MEMORANDUM

verdantas

Date: **February 16, 2023- DRAFT**
RE: **Work Plan for Application of Bioremediation Amendment to Soil, Sediment, and Groundwater at Locations Impacted by the Route 44 Gasoline Spill in Norfolk, CT**
Project Title: **November 5, 2022 Gasoline Spill in Norfolk, CT**
Project Number: **16640-000**

Verdantas has developed this Work Plan to provide details regarding proposed bioremediation activities at select locations in the Town of Norfolk, CT. This Work Plan was developed in response to the gasoline release that occurred on Route 44 on November 5, 2022. The following locations are targeted for remediation in this Work Plan:

- Soil and groundwater located beneath a portion of Maple Avenue;
- The open stormwater drainage channel that runs from the release site on Route 44, along Pettibone Lane, and downstream across Maple Avenue to Emerson Street; and,
- Sand bed #2 at the Norfolk Water Pollution Control Facility (WPCF) located at 250 Greenwood Road West.

The proposed activities described in this Work Plan will be implemented starting in March of 2023. The spill response remains under the lead of the Connecticut Department of Energy and Environmental Protection (CTDEEP), and therefore this Work Plan requires approval by CTDEEP. Based on consultation with CTDEEP, the approved Work Plan will satisfy permitting requirements for addition of the bioremediation amendments proposed herein.

This Work Plan proposes a combination of injection and/or surficial application of Petrox® microbes, manufactured by CL Solutions, LLC, for bioaugmentation purposes within the areas described above. The details presented in this Work Plan are based on current conditions. It is noted that this Work Plan may be amended and adjusted as conditions change throughout the Site and additional sampling data is obtained. Any associated revisions to the Work Plan will be presented in a revised version of this document.

Purpose for using Petrox®

This Work Plan presents an *in-situ* and surficial treatment strategy for the remediation of gasoline-related impacts to soil, groundwater, and/or sediment along the flow path of the release. In addition, sand bed #2 at the Norfolk WPCF, which has been impacted by the gasoline spill, will also undergo a surficial application of Petrox®.

The Petrox® treatment program is intended to facilitate bioremediation when the microbes are in contact with gasoline impacts. Petrox® is a commercial product composed of petroleum-degrading microbial strains that are capable of degrading petroleum hydrocarbons resulting in the formation of carbon dioxide and water. The advantages of applying Petrox® are that gasoline impacts can be safely degraded without completing large excavations (i.e., exposing underground utilities, building footings/structural elements, etc.) or creating major disruptions to infrastructure and

surrounding properties. Petrox® relies on microbial degradation of petroleum impacts and does not damage utilities or create an increased vapor intrusion risk.

Injections Along Maple Avenue

It is anticipated that remediation along Maple Avenue will occur in two (2) phases.

Phase 1 – Injections

This first phase is to take place along the perimeter/downstream monitoring wells on Maple Avenue and along the passive venting piping network that is in place between Maple Ave and adjacent properties. The intent of this application is to treat existing petroleum mass and prevent further migration and expansion of the gasoline impacts below the roadway. Directly applying the microbes in areas with known free product may produce an anoxic environment for the Petrox® microbes and can shock the microbes and reduce the effectiveness of the bioremediation process. As such, Verdantas proposes to inject/apply the Petrox® at the perimeter monitoring wells (i.e., the perimeter of the inferred area of hydrocarbon impact) MW-5, MW-17, and MW-23 that are set at a depth of 15 below ground surface (bgs). Please refer to the attached figure for details on the locations of monitoring wells. The wells that are proposed for injections across Maple Avenue have been highlighted in blue on the attached figure.

Petrox® will also be applied along the 40-foot passive venting system that is highlighted with a pink line in the attached figure. The passive venting system piping is slotted and the backfill around the piping has been established as a crushed stone matrix. As such, the application of Petrox® will distribute along the length of the passive venting system.

Liquid vacuum recovery events take place at select recovery wells (e.g., completed by ESI on a weekly basis) along Maple Avenue. These events should continue after the Petrox® is applied. It is anticipated that over time, the Petrox® microbes will be distributed from the injection locations throughout the inferred zone of impact by these vacuum events.

Phase 2 – Application in Maple Avenue Excavation

It is noted that the impacted locations along Maple Avenue are to undergo excavation procedures under the direction of CTDEEP by ESI during the spring of 2023. As part of a post-excavation remediation program, Verdantas proposes an application of Petrox® in the open excavation prior to backfill by ESI. This application of Petrox® will serve as a polishing step following remediation to further treat any residual gasoline impacts.

It may be warranted to combine the use of Petrox® with the use of other remediation technologies/techniques such as Oxygen Release Compound (ORC®), which has already been used in open excavations under CT DEEP direction and oversight. Combining the use of other remediation strategies and/or compounds will be coordinated with CTDEEP prior to these application programs and will be dependent on the conditions encountered during excavations on Maple Avenue.

Application Across Open Storm Water Drainage Channel

As it currently stands, under the direction of CTDEEP, ESI has completed the removal of sections of visibly impacted soil / sediment along the open drainage channel sections that extend the following properties:

- 97 Greenwood Road East;
- 31 Pettibone Lane;
- 51 Maple Avenue; and,
- 26 Emerson.

The gasoline-related impacts were remediated by shallow excavations to remove/skim impacted soil/sediment and transfer the impacts into containers for transport off Site.

However, it is noted that there may be inaccessible sections of impacted soils (i.e., not accessible by heavy machinery and site personnel) and/or where access would undermine/hinder the drainage channel features (disturb flow path, etc.). As such, this Work Plan proposes the application of Petrox® along the stormwater drainage channel as a remedial measure. The surficial application of Petrox® will promote bioremediation of residually impacted soil/sediment along the length of the open channel.

It is proposed that Petrox® be applied directly to the soils and sediments located along the sides of the open channel using a backpack sprayer. Verdantas will coordinate with CTDEEP to determine the portions of the open stream channel where Petrox® will be applied.

Application at sand bed #2 at WPCF

This Work Plan proposes that a surficial application of Petrox® be applied to the surface of sand bed #2 located in the Norfolk WPCF. The intent is to continue the bioaugmentation/bioremediation of residual gasoline-impacted sand in this sand bed.

Planned Petrox® Injections and Surficial Procedures

The Petrox® that is to be applied via injection and/or surficial application will be mixed with water at a ratio of approximately 55 gallons of water for every 4.5 pounds of Petrox®. ESI will mix and apply the Petrox® mixture as needed. The application activities will be monitored by Verdantas throughout. Supplements or amendments other than those provided by CL Solutions are not anticipated to be used during the injection and surficial applications.

Injection Procedures

Based on our current understanding of the hydrogeological conditions at the locations to undergo injections (MW-5, MW-17, MW-23 and via the passive venting system), the remediation strategy is not anticipated to have adverse effects on the soil or groundwater conditions. Application of Petrox® via injections will be conducted via low-pressure pumps and/or pouring techniques into the respective injection points.

It is anticipated that the total amount of Petrox® to be applied via injection is approximately 385 gallons over two (2) injection events.

A flexible hose will be connected via a submersible pump from the 55-gallon drums to the injection points. The low-pressure injections will not significantly alter groundwater elevations. To avoid mounding at the localized areas during the injection program, an alternating injection sequence shall be applied, meaning that the adjacent injection points will not be injected without lag between the injections. The low-pressure injection program is anticipated to treat impacted soil within the source soil remediation area (the treatment zone). The proposed treatment zones have been selected based upon soil analytical results and an understanding of the release mechanism.

Surficial Application Procedures

It is anticipated that applying Petrox® along the impacted drainage channel sections, the open excavation on Maple Avenue (i.e., to be completed in the Spring of 2023) and the sand bed at the WPCF will be completed by Site personnel via backpack sprayers or directly poured from the 55-gallon drums to the impacted areas. The total amount of Petrox® to be applied will be based on conditions encountered in the field and will be coordinated with CTDEEP. The timing of Petrox® application for these surficial applications will be weather dependent (i.e., ideally Petrox® is to be applied via surficial applications of air temperatures above 55°F) and the number of applications may vary (depending on the level of impacted areas, etc.).

Post-Remediation Soil Sampling

Once Petrox® application procedures are completed, Verdantas will collect representative confirmatory samples in coordination with CTDEEP along the drainage channel and excavations that are to take place. It is expected that samples will be collected after approximately 3 months to allow the Petrox® to work. Confirmatory soil samples will be analyzed for AVOCs and the pertinent gasoline oxygenates using US EPA Method 8260.

Groundwater Monitoring

Verdantas personnel currently conduct periodic groundwater monitoring programs for the monitoring wells that are installed across the Site. Monitoring wells in the vicinity of locations that undergo Petrox® applications will be monitored and sampled quarterly under coordination with CTDEEP. The sampling will be completed in accordance with the CTDEEP guidance document "Low Flow Sampling Procedures" dated June 12, 2000, for the laboratory analysis of AVOCs and gasoline oxygenates using USEPA Method 8260.

Material Handling, Storage and Spill Management

Petrox® is expected to be delivered to Verdantas by the supplier, CL Solution, LLC. The product will be transported to the ESI warehouse to initiate the Petrox® hydration process when needed. Petrox® can be stored in freeze-dried powder form when in a frozen state.

The freeze-dried microbes must be kept frozen until the product is transported to the Site for the varying application programs. The product will be hydrated with clean tap water by ESI personnel in 55-gallon drums prior to use on Site. According to the manufacturer, if spilled in its dry state. Petrox® can simply be swept up and containerized. If spilled in solution, Petrox® can be allowed to dry, swept up and containerized. A copy of the SDS for this product is attached at the end of this work plan.

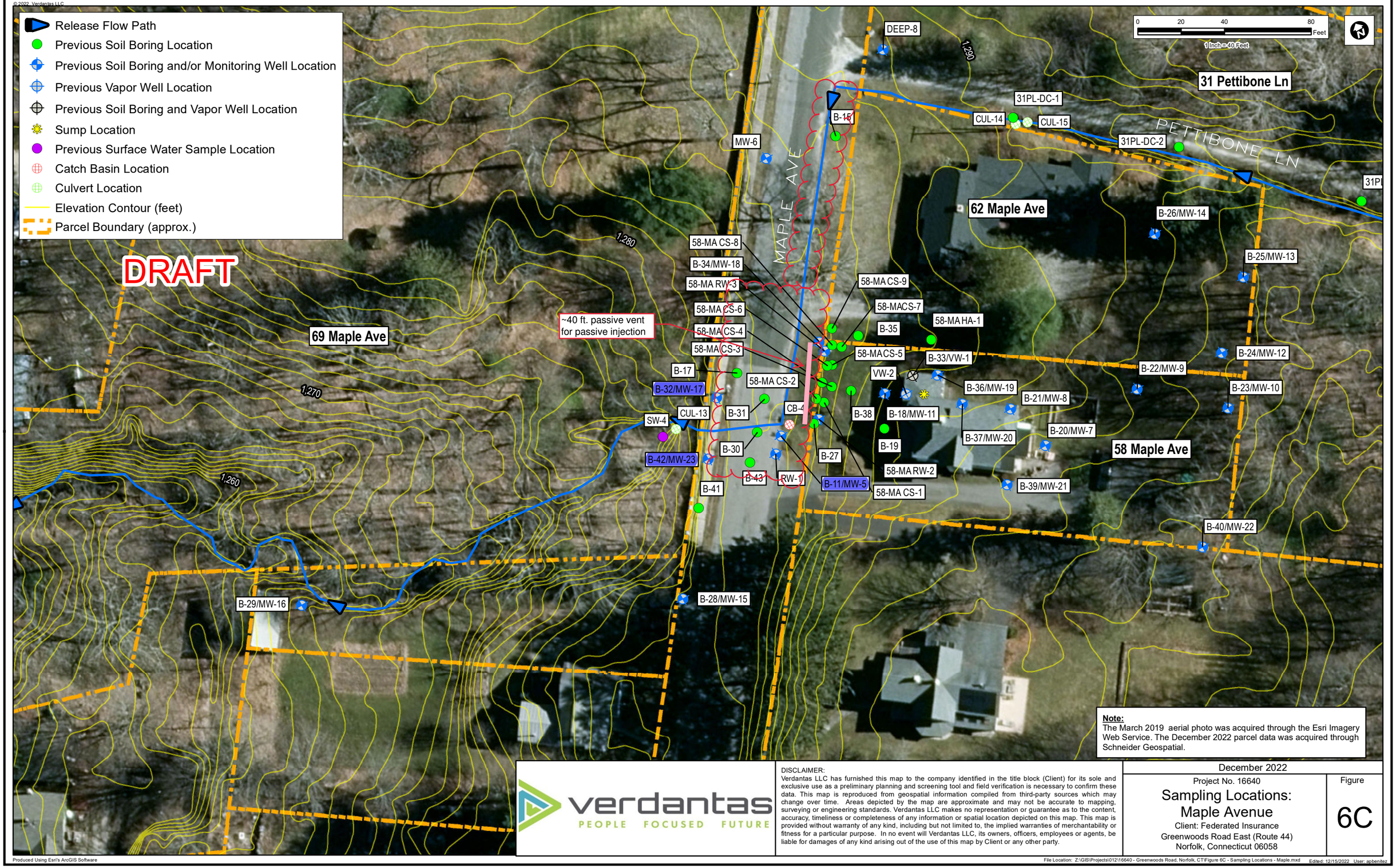
Safety Procedures for Material Handling

The manufacturer's safety recommendations will be followed. Personal protective equipment includes:

- Eye protection – well-sealed goggles or a face shield (recommended for full face protection).
- Respiratory – dust respirator approved by NIOSH/MSA. Hands – neoprene gloves.
- Feet-steel-toed shoes with chemical-resistant soles or neoprene boots.
- Clothing – long sleeve shirts and long pants, considered a laminated Tyvek body suit coveralls.

Attachments

- Proposed Injection / Application Locations
- Petrox® SDS



Note:
The March 2019 aerial photo was acquired through the Esri Imagery Web Service. The December 2022 parcel data was acquired through Schneider Geospatial.

verdantas
PEOPLE FOCUSED FUTURE

DISCLAIMER:
Verdantas LLC has furnished this map to the company identified in the title block (Client) for its sole and exclusive use as a preliminary planning and screening tool and field verification is necessary to confirm these data. This map is reproduced from geospatial information compiled from third-party sources which may change over time. Areas depicted by the map are approximate and may not be accurate to mapping, surveying or engineering standards. Verdantas LLC makes no representation or guarantee as to the content, accuracy, timeliness or completeness of any information or spatial location depicted on this map. This map is provided without warranty of any kind, including but not limited to, the implied warranties of merchantability or fitness for a particular purpose. In no event will Verdantas LLC, its owners, officers, employees or agents, be liable for damages of any kind arising out of the use of this map by Client or any other party.

December 2022

Project No. 16640

Sampling Locations: Maple Avenue

Client: Federated Insurance
Greenwoods Road East (Route 44)
Norfolk, Connecticut 06058

Figure
6C

Produced Using Esri's ArcGIS Software

File Location: Z:\GIS\Projects\012\16640 - Greenwoods Road, Norfolk, CT\Figure 6C - Sampling Locations - Maple.mxd

Edited: 12/15/2022 User: apbenitez

Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 05/29/2015 Reviewed on 05/29/2015

* 1 Identification

· **Product identifier**

· **Trade name: Petrox**
· **Relevant identified uses of the substance or mixture and uses advised against**
· **Product description** Soil bioremediation solution used to neutralize pollutants.
· **Application of the substance / the mixture** Bioremediation of soil.

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Osprey Biotechnics, Inc.
1833A 57th Street
Sarasota, FL 34243
941-351-2700
· **Emergency telephone number:** Chemtrec 1-800-424-9300 or outside USA 1-703-527-3887

* 2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS03 Flame over circle

Ox. Sol. 2 H272 May intensify fire; oxidizer.


GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Acute Tox. 4 H332 Harmful if inhaled.
Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H335 May cause respiratory irritation.

· **Label elements**
· **GHS label elements**
The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**


GHS03 GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**
Trade Secret
Sodium Nitrate
· **Hazard statements**
May intensify fire; oxidizer.
Harmful if swallowed or if inhaled.
Causes serious eye irritation.
May cause respiratory irritation.
· **Precautionary statements**
Take any precaution to avoid mixing with combustibles.
Keep away from heat.

(Contd. on page 2)

Safety Data Sheet (SDS)
OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 05/29/2015 Reviewed on 05/29/2015

Trade name: Petrox

Keep/Store away from clothing/combustible materials.
Avoid breathing dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Wear protective gloves / eye protection / face protection.
Wear eye protection / face protection.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If swallowed: Call a poison center/doctor if you feel unwell.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
If eye irritation persists: Get medical advice/attention.
Rinse mouth.
In case of fire: Use for extinction: CO2, powder or water spray.
Store locked up.
Store in a well-ventilated place. Keep container tightly closed.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· ***Unknown acute toxicity:***
18 percent of the mixture consists of ingredient(s) of unknown toxicity.
· ***Classification system:***
· ***NFPA ratings (scale 0 - 4)***

Health = 2
Fire = 3
Reactivity = 0

The substance possesses oxidizing properties.
· ***HMIS-ratings (scale 0 - 4)***

Health = 1
Fire = 3
Reactivity = 0

· ***Hazard(s) not otherwise classified (HNOC):*** None

*
3 Composition/information on ingredients

· ***Chemical characterization: Mixtures***
· ***Description:*** Mixture of substances listed below with nonhazardous additions.

· ***Dangerous Components:***

	Trade Secret Acute Tox. 4, H302; Acute Tox. 4, H332; STOT SE 3, H335; Eye Irrit. 2B, H320; Combustible Dust	25-50%
7631-99-4	Sodium Nitrate Ox. Sol. 2, H272; Eye Irrit. 2A, H319	15-35%

4 First-aid measures

· ***Description of first aid measures***
· ***General information:***
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

(Contd. on page 3)

· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Consult doctor if symptoms persist.
In case of unconsciousness, place patient securely on side position for transportation.
· **After skin contact:** Generally the product does not irritate the skin.
· **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
· **After swallowing:** Immediately call a doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

*
5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
· **Special hazards arising from the substance or mixture**
If incinerated, product will release the following: Sodium Oxides, Nitrogen Oxides (NOx), Carbon Oxides, Sulfur Oxides.
· **Advice for firefighters**
Product has a combustible dust hazard. Avoid generating dust while extinguishing any fires.
Wet or damp material may start to decompose and release heat causing any nearby combustibles to catch fire. If containers begin to discolor or vent violently, emergency responders should evacuate area.
Use water spray to cool unopened containers.
When product decomposes, it will release oxygen, which may intensify fires. Use caution.
· **Protective equipment:**
Mouth respiratory protective device.
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to section 13.
Ensure adequate ventilation.
Dispose of the collected material according to regulations.
· **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

· **Handling:**
· **Precautions for safe handling**
Thorough dedusting.
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of dust.
· **Information about protection against explosions and fires:**
Protect from heat.
Keep protective respiratory device available.

(Contd. on page 4)

Safety Data Sheet (SDS)
OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 05/29/2015 Reviewed on 05/29/2015

Trade name: Petrox

· ***Conditions for safe storage, including any incompatibilities***
Store away from strong acids, strong bases, strong oxidizing agents, strong reducing agents, powdered metals, organic materials, Alkali metals, Alkaline earth metals, Cyanides and Thiocyanates.
· ***Storage:***
· ***Requirements to be met by storerooms and receptacles:***
Store below 32 °F and keep frozen until ready to hydrate.
· ***Information about storage in one common storage facility:*** Not required.
· ***Further information about storage conditions:***
Keep receptacle tightly sealed.
Protect from heat and direct sunlight.
· ***Specific end use(s)*** No further relevant information available.

*
8 Exposure controls/personal protection

· ***Additional information about design of technical systems:*** No further data; see section 7.

· ***Control parameters***
All ventilation should be designed in accordance with OSHA standard (29 CFR 1910.94). Use local exhaust at filling zones and where leakage and dust formation is probable. Use mechanical (general) ventilation for storage areas. Use appropriate ventilation as required to keep Exposure Limits in Air below TLV & PEL limits.
· ***Components with occupational exposure limits:***
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 that were valid during the creation of this SDS were used as basis.

· ***Exposure controls***
· ***Personal protective equipment:***
· ***General protective and hygienic measures:***
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing and wash before reuse.
Wash hands before breaks and at the end of work.
· ***Breathing equipment:***
Use suitable respiratory protective device in case of insufficient ventilation.
Not necessary if room is well-ventilated.
· ***Protection of hands:***
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Select glove material based on penetration times, rates of diffusion and degradation.
· ***Material of gloves***
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material cannot be calculated in advance and has therefore to be checked prior to the application.
· ***Penetration time of glove material***
The exact break-through time has to be determined and observed by the manufacturer of the protective gloves.
· ***Eye protection:***


Safety glasses

(Contd. on page 5)

Safety Data Sheet (SDS)
OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 05/29/2015 Reviewed on 05/29/2015

Trade name: Petrox

* **9 Physical and chemical properties**

· **Information on basic physical and chemical properties**
· **General Information**
· **Appearance:**

Form:	Crystalline powder
Color:	Light Tan
· **Odor:**	Savory
· **Odor threshold:**	Not determined.
· **pH-value @ 20 °C (68 °F):**	< 8
· **Change in condition**	
Melting point/Melting range:	Not determined.
Boiling point/Boiling range:	600 °C (1112 °F)
· **Flash point:**	210 °C (410 °F)
· **Flammability (solid, gaseous):**	Contact with combustible material may cause fire.
· **Ignition temperature:**	
Decomposition temperature:	Not determined.
· **Auto igniting:**	Product is not self-igniting.
· **Danger of explosion:**	Not determined.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure:**	Not applicable.
· **Density:**	
Relative density	Not determined.
Vapor density	Not applicable.
Evaporation rate	Not applicable.
· **Solubility in / Miscibility with**	
Water:	Soluble.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not applicable.
Kinematic:	Not applicable.
· **Solvent content:**	
Organic solvents:	0.0 %
Solids content:	100.0 %
· **Other information**	No further relevant information available.

* **10 Stability and reactivity**

· **Reactivity** No further relevant information available.
· **Chemical stability** Stable under normal conditions.
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.

(Contd. on page 6)

Safety Data Sheet (SDS)
OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 05/29/2015 Reviewed on 05/29/2015

Trade name: Petrox

· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:**
Strong acids, strong bases, strong oxidizing agents, strong reducing agents, powdered metals, organic materials, Alkali metals, Alkaline earth metals, Cyanides and Thiocyanates.
· **Hazardous decomposition products:**
Sodium Oxides, Nitrogen Oxides (NOx), Carbon Oxides, Sulfur Oxides.

* 11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** No irritating effect.
· **on the eye:** Causes serious eye irritation.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Irritant

· **Carcinogenic categories**
· **IARC (International Agency for Research on Cancer)**
Substance is not listed.

None of the ingredients are listed.

· **NTP (National Toxicology Program)**
None of the ingredients are listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients are listed.

* 12 Ecological information

· **Toxicity**
· **Aquatic toxicity:**
7631-99-4 Sodium Nitrate
EC50 6000 mg/l (Water flea)

· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Not known to be hazardous to water.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

* 13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

(Contd. on page 7)

Safety Data Sheet (SDS)
OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 05/29/2015 Reviewed on 05/29/2015

Trade name: Petrox

· **Uncleaned packagings:**
· **Recommendation:**
Packagings that cannot be cleansed are to be disposed of in the same manner as the product.
Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN1479
· **UN proper shipping name**	
· **DOT**	Oxidizing solid, n.o.s. (Sodium nitrate)
· **ADR**	UN1479 Oxidizing solid, n.o.s. (Sodium nitrate)
· **IMDG, IATA**	OXIDIZING SOLID, N.O.S. (SODIUM NITRATE)
· **Transport hazard class(es)**	

· **DOT**

· **Class**	5.1 Oxidizing substances
· **Label**	5.1

· **ADR**

· **Class**	5.1 (O2) Oxidizing substances
· **Label**	5.1

· **IMDG, IATA**

· **Class**	5.1 Oxidizing substances
· **Label**	5.1
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	III
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Oxidizing substances
· **Danger code (Kemler):**	50
· **EMS Number:**	F-A,S-Q
· **Segregation groups**	Powdered metals, ammonium compounds, cyanides, peroxides
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

· **Transport/Additional information:**

· **DOT**
· **Quantity limitations** On passenger aircraft/rail: 25 kg
On cargo aircraft only: 100 kg

(Contd. on page 8)

Safety Data Sheet (SDS)
OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 05/29/2015 Reviewed on 05/29/2015

Trade name: Petrox

· **ADR**
· **Excepted quantities (EQ)** Code: E1
Maximum net quantity per inner packaging: 30 g
Maximum net quantity per outer packaging: 1000 g

· **IMDG**
· **Limited quantities (LQ)** 5 kg
· **Excepted quantities (EQ)** Code: E1
Maximum net quantity per inner packaging: 30 g
Maximum net quantity per outer packaging: 1000 g
· **UN "Model Regulation":** UN1479, Oxidizing solid, n.o.s. (Sodium nitrate), 5.1, III

* 15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredients are listed.

· **Section 313 (Specific toxic chemical listings):**
None of the ingredients are listed.

· **TSCA (Toxic Substances Control Act):**

50-99-7	glucose
7631-99-4	Sodium Nitrate
7772-98-7	Sodium thiosulphate

· **California Proposition 65**

· **Chemicals known to cause cancer:**
None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients are listed.

· **Chemicals known to cause developmental toxicity:**
None of the ingredients are listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients are listed.

· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients are listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients are listed.

· **GHS label elements**
The product is classified and labeled according to the Globally Harmonized System (GHS).

(Contd. on page 9)

Safety Data Sheet (SDS)
OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 05/29/2015 Reviewed on 05/29/2015

Trade name: Petrox

· **Hazard pictograms**

GHS03 GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**
Trade Secret
Sodium Nitrate

· **Hazard statements**
May intensify fire; oxidizer.
Harmful if swallowed or if inhaled.
Causes serious eye irritation.
May cause respiratory irritation.

· **Precautionary statements**
Take any precaution to avoid mixing with combustibles.
Keep away from heat.
Keep/Store away from clothing/combustible materials.
Avoid breathing dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Wear protective gloves / eye protection / face protection.
Wear eye protection / face protection.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If swallowed: Call a poison center/doctor if you feel unwell.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
If eye irritation persists: Get medical advice/attention.
Rinse mouth.
In case of fire: Use for extinction: CO2, powder or water spray.
Store locked up.
Store in a well-ventilated place. Keep container tightly closed.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· **National regulations:**

The product is subject to be classified according with the latest version of the regulations on hazardous substances.

· **State Right to Know**

	Trade Secret Acute Tox. 4, H302; Acute Tox. 4, H332; STOT SE 3, H335; Eye Irrit. 2B, H320; Combustible Dust	25-50%
CAS: 50-99-7	glucose	25-50%
CAS: 7631-99-4	Sodium Nitrate Ox. Sol. 2, H272; Eye Irrit. 2A, H319	15-35%
CAS: 91079-46-8	Peptones, soybean	5-10%
CAS: 7772-98-7 RTECS: XN6476000	Sodium thiosulphate	≤ 2.5%

All ingredients are listed.

(Contd. on page 10)

Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 05/29/2015 *Reviewed on 05/29/2015*

Trade name: Petrox

· ***Chemical safety assessment:*** A Chemical Safety Assessment has not been carried out.

16 Other information

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

· ***Date of preparation / last revision*** 05/29/2015 / -

· ***Abbreviations and acronyms:***

ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road
ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
Ox. Sol. 2: Oxidising Solids, Hazard Category 2
Acute Tox. 4: Acute toxicity, Hazard Category 4
Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A
Eye Irrit. 2B: Serious eye damage/eye irritation, Hazard Category 2B
STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3

· **** Data compared to the previous version altered.***

SDS created by MSDS Authoring Services www.msdsauthoring.com +1-877-204-9106