

December 31, 2024
Project No. 2302756

VIA EMAIL: anuradha.mohanty@maryland.gov

Anuradha Mohanty
Project Manager
Land and Materials Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite: 625
Baltimore, Maryland 21230

**Re: Addendum 1 to EMP-3, West Water Loop North and South, Revision 1, June 4, 2024
Quantum Maryland, LLC
Frederick, Maryland**

Dear Ms. Mohanty:

GEI Consultants, Inc. is submitting this Addendum 1 to Environmental Management Plan 3 (EMP-3) for the Quantum Maryland, Frederick Maryland project (Site) on behalf of Quantum Maryland, LLC. EMP-3 Revision 1 (dated and approved June 4, 2024) relates to installation of the West Water Loop North and South. As described in EMP-3, the work elements covered by the EMP include

- The West Water Loop North which consists of a 12-inch water line and a parallel 16-inch potable cooling water (PCW) line starting within the EC at the west end of QPS (connecting to the water lines in QPS) running to the south into the SMA (parallel to the B-sewer for part of the distance), then turning west and across the unnamed tributary to Tuscarora Creek (leaving the EC) then turning south to future Lot 400. These water lines cross the creek in parallel HDD borings; and
- The West Water Loop South which consists of a 12-inch water line and 16-inch PCW line installed via HDD across the south end of the site, from the north end of the Mountville Water Line near sewer manhole MH-401 east across the EC and Tuscarora Creek to the vicinity of the Pump Station. The LOD at both ends of this work segment are outside the EC; however the HDD crossing itself is primarily within/beneath the EC.

The primary purpose of this Addendum 1 is to describe modifications to the HDD construction methods intended to reduce potential drilling fluid loss as encountered while drilling through karst terrain on the West Loop South on the west side of Tuscarora Creek near the soil/rock interface between 8 and 15 feet below grade. These methods include moving the HDD entry point eastward along the same design alignment and use of closed cell polyurethane grout and/or cementitious grout to seal the throat of karst features proximal to the HDD bores. This Addendum provides information regarding the locations where

these techniques will be initially employed along West Loop South. However, these same methods may be employed by the driller at additional locations where similar conditions are encountered.

This Addendum also provides chemical information regarding the NSF-61 listing of the grout material for drinking water contact.

Addendum Contents

EMP-3 Addendum 1 is presented in the text of this letter and the following attachments as referenced herein. Much of this information was previously submitted via email dated December 12, 2024, discussed with WSA and the Frederick County Health Department on a December 16, 2024 call, or provided in subsequent correspondence:

Appendix A - Figures

- EMP-3 **Figure 1** – Environmental Management Plan West Loop Water North and South, May 2024, Project 2302756. Unrevised plan provided for location reference of West Loop North (LOD outlined in green) and West Loop South (LOD outlined in red).
- EMP-3 **Figure 3** – West Loop South Features, May 2024. Figure revised December 2024 to show modified HDD entry point and anticipated location of karst feature and grout application.
- New **Figure 10** – Plan and Section of Adjusted HDD Entry and Grout Application

Appendix B – Polyurethane Grout Technical Data

1. Hyperflex (by SealGuard) Safety Data Sheet (SDS)
2. Hyperflex (by SealGuard) Technical Data Sheet
3. NSF-61 Listing (from NSF website)
4. Case Study - Application in HDD and Karst
5. BASF *Product Information: PFAS* statement dated December 19, 2024
6. NSF Annual Test Report dated June 10, 2024

Work Modified Through This Addendum

Following the general description above, this Addendum 1 includes the following specific changes to the approved EMP-3 scope of work.

- There is no proposed change in horizontal alignment of the water lines shown on **Figure 3**.
- The HDD entry point for the 16-inch potable cooling water (PCW) line was moved 40 feet to the east (location shown on **Figure 3** and detailed on **Figure 10**). This point remains within the LOD, within the EMP-3 south EMP boundary, and still outside the EC and the floodway. Further movement of the entry points of any of the 4 HDD bores is a technique which may be used by the driller under this Addendum. Should any entry point move into the floodway, advance permitting through MDE Wetlands and Waterways would be required.

- In order to limit potential loss of drilling fluid (water/bentonite) in karst terrain, closed cell polyurethane grout and/or cementitious grout will be used to seal the throat of karst features proximal to the HDD bores. Based on driller experience, they proposed polyurethane grout. As a backup and/or for other karst features of differing conditions, cement grout may also be employed.
- The selected material is a single component, closed cell, pre-polymeric sealant – HyperFlex by SealGuard, Inc. This material is NSF-61 certified for potable water contact (see **Appendix B3**).
- The polyurethane grout is NSF-61 certified for potable water contact and does not contain intentionally added per- and polyfluoroalkyl substances (PFAS) based on manufacturer statement (see **Appendix B5**). The NSF-61 standard required testing in accordance with reference standard NSF-600. NSF-600 identifies the test parameters and standards required to achieve NSF-61 certification. The results of annual certification laboratory testing conducted by NSF per NSF standard 600 as part of the NSF-61 certification process is provided in **Appendix B6**.
- The same methods (movement of the HDD entry point along the same horizontal alignment, use of polyurethane or cementitious grout) may be used in additional locations along all 4 HDD bores as needed based on field conditions encountered.

Closing

Work will proceed in accordance with EMP-3 Revision 1 as approved June 4, 2024 until receipt of written authorization of this proposed Addendum 1. If you have any questions, please feel free to contact me at 856.291.5723.

Sincerely,

GEI Consultants, Inc.



William Silverstein, P.E.
Senior Consultant`

WBS/:

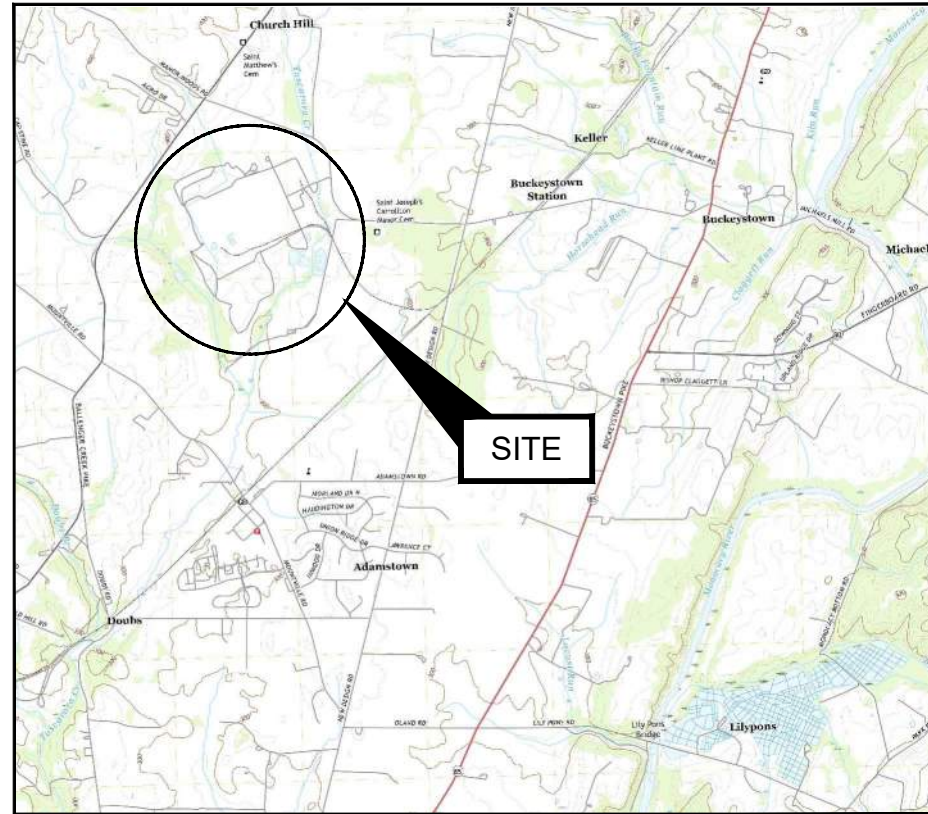
B:\Working\STRUCTURE TONE\2302756 STO Mission Critical - Frederick\07_GEI files\EMP preparation\Subareas\EMP-3 West Loop\EMP3 Addendum 1\EMP-3 Addendum 1 20241231.docx

Appendices

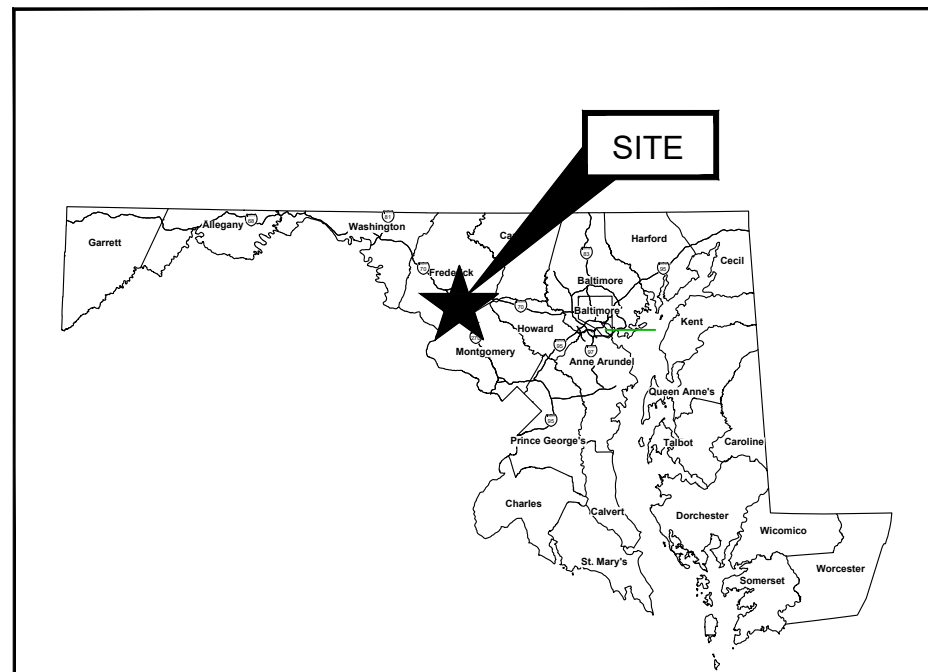
- Appendix A Figures
- Appendix B Polyurethane Grout Technical Data

cc: Ms. Barbara Krupiarz, MDE Land and Materials Administration
Mr. Brian Davis, MDE LMA
Ms. Kate Ansalvish, MDE Water and Science Administration
Mr. William Kennedy, Catellus
Mr. David Irving, Catellus

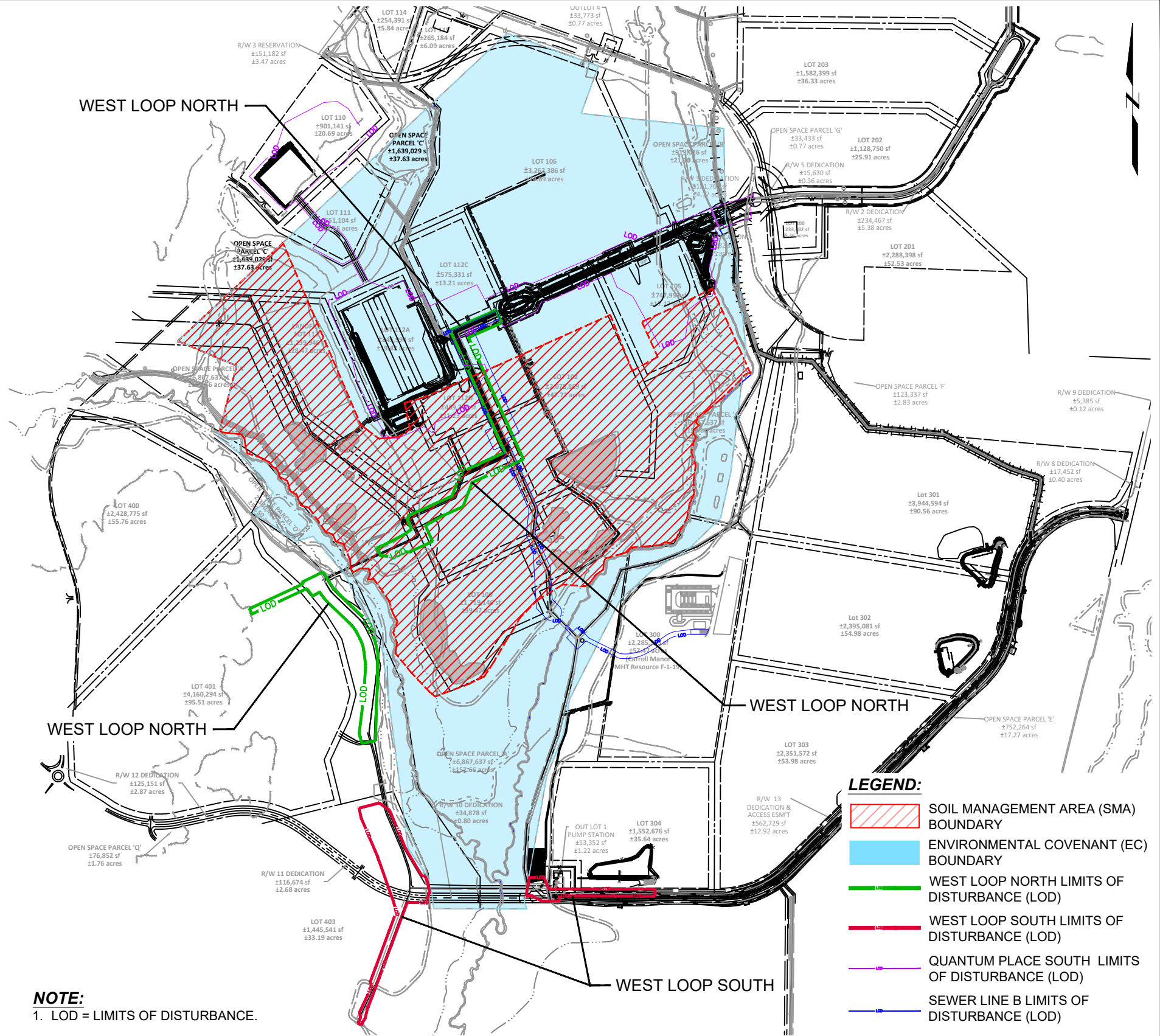
Appendix A Figures



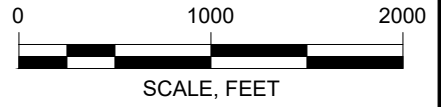
SOURCE:
MAP TAKEN FROM USGS.GOV.



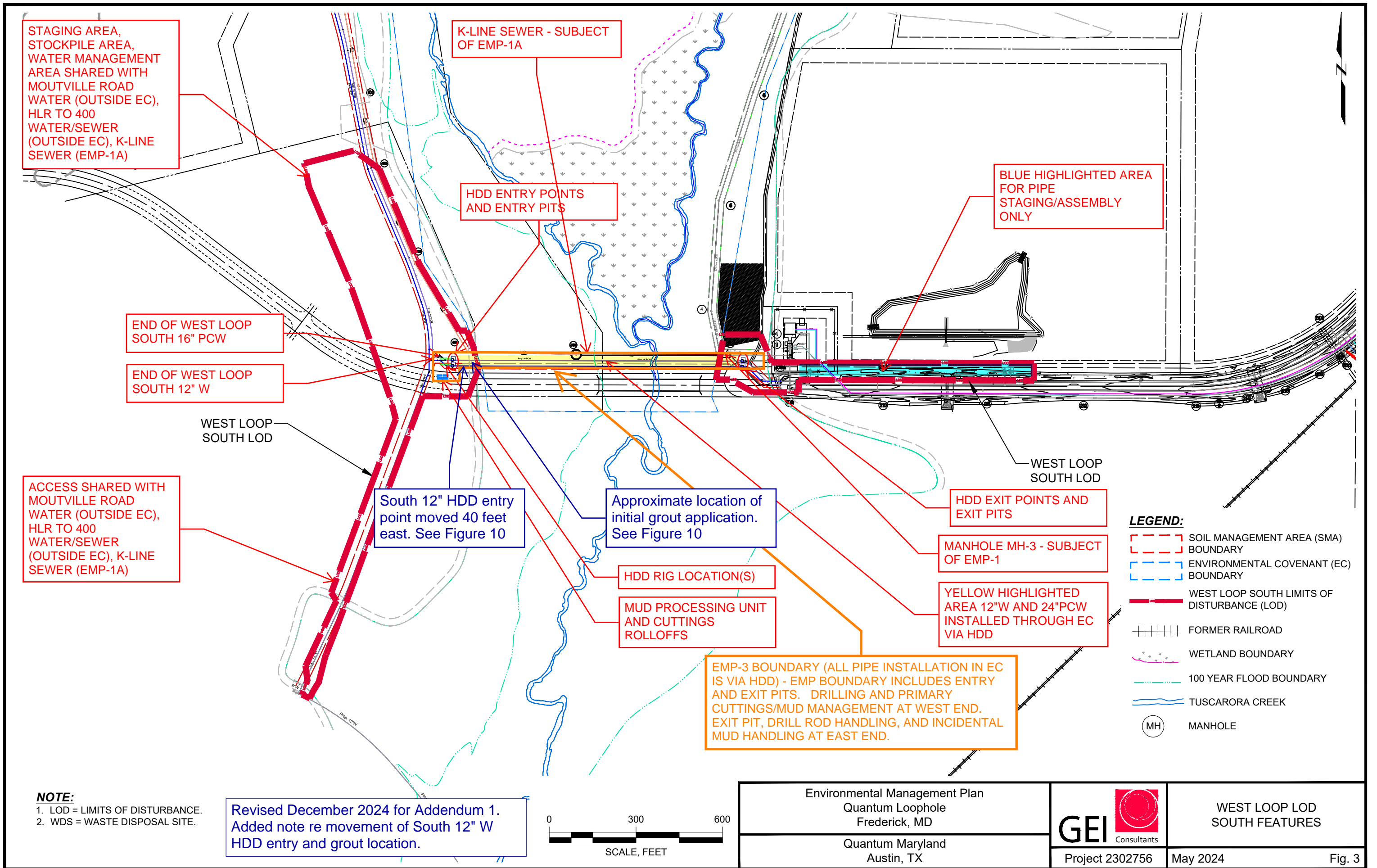
STATE or COUNTY MAP
(NOT TO SCALE)

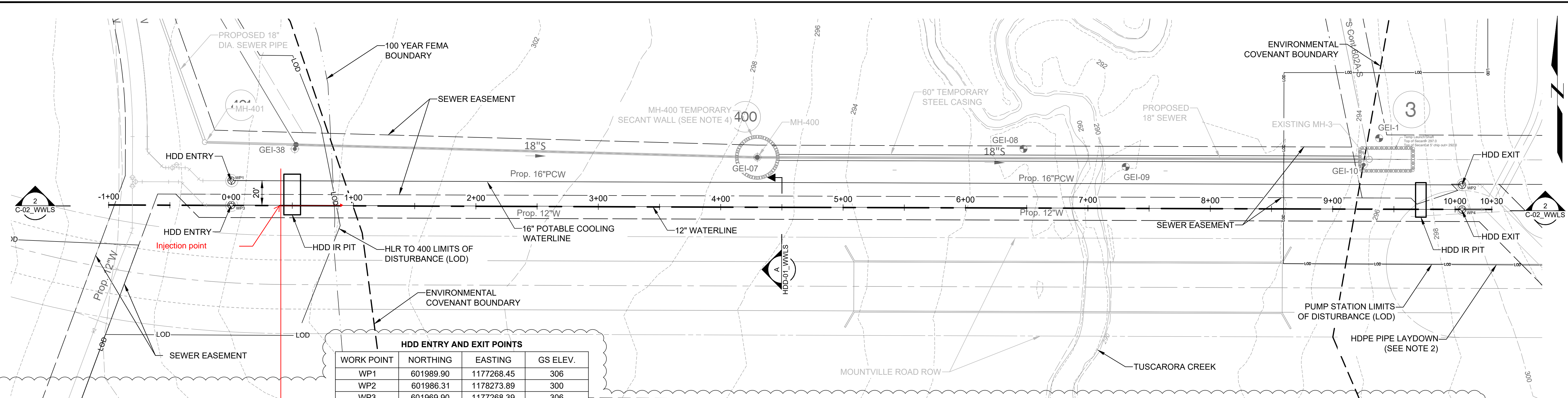


NOTE:
1. LOD = LIMITS OF DISTURBANCE.



Environmental Management Plan Quantum Loophole Frederick, MD Quantum Maryland Austin, TX		ENVIRONMENTAL MANAGEMENT PLAN WEST LOOP WATER NORTH AND SOUTH
		Project 2302756 May 2024 Fig. 1





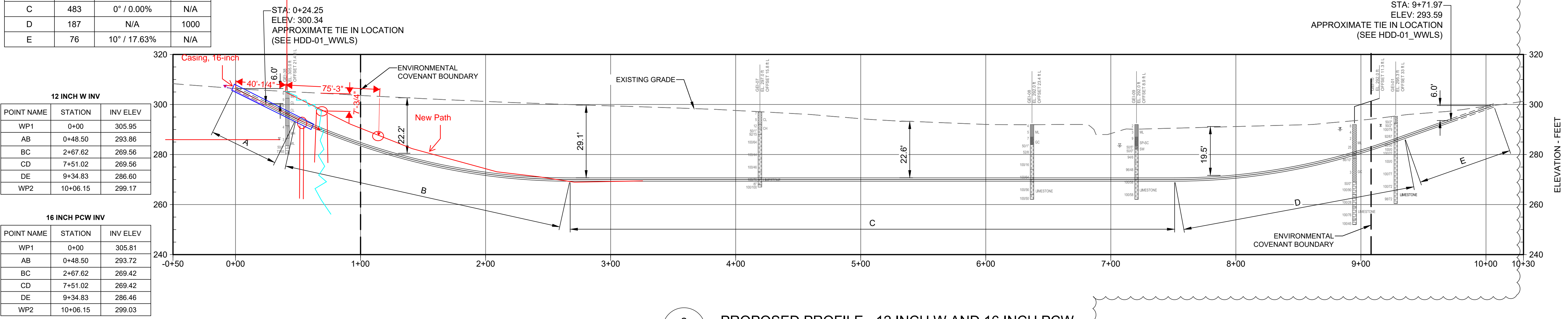
HDD ENTRY AND EXIT POINTS

WORK POINT	NORTHING	EASTING	GS ELEV.
WP1	601989.90	1177268.45	306
WP2	601986.31	1178273.89	300
WP3	601969.90	1177268.39	306
WP4	601966.17	1178273.89	300

HDD BOREPATH GEOMETRY

SEGMENT	LENGTH (FT)	ANGLE / PERCENT GRADE	RADIUS (FT)
A	55	14° / 24.93%	N/A
B	224	N/A	1000
C	483	0° / 0.00%	N/A
D	187	N/A	1000
E	76	10° / 17.63%	N/A

1 PROPOSED PLAN - 12 INCH W AND 16 INCH PCW
C-02_WWLS SCALE: 1" = 40'



12 INCH W INV

POINT NAME	STATION	INV ELEV
WP1	0+00	305.95
AB	0+48.50	293.86
BC	2+67.62	269.56
CD	7+51.02	269.56
DE	9+34.83	286.60
WP2	10+06.15	299.17

16 INCH PCW INV

POINT NAME	STATION	INV ELEV
WP1	0+00	305.81
AB	0+48.50	293.72
BC	2+67.62	269.42
CD	7+51.02	269.42
DE	9+34.83	286.46
WP2	10+06.15	299.03

2 PROPOSED PROFILE - 12 INCH W AND 16 INCH PCW
C-02_WWLS SCALE: 1" = 40' H
1" = 20' V

- NOTE:**
- PERFORMANCE PIPE DRISCOPLEX 4000 DIPS 12" & 16" SERIES PE PIPE OR APPROVED EQUIVALENT.
 - THE PIPE STAGING AND LAYDOWN AREA IS ALONG THE LOD OF HAPPY LANDING ROAD SEE RODGERS DRAWINGS REFERENCED IN THIS DRAWING SET.

LEGEND:

- GEI GEOTECHNICAL BORING (2023)
- GEI MONITORING WELLS (2023)

Attention:

0 1"

If this scale bar does not measure 1" then drawing is not original scale.

HORIZONTAL SCALE, FEET
0 40 80

VERTICAL SCALE, FEET
0 20 40
NOTE: 2x VERTICAL EXAGGERATION

Designed: AL/AWD
Drawn: TM
Checked: XXX
Approved: GAB
P.E. No: 27970
GEI Project 2302756



STO MISSION CRITICAL
330 W 34th ST
NEW YORK, NY 10001

QUANTUM LOOP MARYLAND WEST WATER LOOP SOUTHERN CROSSING HDD DESIGN
FREDERICK, MD

NO	DATE	ISSUE/REVISION	APP
2	5/23/2024	PROFILE REVISIONS	GAB
1	5/10/2024	100% DESIGN	GAB
NO			APP

SHEET NAME
PROPOSED PLAN AND PROFILE OF WATER LINES

SHEET NO.
C-02_WWLS
DWG. NO.
4 OF 7

EMP-3 Addendum 1 Figure 10 - Modified South Loop HDD Entry Point and Grout Location. December 2024

FOR CONSTRUCTION

EDDY, DEREK, B:\Working\STRUCTURE\TONE\2302756_STO_Mission_Critical - Frederick\00_CADD\Design\Sheets\West Water Loop Southern Crossing\C-01 - C-02_WWLS - Plan + Profile.dwg - 5/23/2024

Appendix B Polyurethane Grout Technical Data

B.1. Hyperflex Technical Data Sheet

B.2. Hyperflex Safety Data Sheet

B.3. NSF-61 Website Listing

B.4. Technical Literature – Use in Karst

B.5. BASF *Product Information: PFAS* statement dated December 19, 2024

B.6. NSF Annual Test Report dated June 10, 2024

HyperFlex

Single Component, Closed Cell, Pre-Polymeric Sealant and Adhesive

Applications

For use with less aggressive low flowing water leaks. Hyperflex is a flexible hydrophobic foam with excellent sealing and adhesion qualities that make it perfect for ground and water control applications.

Advantages

- Non-shrink formulation
- Pre-blended catalyst: no on-site mixing
- 20:1 expansion ratio
- Great Migration Into Fractures
- Moisture activated
- NSF-61 approval for potable water

Storage

Maintain seal until ready for application.
Avoid contact with moisture.
Store under 80°F 27°C.

Product has a 2-year shelf life in unopened containers.

Packaging

10 oz (300 ml) Tube
5 gallon pails
55 Gallon Drums

Transport

US D.O.T. Unregulated Class-55

Customer Support

724-625-4550
info@SealGuardInc.com



Uncured Physical Properties

Shrinkage (-20° F)	0% 1 Day	ASTM D-2126
Viscosity (68° F)	375 cps	
Specific Gravity (60° F)	1.18	
Percent Solids	100%	
Color	Amber	
Solvents	None	

Cured Material - Physical Properties

Free Rise		Confined		
Density	2 PCF	Density	50 PCF	N/A
Compressive	125 psi	Compressive	3500 psi	ASTM D-1622
Tensile	75 psi	Tensile	3600 psi	ASTM D-1621
Shear	50 psi	Shear	1760 psi	ASTM D-638
Elongation	40%	Elongation	9%	ASTM D-3574

**** Thoroughly read all instructions and cautions prior to use ****



Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10
Version: 3.0

Page: 1/14
(30749632/SDS_GEN_US/EN)

1. Identification

Product identifier used on the label

HYPERFLEX STI-03-0.15-S

Recommended use of the chemical and restriction on use

Recommended use*: polyurethane component; industrial chemicals
Suitable for use in industrial sector: Polymers industry; chemical industry
Unsuitable for use: Uses other than recommended

* The "Recommended use" identified for this product is provided solely to comply with a Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:

BASF CORPORATION
100 Park Avenue
Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

Emergency telephone number

24 Hour Emergency Response Information

CHEMTREC: 1-800-424-9300
BASF HOTLINE: 1-800-832-HELP (4357)

Other means of identification

Chemical family: aromatic isocyanates
Synonyms: Diphenylmethane Diisocyanate

2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

Acute Tox.	4 (Inhalation - mist)	Acute toxicity
Skin Corr./Irrit.	2	Skin corrosion/irritation
Eye Dam./Irrit.	2B	Serious eye damage/eye irritation
Resp. Sens.	1	Respiratory sensitization
Skin Sens.	1B	Skin sensitization

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10

Version: 3.0

Page: 2/14

(30749632/SDS_GEN_US/EN)

STOT SE	3 (irritating to respiratory system)	Specific target organ toxicity — single exposure
STOT RE	2 (by inhalation)	Specific target organ toxicity — repeated exposure

Label elements

Pictogram:



Signal Word:

Danger

Hazard Statement:

H320	Causes eye irritation.
H315	Causes skin irritation.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.
H335	May cause respiratory irritation.
H373	May cause damage to organs (Olfactory organs) through prolonged or repeated exposure (inhalation).

Precautionary Statements (Prevention):

P280	Wear protective gloves.
P271	Use only outdoors or in a well-ventilated area.
P260	Do not breathe mist or vapour or spray.
P284	In case of inadequate ventilation wear respiratory protection.
P272	Contaminated work clothing should not be allowed out of the workplace.
P264	Wash contaminated body parts thoroughly after handling.

Precautionary Statements (Response):

P312	Call a POISON CENTER or physician if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P314	Get medical advice/attention if you feel unwell.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P333 + P313	If skin irritation or rash occurs: Get medical attention.
P342 + P311	If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
P337 + P313	If eye irritation persists: Get medical attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.

Precautionary Statements (Storage):

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Precautionary Statements (Disposal):

P501	Dispose of contents/container in accordance with local regulations.
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Hazards not otherwise classified

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10

Version: 3.0

Page: 3/14

(30749632/SDS_GEN_US/EN)

No specific dangers known, if the regulations/notes for storage and handling are considered.

Labeling of special preparations (GHS):

CONTAINS ISOCYANATES. INHALATION OF ISOCYANATE MISTS OR VAPORS MAY CAUSE RESPIRATORY IRRITATION, BREATHLESSNESS, CHEST DISCOMFORT AND REDUCED PULMONARY FUNCTION. OVEREXPOSURE WELL ABOVE THE PEL MAY RESULT IN BRONCHITIS, BRONCHIAL SPASMS AND PULMONARY EDEMA. LONG-TERM EXPOSURE TO ISOCYANATES HAS BEEN REPORTED TO CAUSE LUNG DAMAGE, INCLUDING REDUCED LUNG FUNCTION WHICH MAY BE PERMANENT. ACUTE OR CHRONIC OVEREXPOSURE TO ISOCYANATES MAY CAUSE SENSITIZATION IN SOME INDIVIDUALS, RESULTING IN ALLERGIC RESPIRATORY REACTIONS INCLUDING WHEEZING, SHORTNESS OF BREATH AND DIFFICULTY BREATHING. ANIMAL TESTS INDICATE THAT SKIN CONTACT MAY PLAY A ROLE IN CAUSING RESPIRATORY SENSITIZATION.

3. Composition / Information on Ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Diphenylmethane-4,4'-diisocyanate (MDI)

CAS Number: 101-68-8

Content (W/W): ≥ 25.0 - $< 50.0\%$

Synonym: Diphenylmethane diisocyanate; 4,4'-Methylenediphenyl diisocyanate

Methylenediphenyl diisocyanate

CAS Number: 26447-40-5

Content (W/W): ≥ 20.0 - $< 25.0\%$

Synonym: 1,1'-Methylenebis[isocyanatobenzene]; Methylenediphenyl diisocyanate

P-MDI

CAS Number: 9016-87-9

Content (W/W): ≥ 5.0 - $< 7.0\%$

Synonym: Isocyanic acid polymethylenepolyphenylene ester; Polymethylene polyphenylene isocyanate

4. First-Aid Measures

Description of first aid measures

General advice:

First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

If inhaled:

Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.

If on skin:

Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention.

If in eyes:

In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. Remove contact lenses, if present. Immediate medical attention required.

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10

Version: 3.0

Page: 4/14

(30749632/SDS_GEN_US/EN)

If swallowed:

Rinse mouth and then drink 200-300 ml of water. Do not induce vomiting. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required.

Most important symptoms and effects, both acute and delayed

Symptoms: Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11., Eye irritation, skin irritation, allergic symptoms

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Symptoms: Overexposure may cause:; Eye irritation, skin irritation, erythema, chest discomfort, dyspnea, asthma, nausea, headache, vomiting, dizziness, diarrhea, abdominal cramps, Inhalation may provoke the following symptoms:; irritation of respiratory tract, coughing, wheezing

Hazards: Symptoms can appear later.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Hazards: Respiratory sensitization may result in allergic (asthma-like) signs in the lower respiratory tract including wheezing, shortness of breath and difficulty breathing, the onset of which may be delayed. Repeated inhalation of high concentrations may cause lung damage, including reduced lung function, which may be permanent. Substances eliciting lower respiratory tract irritation may worsen the asthma-like reactions that may be produced by product exposures.

Indication of any immediate medical attention and special treatment needed

Note to physician

Antidote: Specific antidotes or neutralizers to isocyanates do not exist.
Treatment: Treatment should be supportive and based on the judgement of the physician in response to the reaction of the patient.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
water spray, dry powder, carbon dioxide, foam

Unsuitable extinguishing media for safety reasons:
water jet

Special hazards arising from the substance or mixture

Hazards during fire-fighting:
nitrous gases, fumes/smoke, isocyanate, vapour

Advice for fire-fighters

Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:

Keep containers cool by spraying with water if exposed to fire. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10
Version: 3.0

Page: 5/14
(30749632/SDS_GEN_US/EN)

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental precautions

Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up

For small amounts: Absorb isocyanate with suitable absorbent material (see § 40 CFR, sections 260, 264 and 265 for further information). Shovel into open container. Spill area can be decontaminated with the following recommended decontamination solution: Mixture of 90 % water, 5-8 % household ammonia, 2-5 % detergent. Allow solution to stand for at least 10 minutes. Pick up with suitable absorbent material. Place into appropriately labeled waste containers. Do not make container pressure tight. Move container to a well-ventilated area (outside). Allow to stand for at least 48 hours to allow escape of evolved carbon dioxide. Dispose of absorbed material in accordance with regulations.

For large amounts: For spills, stop leaks and provide diking to contain the material. Prevent entry into sewage systems, ground and surface waters. If temporary control of isocyanate vapor is required, a blanket of protein foam or other suitable foam (available from most fire departments) may be placed over the spill. Transfer as much liquid as possible via pump or vacuum device into closed but not sealed containers for disposal.

For residues: The following measures should be taken for final cleanup: Spill area can be decontaminated with the following recommended decontamination solution: Mixture of 90 % water, 5-8 % household ammonia, 2-5 % detergent. Wash down spill area with decontamination solution. Allow solution to stand for at least 10 minutes. Pick up with suitable absorbent material. Place into appropriately labeled waste containers. Do not make container pressure tight. Move container to a well-ventilated area (outside). Allow to stand for at least 48 hours to allow escape of evolved carbon dioxide. Dispose of absorbed material in accordance with regulations.

7. Handling and Storage

Precautions for safe handling

Provide suitable exhaust ventilation at the processing machines. Ensure thorough ventilation of stores and work areas. Avoid aerosol formation. Avoid inhalation of dusts/mists/vapours. When handling heated product, vapours of the product should be ventilated, and respiratory protection used. Wear respiratory protection when spraying. Use suitable chemically resistant gloves. Danger of bursting when sealed gastight. Protect against moisture. If bulging of drum occurs, transfer to well ventilated area, puncture to relieve pressure, open vent and let stand for 48 hours before resealing.

Protection against fire and explosion:
No special precautions necessary.

Conditions for safe storage, including any incompatibilities

Keep away from water. Segregate from foods and animal feeds. Segregate from acids and bases.

Suitable materials for containers: Carbon steel (Iron), High density polyethylene (HDPE), Low density polyethylene (LDPE), Stainless steel 1.4301 (V2)

Further information on storage conditions: Formation of CO₂ and build up of pressure possible. Keep container tightly closed and in a well-ventilated place. Outage of containers should be filled with dry inert gas at atmospheric pressure to avoid reaction with moisture.

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10
Version: 3.0

Page: 6/14
(30749632/SDS_GEN_US/EN)

Storage stability:
Storage temperature: 16 - 27 °C
Protect against moisture.
The stated storage temperature is noted for health and safety in the workplace. With regard to Quality, please refer to the product specific Technical Bulletin.

8. Exposure Controls/Personal Protection

Components with occupational exposure limits

Diphenylmethane-4,4'-diisocyanate (MDI)	OSHA PEL	CLV 0.02 ppm 0.2 mg/m ³ ; CLV 0.02 ppm 0.2 mg/m ³ ;
	ACGIH TLV	TWA value 0.005 ppm ;

Advice on system design:

Provide local exhaust ventilation to maintain recommended P.E.L.

Personal protective equipment

Respiratory protection:

When workers are facing concentrations above the occupational exposure limits they must use appropriate certified respirators. When atmospheric levels may exceed the occupational exposure limit (PEL or TLV) NIOSH-certified air-purifying respirators equipped with an organic vapor sorbent and particulate filter can be used as long as appropriate precautions and change out schedules are in place. For emergency or non-routine, high exposure situations, including confined space entry, use a NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions.

Hand protection:

Chemical resistant protective gloves should be worn to prevent all skin contact., Suitable materials may include, chloroprene rubber (Neoprene), nitrile rubber (Buna N), chlorinated polyethylene, polyvinylchloride (Pylox), butyl rubber, depending upon conditions of use.

Eye protection:

Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:

Cover as much of the exposed skin as possible to prevent all skin contact., Suitable materials may include, saran-coated material, depending upon conditions of use.

General safety and hygiene measures:

Wear protective clothing as necessary to prevent contact. Eye wash fountains and safety showers must be easily accessible. Observe the appropriate PEL or TLV value. Wash soiled clothing immediately. Remove contaminated clothing immediately and clean before re-use or dispose it if necessary.

9. Physical and Chemical Properties

Form:	liquid
Odour:	faintly aromatic
Odour threshold:	not applicable
Colour:	amber to brown
pH value:	not applicable
softening point:	-20 °C
Freezing point:	No applicable information available.
Melting point:	No applicable information available.

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10

Version: 3.0

Page: 7/14

(30749632/SDS_GEN_US/EN)

Boiling point:	> 200 °C (5 mmHg)	
Sublimation point:	No applicable information available.	
Flash point:	> 94.00 °C	(closed cup)
Flammability:	not flammable	(derived from flash point)
Lower explosion limit:	For liquids not relevant for classification and labelling. The lower explosion point may be 5 - 15 °C below the flash point.	
Upper explosion limit:	For liquids not relevant for classification and labelling.	
Autoignition:	> 470 °C	
Vapour pressure:	0.00001 mmHg (25.00 °C)	
Density:	1.19 g/cm ³ (20.00 °C)	
Relative density:	No applicable information available.	
Vapour density:	not applicable	
Partitioning coefficient n-octanol/water (log Pow):	Unspecified	
Self-ignition temperature:	Based on its structural properties the product is not classified as self-igniting.	
Thermal decomposition:	No decomposition if stored and handled as prescribed/indicated.	
Viscosity, dynamic:	750 mPa.s (25.00 °C)	
Viscosity, kinematic:	No applicable information available.	
Solubility in water:	Reacts with water.	
Miscibility with water:	Reacts with water.	
Solubility (quantitative):	No applicable information available.	
Solubility (qualitative):	No applicable information available.	
Molar mass:	No data available.	
Evaporation rate:	Value can be approximated from Henry's Law Constant or vapor pressure.	
Other Information:	If necessary, information on other physical and chemical parameters is indicated in this section.	

10. Stability and Reactivity

Reactivity

Corrosion to metals:
Corrosive effects to metal are not anticipated.

Oxidizing properties:
Not an oxidizer.

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

Reacts with water, with formation of carbon dioxide. Risk of bursting. Reacts with alcohols. Reacts with acids. Reacts with alkalis. Reacts with amines. Risk of exothermic reaction. Risk of

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10

Version: 3.0

Page: 8/14

(30749632/SDS_GEN_US/EN)

polymerization. Contact with certain rubbers and plastics can cause brittleness of the substance/product with subsequent loss in strength.

Conditions to avoid

Avoid moisture.

Incompatible materials

acids, amines, alcohols, water, Alkalines, strong bases, Substances/products that react with isocyanates.

Hazardous decomposition products

Decomposition products:

Hazardous decomposition products: carbon monoxide, carbon dioxide, hydrogen cyanide, nitrogen oxides, aromatic isocyanates, gases/vapours

Thermal decomposition:

No decomposition if stored and handled as prescribed/indicated.

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Inhalation of vapours may cause irritation of the mucous membranes of the nose, throat or trachea, breathlessness, chest discomfort, difficult breathing and reduced pulmonary function. Inhalation exposure well above the PEL may result additionally in eye irritation, headache, chemical bronchitis, asthma-like findings or pulmonary edema. Isocyanates have also been reported to cause hypersensitivity pneumonitis, which is characterized by flu-like symptoms, the onset of which may be delayed.

Oral

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Type of value: LD50

Species: rat (male/female)

Value: > 2,000 mg/kg (Directive 84/449/EEC, B.1)

Inhalation

Type of value: ATE

Species: rat

Value: 1.96 mg/l (OECD Guideline 403)

Exposure time: 4 h

An aerosol was tested.

Type of value: LC50

Species: rat

Value: > 2.24 mg/l (OECD Guideline 403)

Exposure time: 1 h

An aerosol was tested.

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10
Version: 3.0

Page: 9/14
(30749632/SDS_GEN_US/EN)

Dermal

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Type of value: LD50

Species: rabbit (male/female)

Value: > 9,400 mg/kg

Assessment other acute effects

Assessment of STOT single:

Causes temporary irritation of the respiratory tract.

Irritation / corrosion

Assessment of irritating effects: Irritating to eyes, respiratory system and skin. Skin contact may result in dermatitis, either irritative or allergic.

Skin

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Species: rabbit

Result: Irritant.

Method: OECD Guideline 404

Eye

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Species: rabbit

Result: non-irritant

Method: OECD Guideline 405

Sensitization

Assessment of sensitization: Sensitization after skin contact possible. The substance may cause sensitization of the respiratory tract. As a result of previous repeated overexposures or a single large dose, certain individuals will develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the PEL/TLV. These symptoms, which include chest tightness, wheezing, cough, shortness of breath, or asthmatic attack, could be immediate or delayed up to several hours after exposure. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air, or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Chronic overexposure to isocyanates has also been reported to cause lung damage, including a decrease in lung function, which may be permanent. Prolonged contact can cause reddening, swelling, rash, scaling, or blistering. In those who have developed a skin sensitization, these symptoms can develop as a result of contact with very small amounts of liquid material, or even as a result of vapour-only exposure. Animal tests indicate that skin contact may play a role in causing respiratory sensitization.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Buehler test

Species: guinea pig

Result: sensitizing

Mouse Local Lymph Node Assay (LLNA)

Species: mouse

Result: sensitizing

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10
Version: 3.0

Page: 10/14
(30749632/SDS_GEN_US/EN)

other

Species: guinea pig

Result: sensitizing

Studies in animals suggest that dermal exposure may lead to pulmonary sensitization. However, the relevance of this result for humans is unclear.

Aspiration Hazard

No aspiration hazard expected.

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: The substance may cause damage to the olfactory epithelium after repeated inhalation. The substance may cause damage to the lung after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Experimental/calculated data: similar to OECD guideline 453 rat (Wistar) (male/female) Inhalation 2 yrs, 6 hr/day 0, 0.2, 1, 6 mg/m³, olfactory epithelium

NOAEL: 0.2 mg/m³

LOAEL: 1 mg/m³

The substance may cause damage to the olfactory epithelium after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure. Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.

Genetic toxicity

Assessment of mutagenicity: The substance was mutagenic in various bacterial test systems; however, these results could not be confirmed in tests with mammals.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Genetic toxicity in vitro: OECD Guideline 471 Ames-test Salmonella typhimurium:with and without metabolic activation ambiguous

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

*Genetic toxicity in vivo: OECD Guideline 474 Micronucleus assay rat (male) Inhalation negative
No clastogenic effect reported.*

Carcinogenicity

Assessment of carcinogenicity: A carcinogenic potential cannot be excluded after prolonged exposure to severely irritating concentrations. These effects are not relevant to humans at occupational levels of exposure. IARC Group 3 (not classifiable as to human carcinogenicity).

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Assessment of carcinogenicity: A carcinogenic potential cannot be excluded after prolonged exposure to severely irritating concentrations. These effects are not relevant to humans at occupational levels of exposure. IARC Group 3 (not classifiable as to human carcinogenicity).

Experimental/calculated data: OECD Guideline 453 rat Inhalation 0, 0.2, 1, 6 mg/m³
Result: Lung tumors

Reproductive toxicity

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10

Version: 3.0

Page: 11/14

(30749632/SDS_GEN_US/EN)

Assessment of reproduction toxicity: Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.

Teratogenicity

Assessment of teratogenicity: The substance did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

Development

OECD Guideline 414 rat Inhalation 0, 1, 4, 12 mg/m³

NOAEL Mat.: 4 mg/m³

NOAEL Teratog.: 4 mg/m³

The substance did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

Other Information

The product has not been tested. The statement has been derived from the properties of the individual components.

Medical conditions aggravated by overexposure

The isocyanate component is a respiratory sensitizer. It may cause allergic reaction leading to asthma-like spasms of the bronchial tubes and difficulty in breathing. Medical supervision of all employees who handle or come into contact with isocyanates is recommended. Contact may aggravate pulmonary disorders. Persons with history of respiratory disease or hypersensitivity should not be exposed to this product. Preemployment and periodic medical examinations with respiratory function tests (FEV₁, FVC as a minimum) are suggested. Persons with asthmatic conditions, chronic bronchitis, other chronic respiratory diseases, recurrent eczema or pulmonary sensitization should be excluded from working with isocyanates. Once a person is diagnosed as having pulmonary sensitization (allergic asthma) to isocyanates, further exposure is not recommended.

12. Ecological Information

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations. Based on long-term (chronic) toxicity study data, the product is very likely not harmful to aquatic organisms.

The product may hydrolyse. The test result maybe partially due to degradation products. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Toxicity to fish

LC₀ (96 h) > 1,000 mg/l, Brachydanio rerio (OECD Guideline 203, static)

Aquatic invertebrates

EC₅₀ (24 h) > 1,000 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)

Aquatic plants

EC₀ (72 h) 1,640 mg/l (growth rate), Scenedesmus subspicatus (OECD Guideline 201, static)

Microorganisms/Effect on activated sludge

Toxicity to microorganisms

OECD Guideline 209 aquatic

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10

Page: 12/14

Version: 3.0

(30749632/SDS_GEN_US/EN)

aerobic bacteria from a domestic water treatment plant/EC50 (3 h): > 100 mg/l

Persistence and degradability

Assessment biodegradation and elimination (H₂O)

Poorly biodegradable. The product is unstable in water. The elimination data also refer to products of hydrolysis.

Elimination information

0 % BOD of the ThOD (28 d) (OECD Guideline 302 C) (aerobic, activated sludge) Poorly biodegradable.

Assessment of stability in water

In contact with water the substance will hydrolyse slowly.

Information on Stability in Water (Hydrolysis)

t_{1/2} 20 h (25 °C)

Bioaccumulative potential

Assessment bioaccumulation potential

Significant accumulation in organisms is not to be expected.

Bioaccumulation potential

Bioconcentration factor: 200 (28 d), Cyprinus carpio (OECD Guideline 305 E)

Mobility in soil

Assessment transport between environmental compartments

The substance will not evaporate into the atmosphere from the water surface.

Adsorption to solid soil phase is not expected.

13. Disposal considerations

Waste disposal of substance:

Incinerate or dispose of in a licensed facility. Do not discharge substance/product into sewer system.

Container disposal:

Steel drums must be emptied and can be sent to a licensed drum reconditioner for reuse, a scrap metal dealer or an approved landfill. Do not attempt to refill or clean containers since residue is difficult to remove. Under no circumstances should empty drums be burned or cut open with gas or electric torch as toxic decomposition products may be liberated. Do not reuse empty containers.

14. Transport Information

Land transport

USDOT

Not classified as a dangerous good under transport regulations

Sea transport

IMDG

Not classified as a dangerous good under transport regulations

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10
Version: 3.0

Page: 13/14
(30749632/SDS_GEN_US/EN)

Air transport

IATA/ICAO

Not classified as a dangerous good under transport regulations

Further information

DOT: This product is regulated if the amount in a single receptacle exceeds the Reportable Quantity (RQ). Please refer to Section 15 of this SDS for the RQ for this product.

15. Regulatory Information

Federal Regulations

Registration status:

Chemical TSCA, US released / listed

EPCRA 311/312 (Hazard categories): Refer to SDS section 2 for GHS hazard classes applicable for this product.

EPCRA 313:

CAS Number

101-68-8
9016-87-9

Chemical name

Diphenylmethane-4,4'-diisocyanate (MDI)
P-MDI

CERCLA RQ

5000 LBS

CAS Number

101-68-8

Chemical name

Diphenylmethane-4,4'-diisocyanate (MDI)

State regulations

State RTK

NJ
PA

CAS Number

101-68-8
101-68-8

Chemical name

Diphenylmethane-4,4'-diisocyanate (MDI)
Diphenylmethane-4,4'-diisocyanate (MDI)

NFPA Hazard codes:

Health: 2 Fire: 1 Reactivity: 1 Special:

HMIS III rating

Health: 2⁺ Flammability: 1 Physical hazard: 1

16. Other Information

SDS Prepared by:

BASF NA Product Regulations
SDS Prepared on: 2021/02/10

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

Safety Data Sheet

HYPERFLEX STI-03-0.15-S

Revision date : 2021/02/10

Page: 14/14

Version: 3.0

(30749632/SDS_GEN_US/EN)

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END OF DATA SHEET



The Public Health and Safety Organization

NSF Product and Service Listings

These NSF Official Listings are current as of **Friday, December 20, 2024** at 12:15 a.m. Eastern Time. Please [contact NSF](#) to confirm the status of any Listing, report errors, or make suggestions.

Alert: NSF is concerned about fraudulent downloading and manipulation of website text. Always confirm this information by clicking on the below link for the most accurate information:

<http://info.nsf.org/Certified/PwsComponents/Listings.asp?Company=3K340&Standard=061&>

NSF/ANSI/CAN 61 Drinking Water System Components - Health Effects

NOTE: Unless otherwise indicated for Materials, Certification is only for the Water Contact Material shown in the Listing. [Click here for a list of Abbreviations used in these Listings.](#) [Click here for the definitions of Water Contact Temperatures denoted in these Listings.](#)

Products certified to NSF/ANSI/CAN 61 comply with the health effects criteria in NSF/ANSI/CAN 600.

SealGuard Inc. - a subsidiary of Sub-Technical Inc.

363 Mars Valencia Road

P.O. Box 1178

Mars, PA 16046

United States

724-625-0008

[Visit this company's website \(http://www.sub-technical.com\)](http://www.sub-technical.com).

Facility : Malcom, IA

Joining and Sealing Materials

**Water
Contact**

**Water
Contact**

Trade Designation	Size	Temp	Material
Grouts[1]			
Hyperflex STI-03-0.15S	[2]	CLD 23	PUR

[1] Minimum cure time is 2 hours at 65°F.

[2] Certified for a maximum of 1% of the surface area of a 9,000 gallon tank or 0.03 sq. in./L.

Number of matching Manufacturers is 1

Number of matching Products is 1

Processing time was 0 seconds


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 - [HyperFlex](#)
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 - [Kits & Accessories](#)
- [Applications](#)
 - [Manhole Rehabilitation](#)
 - [Crack Injections](#)
 - [Curtain Grout Using Soil Rods](#)
 - [Leaking Barrel Joint/Lateral Boot](#)
 - [Case Study: Manhole Repair Along River](#)
 - [Pre-Cast Concrete Structure Leaks](#)
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 - [Joining and Sealing Precast Concrete Sections using HyperFlex](#)
 - [Leaking Corner](#)
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 - [Casement Pipe Grouting](#)
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 - [Tools, Accessories, Materials & How to Use Them](#)
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 - [Cements vs. Polyurethane Grout](#)
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Horizontal Drilling and Hyperflex Grout

Posted by Chris on November 4, 2022 12:50 pm | Comments Off

To install a pipeline underneath an interstate, a horizontal directional drill was used. However, the drilling discovered that the area consisted of large voids / karst zones. The pipeline itself needs to have a solid foundation to rest on. To fill the voids, polyurethane grout was injected into the problem areas. The grout used was [Hyperflex](#), manufactured by SealGuard, Inc. Hyperflex reacts with the moisture in the ground which creates an expanding foam to provide a solid base for the pipeline. Hyperflex is NSF/ANSI/CAN 61 for contact with potable water. The grouting was done by [Sub-Technical, Inc.](#)



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- SealGuard, Inc.
- 1015 Foggy Hollow Road
- Gibsonia, PA 15044
- Tel: [724-625-4550](tel:724-625-4550)
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- info@sealguardinc.com



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Product Information: PFAS

Date: December 19, 2024
Contact: PM Product Stewardship
Email: PM_ProductStewardship_NA@basf.com

Product:

30749632 HYPERFLEX STI-03-0.15-S

Dear Valued Customer:

To the best of our knowledge, based on the information provided by our raw material suppliers plus knowledge of our finished product compositions, the BASF products listed herein do not contain intentionally added Per- or Polyfluoroalkyl Substances (PFAS) defined by § 705.3 of EPA's TSCA Section 8(a)(7) Final Rule as: "any chemical substance or mixture containing a chemical substance that structurally contains at least one of the following three sub-structures:

- (1) R-(CF₂)-CF(R')R", where both the CF₂ and CF moieties are saturated carbons.
- (2) R-CF₂OCF₂-R', where R and R' can either be F, O, or saturated carbons.
- (3) CF₃C(CF₃)R'R", where R' and R" can either be F or saturated carbons"

BASF uses the following definition of intentionally added: deliberately utilized in the formulation of a material or component where its continued presence is desired in the final product to provide a specific characteristic, appearance or quality. Nonetheless, for TSCA 8(a)(7) reporting purposes, BASF understands that EPA seeks reporting on impurities, defined as a chemical substance which is unintentionally present with another chemical substance. (40 CFR 704.3). To the best of our knowledge, based on the information provided by our raw material suppliers plus knowledge of our finished product compositions, the product does not contain any impurities that meets EPA's definition of Per- or Polyfluoroalkyl Substances (PFAS) at 40 CFR § 705.3.

Please be aware that our products should be considered as large volume industrial products and may contain traces of unknown impurities (coming from the raw materials used or from the manufacturing process itself).

For more details on EPA's TSCA Section 8(a)(7) Final Rule (published September 28, 2023), please visit: <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/tsca-section-8a7-reporting-and-recordkeeping>

Kind regards,
BASF Corporation
Performance Materials

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EVALUATION REPORT

Send To: 3K340

Mr. Eric Smith
SealGuard Inc. - a subsidiary of Sub-Technical Inc.
363 Mars Valencia Road
P.O. Box 1178
Mars, PA 16046

Facility: 3K341

BASF - The Chemical Company
106 South Main Street
P.O. Box 247
Malcom IA 50157
United States

Result	PASS	Report Date	10-JUN-2024
Customer Name	SealGuard Inc. - a subsidiary of Sub-Technical Inc.		
Tested To	NSF/ANSI/CAN 61		
Description	Hyperflex STI-03-0.15S liquid Hyperflex		
Trade Designation	Hyperflex STI-03-0.15S		
Test Type	Annual Collection		
Job Number	A-00476379		
Project Number	W0872438		
Project Manager	Alyson Johnson		

Thank you for having your product tested by NSF.

Please contact your Project Manager if you have any questions or concerns pertaining to this report.

Report Authorization *Abbie M. Batog*

Date 10-JUN-2024

Abbie Batog - Senior Manager Commercial Water



General Information

Standard: NSF/ANSI/CAN 61

Monitor Code: B

Monitor Schedule Comments: Hyperflex / STI 03-0.15-S

Physical Description of Sample: liquid Hyperflex

Tested DCC Number: IA16756

Trade Designation/Model Number: Hyperflex STI-03-0.15S

Sample Id: **S-0002098076**
 Description: Sample exposed at 23C and pH 8
 Sampled Date: 05/11/2024
 Received Date: 03/21/2024

Normalization Information:

Date exposure completed: 11-MAY-2024 Calculated N1: 0.0021 Field Exposure Time: 24 hours Lab Exposure Time: 24 hours
 Field Surface Area: 0.03 in2 Lab Surface Area: 60.0 in2
 Field Static Volume: 1 L Lab Static Volume: 4.26 L
 Calculated NFm: 1.00

Compound Reference Key: SPAC

Testing Parameter	Sample	Control	Result	Normalized Result	Units
Ann Arbor Chemistry Lab					
* Standard 61 Additives LAB SUM TEST Code					
Mass applied	10510		10510		mg
External Note:	Product was applied to cement.				
BASE/NEUTRAL/ACID EPA METHOD 625 modified Scan for Tentatively Identified C					
No Compounds Detected					
Scan Control Complete	TRUE				
Semivolatle Compounds, Base/Neutral/Acid Target 625 modified, Data Workup					
Pyridine	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Nitrosodimethylamine (N-)	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
N-Nitrosomethylethylamine	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
5-Methyl-2-hexanone (MIAK)	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
1-Methoxy-2-propanol acetate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2-Heptanone	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Cyclohexanone	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Nitrosodiethylamine (N-)	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Isobutylisobutyrate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Aniline	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Phenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Di(chloroethyl) ether	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2-Chlorophenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2,3-Benzofuran	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
1,3-Dichlorobenzene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
1,4-Dichlorobenzene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
3-Cyclohexene-1-carbonitrile	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2-Ethylhexanol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Benzyl alcohol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L



Sample Id: S-0002098076

Testing Parameter	Sample	Control	Result	Normalized Result	Units
Ann Arbor Chemistry Lab (Continued)					
1,2-Dichlorobenzene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
bis(2-Chloroisopropyl)ether	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2-Methylphenol (o-Cresol)	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
N-Methylaniline	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Acetophenone	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
N-Nitrosodi-n-propylamine	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
N-Nitrosopyrrolidine	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
3- and 4-Methylphenol (m&p-Cresol)	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Hexachloroethane	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2-Phenyl-2-propanol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
N-Nitrosomorpholine	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Nitrobenzene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2,6-Dimethylphenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
N-Vinylpyrrolidinone	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
N-Nitrosopiperidine	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Triethylphosphate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Isophorone	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2-Nitrophenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2,4-Dimethylphenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
bis(2-Chloroethoxy)methane	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2,4-Dichlorophenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Trichlorobenzene (1,2,4-)	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Naphthalene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
4-Chloroaniline	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
1,1,3,3,-Tetramethyl-2-thiourea	ND(4)	ND(4)	ND(4)	ND(0.009)	ug/L
Hexachlorobutadiene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Benzothiazole	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
N-Nitrosodi-n-butylamine	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
4-Chloro-3-methylphenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
p-tert-Butylphenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2-Ethylhexyl glycidyl ether	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2,6-Di-t-butyl-4-methylphenol(BHT)	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Methylnaphthalene, 2-	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Cyclododecane	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2,4,5-Trichlorophenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2,4,6-trichlorophenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
1(3H)-Isobenzofuranone	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2-Chloronaphthalene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2-Nitroaniline	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
1,1'-(1,3-Phenylene)bis ethanone	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2,6-Di-tert-butylphenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Dimethylphthalate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
1,1'-(1,4-Phenylene)bis ethanone	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Acenaphthylene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L



Sample Id: S-0002098076

Testing Parameter	Sample	Control	Result	Normalized Result	Units
Ann Arbor Chemistry Lab (Continued)					
Benzenedimethanol, a,a,a',a'-tetramethyl-1,3-	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2,6-Dinitrotoluene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2,4-Dinitrotoluene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Benzenedimethanol, a,a,a',a'-Tetramethyl-1,4-	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
2,4-Di-tert-butylphenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Dimethyl terephthalate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Acenaphthene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Dibenzofuran	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Ethyl-4-ethoxybenzoate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
4-Nitrophenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Cyclododecanone	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Diethyl Phthalate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
p-tert-Octylphenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Fluorene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
4-Chlorophenylphenylether	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
3-Nitroaniline	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
4-Nitroaniline	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Nitrosodiphenylamine (N-)	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Azobenzene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
4-Bromophenylphenylether	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Hexachlorobenzene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Pentachlorophenol	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Phenanthrene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Anthracene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Diisobutyl phthalate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Dibutyl phthalate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Diphenyl sulfone	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Hydroxymethylphenylbenzotriazole	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Fluoranthene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Pyrene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Butyl benzyl phthalate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Di(2-ethylhexyl)adipate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
3,3-Dichlorobenzidine	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Benzo(a)anthracene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Di(2-ethylhexyl)phthalate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Chrysene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Di-n-octylphthalate	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Benzo(b)fluoranthene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Benzo(k)fluoranthene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Benzo(a)Pyrene (PAH)	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Dibenzo(a,h)anthracene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Indeno(1,2,3-cd)pyrene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
Benzo(g,h,i)perylene	ND(2)	ND(2)	ND(2)	ND(0.004)	ug/L
* Diphenylamine, LC/UV					



Sample Id: S-0002098076

Testing Parameter	Sample	Control	Result	Normalized Result	Units
Ann Arbor Chemistry Lab (Continued)					
Diphenylamine	ND(20)	ND(20)	ND(20)	ND(0.043)	ug/L
* Methyleneedianiline Micro/derivatization GC/ECD					
2,2'-Methyleneedianiline	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
2,4'-Methyleneedianiline	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
4,4'-Methyleneedianiline	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Volatile Organic Compounds (Ref: EPA 524.2)					
Dichlorodifluoromethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Chloromethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Vinyl Chloride	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Bromomethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Chloroethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Trichlorofluoromethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Trichlorotrifluoroethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Methylene Chloride	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,1-Dichloroethylene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
trans-1,2-Dichloroethylene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,1-Dichloroethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
2,2-Dichloropropane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
cis-1,2-Dichloroethylene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Chloroform	3.1	3.5	ND(0.5)	ND(0.0011)	ug/L
Bromochloromethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,1,1-Trichloroethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,1-Dichloropropene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Carbon Tetrachloride	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,2-Dichloroethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Trichloroethylene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,2-Dichloropropane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Bromodichloromethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Dibromomethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
cis-1,3-Dichloropropene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
trans-1,3-Dichloropropene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,1,2-Trichloroethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,3-Dichloropropane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Tetrachloroethylene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Chlorodibromomethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Chlorobenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,1,1,2-Tetrachloroethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Bromoform	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,1,2,2-Tetrachloroethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,2,3-Trichloropropane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,3-Dichlorobenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,4-Dichlorobenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,2-Dichlorobenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Carbon Disulfide	ND(1)	ND(1)	ND(1)	ND(0.002)	ug/L



Sample Id: **S-0002098076**

Testing Parameter	Sample	Control	Result	Normalized Result	Units
Ann Arbor Chemistry Lab (Continued)					
Methyl-tert-Butyl Ether (MTBE)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
tert-Butyl ethyl ether	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Methyl Ethyl Ketone	ND(5)	ND(5)	ND(5)	ND(0.01)	ug/L
Methyl Isobutyl Ketone	ND(5)	ND(5)	ND(5)	ND(0.01)	ug/L
Toluene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Ethyl Benzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
m+p-Xylenes	ND(1)	ND(1)	ND(1)	ND(0.002)	ug/L
o-Xylene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Styrene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Isopropylbenzene (Cumene)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
n-Propylbenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Bromobenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
2-Chlorotoluene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
4-Chlorotoluene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,3,5-Trimethylbenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
tert-Butylbenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,2,4-Trimethylbenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
sec-Butylbenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
p-Isopropyltoluene (Cymene)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,2,3-Trimethylbenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
n-Butylbenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,2,4-Trichlorobenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Hexachlorobutadiene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
1,2,3-Trichlorobenzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Naphthalene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Benzene	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L
Total Trihalomethanes	3.1	3.5	ND(0.5)	ND(0.0011)	ug/L
Total Xylenes	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	ug/L

Sample Id: **S-0002098077**
 Description: Hyperflex ST1-03-0.15S
 Sampled Date: 03/21/2024
 Received Date: 03/21/2024

Testing Parameter	Sample	Control	Result	Normalized Result	Units
Ann Arbor Chemistry Lab					
Lead in solids by ICPMS					
Lead	ND(0.001)		ND(0.001)		%



Testing Laboratories:

	<u>Id</u>	<u>Address</u>
All work performed at: →	NSF_AA	NSF 789 N. Dixboro Road Ann Arbor MI 48105

References to Testing Procedures:

<u>NSF Reference</u>	<u>Parameter / Test Description</u>
C0528	Lead in solids by ICPMS
C1031	* Standard 61 Additives LAB SUM TEST Code
C2023	BASE/NEUTRAL/ACID EPA METHOD 625 modified Scan for Tentatively Identified Compounds (TICs)
C2024	Semivolatiles Compounds, Base/Neutral/Acid Target 625 modified, Data Workup
C4141	* Diphenylamine, LC/UV
C4283	* Methylenedianiline Micro/derivatization GC/ECD
C4662	Volatile Organic Compounds (Ref: EPA 524.2)

Test descriptions preceded by an asterisk "*" indicate that testing has been performed per NSF requirements but is not within its scope of accreditation.

Unless otherwise indicated, method uncertainties are not applied in any determinations of conformity. Testing utilizes the requested sections of any referenced standards, which may not be the entire standard.

Dates of Laboratory Activity: 02-MAY-2024 to 28-MAY-2024