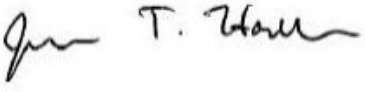
AECOM

In-Situ Chemical Oxidation Injection Pilot Study Work Plan Addendum

Former Duso Chemical Site
Poughkeepsie, Dutchess County, New York
NYSDEC Site No. 3-14-103

July 2023

Quality information

Prepared by	Reviewed by	Reviewed by
		
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1. Introduction

AECOM USA, Inc. (AECOM) has developed this work plan addendum for the New York State Department of Environmental Conversation (NYSDEC) to implement an in-situ chemical oxidation (ISCO) pilot study at the Former Duso Chemical New York State Superfund Site ("Duso Site") located in Poughkeepsie, New York. This work will be performed by the NYSDEC's call-out contractor, Precision Environmental Services, Inc. (PES) and their subcontractor, REGENESIS. AECOM will provide oversight and sampling services.

The Duso Site was formerly occupied by the Duso Chemical Company where volatile organic compounds (VOCs) were released to the soil and groundwater as a result of historic operations. VOCs from the Duso Site also impact the adjacent former Western Publishing property portion of the Mid-Hudson Business Park ("MHBP Treatment Area") and a former railroad right-of-way (ROW)/drainage swale. A site location map is provided as **Figure 1-1**.

This addendum describes updates to the plan for ISCO injections resulting from pre-mobilization and mobilization activities, as well as discussions and agreements with property owners/stakeholders. Additional background information regarding the Duso Site is provided in the May 2023 Work Plan (AECOM, 2023).

1.1 ISCO Injection Pilot Study Objectives

The primary purpose of the proposed pilot study is to evaluate the effectiveness of implementing ISCO injections at the Duso Site to address residual VOC impacts in soil and groundwater along the western edge of the property and prevent offsite migration of VOC-impacted groundwater to the MHBP Treatment Area. The pilot study objectives include:

- Evaluate distribution of injection amendments within the target injection interval;
- Collect information necessary to design an ISCO injection layout (e.g., oxidant loading rates, injection spacing, and injection rates) as a potential site-wide remedial action;
- Evaluate the effectiveness of ISCO at reducing VOCs (including residual chloroethane concentrations) along the western edge of the Duso Site; and,
- Reduce VOC concentrations along the edge of the Duso Site to limit downgradient migration of VOC-impacted groundwater to the MHBP Treatment Area.

2. ISCO Pilot Study Design and Implementation

To address observed increases in VOC concentrations assumed to result from residual contamination along the western edge of the former Duso Chemical Site, bench-scale treatability studies identified persulfate ISCO amendments as the most effective remedial approach. Additional information concerning remedy selection and ISCO pilot study design was described in the May 2023 Work Plan.

2.1 ISCO Amendments

The proposed ISCO injections will utilize a combination of alkaline activated sodium persulfate (highly soluble Klozur® SP) and potassium persulfate (slower release Klozur® KP) to meet the soil and VOC oxidant demand. The persulfate amendments will be activated with a combination of hydrated lime and a 25% solution of sodium hydroxide (NaOH). The NaOH solution is highly soluble and will rapidly activate the Klozur® SP while hydrated lime provides an extended release of an alkaline source for the Klozur® KP to sustain oxidant release over a longer period. The ISCO amendments were delivered to the Site in May 2023 and stored in a secured staging area. Since available packaging mass/volume of amendments may differ slightly from original design quantities, the pilot study amendment injection quantities have been revised based on materials actually received.

Revised calculations and assumptions used to determine caustic and persulfate injection quantities are included in **Appendix A**. Updates proposed by AECOM have been reviewed with Evonik and REGENESIS. The safety data sheets (SDS) for the proposed ISCO amendments are included in **Appendix B**.

2.2 Updates to Injection Layout

The ISCO pilot study will target an injection interval of 5 to 25 ft. bgs to address residual VOC concentrations identified in both shallow and deep monitoring wells along the western edge of the Duso Site and the eastern edge of the former railroad ROW/drainage swale. Injection points are grouped in two rows along the western edge of the Duso Site and the eastern edge of the former railroad ROW/drainage swale. Each row will contain eight injection points spaced approximately 12-ft. apart and are intended to form an overlapping barrier intercepting VOC-impacted groundwater upgradient of monitoring well MHBP-11 and treat VOCs near monitoring well pair BIW-5S/D.

Adjustments to the proposed injection grid have been made in an effort to reduce the potential for contact of injected chemicals with the existing concrete support structure for a Central Hudson Gas & Electric Corp. (CHG&E) transmission tower. Information concerning injectate chemical compatibility has identified that the persulfate chemicals (Klozur® KP and Klozur® SP), and the resulting sulfate byproducts, can chemically degrade concrete. While most structural concrete is formulated to impart some level of sulfate resistance, prolonged exposure can impact its structural integrity. Based on information provided by CHG&E, the concrete footer extends to a depth of approximately 13 feet below ground surface (bgs). Therefore, a significant portion of the footer is located beneath the groundwater potentiometric surface (approximately 5 feet bgs). AECOM further understands that the concrete structure in question was installed in the 1920s, and details regarding the sulfate resistance of the materials are not available. As a result, adjustments to the ISCO injection plan will be enacted to reduce the potential for exposure of the concrete footer to these chemicals and/or byproducts. To achieve this, AECOM proposes adjustments to the injection design as follows:

1. The nearest proposed injection points (#8, #10, and #12) will be shifted to a minimum setback of 15 feet from the concrete structure. It is not expected that the injected persulfate would be distributed beyond a radius of influence (ROI) of 15 feet, and so this distance should reduce the potential for contact of injected chemicals with the concrete.

2. The injection interval for #8, #10 and #12, as well as for the two points upgradient (#9 and #11) will begin at 15 feet bgs rather than the original 5 feet bgs. The footing of the concrete structure may extend down to 13 feet bgs; thus, injecting at a depth below this should further reduce the

potential for contact of injected chemicals with the concrete. The interval of 15 feet to 25 feet bgs also coincides with the zone of highest observed groundwater VOC levels; therefore, maintaining injection influence in this interval should help achieve effective treatment of the more highly-impacted zone.

3. Injection flow rates and pressures will be carefully controlled for the nearest injection points to the CHG&E ROW in order to reduce the potential for injected fluid to distribute outside of the target ROI and depth interval.

4. AECOM recommends that the injection program begin with these locations nearest the concrete structure. In this way, it is more likely that the designed distribution of injection fluid can be achieved compared with a scenario where the surrounding treatment zone may already be saturated from injections at upgradient or cross-gradient injection points.

AECOM anticipates that the volume of ISCO amendment originally planned for the full injection intervals in points #8, #9, #10, #11 and #12 will be redistributed to other injection points as practical. It is likely that certain injection locations and depth intervals will better accept injection fluid than others. During field implementation, additional adjustment of actual injection volumes for a given interval and location is to be expected. The revised injection layout is shown on **Figure 2-1**.

3. Pilot Study Preparation Activities

The following sections detail the pilot study preparation activities required before ISCO injection activities can commence.

3.1 Permitting

Injection of remedial amendments falls under the requirements of the United States Environmental Protection Agency's (USEPA) Underground Injection Control (UIC) program. Currently NYS has not requested program primacy for the federal UIC program. The Former Duso Chemical Site is a state-lead site, therefore the NYSDEC Division of Environmental Remediation (DER) or its call-out contractor (PES) is responsible for submitting the notification to USEPA. In accordance with DER Internal Guidance Procedure 22 (IGP-22), an injection inventory spreadsheet was provided to USEPA Region 2 by PES as part of the notification of injection activities. Injections used to enhance or effect remediation are generally authorized by rule and the notification is all that is required at least 30 days prior to commencement of direct-push injection or well construction.

Permitting was also required by the County of Dutchess, which owns the former railroad ROW/drainage swale property. The required permit applications, plans and fees were provided by PES and AECOM, resulting in issuance of two permits (for well installation and removal activities) to PES and one permit (for monitoring activities) to AECOM.

3.2 Access Agreements

Implementation of the ISCO pilot study will require access to several private properties. These include the Star Gas property (Tax Map ID: 134689-6162-05-042826-0000), the County of Dutchess right of way spur property (Tax Map ID: 134689-6162-05-011773-0000), and the Mid Hudson Business Park (Tax Map ID: 134689-6162-05-005836-0000). NYSDEC has obtained formal access to these properties, and AECOM, PES and their subcontractors are required to abide by the terms in the access agreements during all phases of work.

Additionally, CHG&E maintains an easement with a 20-foot-wide aboveground utility corridor through the County of Dutchess property. NYSDEC, AECOM and PES have developed and executed license agreements with CHG&E for the injections, monitoring, and related activities to be performed within the easement.

4. Schedule and Coordination

4.1 Proposed Schedule

The revised milestone and daily schedules for the ISCO pilot study implementation are included below, along with the responsible party or parties. The full pilot study program is expected to take approximately one year to complete. PES and AECOM will keep NYSDEC apprised via e-mail correspondence and/or telephone calls of schedule changes as they develop.

Activity or Milestone	Completion Date or Estimated Date
PES and AECOM - Mobilize and Begin Well and Porewater Sampling Point Installation; Collect Baseline Soil Samples	Completed May 9 - May 12, 2023
EA and AECOM - Collect Baseline Groundwater Samples	Completed April and May 2023
PES - Swale By-pass Construction	Began in May 2023; to be completed on July 17, 2023
PES and AECOM - Mobilize and Begin ISCO Field Injections	July 17, 2023
PES and AECOM - Complete ISCO Field Injections	August 4, 2023
AECOM - Collect 1-Month Post-Injection Groundwater Samples	September 2023
AECOM - Collect 2-Month Post-Injection Groundwater Samples	October 2023
AECOM - Collect 3-Month Post-Injection Groundwater Samples	November 2023
PES and AECOM - Collect 6-Month Post-Injection Groundwater and Soil Samples	February 2024
AECOM - Submit Final Report	April 2024

Responsible Party	7:30AM-8:00AM	8:00AM - 3:00PM	3:00PM-4:00PM	4:00PM - 5:30PM	5:30 - 8:00PM
PES/ REGENESIS	Arrive on site; mobilization activities including H&S briefing, scope & schedule review; Equipment inspections; Prep. injection solutions	Move rig to injection location, advance probe and inject ISCO amendments	Remove equipment from Star Gas driveway; finish injection or break down and cap rods prior to 3PM arrival of trucks. Perform cleanup or QA/QC activities as needed until restart	Resume injections as practical and/or begin end-of-day activities; secure equipment & materials and manage IDW	Additional work window as needed depending on progress
AECOM	Attend H&S briefing, scope & schedule review; oversight of equipment inspections and injection solution prep.	Oversight of injections, monitoring of MWs and Pore Water wells			Additional oversight as necessary

Notes:

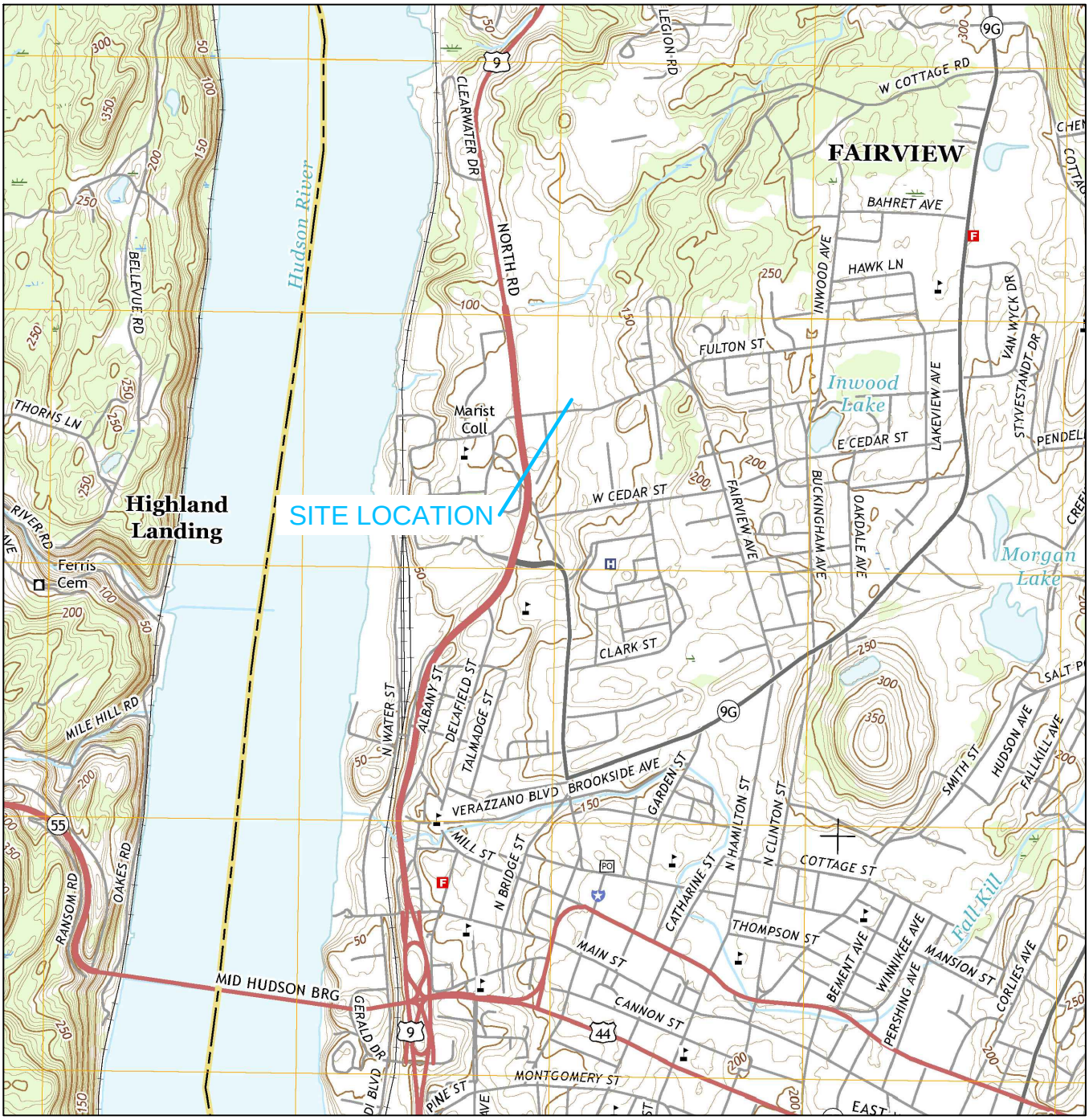
1) REGENESIS will be working 10 hour days (standard); targeting 7:30am start.
2) Construction activities permitted by noise ordinance between the hours of 7am and 8pm.
3) Road closure for access road at rear of the MHBP anticipated to be enforced during working days for the duration of injection activities beginning July 17th.

5. References

AECOM, 2023. In-Situ Chemical Oxidation Injection Pilot Study Work Plan, Former Duso Chemical Site, Poughkeepsie, Dutchess County, New York, NYSDEC Site No. 3-14-103. May 2023.

Figures

Last saved by: SPLAWNM(2022-03-29) Last Plotted: 2022-03-29 Project Management Initials: Designer:_____ Checked:_____ Approved:_____ ANSI A 8.5" x 11"
Filename: \\NA.AECOMNET.COM\LFS\AMER\GREENVILLE-USGRN1\LEGACY\GROUP\EARTH\LATHAM NY WORK\NYSDEC FORMER DUSO CHEM SITE\SITE LOCATION MAP\FIGURE 1-1 - SITE LOCATION MAP.DWG



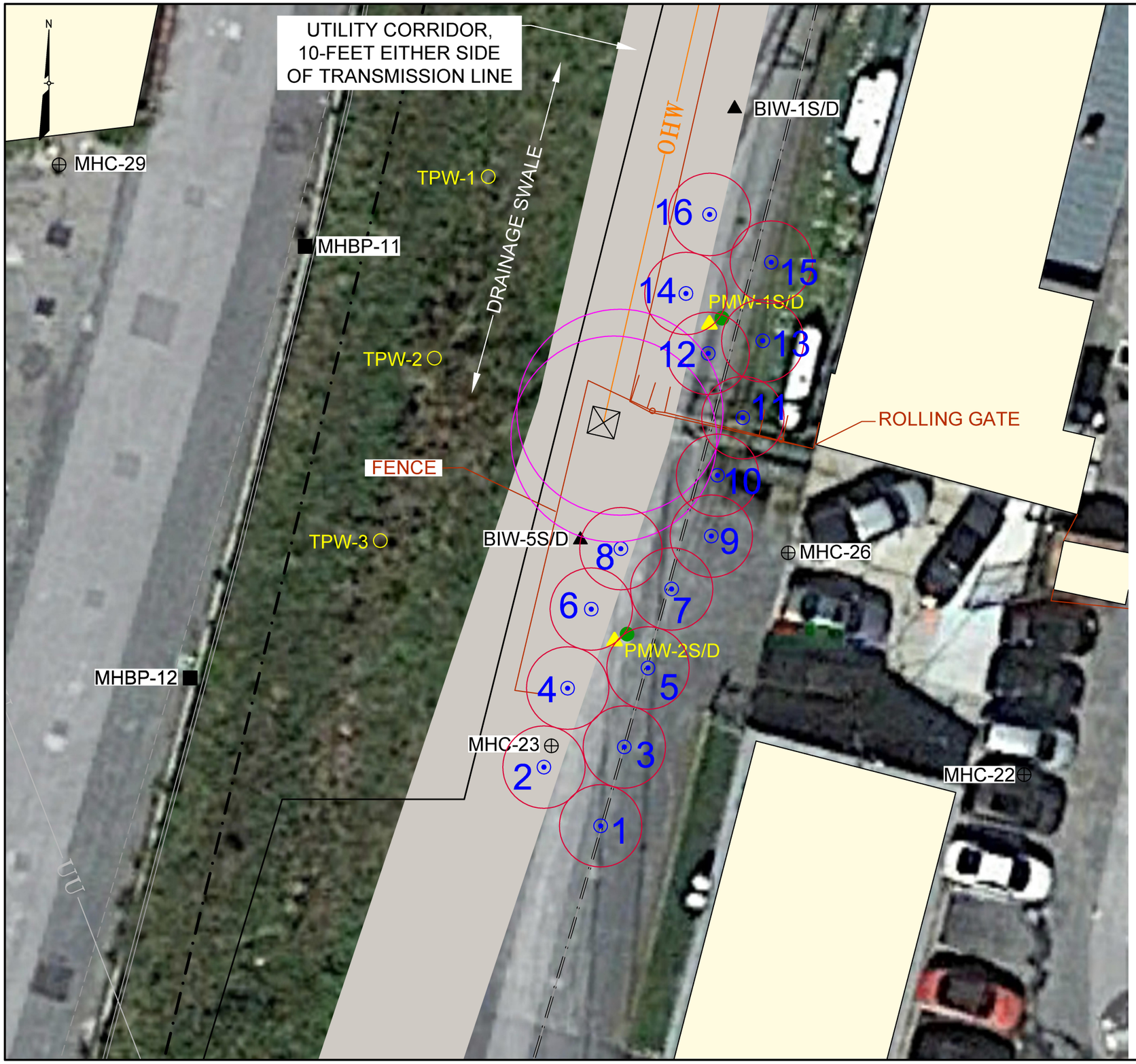
NOTE: MAP DERIVED FROM U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, POUGHKEEPSIE, NY, DATED 2016.

FORMER DUSO CHEMICAL FACILITY
FULTON STREET AND NORTH ROAD
POUGHKEEPSIE, NEW YORK
Project No.: 60647169 Date: 2022/03/28

SITE LOCATION MAP

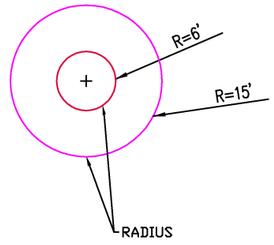
AECOM

Figure: 1-1



LEGEND

- PROPOSED ISCO INJECTION POINT LOCATION
- PMW-1S/D — SHALLOW AND DEEP MONITORING WELL PAIR
- PORE WATER MONITORING POINT
- PROPOSED SOIL BORING LOCATION
- BIW-1S/D — BIOREMEDIATION INJECTION WELL LOCATION (2012)
- MHBP-11 — MID-HUDSON BUSINESS PARK WELL LOCATION (1993-1994, 2015)
- MHC-30 — WELL LOCATION (1990s)
- MANHOLES
- BUILDING
- PROPERTY BOUNDARY
- FENCE (APPROXIMATE)
- PARCEL BOUNDARY
- OHW — OVERHEAD WIRES
- W — UNDERGROUND WATER
- SAN — SANITARY SEWER LINE
- ST — STORMWATER LINE
- UU — UNKNOWN UNDERGROUND UTILITIES
- MHBP TREATMENT AREA (APPROXIMATE IC BOUNDARIES)
- DUSO SITE BOUNDARY (APPROXIMATE IC BOUNDARIES)
- CONCRETE AND METAL ELECTRICAL TOWER



0 15 30

SCALE IN FEET

SOURCE: - BASEMAP WAS PROVIDED BY S.Y. KIM LAND SURVEYOR, JOB NO: 5D-316-11, AUGUST 16, 2011.
- MHBP AND MHC WELL LOCATIONS FROM COORDINATES IN GROUNDWATER SAMPLING FIELD SHEET SUMMARY SPREADSHEET, PROVIDED BY CHAZEN.

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FIGURE 2-1
DETAILED INJECTION PLAN

FORMER DUSO CHEMICAL FACILITY
FULTON STREET AND NORTH ROAD
POUGHKEEPSIE, DUTCHESS COUNTY, NEW YORK

JULY 2023 60647169

Appendix A – Revised Injection Calculations

Former Duso Chemical Site
ISCO Injection Pilot Study
Revised Injection Calculations

1. Target Injection Quantities

	Description		Volume (gal)	Mass (lbs)
Injection Quantities	per 1-ft Interval	Reagent Slurry	29	425
		NaOH Solution	13	138
		Total	42	562
	per Point (5-25ft full interval)	Reagent Slurry	575	8,500
		NaOH Solution	261	2,766
		Total	836	11,265
	per Point (15-25ft deep interval only)	Reagent Slurry	288	4,250
		NaOH Solution	131	1,383
		Total	418	5,633
	Event Total	Reagent Slurry	7,763	114,745
		NaOH Solution	3,527	37,335
		Total	11,289	151,851

2. Injection Chemicals Sequence - "Sandwich" Approach (per injection interval)

	Material	Volume (gallons)
1	**NaOH**	6.5
2	**Reagent Slurry**	29
3	**NaOH**	6.5

3. Reagent Slurry Batch Mix

Batch Volume	**50**	**gallons**	**Project Total Vol.**	7763	gallons
Klozur KP	266.5	lbs	Klozur KP	41380	lbs
Klozur SP	168.6	lbs	Klozur SP	26173	lbs
Hydrated Lime	103.1	lbs	Hydrated Lime	16000	lbs
Water	24.1	gallons	Water	3740	gallons

Notes and Abbreviations:

1. Reagent slurry to include a mixture of Klozur KP (potassium persulfate), Klozur SP (sodium persulfate), hydrated lime, and water.

2. NaOH solution is 25% w/w.

3. Total injection event quantities are estimates assuming 16 total injection points with injection intervals between 5 and 25 ft bgs.

% w/w - Percent by weight
ft bgs - feet below ground surface
gal - gallons
lbs- pounds
NaOH - Sodium hydroxide

Appendix B – Safety Data Sheets

SAFETY DATA SHEET

Classified in accordance 29 CFR 1910.1200

1. Identification

Product identifier: KLOZUR® SP

Other means of identification
None.

Recommended restrictions

Recommended use: Remediation of contaminated soil and groundwater.
Restrictions on use: Not known.

Manufacturer/Importer/Distributor Information

Company Name	:	Evonik Corporation 299 Jefferson Road Parsippany, NJ 07054 USA
Telephone	:	+1 973 929 8000
Fax	:	+1 973 929 8040
E-mail	:	product-regulatory-services@evonik.com

Emergency telephone number:

24-Hour Health Emergency	:	+1 800 424 9300 (CHEMTREC - US & CANADA) 800 681 9531 (CHEMTREC MEXICO) +1 703 527 3887 (CHEMTREC WORLD)

2. Hazard(s) identification

Hazard Classification

Physical Hazards

Oxidizing solids	Category 3

Health Hazards

Acute toxicity (Oral)	Category 4
Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2A
Respiratory sensitizer	Category 1
Skin sensitizer	Category 1
Specific Target Organ Toxicity - Single Exposure	Category 3 (Respiratory tract irritation.)

Label Elements

Hazard Symbol:

Signal Word: Danger

Hazard Statement:

May intensify fire; oxidizer.
Harmful if swallowed.
Causes skin irritation.
Causes serious eye irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
May cause respiratory irritation.

Precautionary Statements

Prevention: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep away from clothing, strong acids, bases, heavy metal salts and other reducing substances, and combustible materials. Take any precaution to avoid mixing with combustibles. Avoid breathing dust/fume/gas/mist/vapors/spray. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/protective clothing/eye protection/face protection. [In case of inadequate ventilation] wear respiratory protection.

Response: IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing. Specific treatment (see supplemental first aid instructions on this label). IF INHALED: Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/ physician. 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 advice/attention. In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

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

Disposal: Dispose of contents/ container to an approved facility in accordance with local, regional, national and international regulations.

Hazard(s) not otherwise classified (HNOC): None.

3. Composition/information on ingredients

Substances

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%)*
Disodium peroxodisulphate		7775-27-1	>99%
Sodium Sulfate		7757-82-6	<1%

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

The exact concentration has been withheld as a trade secret.

4. First-aid measures

Description of necessary first-aid measures

General information: Remove from exposure, lie down. Show this safety data sheet to the doctor in attendance.

Inhalation: Remove from contaminated area. Apply artificial respiration if not breathing. Get medical attention immediately.

Skin Contact: Wash skin thoroughly with soap and water.

Eye contact: If in eyes, hold eyes open, flood with water for at least 15 minutes and see a doctor. Get medical attention.

Ingestion: Never give anything by mouth to an unconscious person. Rinse mouth thoroughly with water. Seek medical attention.

Personal Protection for First-aid Responders: No data available.

Most important symptoms and effects, both acute and delayed

Symptoms: No data available.

Hazards: No data available.

Indication of immediate medical attention and special treatment needed

Treatment: No data available.

5. Fire-fighting measures

General Fire Hazards: Release of oxygen may support combustion. Release of oxygen may support combustion.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Dry powder. Dry sand. Water.

Unsuitable extinguishing media: Carbon dioxide High pressure inert gas, e.g. carbon dioxide jet.

Special hazards arising from the substance or mixture: No data available.

Special protective equipment and precautions for fire-fighters

Special fire-fighting procedures: No data available.

Special protective equipment for fire-fighters: Self-contained breathing apparatus.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Avoid contact with eyes, skin, and clothing. Avoid breathing dust. Use personal protective equipment.

Accidental release measures: Avoid spreading dust or contaminated materials. Prevent runoff from entering drains, sewers, or streams.

Methods and material for containment and cleaning up: Pick up with vacuum or absorbent solid, store in closed container for disposal. Avoid dust formation.

Environmental Precautions: No data available.

7. Handling and storage

Handling

Technical measures (e.g. Local and general ventilation): Use only in well-ventilated areas. Minimize dust generation and accumulation.

Safe handling advice: Wear appropriate personal protective equipment. Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Provide adequate ventilation if fumes or vapors are generated. Handle under inert gas atmosphere in dry equipment.

Contact avoidance measures: No data available.

Storage

Safe storage conditions: Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks and open flame. Do not store near combustible materials. Avoid contamination. Keep away from food, drink and animal feeding stuffs. Avoid formation of dust.

Safe packaging materials: No data available.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

Chemical Identity	Type	Exposure Limit Values	Source
Disodium peroxodisulphate - as persulfate	TWA	0.1 mg/m3	US. ACGIH Threshold Limit Values, as amended (03 2016)

Please refer to the latest edition of the appropriate source text and consult an industrial hygienist or similar professional, or local agencies, for further information.

Biological Limit Values
No biological exposure limits noted for the ingredient(s).

Appropriate Engineering Controls Use only in well-ventilated areas. Minimize dust generation and accumulation.

Individual protection measures, such as personal protective equipment

Eye/face protection: Safety goggles

Skin Protection
Hand Protection: Material: Rubber (natural, latex).Material: Neoprene.Material: Polyvinyl chloride (PVC).

Skin and Body Protection: Long sleeved clothing

Respiratory Protection: Respirator must be worn if exposed to dust. Wear suitable respiratory protection.

Hygiene measures: Wash promptly if skin becomes contaminated. Provide eyewash station and safety shower.

9. Physical and chemical properties

Information on basic physical and chemical properties

Appearance	
Physical state:	solid
Form:	Crystalline
Color:	White
Odor:	Odorless
Odor Threshold:	No data available.
Melting Point:	356 °F/180 °C
Boiling Point:	No data available.
Flammability:	No data available.
Upper/lower limit on flammability or explosive limits	
Explosive limit - upper:	No data available.
Explosive limit - lower:	No data available.
Flash Point:	No data available.
Self Ignition Temperature:	No data available.
Decomposition Temperature:	No data available.
pH:	6 (1 g/l,)
Viscosity	
Dynamic viscosity:	No data available.
Kinematic viscosity:	No data available.
Flow Time:	No data available.
Solubility(ies)	
Solubility in Water:	42 g/l

Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Vapor pressure:	No data available.
Relative density:	No data available.
Density:	2.59 g/cm3
Bulk density:	No data available.
Vapor density (air=1):	No data available.
Particle characteristics	
Particle Size:	< 420 mm
Particle Size Distribution:	No data available.
Specific surface area:	No data available.
Surface charge/Zeta potential:	No data available.
Shape:	No data available.
Crystallinity:	No data available.
Surface treatment:	No data available.

Other information

Oxidizing properties: The substance or mixture is classified as oxidizing with the category 3.

10. Stability and reactivity

Reactivity: No data available.

Chemical Stability: Stable under usual application conditions.

Possibility of hazardous reactions: Breaks down and releases toxic and spontaneously combustible gases when wet

Conditions to avoid: Heat. Moisture.

Incompatible Materials: Bases. Halogens and halogenated compounds. Oxidizing agents. Strong reducing agents. Combustible material

Hazardous Decomposition Products: No data available.

11. Toxicological information

Information on toxicological effects

Information on likely routes of exposure

Inhalation: No data available.

Skin Contact: No data available.

Eye contact: No data available.

Ingestion: No data available.

Acute toxicity (list all possible routes of exposure)

Oral

Product: ATEmix: 929.29 mg/kg

Dermal
Product: Not classified for acute toxicity based on available data.

Inhalation
Product: Not classified for acute toxicity based on available data.

Repeated dose toxicity
Product: No data available.

Skin Corrosion/Irritation
Product: No data available.
Components:

Disodium peroxodisulphate	Irritating.
Sodium Sulfate	OECD 404 (Rabbit): Not irritating

Serious Eye Damage/Eye Irritation
Product: No data available.
Components:

Disodium peroxodisulphate	Irritating.
Sodium Sulfate	Not irritating OECD 405 Rabbit:

Respiratory or Skin Sensitization
Product: No data available.
Components:

Disodium peroxodisulphate	May cause sensitization by skin contact. May cause sensitization by inhalation.
Sodium Sulfate	Maximization Test, OECD 406 (Guinea Pig): Not a skin sensitizer.

Carcinogenicity
Product: No data available.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
No carcinogens present or none present in regulated quantities

ACGIH: US.ACGIH Threshold Limit Values:
No carcinogens present or none present in regulated quantities

US. National Toxicology Program (NTP) Report on Carcinogens:
No carcinogens present or none present in regulated quantities

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050), as amended:
No carcinogens present or none present in regulated quantities

Germ Cell Mutagenicity

In vitro
Product: No data available.
Components:

Sodium Sulfate	Ames test (OECD 471): negative gene mutation test (OECD 476): negative Chromosomal aberration (OECD 473): negative

In vivo
Product: No data available.
Components:

Sodium Sulfate	Chromosomal aberration Intraperitoneal (Mouse, Female, Male): negative

Reproductive toxicity
Product: No data available.

Specific Target Organ Toxicity - Single Exposure

Product:	No data available.
Components:	
Disodium peroxodisulphate	Category 3 with respiratory tract irritation.

Specific Target Organ Toxicity - Repeated Exposure

Product:	No data available.

Aspiration Hazard

Product:	No data available.
Components:	
Sodium Sulfate	Not applicable

Information on health hazards

Other hazards

Product:	No data available.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish

Product:	No data available.
Components:	
Sodium Sulfate	LC 50 (Pimephales promelas, 96 h): 7,960 mg/l

Aquatic Invertebrates

Product:	No data available.
Components:	
Sodium Sulfate	EC 50 (Daphnia magna, 48 h): 1,776 mg/l

Toxicity to Aquatic Plants

Product:	No data available.
Components:	
Sodium Sulfate	EC 50 (Nitscheria linearis, 120 h): 1,900 mg/l (US-EPA-method)

Toxicity to microorganisms

Product:	No data available.

Chronic hazards to the aquatic environment:

Fish

Product:	No data available.

Aquatic Invertebrates

Product:	No data available.
Components:	
Sodium Sulfate	Lowest Observed Effect Concentration (Ceriodaphnia dubia, 7 d): 1,329 mg/l EC 50 (Ceriodaphnia dubia, 7 d): 1,698 mg/l

Toxicity to Aquatic Plants

Product:	No data available.

Toxicity to microorganisms

Product:	No data available.

Persistence and Degradability

Biodegradation
Product: No data available.

BOD/COD Ratio
Product: No data available.

Bioaccumulative potential

Bioconcentration Factor (BCF)
Product: No data available.

Partition Coefficient n-octanol / water (log Kow)
Product: No data available.
Components:
Sodium Sulfate Log Kow: 3.0

Mobility in soil:

Product No data available.

Results of PBT and vPvB assessment:

Product No data available.

Other adverse effects:

Other hazards
Product: No data available.

13. Disposal considerations

Disposal methods: Waste must be disposed of in accordance with federal, state, provincial and local regulations.

Contaminated Packaging: No data available.

14. Transport information

Domestic regulation

49 CFR
UN/ID/NA number : UN 1505
Proper shipping name : Sodium persulfate

Class : 5.1
Packing group : III
Labels : 5.1
ERG Code : 140
Marine pollutant : no

International Regulations

IATA-DGR
UN/ID No. : UN 1505
Proper shipping name : Sodium persulphate
Class : 5.1

Packing group	:	III
Labels	:	5.1
Packing instruction (cargo aircraft)	:	563
Packing instruction (passenger aircraft)	:	559

IMDG-Code

UN number or ID number	:	UN 1505
Proper shipping name	:	SODIUM PERSULPHATE
Class	:	5.1
Packing group	:	III
Labels	:	5.1
EmS Code	:	F-A, S-Q
Marine pollutant	:	no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

15. Regulatory information

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
None present or none present in regulated quantities.

US. Toxic Substances Control Act (TSCA) Section 5(a)(2) Final Significant New Use Rules (SNURs) (40 CFR 721, Subpt E)
None present or none present in regulated quantities.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050), as amended
None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):
None present or none present in regulated quantities.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Oxidizer (liquid, solid or gas), Acute toxicity (any route of exposure), Skin Corrosion or Irritation, Serious eye damage or eye irritation, Respiratory or Skin Sensitization, Specific target organ toxicity (single or repeated exposure)

US. EPCRA (SARA Title III) Section 304 Extremely Hazardous Substances Reporting Quantities and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Hazardous Substances

None present or none present in regulated quantities.

US. EPCRA (SARA Title III Section 313 Toxic Chemical Release Inventory (TRI) Reporting

None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):
None present or none present in regulated quantities.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)
None present or none present in regulated quantities.

US State Regulations

US. California Proposition 65
No ingredient requiring a warning under CA Prop 65.

16.Other information, including date of preparation or last revision

Issue Date:	09/06/2022
Version #:	1.0
Further Information:	No data available.
Revision Information	Changes since the last version are highlighted in the margin. This version replaces all previous versions.
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SAFETY DATA SHEET

Classified in accordance 29 CFR 1910.1200

1. Identification

Product identifier: KLOZUR® KP

Other means of identification
None.

Recommended restrictions

Recommended use: Remediation of contaminated soil and groundwater.
Restrictions on use: Not known.

Manufacturer/Importer/Distributor Information

Company Name	:	Evonik Corporation 299 Jefferson Road Parsippany, NJ 07054 USA
Telephone	:	+1 973 929 8000
Fax	:	+1 973 929 8040
E-mail	:	product-regulatory-services@evonik.com

Emergency telephone number:

24-Hour Health Emergency	:	+1 800 424 9300 (CHEMTREC - US & CANADA) 800 681 9531 (CHEMTREC MEXICO) +1 703 527 3887 (CHEMTREC WORLD)

2. Hazard(s) identification

Hazard Classification

Physical Hazards

Oxidizing solids	Category 3

Health Hazards

Acute toxicity (Oral)	Category 4
Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2A
Respiratory sensitizer	Category 1
Skin sensitizer	Category 1
Specific Target Organ Toxicity - Single Exposure	Category 3 (Respiratory tract irritation.)

Label Elements

Hazard Symbol:

Signal Word: Danger

Hazard Statement:

May intensify fire; oxidizer.
Harmful if swallowed.
Causes skin irritation.
Causes serious eye irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
May cause respiratory irritation.

Precautionary Statements

Prevention: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep away from clothing, strong acids, bases, heavy metal salts and other reducing substances, and combustible materials. Take any precaution to avoid mixing with combustibles. Avoid breathing dust/fume/gas/mist/vapors/spray. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/protective clothing/eye protection/face protection. [In case of inadequate ventilation] wear respiratory protection.

Response: IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing. Specific treatment (see supplemental first aid instructions on this label). IF INHALED: Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/ physician. 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 advice/attention. In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

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

Disposal: Dispose of contents/ container to an approved facility in accordance with local, regional, national and international regulations.

Hazard(s) not otherwise classified (HNOC): None.

3. Composition/information on ingredients

Substances

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%)*
potassium peroxodisulphate		7727-21-1	>98%
Potassium sulphate		7778-80-5	<2%

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

The exact concentration has been withheld as a trade secret.

4. First-aid measures

Description of necessary first-aid measures

General information: Remove from exposure, lie down. Show this safety data sheet to the doctor in attendance.

Inhalation: Remove from contaminated area. Apply artificial respiration if not breathing. Get medical attention immediately.

Skin Contact: Wash skin thoroughly with soap and water.

Eye contact: If in eyes, hold eyes open, flood with water for at least 15 minutes and see a doctor. Get medical attention.

Ingestion: Never give anything by mouth to an unconscious person. Rinse mouth thoroughly with water. Seek medical attention.

Personal Protection for First-aid Responders: No data available.

Most important symptoms and effects, both acute and delayed

Symptoms: No data available.

Hazards: No data available.

Indication of immediate medical attention and special treatment needed

Treatment: No data available.

5. Fire-fighting measures

General Fire Hazards: Release of oxygen may support combustion.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Dry powder. Dry sand. Water.

Unsuitable extinguishing media: Carbon dioxide High pressure inert gas, e.g. carbon dioxide jet.

Special hazards arising from the substance or mixture: No data available.

Special protective equipment and precautions for fire-fighters

Special fire-fighting procedures: No data available.

Special protective equipment for fire-fighters: Self-contained breathing apparatus.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Avoid contact with eyes, skin, and clothing. Avoid breathing dust. Use personal protective equipment.

Accidental release measures: Avoid spreading dust or contaminated materials. Prevent runoff from entering drains, sewers, or streams.

Methods and material for containment and cleaning up: Pick up with vacuum or absorbent solid, store in closed container for disposal. Avoid dust formation.

Environmental Precautions: No data available.

7. Handling and storage

Handling

Technical measures (e.g. Local and general ventilation): Use only in well-ventilated areas. Minimize dust generation and accumulation.

Safe handling advice: Wear appropriate personal protective equipment. Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Provide adequate ventilation if fumes or vapors are generated. Handle under inert gas atmosphere in dry equipment.

Contact avoidance measures: No data available.

Storage

Safe storage conditions: Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks and open flame. Do not store near combustible materials. Avoid contamination. Keep away from food, drink and animal feeding stuffs. Avoid formation of dust.

Safe packaging materials: No data available.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

Chemical Identity	Type	Exposure Limit Values	Source
potassium peroxodisulphate - as persulfate	TWA	0.1 mg/m3	US. ACGIH Threshold Limit Values, as amended (03 2016)

Please refer to the latest edition of the appropriate source text and consult an industrial hygienist or similar professional, or local agencies, for further information.

Biological Limit Values
No biological exposure limits noted for the ingredient(s).

Appropriate Engineering Controls Use only in well-ventilated areas. Minimize dust generation and accumulation.

Individual protection measures, such as personal protective equipment

Eye/face protection: Safety goggles

Skin Protection
Hand Protection: Material: Rubber (natural, latex).Material: Neoprene.

Skin and Body Protection: Long sleeved clothing

Respiratory Protection: Respirator must be worn if exposed to dust. Wear suitable respiratory protection.

Hygiene measures: Wash promptly if skin becomes contaminated. Provide eyewash station and safety shower.

9. Physical and chemical properties

Information on basic physical and chemical properties

Appearance	
Physical state:	solid
Form:	Crystalline
Color:	White
Odor:	Odorless
Odor Threshold:	No data available.
Melting Point:	> 212 °F/> 100 °C
Boiling Point:	No data available.
Flammability:	No data available.
Upper/lower limit on flammability or explosive limits	
Explosive limit - upper:	No data available.
Explosive limit - lower:	No data available.
Flash Point:	Not applicable
Self Ignition Temperature:	No data available.
Decomposition Temperature:	No data available.
SADT:	> 100 °C ,
pH:	6.4 1% solution
Viscosity	
Dynamic viscosity:	No data available.
Kinematic viscosity:	No data available.
Flow Time:	No data available.
Solubility(ies)	
Solubility in Water:	5.6 g/l (77 °F/25 °C)
Solubility (other):	No data available.

Partition coefficient (n-octanol/water):	No data available.
Vapor pressure:	No data available.
Relative density:	No data available.
Density:	2.48 g/cm3
Bulk density:	No data available.
Vapor density (air=1):	No data available.

Other information

Oxidizing properties:	The substance or mixture is classified as oxidizing with the category 3.
Molecular weight:	270.31 g/mol

10. Stability and reactivity

Reactivity:	No data available.
Chemical Stability:	Stable under usual application conditions.
Possibility of hazardous reactions:	Breaks down and releases toxic and spontaneously combustible gases when wet
Conditions to avoid:	Heat. Moisture.
Incompatible Materials:	Bases. Halogens and halogenated compounds. Oxidizing agents. Strong reducing agents. Combustible material Strong acids
Hazardous Decomposition Products:	No data available.

11. Toxicological information

Information on toxicological effects

Information on likely routes of exposure

Inhalation:	No data available.
Skin Contact:	No data available.
Eye contact:	No data available.
Ingestion:	No data available.

Acute toxicity (list all possible routes of exposure)

Oral
Product: ATEmix: 306.12 mg/kg

Dermal
Product: ATEmix: 2,040.82 mg/kg

Inhalation
Product: Not classified for acute toxicity based on available data.

Repeated dose toxicity

Product:	No data available.
Components:	
Potassium sulphate	NOAEL (Rat(Female, Male), Oral, daily): 1,500 mg/kg LOAEL (Rat(Female, Male), Oral, daily): 1,500 mg/kg Literature

Skin Corrosion/Irritation

Product:	No data available.
Components:	
potassium peroxodisulphate	Irritating.
Potassium sulphate	EU method B.46 (In Vitro Skin Irritation: Reconstructed Human Epidermis Model Test) (Human, reconstructed epidermis (RhE) model): Not irritating

Serious Eye Damage/Eye Irritation

Product:	Strongly irritating.

Respiratory or Skin Sensitization

Product:	No data available.
Components:	
potassium peroxodisulphate	May cause sensitization by skin contact. May cause sensitization by inhalation.
Potassium sulphate	Local Lymph Node Assay (LLNA), OECD 429 (Mouse): Not a skin sensitizer.

Carcinogenicity

Product:	No data available.
Components:	
Potassium sulphate	Oral

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
No carcinogens present or none present in regulated quantities

ACGIH: US.ACGIH Threshold Limit Values:
No carcinogens present or none present in regulated quantities

US. National Toxicology Program (NTP) Report on Carcinogens:
No carcinogens present or none present in regulated quantities

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050), as amended:
No carcinogens present or none present in regulated quantities

Germ Cell Mutagenicity

In vitro

Product:	No data available.
Components:	
Potassium sulphate	Mutagenicity (reverse mutation assay) (OECD 471): negative Mutagenicity (reverse mutation assay) (OECD 471): negative

In vivo

Product:	No data available.

Reproductive toxicity

Product:	No data available.

Specific Target Organ Toxicity - Single Exposure

Product:	No data available.
Components:	
potassium peroxodisulphate	Inhalation: Respiratory system - Category 3 with respiratory tract irritation.

Specific Target Organ Toxicity - Repeated Exposure

Product:	No data available.

Aspiration Hazard

Product:	No data available.
Components:	
potassium peroxodisulphate	Not applicable
Potassium sulphate	Not applicable

Information on health hazards

Other hazards

Product:	No data available.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish

Product:	No data available.
Components:	
Potassium sulphate	LC 50 (Pimephales promelas, 96 h): 680 mg/l Literature

Aquatic Invertebrates

Product:	No data available.
Components:	
Potassium sulphate	LC 50 (Daphnia magna, 48 h): 720 mg/l

Toxicity to Aquatic Plants

Product:	No data available.
Components:	
Potassium sulphate	EC 50 (Chlorella vulgaris (Fresh water algae), 18 d): 2,700 mg/l

Toxicity to microorganisms

Product:	No data available.

Chronic hazards to the aquatic environment:

Fish

Product:	No data available.

Aquatic Invertebrates

Product:	No data available.

Toxicity to Aquatic Plants

Product:	No data available.

Toxicity to microorganisms

Product:	No data available.

Persistence and Degradability

Biodegradation

Product:	No data available.
Components:	
Potassium sulphate	The methods for determining the biological degradability are not applicable to inorganic substances.

BOD/COD Ratio

Product: No data available.

Bioaccumulative potential

Bioconcentration Factor (BCF)
Product: No data available.

Partition Coefficient n-octanol / water (log Kow)
Product: No data available.
Components:
potassium peroxodisulphate: Log Kow: -1 20 °C

Mobility in soil:

Product No data available.

Results of PBT and vPvB assessment:

Product No data available.

Other adverse effects:

Other hazards
Product: No data available.

13. Disposal considerations

Disposal methods: Waste must be disposed of in accordance with federal, state, provincial and local regulations.

Contaminated Packaging: No data available.

14. Transport information

Domestic regulation

49 CFR

UN/ID/NA number	:	UN 1492
Proper shipping name	:	Potassium persulfate
Class	:	5.1
Packing group	:	III
Labels	:	5.1
ERG Code	:	140
Marine pollutant	:	no

International Regulations

IATA-DGR

UN/ID No.	:	UN 1492
Proper shipping name	:	Potassium persulphate
Class	:	5.1
Packing group	:	III
Labels	:	5.1
Packing instruction (cargo aircraft)	:	563
Packing instruction (passenger aircraft)	:	559

IMDG-Code

UN number or ID number	:	UN 1492
Proper shipping name	:	POTASSIUM PERSULPHATE
Class	:	5.1
Packing group	:	III
Labels	:	5.1
EmS Code	:	F-A, S-Q
Marine pollutant	:	no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

15. Regulatory information

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
None present or none present in regulated quantities.

US. Toxic Substances Control Act (TSCA) Section 5(a)(2) Final Significant New Use Rules (SNURs) (40 CFR 721, Subpt E)
None present or none present in regulated quantities.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050), as amended
None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):
None present or none present in regulated quantities.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Oxidizer (liquid, solid or gas), Acute toxicity (any route of exposure), Skin Corrosion or Irritation, Serious eye damage or eye irritation, Respiratory or Skin Sensitization, Specific target organ toxicity (single or repeated exposure)

US. EPCRA (SARA Title III) Section 304 Extremely Hazardous Substances Reporting Quantities and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Hazardous Substances

None present or none present in regulated quantities.

US. EPCRA (SARA Title III Section 313 Toxic Chemical Release Inventory (TRI) Reporting

None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):
None present or none present in regulated quantities.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)
None present or none present in regulated quantities.

US State Regulations

US. California Proposition 65

No ingredient requiring a warning under CA Prop 65.

Inventory Status:

US TSCA Inventory:	Included on Inventory.	

16.Other information, including date of preparation or last revision

Issue Date: 09/07/2022

Version #: 1.0

Further Information: No data available.

Revision Information Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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SAFETY DATA SHEET

Classified in accordance 29 CFR 1910.1200

1. Identification

Product identifier: KLOZUR® CAUSTIC

Other means of identification
None.

Recommended restrictions

Recommended use: Remediation of contaminated soil and groundwater.
Restrictions on use: Not known.

Manufacturer/Importer/Distributor Information

Company Name	:	Evonik Corporation 299 Jefferson Road Parsippany, NJ 07054 USA
Telephone	:	+1 973 929 8000
Fax	:	+1 973 929 8040
E-mail	:	product-regulatory-services@evonik.com

Emergency telephone number:

24-Hour Health Emergency	:	+1 800 424 9300 (CHEMTREC - US & CANADA) 800 681 9531 (CHEMTREC MEXICO) +1 703 527 3887 (CHEMTREC WORLD)

2. Hazard(s) identification

Hazard Classification

Physical Hazards

Corrosive to metal	Category 1

Health Hazards

Skin Corrosion/Irritation	Category 1A
Serious Eye Damage/Eye Irritation	Category 1

Label Elements

Hazard Symbol:

Signal Word: Danger

Hazard Statement:

May be corrosive to metals.
Causes severe skin burns and eye damage.

Precautionary Statements

Prevention: Keep only in original packaging. 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.

Response: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. Wash contaminated clothing before reuse. Specific treatment (see supplemental first aid instructions on this label). IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Absorb spillage to prevent material damage.

Storage: Store locked up. Store in corrosive resistant stainless steel container with a resistant inner liner.

Disposal: Dispose of contents/ container to an approved facility in accordance with local, regional, national and international regulations.

Hazard(s) not otherwise classified (HNOC): None.

3. Composition/information on ingredients

Mixtures

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%)*
sodium hydroxide		1310-73-2	25%

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

The exact concentration has been withheld as a trade secret.

4. First-aid measures

Description of necessary first-aid measures

General information: Pay attention to self-protection. Remove victims from hazardous area. Immediately remove soiled or soaked clothing and remove it to a safe distance. Keep victim warm, in a stabilized position and covered. Do not leave the victim unattended. Place patients who are unconscious but breathing in the stabilized lateral position.

Inhalation:	Potential for exposure by inhalation if aerosols or mists are generated. After inhalation move subject to fresh air. With labored breathing: Provide with oxygen. Consult a doctor immediately. If the casualty is not breathing: Perform mouth-to-mouth resuscitation, notify emergency physician immediately.
Skin Contact:	Wash off affected area immediately with plenty of water for at least 15 minutes. Get medical attention if any discomfort continues.
Eye contact:	With eye held open, thoroughly rinse immediately with plenty of water for at least 10 minutes. Notify emergency physician immediately (key words: burns in eye).
Ingestion:	Rinse mouth. Immediately give large quantities of water to drink. Notify the emergency physician immediately.
Personal Protection for First-aid Responders:	No data available.

Most important symptoms and effects, both acute and delayed

Symptoms:	Corrosive
Hazards:	Strongly irritating to corrosive.

Indication of immediate medical attention and special treatment needed

Treatment:	The initial focus is only on the local action, characterized by quickly progressing deep tissue damage. Coughing is a symptom of a respiratory tract irritation after inhalation of aerosols or mists from caustic liquids. In the eye, caustic liquids cause, depending on the intensity of exposure, severe irritation, destruction, and ablation of the epithelium of the conjunctiva and cornea, corneal clouding, edema and ulcerations. Danger! Possible loss of eyesight! Superficial irritations and damage up to ulcerations and scarring develop on the skin.

5. Fire-fighting measures

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media:	The product is non-combustible. In case of fire in the surroundings: Water spray, foam, CO2, dry powder.
Unsuitable extinguishing media:	High volume water jet.
Special hazards arising from the substance or mixture:	In case of fire-fighting with water or foam be aware of dangers of corrosion and of slipping.

Special protective equipment and precautions for fire-fighters

Special fire-fighting procedures:	Cool containers/tanks with water spray.
Special protective equipment for fire-fighters:	In case of fire use self-contained breathing apparatus if necessary.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:	For personal protection see section 8.
Accidental release measures:	No data available.
Methods and material for containment and cleaning up:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). After cleaning, flush away traces with water. Fill into marked, sealable containers. To be disposed of in compliance with existing regulations.
Environmental Precautions:	Prevent product from entering drains. Do not allow to reach the sewage system, the ground or natural water bodies.

7. Handling and storage

Handling

Technical measures (e.g. Local and general ventilation):	Provide natural or explosion-proof ventilation adequate to ensure concentrations are kept below exposure limits.Provide readily accessible eye wash stations and safety showers.
Safe handling advice:	Avoid residues of the product on the containers. For personal protection see section 8.Handle in accordance with good industrial hygiene and safety practice.
Contact avoidance measures:	No data available.

Storage

Safe storage conditions:	In order to ensure due transportation, make certain that stacks are of the correct height, containers are securely fastened so as not to fall off, and labelled according to the regulations.Store in the original receptable, keeping this tightly sealed, under cool and dry conditions. Minimum storage temperature: 15 °C. Suitable materials are: Stainless steel. rubber-lined steel polyolefins Inadequate materials are: aluminium zinc enamel
Safe packaging materials:	No data available.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

Chemical Identity	Type	Exposure Limit Values	Source
sodium hydroxide	Ceiling	2 mg/m3	US. ACGIH Threshold Limit Values, as amended (03 2016)
	Ceil_Time	2 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended (2010)
	PEL	2 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended (03 2016)

Please refer to the latest edition of the appropriate source text and consult an industrial hygienist or similar professional, or local agencies, for further information.

Biological Limit Values
No biological exposure limits noted for the ingredient(s).

Appropriate Engineering Controls Provide natural or explosion-proof ventilation adequate to ensure concentrations are kept below exposure limits. Provide readily accessible eye wash stations and safety showers.

Individual protection measures, such as personal protective equipment

Eye/face protection: close-fitting protective goggles (e.g. closed goggles)

Skin Protection

Hand Protection: Material: Kächele-Cama Latex GmbH (KCL), Germany
Guideline: DIN EN 374
Additional Information: Applies to handling for longer periods or of large amountsMaterial: Kächele-Cama Latex GmbH (KCL), Germany
Guideline: DIN EN 374
Additional Information: Applies to handling for brief periods or of small amounts

Skin and Body Protection: Anti-static suit. acid-resistant protective clothing Alkali-resistant protective clothing

Respiratory Protection: in case vapors or aerosols appear use respiratory equipment with suitable filter or wear a self contained respiratory apparatus Suitable filter: A, code colour brown Note time limit for wearing respiratory protective equipment.

Hygiene measures: Avoid contact with skin and eyes. Wash contact areas after handling. Do not eat, drink, smoke, or sniff while at work. Wash your hands and/or face before breaks and before termination of work. Take off clothing and shoes contaminated with product. Clean before reuse.

9. Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Physical state:	liquid
Form:	liquid
Color:	colorless
Odor:	Odorless
Odor Threshold:	No data available.
Freezing point:	3 °F/-16 °C
Boiling Point:	241 °F/116 °C
Flammability:	No data available.

Upper/lower limit on flammability or explosive limits

Explosive limit - upper:	Not applicable
Explosive limit - lower:	Not applicable
Flash Point:	Not applicable
Self Ignition Temperature:	Not expected during handling from practical experience.
Decomposition Temperature:	Not expected during handling from practical experience.
pH:	14 (20 °C)
Viscosity	
Dynamic viscosity:	6.4 mPa.s (77 °F/25 °C)
Kinematic viscosity:	5.20 mm2/s (86 °F/30 °C)
Flow Time:	No data available.
Solubility(ies)	
Solubility in Water:	> 10 g/l Soluble
Solubility (other):	Soluble
Partition coefficient (n-octanol/water):	No data available.
Vapor pressure:	10 - 18 hPa (86 °F/30 °C)
Relative density:	No data available.
Density:	1.273 g/cm3 (68 °F/20 °C)
Bulk density:	No data available.
Relative vapor density:	No data available.

Other information

Explosive properties:	Not expected during handling from practical experience.
Oxidizing properties:	Not expected during handling from practical experience.
Minimum ignition temperature:	Not applicable
Formation of Flammable Gases:	Not expected during handling from practical experience.
Peroxides:	Not expected during handling from practical experience.
Metal Corrosion:	Corrosive to metal
Evaporation Rate:	No data available.
Molecular weight:	40 g/mol

10. Stability and reactivity

Reactivity:	No data available.
Chemical Stability:	No data available.
Possibility of hazardous reactions:	Evolution of hydrogen with: various metals e.g.: aluminium, magnesium, zinc (Formation of detonating gas with atmospheric oxygen). Exothermic reaction with: acids
Conditions to avoid:	No further information available
Incompatible Materials:	aluminium Magnesium zinc acids
Hazardous Decomposition Products:	No hazardous decomposition products are known.

11. Toxicological information

Information on toxicological effects

Information on likely routes of exposure

Inhalation:	No data available.
Skin Contact:	Relevant route of exposure. Information on effects are given below.
Eye contact:	Relevant route of exposure. Information on effects are given below.
Ingestion:	If handled correctly, not a relevant route of exposure. Information on effects are given below.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation:	No data available.
Skin Contact:	Relevant route of exposure. Information on effects are given below.
Eye contact:	Relevant route of exposure. Information on effects are given below.
Ingestion:	If handled correctly, not a relevant route of exposure. Information on effects are given below.

Acute toxicity (list all possible routes of exposure)

Oral
Product: Not classified for acute toxicity based on available data.

Dermal
Product: Not classified for acute toxicity based on available data.

Inhalation
Product: No data available.
Not classified for acute toxicity based on available data.

Repeated dose toxicity
Product: No data available.

Skin Corrosion/Irritation
Product: Corrosive. (Rabbit): Corrosive.; Literature

Serious Eye Damage/Eye Irritation
Product: No data available.
Components:
sodium hydroxide — Risk of serious damage to eyes. OECD 405 Rabbit:

Respiratory or Skin Sensitization
Product: No data available.
Components:
sodium hydroxide — Sensitization test (man): Not a skin sensitizer.

Carcinogenicity
Product: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
No carcinogens present or none present in regulated quantities

ACGIH: US.ACGIH Threshold Limit Values:
No carcinogens present or none present in regulated quantities

US. National Toxicology Program (NTP) Report on Carcinogens:
No carcinogens present or none present in regulated quantities

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050), as amended:
No carcinogens present or none present in regulated quantities

Germ Cell Mutagenicity

In vitro

Product:	No data available.
Components:	
sodium hydroxide	Ames test (OECD 471): negative gene mutation test (analogous OECD method): positive

In vivo

Product:	No data available.
Components:	
sodium hydroxide	Micronucleus test (analogous OECD method) Intraperitoneal (Mouse, Female, Male): negative

Reproductive toxicity
Product: No data available.

Specific Target Organ Toxicity - Single Exposure
Product: No data available.

Specific Target Organ Toxicity - Repeated Exposure
Product: No data available.

Aspiration Hazard

Product:	No data available.
Components:	
sodium hydroxide	Not applicable

Information on health hazards

Other hazards
Product: No data available.

12. Ecological information

Ecotoxicity:
Acute hazards to the aquatic environment:

Fish
Product: No data available.

Aquatic Invertebrates

Product:	No data available.
Components:	
sodium hydroxide	EC 50 (Ceriodaphnia, 48 h): 40.4 mg/l Literature

Toxicity to Aquatic Plants
Product: No data available.

Toxicity to microorganisms
Product: No data available.

Chronic hazards to the aquatic environment:

Fish
Product: No data available.

Aquatic Invertebrates
Product: No data available.

Toxicity to Aquatic Plants
Product: No data available.

Toxicity to microorganisms
Product: No data available.

Persistence and Degradability

Biodegradation
Product: No data available.

BOD/COD Ratio
Product: No data available.

Bioaccumulative potential

Bioconcentration Factor (BCF)
Product: No data available.

Partition Coefficient n-octanol / water (log Kow)
Product: Log Kow: No data available.

Mobility in soil:

Product No data available.

Results of PBT and vPvB assessment:

Product Not a PBT, vPvB substance as per the criteria of the REACH Regulation.

Other adverse effects:

Other hazards
Product: No further information available

Additional Information: no ecotoxicological studies with the product available.

13. Disposal considerations

Disposal methods: Discharge, treatment, or disposal may be subject to national, state, or local laws.

Contaminated Packaging: Dispose of container and unused contents in accordance with federal, state, and local requirements.

14. Transport information

Domestic regulation

49 CFR
UN/ID/NA number : UN 1824
Proper shipping name : Sodium hydroxide solution

Class	:	8
Packing group	:	II
Labels	:	8
ERG Code	:	154
Marine pollutant	:	no
Remarks	:	FOR USA ONLY: When shipping in, by or via USA note of the Reportable Quantity-Regulation!

International Regulations

IATA-DGR

UN/ID No.	:	UN 1824
Proper shipping name	:	Sodium hydroxide solution
Class	:	8
Packing group	:	II
Labels	:	8
Packing instruction (cargo aircraft)	:	855
Packing instruction (passenger aircraft)	:	851
Remarks	:	FOR USA ONLY: When shipping in, by or via USA note of the Reportable Quantity-Regulation!

IMDG-Code

UN number or ID number	:	UN 1824
Proper shipping name	:	SODIUM HYDROXIDE SOLUTION
Class	:	8
Packing group	:	II
Labels	:	8
EmS Code	:	F-A, S-B
Marine pollutant	:	no
Remarks	:	Keep separate from acids., FOR USA ONLY: When shipping in, by or via USA note of the Reportable Quantity-Regulation!

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

15. Regulatory information

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
None present or none present in regulated quantities.

US. Toxic Substances Control Act (TSCA) Section 5(a)(2) Final Significant New Use Rules (SNURs) (40 CFR 721, Subpt E)
None present or none present in regulated quantities.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050), as amended
None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

Chemical Identity
SODIUM HYDROXIDE

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Corrosive to metal, Skin Corrosion or Irritation, Serious eye damage or eye irritation

US. EPCRA (SARA Title III) Section 304 Extremely Hazardous Substances Reporting Quantities and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Hazardous Substances

None present or none present in regulated quantities.

US. EPCRA (SARA Title III Section 313 Toxic Chemical Release Inventory (TRI) Reporting

None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):
None present or none present in regulated quantities.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

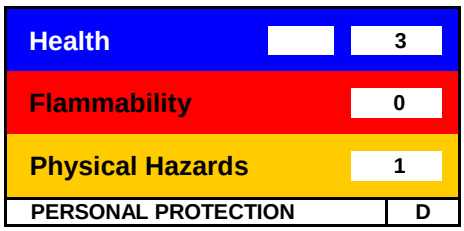
Chemical Identity
SODIUM HYDROXIDE

US State Regulations

US. California Proposition 65
No ingredient requiring a warning under CA Prop 65.

16.Other information, including date of preparation or last revision

HMIS Hazard ID



D - Face Shield, Gloves & Apron

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe; RNP - Rating not possible; *Chronic health effect

Issue Date:	09/08/2022
Version #:	1.0
Further Information:	No data available.
Revision Information	Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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Safety Data Sheet

Hydrated Lime

Revision date:
July 11, 2019

1. Identification

Product Name: Hydrated Lime

Synonyms:
Chemical Hydrate
Commercial Hydrate
Hyd Chem SS,
Hyd Lime Chem,
Hydrate Tailings,
Hydrated Lime Kiln Dust,
Industrial Hydrate,
Pink Hydrate,

Recommended Uses: Water treatment, steel flux, caustic agent, pH adjustment, acid gas absorption, construction

Manufacturer: Carmeuse Americas

US Office
11 Stanwix Street, 21st Floor
Pittsburgh, PA 15222
Phone: (412) 995-5500
Fax: (412) 995-5594

Canadian Office
PO Box 190
Ingersoll, ON N5C 3K5
Phone: (519) 423-6283
Fax: (519) 423-6545

Emergency Contact: Infotrac: (800) 535-5053 (24 hrs a day, 7 days a week)

2. Hazards Identification

GHS classification

Physical Hazards

None

Health Hazards

Skin Irritation	Category 2
Eye Damage	Category 1
Carcinogenicity	Category 1A
Specific Target Organ Toxicity – Single Exposure	Category 3

GHS Label Elements:

Signal Word: Danger

Hazard Statements:
Causes skin irritation.
Causes serious eye damage.
May cause respiratory irritation.
May cause cancer through inhalation

Precautionary Statements:
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep container tightly closed
Do not breathe dust.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in well-ventilated area
Wear protective gloves, clothing and eye protection

Pictograms:

3. Composition

Chemical name	% by weight	CAS#
Calcium hydroxide	> 85	1305-62-0
Silica-crystalline quartz	< 1	14808-60-7

4. First Aid Measures

Eyes: Immediately flush eyes with generous amounts of water for at least 15 minutes. Pull back the eyelid to ensure that all lime dust has been washed out. Seek medical attention immediately. Do not rub eyes.

Skin: Wash exposed area with large amounts of water. Seek medical attention immediately.

Ingestion: Do not induce vomiting. Seek medical attention immediately. Never give anything by mouth unless instructed to do so by medical personnel.

Inhalation: Move victim to fresh air. Seek medical attention if necessary. If breathing has stopped, give artificial respiration

Most Important Symptoms: Irritation of skin, eyes, gastrointestinal tract or respiratory tract.

Immediate medical attention / special treatment? See first aid information above. Note to Physicians: Provide general supportive measures and treat symptomatically.

5. Fire Fighting Measures

Suitable (and unsuitable) fire extinguishing media: Use dry chemical fire extinguisher. Do not use water or halogenated compounds, except that large amounts of water may be used to deluge small quantities of this product.

Specific hazards arising from the product	Inhalation, skin or eye contact, can result in serious injury. This product is not combustible or flammable. This product is not considered to be an explosion hazard, although reaction with water or other incompatible materials may rupture containers. When this product is wet, it can be very slippery and can result in a slip hazard. Hazardous Combustion Products: None.
Special protective equipment and precautions for fire fighters	Wear full fire-fighting turn-out gear (full Bunker gear), and respiratory protection (SCBA) to prevent inhalation, skin or eye contact.

6. Accidental Release Measures

Personal precautions, protective equipment, emergency procedures:

Avoid inhalation, eye and skin contact. Avoid generating airborne dust. Wear appropriate protective clothing as described in section 8.

Methods and materials for containment and clean up:

Utilize cleanup methods that minimize generating dust: vacuum. Avoid dry sweeping. Residue on surfaces may be removed with copious amount of water or vinegar.

7. Handling & Storage

Safe Handling: Avoid inhalation, skin and eye contact. Avoid generating airborne dust. An eye wash station should be readily available when this product is handled.

Safe Storage: Keep in tightly closed containers. Protect containers from physical damage. Store in a cool, dry, and well-ventilated location. Do not store near incompatible materials (see Section 10 below). Keep away from moisture. Long-term storage in aluminum containers is not recommended, as calcium oxide may corrode aluminum over long periods of time

8. Exposure Controls/Personal Protection

Occupational Exposure Limits

	OSHA PEL (mg/m^3)	ACGIH TLV (mg/m^3)	Ont. Reg. 833 TWAEV (mg/m^3)
Calcium hydroxide	15 (total) 5 (respirable)	5	5
Silica, *crystalline quartz, cristobalite and tridymite*	0.05 (respirable)	0.025 (respirable)	0.1

Engineering Controls: Use with adequate general or local exhaust ventilation and to maintain exposure below occupational exposure limits.

Individual Protection Measures (Personal Protective Equipment):

Specific Eye / Face Protection:	Safety glasses with side shields. In windy conditions, or if work activity generates elevated airborne dust levels, dust proof or chemical goggles are recommended. Contact lenses should not be worn.
Specific Skin Protection:	When there is a risk of skin contact, wear appropriate clothing and gloves to prevent contact.
Specific Respiratory Protection:	If exposure limits are exceeded, an approved particulate respirator, or supplied air respirator, appropriate for the airborne concentrations, should be used. Selection and use of the respiratory protective equipment must be in accordance with applicable regulations and good industrial hygiene practices.
Other:	An emergency eye wash fountain and shower are recommended.

9. Physical & Chemical Properties

Appearance:	White powder
Odor:	Odorless
Odor threshold:	Not Applicable
pH at 25 degrees C:	12.45
Melting Point:	1076 °F (580 °C)
Boiling Point and range:	5162 °F (2850 °C)
Flash Point:	Not Applicable
Evaporation Rate:	Not Applicable
Flammability:	Not Applicable
Upper/lower flammability or explosive limits	Not Applicable
Vapor pressure/density:	Non Volatile
Relative density:	2.24
Solubility:	Slightly soluble in water: 0.2% @ 0 °C. Soluble in acids, glycerin, and sugar solutions
Partition coefficient: n-octanol/water	Not applicable
Auto-ignition temperature:	Not Available
Decomposition temperature:	Not available
Viscosity:	Not Applicable

10. Stability & Reactivity

Reactivity: Reacts with acids to form calcium salts, releasing heat. Reacts with carbon dioxide in air to form calcium carbonate. See also Incompatibility below.

Chemical stability: Stable under normal storage and handling conditions.

Possibility of Hazardous Reactions: See "reactivity" above.

Conditions to avoid: Vicinity of incompatible materials.

Incompatibility: This product should not be mixed or stored with the following materials, due to the potential for violent reaction and release of heat:

- acids
- reactive fluoridated compounds
- reactive brominated compounds
- reactive powdered metals
- reactive phosphorous compounds
- aluminum powder
- organic acid anhydrides
- nitro-organic compounds
- interhalogenated compounds

Hazardous decomposition products: None

11. Toxicological Information

Likely routes of exposure & symptoms:

Eyes: Contact can cause severe irritation or burning of eyes, including permanent damage.

Skin: Contact can cause severe irritation or burning of skin, especially in the presence of moisture.

Ingestion: This product can cause severe irritation or burning of gastrointestinal tract if swallowed.

Inhalation: This product can cause severe irritation of the respiratory system.

Chronic health effects: This product contains trace amounts of crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica can cause silicosis, as serious lung disease.

Respiratory or skin sensitization: This material is not known to cause sensitization

Germ cell mutagenicity: No data available.

Carcinogenicity:	This product is not listed as carcinogenic by OSHA, IARC, NTP, ACGIH, or the EU Directives. This product may contain trace amounts of crystalline silica quartz which is listed by IARC as “Carcinogenic to Humans” (Group 1) and “Known to be a Human Carcinogen" by NTP (National Toxicology Program).
Reproductive toxicity:	No Data Available.
Numerical Measures of Toxicity	Crystalline Silica: Oral Rat LD_{50} > 22,500 mg/kg Calcium Hydroxide: Oral (rat) LD_{50}: 7340 mg/kg

12. Ecological Information

Because of the elevated pH of this product, it might be expected to produce some ecotoxicity upon exposure to certain aquatic organisms and aquatic systems in high concentrations
This material shows no bioaccumulation effect or food chain concentration toxicity.

13. Disposal Considerations

Dispose of contents in accordance with federal, state, provincial and local regulations.

14. Transport Information

Not regulated by Department of Transportation, Transport of Dangerous Goods

15. Regulatory Information

CERCLA Hazardous Substances	Not listed
SARA Toxic Chemical (40 CFR 372.65)	Not listed
SARA Section 302 Extremely Hazardous Substances (40 CFR 355)	Not listed
SARA 311/312	Not listed
SARA Section 313 Toxic Chemicals reporting requirements	None
Threshold planning quantity (TPQ)	Not listed
RCRA Hazardous Waste Classification (40 CFR 261)	Not Classified
EPA Toxic Substances Control Act (TSCA) Status	The components of this product are each listed on the TSCA Inventory List in the “active” status.
California Proposition 65	Airborne crystalline silica particulates of respirable size are known to the State of California to cause cancer.
NFPA ratings	Health: 3 Fire: 0 Reactivity: 0
HMIS Ratings	Health: 3 Fire: 0 Reactivity: 0 Personal protection: E
OSHA Specifically regulated substance (29 CFR 1910)	Not listed
OSHA Air contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A)	Listed
MSHA	Not listed
Canada DSL	Listed

Canadian WHMIS Classification	D2A, Materials Causing other toxic effects. E, Corrosive Material

Canada CPR This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation of a Canada and this SDS contains all the required information.

16. Other Information

List of GHS Hazard Statements:	H315: Causes skin irritation H318: Causes serious eye damage H335: May cause respiratory irritation. H350: May cause cancer through inhalation
List of GHS Precautionary Statements:	P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P233: Keep container tightly closed P260: Do not breathe dust. P264: Wash thoroughly after handling. P270: Do not eat, drink or smoke when using this product. P271: Use only outdoors or in well-ventilated area P280: Wear protective gloves, clothing and eye protection

Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act	IARC	International Agency for Research on Cancer
NTP	National Toxicology Program		

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