prolonged, repeated exposure to high levels of benzene vapor can cause bone marrow suppression and cancer in multiple organ systems. Studies in laboratory animals show evidence of adverse effects on male reproductive organs following high levels of exposure but no significant effects on reproduction have been observed. Embryotoxicity has been reported in studies of laboratory animals but effects were limited to reduced fetal weight and minor skeletal variations. Benzene has been classified as a proven human carcinogen by OSHA and a Group 1 (Carcinogenic to Humans) material by IARC. The current proposed IARC classification for benzene is summarized as follows: Sufficient evidence for Acute Myeloid Leukemia; limited evidence for Acute Lymphatic Leukemia, Chronic Lymphatic Leukemia, Non-Hodgkin Lymphoma, and Multiple Myeloma.

**NAPHTHAS:** In a large epidemiological study on over 15,000 employees at several petroleum refineries and amongst residents located near these refineries, no increased risk of kidney cancer was observed in association with gasoline exposures (a similar material). In a similar study, no increased risk of kidney cancer was observed among petroleum refinery workers, but there was a slight trend in the incidence of kidney cancers among service station employees, especially after a 30-year latency period. Altered mental state, drowsiness, peripheral motor neuropathy, irreversible brain damage (so-called Petrol Sniffer's Encephalopathy), delirium, seizures, and sudden death have been reported from repeated overexposure to some hydrocarbon solvents, naphthas, and gasoline.

**ISOPARAFFINS:** Studies in laboratory animals have shown that long-term exposure to similar materials (isoparaffins) can cause kidney damage and kidney cancer in male laboratory rats. However, in-depth research indicates that these findings are unique to the male rat, and that these effects are not relevant to humans.

**TOLUENE:** Case studies of persons abusing toluene suggest isolated incidences of adverse effects on the fetus including birth defects. Abuse of toluene at high concentrations (e.g., glue sniffing and solvent abuse) has been associated with adverse effects on the liver, kidney and nervous system, and can cause CNS depression, cardiac arrhythmias, and death. Studies of workers indicate longterm exposure may be related to impaired color vision and hearing. Some studies of workers suggest longterm exposure may be related to neurobehavioral and cognitive changes. Some of these effects have been observed in laboratory animals following repeated exposure to high levels of toluene. Several studies of workers suggest longterm exposure may be related to small increases in spontaneous abortions and changes in some gonadotropic hormones. However, the weight of evidence does not indicate toluene is a reproductive hazard to humans. Studies in laboratory animals indicate some changes in reproductive organs following high levels of exposure, but no significant effects on mating performance or reproduction were observed. Case studies of persons abusing toluene suggest isolated incidences of adverse effects on the fetus including birth defects. Findings in laboratory animals have been largely negative. Positive findings include small increases in minor skeletal and visceral malformations and developmental delays following very high levels of maternal exposure. Studies of workers indicate long-term exposure may be related to effects on the liver, kidney and blood, but these appear to be limited to changes in serum enzymes and decreased leukocyte counts. Adverse effects on the liver, kidney, thymus and nervous system were observed in animal

studies following very high levels of exposure. The relevance of these findings to humans is not clear at this time.

**ETHYLBENZENE:** Findings from a 2-year inhalation study in rodents conducted by NTP were as follows: Effects were observed only at the highest exposure level (750 ppm). At this level the incidence of renal tumors was elevated in male rats (tubular carcinomas) and female rats (tubular adenomas). The incidence of tumors was also elevated in male mice (alveolar and bronchiolar carcinomas) and female mice (hepatocellular carcinomas). IARC has classified ethyl benzene as "possibly carcinogenic to humans" (Group 2B). Studies in laboratory animals indicate some evidence of post-implantation deaths following high levels of maternal exposure. The relevance of these findings to humans is not clear at this time. Studies in laboratory animals indicate limited evidence of renal malformations, resorptions, and developmental delays following high levels of maternal exposure with evidence of maternal toxicity. The relevance of these findings to humans is not clear at this time. Studies in laboratory animals have demonstrated evidence of ototoxicity (hearing loss) following exposure levels as low as 300 ppm for 5 days. Studies in laboratory animals indicate some evidence of adverse effects on the liver, kidney, thyroid, and pituitary gland.

**XYLENES, ALL ISOMERS:** Overexposure to xylene may cause upper respiratory tract irritation, headache, cyanosis, blood serum changes, nervous system damage and narcosis. Effects may be increased by the use of alcoholic beverages. Evidence of liver and kidney impairment were reported in workers recovering from a gross overexposure. Effects from Prolonged or Repeated Exposure: Impaired neurological function was reported in workers exposed to solvents including xylene. Studies in laboratory animals have shown evidence of impaired hearing following high levels of exposure. Studies in laboratory animals suggest some changes in reproductive organs following high levels of exposure but no significant effects on reproduction were observed. Studies in laboratory animals indicate skeletal and visceral malformations, developmental delays, and increased fetal resorptions following extremely high levels of maternal exposure with evidence of maternal toxicity. The relevance of these observations to humans is not clear at this time. Adverse effects on the liver, kidney, bone marrow (changes in blood cell parameters) were observed in laboratory animals following high levels of exposure. The relevance of these observations to humans is not clear at this time.

**C9 AROMATIC HYDROCARBONS:** A developmental inhalation study was conducted in laboratory mice. Increased implantation losses, reduced fetal weights, delayed ossification and an increased incidence of cleft palate were observed at the highest exposure level (1,500 ppm). This exposure level was extremely toxic to pregnant female mice (44% mortality). Reduced fetal body weights were also observed at 500 ppm. A multi-generation reproduction inhalation study was conducted in laboratory rats. Reductions in pup weights, pup weight gain, litter size, and pup survival were observed at 1,500 ppm, an exposure level at which significant maternal toxicity was observed. Reduced pup weight gain was also observed at 500 ppm.

**NAPHTHALENE:** Severe jaundice, neurotoxicity (kernicterus) and fatalities have been reported in young children and infants as a result of hemolytic anemia from overexposure to naphthalene. Persons with glucose 6-phosphate dehydrogenase (G6PD) deficiency are more prone to the hemolytic effects of naphthalene. Adverse effects on the kidney have been reported in persons overexposed to naphthalene but these effects are believed to be a consequence of hemolytic anemia, and not a direct effect. Hemolytic anemia has been observed in laboratory animals exposed to naphthalene. Laboratory rodents exposed to naphthalene vapor for 2 years (lifetime studies) developed non-neoplastic and neoplastic tumors and inflammatory lesions of the nasal and respiratory tract. Cataracts and other adverse effects on the eye have been observed in laboratory animals exposed to high levels of naphthalene. Findings from a large number of bacterial and mammalian cell mutation assays have been negative. A few studies have shown chromosomal effects (elevated levels of Sister Chromatid Exchange or chromosomal aberrations) in vitro. Naphthalene has been classified as Possibly Carcinogenic to Humans (2B) by IARC, based on findings from studies in laboratory animals.

**N-HEXANE:** Long-term or repeated exposure to n-hexane can cause peripheral nerve

damage. Initial symptoms are numbness of the fingers and toes. Also, motor weakness can occur in the digits, but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. Testicular atrophy and partial to full loss of the germ cell line were observed in sub-chronic high-dose inhalation studies of laboratory rodents. These effects appeared irreversible. Rodent reproduction studies have shown evidence of reduced fetal weight but no frank malformations.

PENTANES: Studies of pentane isomers in laboratory animals indicate exposure to extremely high levels (roughly 10 vol.%) may induce cardiac arrhythmias (irregular heartbeats) which may be serious or fatal.

ETHANOL: Repeated ingestion of ethanol can result in alcohol abuse, causing behavioral changes, memory loss, impaired judgement, decreased appetite, irregular heartbeats, and decreased fertility. Prolonged and repeated ingestion of ethanol has also been associated with cancers of the mouth, pharynx, esophagus and liver. Ethanol ingestion by pregnant women can cause miscarriage, low birth weight, premature birth and fetal alcohol syndrome. In males, acute and chronic alcohol ingestion may affect gonadal hormone levels. It may also affect the liver, kidney, brain, blood and cardiovascular system.

CARBON MONOXIDE: is a chemical asphyxiant with no warning properties (such as odor). At 400-500 ppm for 1 hour headache and dyspnea may occur. If activity is increased, symptoms of overexposure may include nausea, irritability, increased respiration, tinnitus, sweating, chest pain, confusion, impaired judgement, dizziness, weakness, drowsiness, ataxia, irregular heart beat, cyanosis and pallor. Levels in excess of 1000 ppm can result in collapse, loss of consciousness, respiratory failure and death. Extremely high concentrations (12,800 ppm) can cause immediate unconsciousness and death in 1-3 minutes. Repeated anoxia can lead to central nervous system damage and peripheral neuropathy, with loss of sensation in the fingers, amnesia, and mental deterioration and possible congestive heart failure. Damage may also occur to the fetus, lung, liver, kidney, spleen, cardiovascular system and other organs.

COMBUSTION ENGINE EXHAUST: Chronic inhalation studies of gasoline engine exhaust in mice, rats and hamsters did not produce any carcinogenic effects. Condensates/extracts of gasoline engine exhaust produced an increase in tumors compared to controls when testing by skin painting, subcutaneous injection, intratracheal instillation or implantation into the lungs.

**Adverse effects related to the physical, chemical and toxicological characteristics**

**Signs & Symptoms** Nausea, vomiting, signs of nervous system depression: headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue.

**Sensitization** Not expected to be a skin or respiratory sensitizer.

**Mutagenic effects** May cause genetic defects.

**Carcinogenicity** Cancer designations are listed in the table below.

Name	ACGIH (Class)	IARC (Class)	NTP	OSHA
Gasoline 86290-81-5	Confirmed animal carcinogen (A3)	Possibly Carcinogenic (2B)	Not Listed	Not Listed
Toluene 108-88-3	Not Classifiable (A4)	Not Classifiable (3)	Not Listed	Not Listed
Ethyl Alcohol 64-17-5	Confirmed animal carcinogen (A3)	Carcinogenic (1) Alcoholic Beverages	Known to be human carcinogen - Alcoholic Beverage Consumption	Not Listed
Xylene (mixed isomers) 1330-20-7	Not Classifiable (A4)	Not Classifiable (3)	Not Listed	Not Listed
1,2,4 Trimethylbenzene 95-63-6	Not Listed	Not Listed	Not Listed	Not Listed

Benzene 71-43-2	Confirmed human carcinogen (A1)	Carcinogenic to humans (1)	Known to be human carcinogen	Known carcinogen
n-Hexane 110-54-3	Not Listed	Not Listed	Not Listed	Not Listed
Ethylbenzene 100-41-4	Confirmed animal carcinogen (A3)	Possible human carcinogen (2B)	Not Listed	Not Listed
Naphthalene 91-20-3	Confirmed animal carcinogen (A3)	Possible human carcinogen (2B)	Reasonably anticipated to be a human carcinogen	Not Listed

**Reproductive toxicity** Suspected of damaging fertility or the unborn child.

**Specific Target Organ Toxicity (STOT) - single exposure** Respiratory system. Central nervous system.

**Specific Target Organ Toxicity (STOT) - repeated exposure** Not classified.

**Aspiration hazard** May be fatal if swallowed or vomited and enters airways.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity** This product should be considered toxic to aquatic organisms, with the potential to cause long lasting adverse effects in the aquatic environment.

Name	Algae/aquatic plants	Fish	Toxicity to Microorganisms	Crustacea
Gasoline 86290-81-5	72-hr EC50 = 56 mg/l Algae	96-hr LC50 = 11 mg/l Rainbow trout (static)	-	48-hr LC50 = 7.6 mg/l Daphnia magna
Toluene 108-88-3	72-hr EC50 = 12.5 mg/l Algae	96-hr LC50 <= 10 mg/l Rainbow trout	-	48-hr EC50 = 5.46-9.83 mg/l Daphnia magna 48-hr EC50 = 11.5 mg/l Daphnia magna (Static)
Ethyl Alcohol 64-17-5	-	96-hr LC50 >1,000 mg/l Rainbow Trout (static) 96-hr LC50 >100 mg/l Fathead minnow (static)	-	48-hr LC50 >1,000 mg/l Daphnia magna
Xylene (mixed isomers) 1330-20-7	72-hr EC50 = 11 mg/l Algae	96-hr LC50 = 8 mg/l Rainbow trout	-	48-hr LC50 = 3.82 mg/l Daphnia magna
1,2,4 Trimethylbenzene 95-63-6	-	96-hr LC50 = 7.19-8.28 mg/l Fathead minnow (flow-through)	-	48-hr EC50 = 6.14 mg/L Daphnia magna
Benzene 71-43-2	72-hr EC50 = 29 mg/l Algae	96-hr LC50 = 5.3 mg/l Rainbow trout (flow-through)	-	48-hr EC50 = 8.76-15.6 mg/l Daphnia magna (Static)
n-Hexane 110-54-3	-	96-hr LC50 = 2.5 mg/l Fathead minnow	-	-
Ethylbenzene 100-41-4	72-hr EC50 = 1.7-7.6 mg/l Algae	96-hr LC50 = 4 mg/L Rainbow trout	-	48-hr EC50 = 1-4 mg/L Daphnia magna
Naphthalene 91-20-3	-	96-hr LC50 = 0.91-2.82 mg/l Rainbow trout (static) 96-hr LC50 = 1.99 mg/l Fathead minnow (static)	-	48-hr LC50 = 1.6 mg/l Daphnia magna

**Persistence and degradability** Expected to be inherently biodegradable. The presence of ethanol in this product may impede the biodegradation of benzene, toluene, ethylbenzene and xylene in groundwater, resulting in elongated plumes of these constituents.

**Bioaccumulation** Has the potential to bioaccumulate.

**Mobility in soil** May partition into air, soil and water.

**Other adverse effects** No information available.

### 13. DISPOSAL CONSIDERATIONS

**Description of Waste Residues**

This material may be a flammable liquid waste.

**Safe Handling of Wastes**

Handle in accordance with applicable local, state, and federal regulations. Use personal protection measures as required. Use appropriate grounding and bonding practices. Use only non-sparking tools. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. No smoking.

**Disposal of Wastes / Methods of Disposal**

The user is responsible for determining if any discarded material is a hazardous waste (40 CFR 262.11). Dispose of in accordance with federal, state and local regulations.

**Methods of Contaminated Packaging Disposal**

Empty containers should be completely drained and then discarded or recycled, if possible. Do not cut, drill, grind or weld on empty containers since explosive residues may be present. Dispose of in accordance with federal, state and local regulations.

### 14. TRANSPORT INFORMATION

**DOT (49 CFR 172.101):**

<b>UN Proper shipping name:</b>	Gasoline
<b>UN/Identification No:</b>	UN 1203
<b>Transport Hazard Class(es):</b>	3
<b>Packing group:</b>	II

**TDG (Canada):**

<b>UN Proper shipping name:</b>	Gasoline
<b>UN/Identification No:</b>	UN 1203
<b>Transport Hazard Class(es):</b>	3
<b>Packing group:</b>	II

### 15. REGULATORY INFORMATION

**US Federal Regulatory Information:**

US TSCA Chemical Inventory Section 8(b):	This product and/or its components are listed on the TSCA Chemical Inventory.
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**EPA Superfund Amendment & Reauthorization Act (SARA):**

**SARA Section 302:** This product does not contain any component(s) included on EPA's Extremely Hazardous Substance (EHS) List.

Name	CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs
Gasoline	NA
Toluene	NA
Ethyl Alcohol	NA
Xylene (mixed isomers)	NA
1,2,4 Trimethylbenzene	NA
Benzene	NA
n-Hexane	NA
Ethylbenzene	NA
Naphthalene	NA

**SARA Section 304:** This product may contain component(s) identified either as an EHS or a CERCLA Hazardous substance which in case of a spill or release may be subject to SARA reporting requirements:



Name	CERCLA/SARA - Hazardous Substances and their Reportable Quantities
Gasoline	NA
Toluene	1000 lb final RQ 454 kg final RQ
Ethyl Alcohol	NA
Xylene (mixed isomers)	100 lb final RQ 45.4 kg final RQ
1,2,4 Trimethylbenzene	NA
Benzene	10 lb final RQ 4.54 kg final RQ
n-Hexane	5000 lb final RQ 2270 kg final RQ
Ethylbenzene	1000 lb final RQ 454 kg final RQ
Naphthalene	100 lb final RQ 45.4 kg final RQ

**SARA:** The following EPA hazard categories apply to this product:

- Acute Health Hazard
- Chronic Health Hazard
- Fire Hazard

**SARA Section 313:** This product may contain component(s), which if in exceedance of the de minimus threshold, may be subject to the reporting requirements of SARA Title III Section 313 Toxic Release Reporting (Form R).

Name	CERCLA/SARA 313 Emission reporting:
Gasoline	None
Toluene	1.0 % de minimis concentration
Ethyl Alcohol	None
Xylene (mixed isomers)	1.0 % de minimis concentration
1,2,4 Trimethylbenzene	None
Benzene	0.1 % de minimis concentration
n-Hexane	1.0 % de minimis concentration
Ethylbenzene	0.1 % de minimis concentration
Naphthalene	0.1 % de minimis concentration

**State and Community Right-To-Know Regulations:**

The following component(s) of this material are identified on the regulatory lists below:

**Gasoline**

- |   |   |
|---|---|
| Louisiana Right-To-Know:                              | Not Listed.   |
| California Proposition 65:                            | Not Listed.   |
| New Jersey Right-To-Know:                             | SN 0957   |
| Pennsylvania Right-To-Know:                           | Present   |
| Massachusetts Right-To Know:                          | Present   |
| Florida Substance List:                               | Not Listed.   |
| Rhode Island Right-To-Know:                           | Not Listed.   |
| Michigan Critical Materials Register List:            | Not Listed.   |
| Massachusetts Extraordinarily Hazardous Substances:   | Not Listed.   |
| California - Regulated Carcinogens:                   | Not Listed.   |
| Pennsylvania RTK - Special Hazardous Substances:      | Not Listed.   |
| New Jersey - Special Hazardous Substances:            | Carcinogen; Flammable - third degree  |
| New Jersey - Environmental Hazardous Substances List: | SN 0957 TPQ: 10000 lb (Under N.J.A.C. 7:1G, environmental hazardous substances in mixtures such as gasoline or new and used petroleum oil may be reported under these categories) |
| Illinois - Toxic Air Contaminants                     | Present   |

<p>New York - Reporting of Releases Part 597 - List of Hazardous Substances:</p> <p>Toluene</p> <p>Louisiana Right-To-Know: California Proposition 65:</p> <p>New Jersey Right-To-Know: Pennsylvania Right-To-Know: Massachusetts Right-To Know: Florida Substance List: Rhode Island Right-To-Know: Michigan Critical Materials Register List: Massachusetts Extraordinarily Hazardous Substances: California - Regulated Carcinogens: Pennsylvania RTK - Special Hazardous Substances: New Jersey - Special Hazardous Substances: New Jersey - Environmental Hazardous Substances List: Illinois - Toxic Air Contaminants New York - Reporting of Releases Part 597 - List of Hazardous Substances:</p> <p>Ethyl Alcohol</p> <p>Louisiana Right-To-Know: California Proposition 65:</p> <p>New Jersey Right-To-Know: Pennsylvania Right-To-Know: Massachusetts Right-To Know: Florida Substance List: Rhode Island Right-To-Know: Michigan Critical Materials Register List: Massachusetts Extraordinarily Hazardous Substances: California - Regulated Carcinogens: Pennsylvania RTK - Special Hazardous Substances: New Jersey - Special Hazardous Substances: New Jersey - Environmental Hazardous Substances List: Illinois - Toxic Air Contaminants New York - Reporting of Releases Part 597 - List of Hazardous Substances:</p> <p>Xylene (mixed isomers)</p> <p>Louisiana Right-To-Know: California Proposition 65: New Jersey Right-To-Know: Pennsylvania Right-To-Know: Massachusetts Right-To Know: Florida Substance List: Rhode Island Right-To-Know: Michigan Critical Materials Register List: Massachusetts Extraordinarily Hazardous Substances: California - Regulated Carcinogens: Pennsylvania RTK - Special Hazardous Substances: New Jersey - Special Hazardous Substances: New Jersey - Environmental Hazardous Substances List:</p>	<p>Not Listed.</p> <p>Not Listed. Developmental toxicity, initial date 1/1/91 Female reproductive toxicity, initial date 8/7/09 SN 1866 Environmental hazard Present Not Listed. Toxic (skin); Flammable (skin) 100 lb Annual usage threshold Not Listed. Not Listed. Not Listed. Flammable - third degree; Teratogen SN 1866 TPQ: 500 lb Present 1000 lb RQ (air); 1 lb RQ (land/water)</p> <p>Not Listed. Carcinogen, initial date 4/29/11 (in alcoholic beverages) Carcinogen, initial date 7/1/88 (when associated with alcohol abuse) Developmental toxicity, initial date 10/1/87 (in alcoholic beverages) SN 0844 Present Teratogen Not Listed. Toxic; Flammable Not Listed. Not Listed. Not Listed. Not Listed. Carcinogen; Flammable - third degree; Mutagen; Teratogen Not Listed. Present Not Listed.</p> <p>Not Listed. Not Listed. SN 2014 Environmental hazard Present Not Listed. Toxic (skin); Flammable (skin) 100 lb Annual usage threshold all isomers Not Listed. Not Listed. Not Listed. Flammable - third degree SN 2014 TPQ: 500 lb</p>
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Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	1000 lb RQ (air); 1 lb RQ (land/water)
1,2,4 Trimethylbenzene	
Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Not Listed.
New Jersey Right-To-Know:	SN 1929
Pennsylvania Right-To-Know:	Present
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Toxic
Michigan Critical Materials Register List:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed.
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Not Listed.
New Jersey - Special Hazardous Substances:	Not Listed.
New Jersey - Environmental Hazardous Substances List:	Not Listed.
Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed.
Benzene	
Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Carcinogen, initial date 2/27/87 Developmental toxicity, initial date 12/26/97 Male reproductive toxicity, initial date 12/26/97
New Jersey Right-To-Know:	SN 0197
Pennsylvania Right-To-Know:	Environmental hazard; Special hazardous substance
Massachusetts Right-To Know:	Carcinogen; Extraordinarily hazardous
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Toxic (skin); Flammable (skin); Carcinogen (skin)
Michigan Critical Materials Register List:	100 lb Annual usage threshold
Massachusetts Extraordinarily Hazardous Substances:	Carcinogen; Extraordinarily hazardous
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Present
New Jersey - Special Hazardous Substances:	Carcinogen; Flammable - third degree; Mutagen
New Jersey - Environmental Hazardous Substances List:	SN 0197 TPQ: 500 lb
Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	10 lb RQ (air); 1 lb RQ (land/water)
n-Hexane	
Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Not Listed.
New Jersey Right-To-Know:	SN 1340
Pennsylvania Right-To-Know:	Present
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Toxic; Flammable
Michigan Critical Materials Register List:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed.
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Not Listed.
New Jersey - Special Hazardous Substances:	Flammable - third degree
New Jersey - Environmental Hazardous Substances List:	SN 1340 TPQ: 500 lb
Illinois - Toxic Air Contaminants	Present

New York - Reporting of Releases Part 597 - List of Hazardous Substances:	1 lb RQ (air); 1 lb RQ (land/water)
<b>Ethylbenzene</b>	
Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Carcinogen, initial date 6/11/04
New Jersey Right-To-Know:	SN 0851
Pennsylvania Right-To-Know:	Environmental hazard
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Toxic; Flammable
Michigan Critical Materials Register List:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed.
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Not Listed.
New Jersey - Special Hazardous Substances:	Carcinogen; flammable - Third degree
New Jersey - Environmental Hazardous Substances List:	SN 0851 TPQ: 500 lb
Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	1000 lb RQ (air); 1 lb RQ (land/water)
<b>Naphthalene</b>	
Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Carcinogen, initial date 4/19/02
New Jersey Right-To-Know:	SN 1322 SN 3758
Pennsylvania Right-To-Know:	Environmental hazard Present (particulate)
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Toxic; Flammable
Michigan Critical Materials Register List:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed.
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Not Listed.
New Jersey - Special Hazardous Substances:	Carcinogen
New Jersey - Environmental Hazardous Substances List:	SN 1322 TPQ: 500 lb (Reportable at the de minimis quantity of >0.1%)
Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	100 lb RQ (air); 1 lb RQ (land/water)

**Canada DSL/NDSL Inventory:** This product and/or its components are listed either on the Domestic Substances List (DSL) or are exempt.

**Canadian Regulatory Information:** "This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the (M)SDS contains all the information required by the Controlled Products Regulations."

Name	Canada - WHMIS: Classifications of Substances:	Canada - WHMIS: Ingredient Disclosure:
Gasoline	B2,D2A,D2B	0.1%
Toluene	B2,D2A,D2B	0.1%
Ethyl Alcohol	B2,D2B	0.1%
Xylene (mixed isomers)	B2,D2A,D2B	m-, o-isomers 1.0%; p-isomer 0.1%
1,2,4 Trimethylbenzene	B3	1
Benzene	B2,D2A,D2B	0.1%
n-Hexane	B2,D2A,D2B	1%
Ethylbenzene	B2,D2A,D2B	0.1%
Naphthalene	B4,D2A	0.1%



NOTE: Not Applicable.

## 16. OTHER INFORMATION

Prepared By Toxicology and Product Safety  
Revision Date: 05/14/2015

**Revision Note:**

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is intended as guidance for safe handling, use, processing, storage, transportation, accidental release, clean-up and disposal and is not considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.


# SAFETY DATA SHEET

## Helium

### Section 1. Identification

<b>GHS product identifier</b>	: Helium
<b>Chemical name</b>	: Helium
<b>Other means of identification</b>	: helium (dot); Helium-4; He; o-Helium; UN 1046, Helium USP
<b>Product use</b>	: Synthetic/Analytical chemistry.
<b>Synonym</b>	: helium (dot); Helium-4; He; o-Helium; UN 1046, Helium USP
<b>SDS #</b>	: 001025
<b>Supplier's details</b>	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
<b>24-hour telephone</b>	: 1-866-734-3438

### Section 2. Hazards identification

<b>OSHA/HCS status</b>	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Classification of the substance or mixture</b>	: GASES UNDER PRESSURE - Compressed gas
<b>GHS label elements</b>	
<b>Hazard pictograms</b>	: 
<b>Signal word</b>	: Warning
<b>Hazard statements</b>	: Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation.
<b>Precautionary statements</b>	
<b>General</b>	: Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction.
<b>Prevention</b>	: Not applicable.
<b>Response</b>	: Not applicable.
<b>Storage</b>	: Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.
<b>Disposal</b>	: Not applicable.
<b>Hazards not otherwise classified</b>	: In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.

## Section 3. Composition/information on ingredients

<b>Substance/mixture</b>	: Substance
<b>Chemical name</b>	: Helium
<b>Other means of identification</b>	: helium (dot); Helium-4; He; o-Helium; UN 1046, Helium USP

### CAS number/other identifiers

<b>CAS number</b>	: 7440-59-7
<b>Product code</b>	: 001025

Ingredient name	%	CAS number
Helium	100	7440-59-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.**

Occupational exposure limits, if available, are listed in Section 8.

## Section 4. First aid measures

### Description of necessary first aid measures

<b>Eye contact</b>	: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
<b>Inhalation</b>	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
<b>Skin contact</b>	: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
<b>Ingestion</b>	: As this product is a gas, refer to the inhalation section.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

<b>Eye contact</b>	: Contact with rapidly expanding gas may cause burns or frostbite.
<b>Inhalation</b>	: No known significant effects or critical hazards.
<b>Skin contact</b>	: Contact with rapidly expanding gas may cause burns or frostbite.
<b>Frostbite</b>	: Try to warm up the frozen tissues and seek medical attention.
<b>Ingestion</b>	: As this product is a gas, refer to the inhalation section.

#### Over-exposure signs/symptoms

<b>Eye contact</b>	: No specific data.
<b>Inhalation</b>	: No specific data.
<b>Skin contact</b>	: No specific data.
<b>Ingestion</b>	: No specific data.

### Indication of immediate medical attention and special treatment needed, if necessary

<b>Notes to physician</b>	: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
<b>Specific treatments</b>	: No specific treatment.

## Section 4. First aid measures

- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.

- Specific hazards arising from the chemical** : Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

- Hazardous thermal decomposition products** : No specific data.

- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

- Environmental precautions** : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

- Small spill** : Immediately contact emergency personnel. Stop leak if without risk.
- Large spill** : Immediately contact emergency personnel. Stop leak if without risk. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.



## Section 7. Handling and storage

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
Helium	Oxygen Depletion [Asphyxiant]

**Appropriate engineering controls** : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

**Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

### Skin protection

**Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

**Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

### Appearance

Physical state	: Gas. [Compressed gas.]
Color	: Colorless.
Molecular weight	: 4 g/mole
Molecular formula	: He
Boiling/condensation point	: -268.9°C (-452°F)
Melting/freezing point	: -272.2°C (-458°F)
Critical temperature	: -267.9°C (-450.2°F)
Odor	: Odorless.
Odor threshold	: Not available.
pH	: Not available.
Flash point	: [Product does not sustain combustion.]
Burning time	: Not applicable.
Burning rate	: Not applicable.
Evaporation rate	: Not available.
Flammability (solid, gas)	: Not available.
Lower and upper explosive (flammable) limits	: Not available.
Vapor pressure	: Not available.
Vapor density	: 0.14 (Air = 1)      Liquid Density@BP: 7.8 lb/ft <sup>3</sup> (125 kg/m <sup>3</sup> )
Specific Volume (ft <sup>3</sup> /lb)	: 96.1538
Gas Density (lb/ft <sup>3</sup> )	: 0.0104
Relative density	: Not applicable.
Solubility	: Not available.
Solubility in water	: Not available.
Partition coefficient: n-octanol/water	: 0.28
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
SADT	: Not available.
Viscosity	: Not applicable.

## Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: No specific data.
Incompatible materials	: No specific data.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Hazardous polymerization	: Under normal conditions of storage and use, hazardous polymerization will not occur.

## Section 10. Stability and reactivity

### Irritation/Corrosion

Not available.

### Sensitization

Not available.

### Mutagenicity

Not available.

### Carcinogenicity

Not available.

### Reproductive toxicity

Not available.

### Teratogenicity

Not available.

### Specific target organ toxicity (single exposure)

Not available.

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

### Potential acute health effects

- Eye contact** : Contact with rapidly expanding gas may cause burns or frostbite.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : Contact with rapidly expanding gas may cause burns or frostbite.
- Ingestion** : As this product is a gas, refer to the inhalation section.

### Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : No specific data.
- Inhalation** : No specific data.
- Skin contact** : No specific data.
- Ingestion** : No specific data.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

#### Long term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

### Potential chronic health effects

Not available.

- General** : No known significant effects or critical hazards.
- Carcinogenicity** : No known significant effects or critical hazards.

## Section 11. Toxicological information

- Mutagenicity** : No known significant effects or critical hazards.  
**Teratogenicity** : No known significant effects or critical hazards.  
**Developmental effects** : No known significant effects or critical hazards.  
**Fertility effects** : No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Not available.

## Section 12. Ecological information

### Toxicity

Not available.

### Persistence and degradability

Not available.

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
Helium	0.28	-	low

### Mobility in soil






- Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.

- Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

- Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

## Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
<b>UN number</b>	UN1046	UN1046	UN1046	UN1046	UN1046
<b>UN proper shipping name</b>	HELIUM, COMPRESSED	HELIUM, COMPRESSED	HELIUM, COMPRESSED	HELIUM, COMPRESSED	HELIUM, COMPRESSED
<b>Transport hazard class(es)</b>	2.2 	2.2 	2.2 	2.2 	2.2 

## Section 14. Transport information

<b>Packing group</b>	-	-	-	-	-
<b>Environment</b>	No.	No.	No.	No.	No.
<b>Additional information</b>	<p><b>Limited quantity</b> Yes.</p> <p><b>Packaging instruction</b> <b>Passenger aircraft</b> Quantity limitation: 75 kg</p> <p><b>Cargo aircraft</b> Quantity limitation: 150 kg</p>	<p>Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2).</p> <p><b>Explosive Limit and Limited Quantity Index</b> 0.125</p> <p><b>Passenger Carrying Road or Rail Index</b> 75</p>	-	-	<p><b>Passenger and Cargo Aircraft</b>Quantity limitation: 75 kg <b>Cargo Aircraft Only</b> Quantity limitation: 150 kg</p>

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

**Special precautions for user** : **Transport within user’s premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined  
**United States inventory (TSCA 8b):** This material is listed or exempted.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

**SARA 302/304**

**Composition/information on ingredients**

No products were found.

**SARA 304 RQ** : Not applicable.

**SARA 311/312**

**Classification** : Sudden release of pressure

**Composition/information on ingredients**

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Helium	100	No.	Yes.	No.	No.	No.

## Section 15. Regulatory information

### State regulations

- Massachusetts** : This material is listed.  
**New York** : This material is not listed.  
**New Jersey** : This material is listed.  
**Pennsylvania** : This material is listed.

### International regulations

#### International lists

#### National inventory

- Australia** : This material is listed or exempted.  
**Canada** : This material is listed or exempted.  
**China** : This material is listed or exempted.  
**Europe** : This material is listed or exempted.  
**Japan** : Not determined.  
**Malaysia** : Not determined.  
**New Zealand** : This material is listed or exempted.  
**Philippines** : This material is listed or exempted.  
**Republic of Korea** : This material is listed or exempted.  
**Taiwan** : This material is listed or exempted.

### Canada

- WHMIS (Canada)** : Class A: Compressed gas.  
**CEPA Toxic substances**: This material is not listed.  
**Canadian ARET**: This material is not listed.  
**Canadian NPRI**: This material is not listed.  
**Alberta Designated Substances**: This material is not listed.  
**Ontario Designated Substances**: This material is not listed.  
**Quebec Designated Substances**: This material is not listed.

## Section 16. Other information

**Canada Label requirements** : Class A: Compressed gas.

### Hazardous Material Information System (U.S.A.)

Health	0
Flammability	0
Physical hazards	3

**Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.**

The customer is responsible for determining the PPE code for this material.

### National Fire Protection Association (U.S.A.)



Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

## Section 16. Other information

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

### Procedure used to derive the classification

Classification	Justification
Press. Gas Comp. Gas, H280	Expert judgment

### History

**Date of printing** : 2/12/2016

**Date of issue/Date of revision** : 2/12/2016

**Date of previous issue** : No previous validation

**Version** : 0.01

### Key to abbreviations

: ATE = Acute Toxicity Estimate  
 BCF = Bioconcentration Factor  
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals  
 IATA = International Air Transport Association  
 IBC = Intermediate Bulk Container  
 IMDG = International Maritime Dangerous Goods  
 LogPow = logarithm of the octanol/water partition coefficient  
 MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)  
 UN = United Nations

**References** : Not available.

📄 Indicates information that has changed from previously issued version.

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



# Fisher Scientific

Part of Thermo Fisher Scientific

## SAFETY DATA SHEET

Creation Date 24-Aug-2009

Revision Date 10-Jan-2017

Revision Number 3

### 1. Identification

**Product Name** Hydrochloric Acid

**Cat No. :** A144-212; A144-212LC; A144-500; A144-500LB; A144-500LC;  
A144-612GAL; A144C-212; A144C-212EA; A144P-19; A144P-20;  
A144S-212; A144S-212EA; A144S-500; A144SI-212

**Synonyms** Muriatic acid

**Recommended Use** Laboratory chemicals.

**Uses advised against** No Information available

**Details of the supplier of the safety data sheet**

Company	Supplier	Emergency Telephone Number
Fisher Scientific One Reagent Lane Fair Lawn, NJ 07410 Tel: (201) 796-7100	Fisher Scientific UK Bishop Meadow Rd Loughborough, Leicestershire, LE11 5RG Great Britain Tel: 01509 231166	CHEMTREC®, Inside the USA: 800-424-9300 CHEMTREC®, Outside the USA: 001-703-527-3887

### 2. Hazard(s) identification

#### Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Skin Corrosion/irritation	Category 1 B
Serious Eye Damage/Eye Irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

#### Label Elements

##### **Signal Word**

Danger

##### **Hazard Statements**

May be corrosive to metals  
Causes severe skin burns and eye damage  
May cause respiratory irritation



**Precautionary Statements****Prevention**

Do not breathe dust/fume/gas/mist/vapors/spray  
 Wash face, hands and any exposed skin thoroughly after handling  
 Wear protective gloves/protective clothing/eye protection/face protection  
 Use only outdoors or in a well-ventilated area  
 Keep only in original container

**Response**

Immediately call a POISON CENTER or doctor/physician

**Inhalation**

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

**Skin**

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower  
 Wash contaminated clothing before reuse

**Eyes**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

**Ingestion**

IF SWALLOWED: Rinse mouth. DO NOT induce vomiting

**Spills**

Absorb spillage to prevent material damage

**Storage**

Store locked up  
 Store in a well-ventilated place. Keep container tightly closed  
 Store in corrosive resistant polypropylene container with a resistant inliner  
 Store in a dry place

**Disposal**

Dispose of contents/container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)**

None identified

### 3. Composition / information on ingredients

Component	CAS-No	Weight %
Water	7732-18-5	62-65
Hydrochloric acid	7647-01-0	35-38

### 4. First-aid measures

**Eye Contact**

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

**Skin Contact**

Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

**Inhalation**

Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.

<b>Ingestion</b>	Do not induce vomiting. Call a physician or Poison Control Center immediately.
<b>Most important symptoms/effects</b>	Causes burns by all exposure routes. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation
<b>Notes to Physician</b>	Treat symptomatically

## 5. Fire-fighting measures

<b>Suitable Extinguishing Media</b>	Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.
<b>Unsuitable Extinguishing Media</b>	No information available
<b>Flash Point</b>	No information available
<b>Method -</b>	No information available
<b>Autoignition Temperature</b>	No information available
<b>Explosion Limits</b>	
<b>Upper</b>	No data available
<b>Lower</b>	No data available
<b>Sensitivity to Mechanical Impact</b>	No information available
<b>Sensitivity to Static Discharge</b>	No information available

### Specific Hazards Arising from the Chemical

Corrosive Material. Causes burns by all exposure routes. Thermal decomposition can lead to release of irritating gases and vapors.

### Hazardous Combustion Products

Hydrogen chloride gas

### Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

### NFPA

<b>Health</b>	<b>Flammability</b>	<b>Instability</b>	<b>Physical hazards</b>
3	0	0	N/A

## 6. Accidental release measures

<b>Personal Precautions</b>	Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Do not get in eyes, on skin, or on clothing.
<b>Environmental Precautions</b>	Should not be released into the environment. See Section 12 for additional ecological information.

**Methods for Containment and Clean Up** Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

## 7. Handling and storage

<b>Handling</b>	Wear personal protective equipment. Do not breathe vapors or spray mist. Do not get in eyes, on skin, or on clothing. Do not ingest.
<b>Storage</b>	Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area.

## 8. Exposure controls / personal protection

### Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
Hydrochloric acid	Ceiling: 2 ppm	Ceiling: 5 ppm Ceiling: 7 mg/m <sup>3</sup> (Vacated) Ceiling: 5 ppm (Vacated) Ceiling: 7 mg/m <sup>3</sup>	IDLH: 50 ppm Ceiling: 5 ppm Ceiling: 7 mg/m <sup>3</sup>

Component	Quebec	Mexico OEL (TWA)	Ontario TWAEV
Hydrochloric acid	Ceiling: 5 ppm Ceiling: 7.5 mg/m <sup>3</sup>	Ceiling: 5 ppm Ceiling: 7 mg/m <sup>3</sup>	CEV: 2 ppm

*Legend*

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

**Engineering Measures** Ensure that eyewash stations and safety showers are close to the workstation location.

**Personal Protective Equipment**

**Eye/face Protection** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin and body protection** Wear appropriate protective gloves and clothing to prevent skin exposure.

**Respiratory Protection** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

**Hygiene Measures** Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	pungent
Odor Threshold	No information available
pH	< 1
Melting Point/Range	-35 °C / -31 °F
Boiling Point/Range	57 °C / 135 °F @ 760 mmHg
Flash Point	No information available
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	125 mbar @ 20 °C
Vapor Density	1.27
Specific Gravity	1.18
Solubility	Soluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	1.8 mPa.s @ 15°C
Molecular Formula	HCl.H <sub>2</sub> O
Molecular Weight	36.46

## 10. Stability and reactivity

<b>Reactive Hazard</b>	None known, based on information available
<b>Stability</b>	Stable under normal conditions.
<b>Conditions to Avoid</b>	Incompatible products. Excess heat.
<b>Incompatible Materials</b>	Metals, Strong oxidizing agents, Bases, sodium hypochlorite, Amines, Fluorine, Cyanides, Alkaline
<b>Hazardous Decomposition Products</b>	Hydrogen chloride gas
<b>Hazardous Polymerization</b>	Hazardous polymerization does not occur.
<b>Hazardous Reactions</b>	Contact with metals may evolve flammable hydrogen gas.

## 11. Toxicological information

### Acute Toxicity

#### Product Information

##### Oral LD50

Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

##### Dermal LD50

Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

##### Vapor LC50

Based on ATE data, the classification criteria are not met. ATE > 20 mg/l.

#### Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Water	-	Not listed	Not listed
Hydrochloric acid	238 - 277 mg/kg ( Rat )	> 5010 mg/kg ( Rabbit )	1.68 mg/L ( Rat ) 1 h

**Toxicologically Synergistic Products** No information available

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Irritation** Causes burns by all exposure routes

**Sensitization** No information available

**Carcinogenicity** The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Water	7732-18-5	Not listed	Not listed	Not listed	Not listed	Not listed
Hydrochloric acid	7647-01-0	Not listed	Not listed	Not listed	Not listed	Not listed

*IARC: (International Agency for Research on Cancer)*

*IARC: (International Agency for Research on Cancer)*

*Group 1 - Carcinogenic to Humans*

*Group 2A - Probably Carcinogenic to Humans*

*Group 2B - Possibly Carcinogenic to Humans*

**Mutagenic Effects** No information available

**Reproductive Effects** No information available.

**Developmental Effects** No information available.

**Teratogenicity** No information available.

**STOT - single exposure** Respiratory system

**STOT - repeated exposure** None known

**Aspiration hazard** No information available

**Symptoms / effects, both acute and delayed** Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

**Endocrine Disruptor Information** No information available

**Other Adverse Effects** The toxicological properties have not been fully investigated.

## 12. Ecological information

### Ecotoxicity

Do not empty into drains. Large amounts will affect pH and harm aquatic organisms.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Hydrochloric acid	-	282 mg/L LC50 96 h Gambusia affinis mg/L LC50 48 h Leuciscus idus	-	56mg/L EC50 72h Daphnia

**Persistence and Degradability** Persistence is unlikely based on information available.

**Bioaccumulation/ Accumulation** No information available.

**Mobility** Will likely be mobile in the environment due to its water solubility.

## 13. Disposal considerations

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

## 14. Transport information

### DOT

UN-No UN1789  
 Proper Shipping Name HYDROCHLORIC ACID  
 Hazard Class 8  
 Packing Group II

### TDG

UN-No UN1789  
 Proper Shipping Name HYDROCHLORIC ACID  
 Hazard Class 8  
 Packing Group II

### IATA

UN-No UN1789  
 Proper Shipping Name Hydrochloric acid  
 Hazard Class 8  
 Packing Group II

### IMDG/IMO

UN-No UN1789  
 Proper Shipping Name Hydrochloric acid  
 Hazard Class 8  
 Packing Group II

## 15. Regulatory information

### International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Water	X	X	-	231-791-2	-		X	-	X	X	X
Hydrochloric acid	X	X	-	231-595-7	-		X	X	X	X	X

#### Legend:

X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

### U.S. Federal Regulations

TSCA 12(b) Not applicable

### SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Hydrochloric acid	7647-01-0	35-38	1.0

### SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

### CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Hydrochloric acid	X	5000 lb	-	-

### Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Hydrochloric acid	X		-

OSHA Occupational Safety and Health Administration

Not applicable

Component	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Hydrochloric acid	-	TQ: 5000 lb

### CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Hydrochloric acid	5000 lb	5000 lb

**California Proposition 65** This product does not contain any Proposition 65 chemicals

### U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Water	-	-	X	-	-
Hydrochloric acid	X	X	X	X	X

### U.S. Department of Transportation

Reportable Quantity (RQ):	Y
DOT Marine Pollutant	N
DOT Severe Marine Pollutant	N

### U.S. Department of Homeland Security

This product contains the following DHS chemicals:

Component	DHS Chemical Facility Anti-Terrorism Standard
Hydrochloric acid	0 lb STQ (anhydrous); 11250 lb STQ (37% concentration or greater)

**Other International Regulations**

Mexico - Grade No information available

**Canada**

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

WHMIS Hazard Class D1A Very toxic materials  
E Corrosive material



## 16. Other information

Prepared By Regulatory Affairs  
Thermo Fisher Scientific  
Email: EMSDS.RA@thermofisher.com

Creation Date 24-Aug-2009  
Revision Date 10-Jan-2017  
Print Date 10-Jan-2017  
Revision Summary SDS sections updated; 2; 3; 11  
Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of SDS**

# SAFETY DATA SHEET

## Isopropyl Alcohol (Isopropanol)

### Section 1. Identification

<b>GHS product identifier</b>	: Isopropyl Alcohol (Isopropanol)
<b>Chemical name</b>	: Isopropyl alcohol
<b>Other means of identification</b>	: propan-2-ol; 2-Propanol; isopropanol; isopropyl alcohol
<b>Product use</b>	: Synthetic/Analytical chemistry.
<b>Synonym</b>	: propan-2-ol; 2-Propanol; isopropanol; isopropyl alcohol
<b>SDS #</b>	: 001105
<b>Supplier's details</b>	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
<b>Emergency telephone number (with hours of operation)</b>	: 1-866-734-3438

### Section 2. Hazards identification

<b>OSHA/HCS status</b>	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Classification of the substance or mixture</b>	: FLAMMABLE LIQUIDS - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3

#### GHS label elements

##### Hazard pictograms



##### Signal word

: Danger

##### Hazard statements

: Highly flammable liquid and vapor.  
May form explosive mixtures with air.  
Causes serious eye irritation.  
May cause drowsiness and dizziness.

#### Precautionary statements

##### General

: Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

##### Prevention

: Wear protective gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Wash hands thoroughly after handling. Use and store only outdoors or in a well ventilated place.



## Section 2. Hazards identification

- Response** : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.
- Storage** : Store locked up. Store in a well-ventilated place. Keep cool.
- Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.
- Hazards not otherwise classified** : None known.

## Section 3. Composition/information on ingredients

- Substance/mixture** : Substance
- Chemical name** : Isopropyl alcohol
- Other means of identification** : propan-2-ol; 2-Propanol; isopropanol; isopropyl alcohol

### CAS number/other identifiers

- CAS number** : 67-63-0
- Product code** : 001105

Ingredient name	%	CAS number
propan-2-ol	100	67-63-0

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

## Section 4. First aid measures

### Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention.

## Section 4. First aid measures

immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

- Eye contact** : Causes serious eye irritation.
- Inhalation** : Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness.
- Skin contact** : No known significant effects or critical hazards.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Ingestion** : Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.

#### Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
  - pain or irritation
  - watering
  - redness
- Inhalation** : Adverse symptoms may include the following:
  - nausea or vomiting
  - headache
  - drowsiness/fatigue
  - dizziness/vertigo
  - unconsciousness
- Skin contact** : No specific data.
- Ingestion** : No specific data.

### Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

- Suitable extinguishing media** : Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam.
- Unsuitable extinguishing media** : Do not use water jet.

- Specific hazards arising from the chemical** : Highly flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

## Section 5. Fire-fighting measures

- Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide
- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

## Section 7. Handling and storage

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
propan-2-ol	<p><b>ACGIH TLV (United States, 3/2012).</b> TWA: 200 ppm 8 hours. STEL: 400 ppm 15 minutes.</p> <p><b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 400 ppm 8 hours. TWA: 980 mg/m<sup>3</sup> 8 hours. STEL: 500 ppm 15 minutes. STEL: 1225 mg/m<sup>3</sup> 15 minutes.</p> <p><b>NIOSH REL (United States, 1/2013).</b> TWA: 400 ppm 10 hours. TWA: 980 mg/m<sup>3</sup> 10 hours. STEL: 500 ppm 15 minutes. STEL: 1225 mg/m<sup>3</sup> 15 minutes.</p> <p><b>OSHA PEL (United States, 6/2010).</b> TWA: 400 ppm 8 hours. TWA: 980 mg/m<sup>3</sup> 8 hours.</p>

**Appropriate engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

## Section 8. Exposure controls/personal protection

- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

### Appearance

- Physical state** : Liquid. [COLORLESS LIQUID WITH THE ODOR OF RUBBING ALCOHOL]
- Color** : Colorless.
- Molecular weight** : 60.11 g/mole
- Molecular formula** : C3-H8-O
- Boiling/condensation point** : 83°C (181.4°F)
- Melting/freezing point** : -90°C (-130°F)
- Critical temperature** : Not available.
- Odor** : Alcohol-like.
- Odor threshold** : Not available.
- pH** : Not available.
- Flash point** : Closed cup: 11.7°C (53.1°F)
- Burning time** : Not applicable.
- Burning rate** : Not applicable.
- Evaporation rate** : 1.7 (butyl acetate = 1)
- Flammability (solid, gas)** : Not available.
- Lower and upper explosive (flammable) limits** : Lower: 2%  
Upper: 12%
- Vapor pressure** : 4.4 kPa (33.002681467 mm Hg) [room temperature]
- Vapor density** : 2.1 (Air = 1)
- Specific Volume (ft<sup>3</sup>/lb)** : 1.2739
- Gas Density (lb/ft<sup>3</sup>)** : 0.785
- Relative density** : 0.79

## Section 9. Physical and chemical properties

<b>Solubility</b>	: Not available.
<b>Solubility in water</b>	: Not available.
<b>Partition coefficient: n-octanol/water</b>	: 0.05
<b>Auto-ignition temperature</b>	: 456°C (852.8°F)
<b>Decomposition temperature</b>	: Not available.
<b>SADT</b>	: Not available.
<b>Viscosity</b>	: Not available.

## Section 10. Stability and reactivity

<b>Reactivity</b>	: No specific test data related to reactivity available for this product or its ingredients.
<b>Chemical stability</b>	: The product is stable.
<b>Possibility of hazardous reactions</b>	: Under normal conditions of storage and use, hazardous reactions will not occur.
<b>Conditions to avoid</b>	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
<b>Incompatibility with various substances</b>	: Highly reactive or incompatible with the following materials: acids and moisture.
<b>Hazardous decomposition products</b>	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
<b>Hazardous polymerization</b>	: Under normal conditions of storage and use, hazardous polymerization will not occur.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
propan-2-ol	LC50 Inhalation Gas.	Rat	45248 ppm	1 hours
	LD50 Dermal	Rabbit	12800 mg/kg	-
	LD50 Oral	Rat	5000 mg/kg	-

#### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
propan-2-ol	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Eyes - Severe irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	500 milligrams	-

#### Sensitization

Not available.

## Section 11. Toxicological information

### Mutagenicity

Not available.

### Carcinogenicity

Not available.

### Classification

Product/ingredient name	OSHA	IARC	NTP
propan-2-ol	-	3	-

### Reproductive toxicity

Not available.

### Teratogenicity

Not available.

### Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
propan-2-ol	Category 3	Not applicable.	Narcotic effects

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

### Potential acute health effects

- Eye contact** : Causes serious eye irritation.
- Inhalation** : Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness.
- Skin contact** : No known significant effects or critical hazards.
- Ingestion** : Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.

### Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : Adverse symptoms may include the following:  
pain or irritation  
watering  
redness
- Inhalation** : Adverse symptoms may include the following:  
nausea or vomiting  
headache  
drowsiness/fatigue  
dizziness/vertigo  
unconsciousness
- Skin contact** : No specific data.
- Ingestion** : No specific data.

### Delayed and immediate effects and also chronic effects from short and long term exposure

**Date of issue/Date of revision** : 5/20/2015. **Date of previous issue** : 10/28/2014. **Version** : 0.02 8/14



## Section 11. Toxicological information

### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Long term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

Not available.

**General** : No known significant effects or critical hazards.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Not available.

## Section 12. Ecological information

### Toxicity

Product/ingredient name	Result	Species	Exposure
propan-2-ol	Acute LC50 1400000 to 1950000 µg/l Marine water	Crustaceans - Crangon crangon	48 hours
	Acute LC50 4200 mg/l Fresh water	Fish - Rasbora heteromorpha	96 hours

### Persistence and degradability

Not available.

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
propan-2-ol	0.05	-	low

### Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.






**Other adverse effects** : No known significant effects or critical hazards.



## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
<b>UN number</b>	UN1219	UN1219	UN1219	UN1219	UN1219
<b>UN proper shipping name</b>	ISOPROPANOL OR ISOPROPYL ALCOHOL	ISOPROPANOL; OR ISOPROPYL ALCOHOL	ISOPROPANOL OR ISOPROPYL ALCOHOL	ISOPROPANOL (ISOPROPYL ALCOHOL)	ISOPROPANOL
<b>Transport hazard class(es)</b>	3 	3 	3 	3 	3 
<b>Packing group</b>	II	II	II	II	II
<b>Environment</b>	No.	No.	No.	No.	No.
<b>Additional information</b>	<u>Limited quantity</u> Yes.  <u>Packaging instruction</u> <b>Passenger aircraft</b> Quantity limitation: 5 L  <b>Cargo aircraft</b> Quantity limitation: 60 L  <u>Special provisions</u> IB2, T4, TP1	<u>Explosive Limit and Limited Quantity Index</u> 1  <u>Passenger Carrying Road or Rail Index</u> 5	-	-	<u>Passenger and Cargo Aircraft</u> Quantity limitation: 5 L <u>Cargo Aircraft Only</u> Quantity limitation: 60 L <u>Limited Quantities - Passenger Aircraft</u> Quantity limitation: 1 L

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

**Special precautions for user** : **Transport within user’s premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : TSCA 8(a) CDR Exempt/Partial exemption: Not determined  
**United States inventory (TSCA 8b)**: This material is listed or exempted.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.

### SARA 311/312

**Classification** : Fire hazard  
 Immediate (acute) health hazard

#### Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
propan-2-ol	100	Yes.	No.	No.	Yes.	No.

### SARA 313

	Product name	CAS number	%
<b>Form R - Reporting requirements</b>	Isopropyl alcohol	67-63-0	100
<b>Supplier notification</b>	Isopropyl alcohol	67-63-0	100

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

### State regulations

**Massachusetts** : This material is listed.  
**New York** : This material is not listed.  
**New Jersey** : This material is listed.  
**Pennsylvania** : This material is listed.  
**Canada inventory** : This material is listed or exempted.

### International regulations

## Section 15. Regulatory information

- International lists**
- Australia inventory (AICS):** This material is listed or exempted.
  - China inventory (IECSC):** This material is listed or exempted.
  - Japan inventory:** This material is listed or exempted.
  - Korea inventory:** This material is listed or exempted.
  - Malaysia Inventory (EHS Register):** Not determined.
  - New Zealand Inventory of Chemicals (NZIoC):** This material is listed or exempted.
  - Philippines inventory (PICCS):** This material is listed or exempted.
  - Taiwan inventory (CSNN):** Not determined.

**Chemical Weapons Convention List Schedule I Chemicals** : Not listed

**Chemical Weapons Convention List Schedule II Chemicals** : Not listed

**Chemical Weapons Convention List Schedule III Chemicals** : Not listed

### Canada

- WHMIS (Canada)**
- : Class B-2: Flammable liquid
  - : Class D-2B: Material causing other toxic effects (Toxic).
  - CEPA Toxic substances:** This material is not listed.
  - Canadian ARET:** This material is not listed.
  - Canadian NPRI:** This material is listed.
  - Alberta Designated Substances:** This material is not listed.
  - Ontario Designated Substances:** This material is not listed.
  - Quebec Designated Substances:** This material is not listed.

## Section 16. Other information

- Canada Label requirements** : Class B-2: Flammable liquid  
Class D-2B: Material causing other toxic effects (Toxic).

### Hazardous Material Information System (U.S.A.)

Health	*	2
Flammability		3
Physical hazards		0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

### National Fire Protection Association (U.S.A.)



## Section 16. Other information

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

### History

**Date of printing** : 5/20/2015.

**Date of issue/Date of revision** : 5/20/2015.

**Date of previous issue** : 10/28/2014.

**Version** : 0.02

**Key to abbreviations** :

- ATE = Acute Toxicity Estimate
- BCF = Bioconcentration Factor
- GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- IATA = International Air Transport Association
- IBC = Intermediate Bulk Container
- IMDG = International Maritime Dangerous Goods
- LogPow = logarithm of the octanol/water partition coefficient
- MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
- UN = United Nations
- ACGIH – American Conference of Governmental Industrial Hygienists
- AIHA – American Industrial Hygiene Association
- CAS – Chemical Abstract Services
- CEPA – Canadian Environmental Protection Act
- CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act (EPA)
- CFR – United States Code of Federal Regulations
- CPR – Controlled Products Regulations
- DSL – Domestic Substances List
- GWP – Global Warming Potential
- IARC – International Agency for Research on Cancer
- ICAO – International Civil Aviation Organisation
- Inh – Inhalation
- LC – Lethal concentration
- LD – Lethal dosage
- NDSL – Non-Domestic Substances List
- NIOSH – National Institute for Occupational Safety and Health
- TDG – Canadian Transportation of Dangerous Goods Act and Regulations
- TLV – Threshold Limit Value
- TSCA – Toxic Substances Control Act
- WEEL – Workplace Environmental Exposure Level
- WHMIS – Canadian Workplace Hazardous Material Information System

**References** : Not available.

▣ Indicates information that has changed from previously issued version.

### Notice to reader

## Section 16. Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

**Safety Data Sheet**  
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and  
GHS

Effective date: 05/12/2015

Revision: 05/12/2015

**LIQUINOX****1 Identification of the Substance/mixture and of the Company/Undertaking****1.1 Product identifier**Trade name: **LIQUINOX**

Application of the substance / the preparation: Hand detergent.

**1.2 Relevant identified uses of the substance or mixture and uses advised against:**

No additional information available.

**1.3 Details of the supplier of the Safety Data Sheet****Manufacturer/Supplier:**

Alconox, Inc.  
30 Glenn St., Suite 309  
White Plains, NY 10603  
Phone: 914-948-4040



Further information obtainable from: Product Safety Department.

**1.4 Emergency telephone number:**

ChemTel Inc.: (800)255-3924, +1 (813)248-0585

**2 Hazards Identification****2.1 Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008:**

Classification according to Directive 67/548/EEC or Directive 1999/45/EC:



GHS07

*Skin Irrit. 2, H315: Causes skin irritation.***Information concerning particular hazards for human and environment:**

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

**Classification system:**

The classification is according to the latest editions of the EU-lists, and extended by company and literature data

**2.2 Label elements****Labelling according to Regulation (EC) No 1272/2008:**

The product is classified and labelled according to the CLP regulation.

**Hazard pictograms:**

GHS07

**Signal word:** Warning**Hazard-determining components of labelling:**

Alkyl benzene sulfonic acid, sodium salt.

# Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and  
GHS

Effective date: 05/12/2015

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## LIQUINOX

**Hazard statements:**

H315: Causes skin irritation.

**Precautionary statements:**

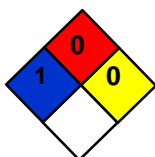
P332+P313: If skin irritation occurs: Get medical advice/attention.

P302+P352: IF ON SKIN: Wash with plenty of soap and water.

P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

**Other Hazard description:****WHMIS-classification and symbols:**

D2B - Toxic material causing other toxic effects

**NFPA ratings (scale 0 - 4)**

Health = 1

Fire = 0

Reactivity = 0

**HMIS-ratings (scale 0 - 4)**

HEALTH	1	
FIRE	0	
REACTIVITY	0	

Health = 1

Fire = 0

Reactivity = 0

**2.3 Other hazards****Results of PBT and vPvB assessment**

PBT: Not applicable.

vPvB: Not applicable.

**3 Composition/Information on Ingredients****3.2 Chemical characterization:** Mixture**Description:** Hazardous ingredients of mixture listed below.

Identifying Nos.	Description	Wt. %
CAS: 68081-81-2	Alkyl benzene sulfonic acid, sodium salt	10 - 25%
CAS: 1300-72-7 EINECS: 215-090-9	Sodium xylene sulphonate	2.5 - 10%
CAS: 84133-50-6	Alcohol Ethoxylate	2.5 - 10%
CAS: 68603-42-9 EINECS: 271-657-0	Coconut diethanolamide	2.5 - 10%
CAS: 17572-97-3 EINECS: 241-543-5	Ethylenediaminetetraacetic acid, tripotassium salt	2.5 - 10%

**Additional information:** For the wording of the listed risk phrases refer to section 16.

**Safety Data Sheet**  
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and  
GHS

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**LIQUINOX****4 First Aid Measures****4.1 Description of first aid measures****General information:**

Take affected persons out into the fresh air.

**After inhalation:**

Supply fresh air; consult doctor in case of complaints.

**After skin contact:**

Immediately wash with water and soap and rinse thoroughly for 30 minutes. If skin irritation continues, consult a doctor.

**After eye contact:**

Remove contact lenses if worn.

Rinse opened eye for at least 30 minutes under running water, lifting upper and lower lids occasionally. Immediately consult a doctor.

**After swallowing:**

Do not induce vomiting; call for medical help immediately. Rinse out mouth and then drink plenty of water.

A person vomiting while laying on their back should be turned onto their side.

**4.2 Most important symptoms and effects, both acute and delayed:**

Irritating, all routes of exposure.

**4.3 Indication of any immediate medical attention and special treatment needed:**

No additional information available.

**5 Firefighting Measures****5.1 Extinguishing media:****Suitable extinguishing agents:**

CO<sub>2</sub>, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

**5.2 Special hazards arising from the substance or mixture:**

No additional information available.

**5.3 Advice for firefighters:****Protective equipment:**

Wear self-contained respiratory protective device.

Wear fully protective suit.

**6 Accidental Release Measures****6.1 Personal precautions, protective equipment and emergency procedures:**

Ensure adequate ventilation.

Particular danger of slipping on leaked/spilled product.

**6.2 Environmental precautions:**

Dilute with plenty of water.

Do not allow to enter sewers/ surface or ground water.

**6.3 Methods and material for containment and cleaning up:**

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Clean the affected area carefully; suitable cleaners are: Warm water

Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.

**6.4 Reference to other sections:**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information

**7 Handling and Storage****7.1 Precautions for safe handling:**

No special precautions are necessary if used correctly.

**Information about fire - and explosion protection:**

No special measures required.



# Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and  
GHS

Effective date: 05/12/2015

Revision: 05/12/2015

## LIQUINOX

### 7.2 Conditions for safe storage, including any incompatibilities:

**Storage:****Requirements to be met by storerooms and receptacles:** No special requirements.**Information about storage in one common storage facility:** No special requirements.**Further information about storage conditions:** None

### 7.3 Specific end use(s):

 No additional information available.

## 8 Exposure Controls/Personal Protection

### 8.1 Control parameters

**Ingredients with limit values that require monitoring at the workplace:**

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

**Additional information:** The lists valid during the making were used as basis.

### 8.2 Exposure controls:

**Personal protective equipment:****General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

**Respiratory protection:**

Not required under normal conditions of use.

**Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product. Selection of the glove material should be based on the penetration time, rates of diffusion and the degradation of the glove material.

**Material of gloves:**

The selection of a suitable gloves does not only depend on the material, but also on the quality, and varies from manufacturer to manufacturer.

**Penetration time of glove material:**

The exact break through time has to be determined by the manufacturer of the protective gloves. DO NOT exceed the breakthrough time set by the Manufacturer.

**For long term contact, gloves made of the following materials are considered suitable:**

Butyl rubber, BR

Nitrile rubber, NBR

Natural rubber (NR)

Neoprene gloves

**Eye protection:**

Safety glasses

Goggles recommended during refilling.

**Body protection:** Protective work clothing

# Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and  
GHS

Effective date: 05/12/2015

Revision: 05/12/2015

## LIQUINOX

### 9 Physical and Chemical Properties

#### 9.1 Information on basic physical and chemical properties:

##### General Information:

##### Appearance:

Form:	Liquid
Color:	Light Yellow
Odor:	Odorless
Odor threshold:	Not determined.
pH-value:	8.5

##### Change in condition:

Melting point/Melting range:	Not determined.
Boiling point/Boiling range:	100°C

Flash point: Not applicable.

Flammability (solid, gaseous): Not applicable.

Ignition temperature: Not applicable.

Decomposition temperature: Not determined.

Self-igniting: Product is not selfigniting.

Danger of explosion: Product does not present an explosion hazard.

##### Explosion limits:

Lower:	Not determined.
Upper:	Not determined.

Vapor pressure at 20°C: 23 hPa

Density: 1.08 g/cm<sup>3</sup>

Relative density: Not determined.

Vapor density: Not determined.

Evaporation rate: Not determined.

Solubility in / Miscibility with water: Fully miscible.

Segregation coefficient (n-octanol/water): Not determined.

##### Viscosity:

Dynamic:	Not determined.
Kinematic:	Not determined.

##### Solvent content:

Organic solvents:	Not determined.
Solids content:	Not determined.

9.2 Other information: No additional information available.

### 10 Stability and Reactivity

#### 10.1 Reactivity:

#### 10.2 Chemical stability:

##### Thermal decomposition / conditions to be avoided:

No decomposition if used according to specifications.

#### 10.3 Possibility of hazardous reactions:

Reacts with strong oxidizing agents. Reacts with strong acids.

#### 10.4 Conditions to avoid:

No additional information available.

#### 10.5 Incompatible materials:

No additional information available.

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## LIQUINOX

**10.6 Hazardous decomposition products:**

Carbon monoxide and carbon dioxide  
Sulphur oxides (SO<sub>x</sub>)  
Nitrogen oxides

## 11 Toxicological Information

**11.1 Information on toxicological effects:****Toxicity data:** Toxicity data is available for mixture:**Primary irritant effect:****On the skin:** Irritating to skin and mucous membranes.**On the eye:** Strong irritant with the danger of severe eye injury.**Sensitization:** No sensitizing effects known.**Additional toxicological information:**

The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version: Irritant

## 12 Ecological Information

**12.1 Toxicity:****Aquatic toxicity:** No additional information available.**12.2 Persistence and degradability:** Biodegradable.**12.3 Bioaccumulative potential:** Does not accumulate in organisms.**12.4 Mobility in soil:** No additional information available.**Additional ecological information:****General notes:**

Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water.

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

Must not reach sewage water or drainage ditch undiluted or un-neutralized.

**12.5 Results of PBT and vPvB assessment:****PBT:** Not applicable.**vPvB:** Not applicable.**12.6 Other adverse effects:** No additional information available.

## 13 Disposal Considerations

**13.1 Waste treatment methods:****Recommendation:**

Smaller quantities can be disposed of with household waste.

Small amounts may be diluted with plenty of water and washed away. Dispose of bigger amounts in accordance with Local Authority requirements.

The surfactant used in this product complies with the biodegradability criteria as laid down in Regulation (EC)

No. 648/2004 on detergents. Data to support this assertion are held at the disposal of the competent authorities of the Member States and will be made available to them, at their direct request or at the request of a detergent manufacturer.

**Uncleaned packaging:****Recommendation:** Disposal must be made according to official regulations.**Recommended cleansing agents:** Water, together with cleansing agents, if necessary.

## 14 Transport Information

**14.1 UN-Number:**

DOT, ADR, ADN, IMDG, IATA:

Not Regulated

**14.2 UN proper shipping name:**

DOT, ADR, IMDG, IATA:

Not Regulated

## Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and  
GHS

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### LIQUINOX

**14.3 Transport hazard class(es):**

DOT, ADR, IMDG, IATA:

Class:	Not Regulated
Label:	-

**14.4 Packing group:**

DOT, ADR, IMDG, IATA: Not Regulated

**14.5 Environmental hazards:**

Marine pollutant: No

**14.6 Special precautions for user:**

Not applicable.

**14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.

UN "Model Regulation": Not Regulated

### 15 Regulatory Information

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:****United States (USA):****SARA:****Section 355 (extremely hazardous substances):** None of the ingredient is listed.**Section 313 (Specific toxic chemical listings):** None of the ingredient is listed.**TSCA (Toxic Substances Control Act):** All ingredients are listed.**Proposition 65 (California):****Chemicals known to cause cancer:** None of the ingredient is listed.**Chemicals known to cause reproductive toxicity for females:** None of the ingredient is listed.**Chemicals known to cause reproductive toxicity for males:** None of the ingredient is listed.**Chemicals known to cause developmental toxicity:** None of the ingredient is listed.**Carcinogenic Categories:****EPA (Environmental Protection Agency):** None of the ingredient is listed.**TLV (Threshold Limit Value established by ACGIH):** None of the ingredient is listed.**NIOSH-Ca (National Institute for Occupational Safety and Health):** None of the ingredient is listed.**OSHA-Ca (Occupational Safety & Health Administration):** None of the ingredient is listed.**Canadá:****Canadian Domestic Substances List (DSL):** All ingredients are listed.**Canadian Ingredient Disclosure list (limit 0.1%):** None of the ingredient is listed.**Canadian Ingredient Disclosure list (limit 1%):** None of the ingredient is listed.**15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

### 16 Other Information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

**Relevant phrases:**

H315: Causes skin irritation.

**Safety Data Sheet**  
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and  
GHS

Effective date: 05/12/2015

Revision: 05/12/2015

**LIQUINOX****Abbreviations and Acronyms:**

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.  
IMDG: International Maritime Code for Dangerous Goods.  
DOT: US Department of Transportation.  
IATA: International Air Transport Association.  
GHS: Globally Harmonized System of Classification and Labelling of Chemicals.  
ACGIH: American Conference of Governmental Industrial Hygienists.  
NFPA: National Fire Protection Association (USA).  
HMIS: Hazardous Materials Identification System (USA).  
WHMIS: Workplace Hazardous Materials Information System (Canada).  
VOC: Volatile Organic Compounds (USA, EU).  
LC50: Lethal concentration, 50 percent.  
LD50: Lethal dose, 50 percent.

**SDS Created by:**

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# Fisher Scientific

Part of Thermo Fisher Scientific

## SAFETY DATA SHEET

Creation Date 12-Mar-2009

Revision Date 28-Nov-2016

Revision Number 5

### 1. Identification

**Product Name** Nitric acid (65 - 70%)

**Cat No. :** A198C-212, A200-212, A200-212LC, A200-500, A200-500LC, A200-612GAL, A200C-212, A200S-212, A200S-212LC, A200S-500, A200SI-212, A467-1, A467-2, A467-250, A467-500, A483-212; S719721

**Synonyms** Azotic acid; Engraver's acid; Aqua fortis

**Recommended Use** Laboratory chemicals.

**Uses advised against** No Information available

**Details of the supplier of the safety data sheet**

**Company**  
Fisher Scientific  
One Reagent Lane  
Fair Lawn, NJ 07410  
Tel: (201) 796-7100

**Emergency Telephone Number**  
CHEMTREC®, Inside the USA: 800-424-9300  
CHEMTREC®, Outside the USA: 001-703-527-3887

### 2. Hazard(s) identification

**Classification**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Oxidizing liquids	Category 3
Corrosive to metals	Category 1
Skin Corrosion/Irritation	Category 1 A
Serious Eye Damage/Eye Irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

**Label Elements**

**Signal Word**  
Danger

**Hazard Statements**  
May intensify fire; oxidizer  
May be corrosive to metals  
Causes severe skin burns and eye damage  
May cause respiratory irritation

**Precautionary Statements****Prevention**

Do not breathe dust/fume/gas/mist/vapors/spray  
 Wash face, hands and any exposed skin thoroughly after handling  
 Wear protective gloves/protective clothing/eye protection/face protection  
 Use only outdoors or in a well-ventilated area  
 Keep away from heat/sparks/open flames/hot surfaces. - No smoking  
 Keep/Store away from clothing/ other combustible materials  
 Take any precaution to avoid mixing with combustibles  
 Keep only in original container

**Response**

Immediately call a POISON CENTER or doctor/physician

**Inhalation**

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

**Skin**

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower  
 Wash contaminated clothing before reuse

**Eyes**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

**Ingestion**

IF SWALLOWED: Rinse mouth. DO NOT induce vomiting

**Fire**

In case of fire: Use CO<sub>2</sub>, dry chemical, or foam for extinction

**Spills**

Absorb spillage to prevent material damage

**Storage**

Store locked up  
 Store in a well-ventilated place. Keep container tightly closed  
 Store in corrosive resistant polypropylene container with a resistant inliner  
 Store in a dry place

**Disposal**

Dispose of contents/container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)**

None identified

### 3. Composition / information on ingredients

Component	CAS-No	Weight %
Nitric acid	7697-37-2	65 - 70
Water	7732-18-5	30 - 35

### 4. First-aid measures

**General Advice**

Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

**Eye Contact**

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

<b>Skin Contact</b>	Wash off immediately with plenty of water for at least 15 minutes. Remove and wash contaminated clothing before re-use. Call a physician immediately.
<b>Inhalation</b>	If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Remove from exposure, lie down. Call a physician immediately.
<b>Ingestion</b>	Do not induce vomiting. Never give anything by mouth to an unconscious person. Clean mouth with water. Call a physician immediately.
<b>Most important symptoms/effects</b>	Causes burns by all exposure routes. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated
<b>Notes to Physician</b>	Treat symptomatically

## 5. Fire-fighting measures

<b>Suitable Extinguishing Media</b>	CO <sub>2</sub> , dry chemical, dry sand, alcohol-resistant foam.
<b>Unsuitable Extinguishing Media</b>	No information available
<b>Flash Point</b>	Not applicable
<b>Method -</b>	No information available
<b>Autoignition Temperature</b>	No information available
<b>Explosion Limits</b>	
<b>Upper</b>	No data available
<b>Lower</b>	No data available
<b>Oxidizing Properties</b>	Oxidizer
<b>Sensitivity to Mechanical Impact</b>	No information available
<b>Sensitivity to Static Discharge</b>	No information available

### Specific Hazards Arising from the Chemical

Thermal decomposition can lead to release of irritating gases and vapors. The product causes burns of eyes, skin and mucous membranes. Oxidizer: Contact with combustible/organic material may cause fire. May ignite combustibles (wood paper, oil, clothing, etc.).

### Hazardous Combustion Products

Nitrogen oxides (NO<sub>x</sub>) Thermal decomposition can lead to release of irritating gases and vapors

### Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

### NFPA

<b>Health</b>	<b>Flammability</b>	<b>Instability</b>	<b>Physical hazards</b>
4	0	0	OX

## 6. Accidental release measures

<b>Personal Precautions</b>	Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Use personal protective equipment.
<b>Environmental Precautions</b>	Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional ecological information.
<b>Methods for Containment and Clean Up</b>	Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Sweep up and shovel into suitable containers for disposal.

## 7. Handling and storage



**Handling** Use only under a chemical fume hood. Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Do not ingest. Do not breathe vapors or spray mist. Keep away from clothing and other combustible materials.

**Storage** Keep containers tightly closed in a cool, well-ventilated place. Do not store near combustible materials.

## 8. Exposure controls / personal protection

### Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
Nitric acid	TWA: 2 ppm STEL: 4 ppm	(Vacated) TWA: 2 ppm (Vacated) TWA: 5 mg/m <sup>3</sup> (Vacated) STEL: 4 ppm (Vacated) STEL: 10 mg/m <sup>3</sup> TWA: 2 ppm TWA: 5 mg/m <sup>3</sup>	IDLH: 25 ppm TWA: 2 ppm TWA: 5 mg/m <sup>3</sup> STEL: 4 ppm STEL: 10 mg/m <sup>3</sup>
Component	Quebec	Mexico OEL (TWA)	Ontario TWA/STEL
Nitric acid	TWA: 2 ppm TWA: 5.2 mg/m <sup>3</sup> STEL: 4 ppm STEL: 10 mg/m <sup>3</sup>	TWA: 2 ppm TWA: 5 mg/m <sup>3</sup> STEL: 4 ppm STEL: 10 mg/m <sup>3</sup>	TWA: 2 ppm STEL: 4 ppm

#### Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

**Engineering Measures** Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.

### Personal Protective Equipment

**Eye/face Protection** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Tightly fitting safety goggles. Face-shield.

**Skin and body protection** Long sleeved clothing.

**Respiratory Protection** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

**Hygiene Measures** Keep away from food, drink and animal feeding stuffs. When using, do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Provide regular cleaning of equipment, work area and clothing. Avoid contact with skin, eyes and clothing. For environmental protection remove and wash all contaminated protective equipment before re-use. Wear suitable gloves and eye/face protection.

## 9. Physical and chemical properties

<b>Physical State</b>	Liquid
<b>Appearance</b>	Clear Colorless, Light yellow
<b>Odor</b>	Strong Acrid
<b>Odor Threshold</b>	No information available
<b>pH</b>	< 1.0 (0.1M)
<b>Melting Point/Range</b>	-41 °C / -41.8 °F
<b>Boiling Point/Range</b>	Not applicable
<b>Flash Point</b>	Not applicable

Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	0.94 kPa (20°C)
Vapor Density	No information available
Specific Gravity	1.40
Solubility	miscible
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	HNO <sub>3</sub>
Molecular Weight	63.02

## 10. Stability and reactivity

Reactive Hazard	Yes
Stability	Oxidizer: Contact with combustible/organic material may cause fire.
Conditions to Avoid	Incompatible products. Combustible material. Excess heat. Exposure to air or moisture over prolonged periods.
Incompatible Materials	Combustible material, Strong bases, Reducing agents, Metals, Powdered metals, Organic materials, Aldehydes, Alcohols, Cyanides, Ammonia, Strong reducing agents
Hazardous Decomposition Products	Nitrogen oxides (NO <sub>x</sub> ), Thermal decomposition can lead to release of irritating gases and vapors
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

## 11. Toxicological information

### Acute Toxicity

#### Product Information

##### Oral LD50

Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

##### Dermal LD50

Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

##### Vapor LC50

Based on ATE data, the classification criteria are not met. ATE > 20 mg/l.

#### Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Nitric acid	Not listed	Not listed	LC50 = 2500 ppm. (Rat) 1h
Water	-	Not listed	Not listed

**Toxicologically Synergistic Products** No information available

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Irritation** Causes severe burns by all exposure routes

**Sensitization** No information available

**Carcinogenicity** The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Nitric acid	7697-37-2	Not listed	Not listed	Not listed	Not listed	Not listed
Water	7732-18-5	Not listed	Not listed	Not listed	Not listed	Not listed

**Mutagenic Effects** No information available

<b>Reproductive Effects</b>	No information available.
<b>Developmental Effects</b>	No information available.
<b>Teratogenicity</b>	No information available.
<b>STOT - single exposure</b>	Respiratory system
<b>STOT - repeated exposure</b>	None known
<b>Aspiration hazard</b>	No information available
<b>Symptoms / effects, both acute and delayed</b>	Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated
<b>Endocrine Disruptor Information</b>	No information available
<b>Other Adverse Effects</b>	The toxicological properties have not been fully investigated.

## 12. Ecological information

### Ecotoxicity

Do not empty into drains. Large amounts will affect pH and harm aquatic organisms.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Nitric acid	Not listed	LC50: = 72 mg/L, 96h (Gambusia affinis)	Not listed	Not listed

**Persistence and Degradability** Miscible with water Persistence is unlikely based on information available.  
**Bioaccumulation/ Accumulation** No information available.

**Mobility** Will likely be mobile in the environment due to its water solubility.

Component	log Pow
Nitric acid	-2.3

## 13. Disposal considerations

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

## 14. Transport information

### DOT

UN-No UN2031  
 Proper Shipping Name NITRIC ACID  
 Hazard Class 8  
 Subsidiary Hazard Class 5.1  
 Packing Group II

### TDG

UN-No UN2031  
 Proper Shipping Name NITRIC ACID  
 Hazard Class 8  
 Subsidiary Hazard Class 5.1  
 Packing Group II

### IATA

UN-No UN2031  
 Proper Shipping Name NITRIC ACID  
 Hazard Class 8  
 Subsidiary Hazard Class 5.1  
 Packing Group II

**IMDG/IMO**

UN-No	UN2031
Proper Shipping Name	NITRIC ACID
Hazard Class	8
Subsidiary Hazard Class	5.1
Packing Group	II

**15. Regulatory information**

All of the components in the product are on the following Inventory lists: X = listed

**International Inventories**

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Nitric acid	X	X	-	231-714-2	-		X	X	X	X	X
Water	X	X	-	231-791-2	-		X	-	X	X	X

**Legend:**

X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

**U.S. Federal Regulations**

TSCA 12(b) Not applicable

**SARA 313**

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Nitric acid	7697-37-2	65 - 70	1.0

**SARA 311/312 Hazard Categories**

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	Yes

**CWA (Clean Water Act)**

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Nitric acid	X	1000 lb	-	-

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration

Component	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Nitric acid	-	TQ: 500 lb

**CERCLA**

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive

Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Nitric acid	1000 lb	1000 lb

**California Proposition 65** This product does not contain any Proposition 65 chemicals

#### U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Nitric acid	X	X	X	X	X
Water	-	-	X	-	-

#### U.S. Department of Transportation

Reportable Quantity (RQ): Y  
 DOT Marine Pollutant N  
 DOT Severe Marine Pollutant N

#### U.S. Department of Homeland Security

This product contains the following DHS chemicals:

Component	DHS Chemical Facility Anti-Terrorism Standard
Nitric acid	2000 lb STQ

#### Other International Regulations

**Mexico - Grade** No information available

#### Canada

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

**WHMIS Hazard Class** C Oxidizing materials  
 E Corrosive material  
 D2B Toxic materials



### 16. Other information

**Prepared By** Regulatory Affairs  
 Thermo Fisher Scientific  
 Email: EMSDS.RA@thermofisher.com

**Creation Date** 12-Mar-2009  
**Revision Date** 28-Nov-2016  
**Print Date** 28-Nov-2016  
**Revision Summary** This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

#### Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**Appendix B: OU-2 RI Public Right-of-Way  
Management Plan**

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28 June 2023

## MEMORANDUM

**TO:** Matt Dunham, Project Manager, NYSDEC

**FROM:** Emily Cummings, Project Manager

**SUBJECT:** OU-2 RI Public Right-of-Way Management Plan - DRAFT  
Admiral Cleaners  
Watervliet, New York  
EA Work Assignment No. 009806-04

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EA Engineering, P.C. and its affiliate EA Science and Technology (EA) were tasked by the New York State Department of Environmental Conservation (NYSDEC) under Work Assignment Number (No.) D009806-04 to perform remedial investigation (RI) and feasibility study (FS) activities at the Admiral Cleaners Site (No. 401075). EA is currently completing a RI of operable unit (OU)-2.

### 1. PROJECT SCHEDULE

The RI of OU-2 consists of multiple phases of bedrock and overburden drilling, well installation, packer testing, and groundwater sampling to investigate the spatial and vertical gradient of contamination associated with the site. Specific work activities are described in the RI OU-2 Work Plan<sup>1</sup>. Activities associated with this RI have been divided into three phases. Phase I is planned for July through August 2023. Phase II is expected to begin in winter of 2024, and Phase III, if needed, will occur in Spring 2024.

Since bedrock well drilling is expected to occur adjacent to roadways and sidewalks, at the request of the NYSDEC and the City of Watervliet, EA has prepared this memorandum to manage the public Right-of-Way requirements for areas impacted by the RI. At this time, only Phase I activities have been planned. Phase II and III activities will be dependent upon the results of preceding phases. Therefore, this Public Right-of-Way Management Plan was authored only for Phase I activities.

### 2. PUBLIC RIGHT-OF-WAY MANAGEMENT PLAN

EA has prepared a Public Right-of-Way Management plan, in accordance with the New York State Department of Transportation Work Zone Traffic Control Manual (February 2015) and U.S. Department of Transportation Federal Highway Administration's Manual on Uniform Traffic Control Devices (2009). The Public Right-of-Way Management Plan will be submitted to the NYSDEC and City of Watervliet as a draft version for review and comment. EA will notify the City of Watervliet public and emergency services of the proposed plan while the document is still in the draft phase. The City of Watervliet and NYSDEC will be provided with a Final Public Right-

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<sup>1</sup> EA. 2023. Remedial Investigation Operable Unit 2 Phase I Work Plan. June



of-Way Management Plan in advance of EA's mobilization to site.

### 3. IMPACTED AREAS

As shown on Figure 1, it is anticipated that several sidewalks and parking spots will be unavailable to residents and businesses during planned drilling activities. EA will seek to obtain road closure permits to cordon off several parking spots, in order to create an adequately sized workspace for drilling activities. Additionally, EA will seek to obtain a sidewalk closure permit from the City of Watervliet, in order to close off portions of the sidewalk unsafe for pedestrians. During drilling, The public Right-of-Way will be routed around the work areas. EA will block off the crosswalks, sidewalks, and parking locations identified in Figure 1 with appropriate signage, cones, and barricades. Signage will include signs which denote "No Parking, Crosswalk Closed, Sidewalk Closed, and Detour." EA will use detour signs in combination with sidewalk closed and crosswalk closed signs, to orient pedestrians away from the roadwork area. Additional street parking along 19<sup>th</sup> Street between 5<sup>th</sup> Avenue and 6<sup>th</sup> Avenue is intended to accommodate the parking spots that will be closed during this project.

During Phase I, the western sidewalk and parking along 7<sup>th</sup> Avenue, near the junction between 7<sup>th</sup> Avenue and 19<sup>th</sup> Street, will be unavailable. EA will also block off adjacent parking spots in the parking lot of 701 19<sup>th</sup> Street. Pedestrians will be redirected to use the eastern sidewalk of 7<sup>th</sup> Avenue when work is being conducted adjacent to 701 19<sup>th</sup> Street. South bound pedestrians on 7<sup>th</sup> Avenue will be redirected to the eastern sidewalk and the temporary crosswalk on 7<sup>th</sup> Avenue. North bound pedestrians on 7<sup>th</sup> Avenue will be redirected to use the eastern sidewalk at the junction of 19<sup>th</sup> Street and 7<sup>th</sup> Avenue.

During Phase I, the northern and eastern crosswalks, at the intersection of 6<sup>th</sup> Avenue and 19<sup>th</sup> Street will be unavailable during Phase I. The adjacent sidewalk on the eastern side of 6<sup>th</sup> Avenue and northern sidewalk on 19<sup>th</sup> Street will be closed to pedestrians too. East bound pedestrians on the northern side of 19<sup>th</sup> street will be instructed to utilize the western and southern crosswalk at the intersection between 6<sup>th</sup> Avenue and 19<sup>th</sup> Street to cross over onto the southern sidewalk of 19<sup>th</sup> street. North bound pedestrians on the east side of 6<sup>th</sup> Avenue will also be instructed to use the southern and western crosswalks at the intersection between 19<sup>th</sup> Street and 6<sup>th</sup> Avenue. West bound pedestrians using the sidewalk on the northern side of the 19<sup>th</sup> Street will be redirected to use the western crosswalk of 7<sup>th</sup> Avenue and 19<sup>th</sup> Street. Additionally, a temporary crosswalk will be established north of the eastern sidewalk closure on 6<sup>th</sup> Avenue.

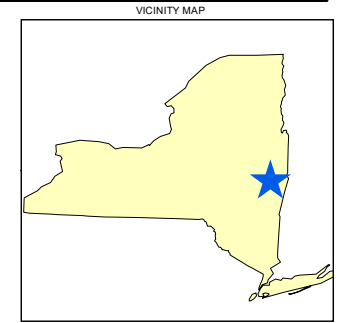
If you have any questions or require additional information, please do not hesitate to contact me at [ecummings@eaest.com](mailto:ecummings@eaest.com) or 315-565-6553.

cc: P. LaBoissiere (City of Watervliet)  
D. Conan (EA)

P. Gannon (EA)

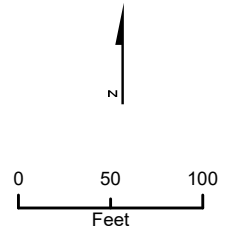
## **Figures**

G:\Projects\State&Local\NY\DEC - D007624\ID007624 - Work Assignments\14907.38 - Admiral Cleaners 05\_GIS\Projects\IRM\Traffic Plan\Fig 1\_ProposedTrafficControls.mxd



- Legend**
- Open Crosswalks
  - Open Sidewalks
  - Site Location
  - Crosswalk Closed During Phase I
  - Sidewalks Closed During Phase I
  - Parking Closure during Phase I
  - Proposed Intermediate Well
  - Proposed Shallow Well

Map Date: 6/23/2023



**Figure 1**  
**Proposed Public Right-of-Way Controls**  
 Admiral Cleaners  
 Watervliet, Albany County, NY