VAPOR INTRUSION MITIGATION REPORT

FORMER TETERS FLORAL PROPERTY
912 SOUTH CHURCH AVENUE
LOUISVILLE, MISSISSIPPI

PPM PROJECT NO. 30128306

JUNE 15, 2022

PPM CONSULTANTS

VAPOR INTRUSION MITIGATION REPORT

AT

TETERS FLORAL PROPERTY
912 SOUTH CHURCH AVENUE
LOUISVILLE, MISSISSIPPI

PREPARED FOR:

WINSTON COUNTY ECONOMIC DEVELOPMENT DISTRICT PARTNERSHIP
POST OFFICE BOX 551
LOUISVILLE, MISSISSIPPI 39339

WINSTON PARTNERSHIP

PPM PROJECT NO. 30128306

JUNE 15, 2022

PREPARED BY:

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REVIEWED BY:

ANNIE MCILWAIN, P.E.
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RIDGELAND, MISSISSIPPI 39157
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1.0 INTRODUCTION

PPM Consultants, Inc. (PPM) was retained by the Winston County Economic Development District Partnership to conduct Vapor Intrusion Mitigation efforts within the Former Teters' Floral Property located at 912 South Church Avenue in Louisville, Winston County, Mississippi. The purpose of the mitigation effort was to eliminate possible vapor intrusion pathways and compare post-mitigation indoor air sampling results to the United States Environmental Protection Agency (USEPA) Vapor Intrusion Screening Levels (VISL). The chemicals of potential concern are associated with solvent use processes of prior tenants and the current tenant's use of aerosol sprays. This report describes mitigation actions performed, field methodology, presents analytical results, and provides conclusions from the mitigative actions and Post Mitigation Indoor Air Sampling conducted in April and May of 2022 at the site.

1.1 SCOPE OF WORK

PPM and Snyder Environmental performed vapor intrusion mitigation actions on April 14, 2022. The following scope of work was completed as part of the Mississippi Department of Environmental Quality (MDEQ)-approved mitigation actions for the Former Teters' Floral Property:

- Seal up to 60 linear feet (lf) of concrete cracks using concrete/cement around multiple interior facility doorways in the areas of concern identified by PPM.
- Plug up to six approximately 4-inch diameter floor drains using concrete/cement.
- Plug up to 10 unused plumbing and utility fixtures using appropriately-sized metallic pipe fittings.
- Fill an approximately 1-foot wide by 60-foot long by 10-inch deep trench with concrete.
- Identify and recommend means to increase air exchange within the impacted area.

PPM also performed post-mitigation indoor air assessment fieldwork on May 24, 2022. A total of five indoor air samples and one ambient air sample were collected at the site. Indoor air samples were collected and submitted for laboratory analysis based upon conditions specific to that portion of the site. The following scope of work was completed for the limited indoor air assessment of the Former Teters' Floral Property:

- Ventilate the building for a minimum of 96 hours after roof-top fan was operational prior to sample collection.
- Collect five indoor air samples (IA-1 through IA-5) and one ambient air sample (AA-1).
- Analyze the indoor air samples and ambient air samples for the target volatile organic compounds (VOC) perchloroethylene (PCE), trichloroethene (TCE), cis 1,2-dichloroethene, and vinyl chloride.
- Prepare this report presenting the scope of work, site background, investigative methodology, findings, and conclusions from the mitigative actions and post-mitigation indoor air assessment.

1.2 DEVIATIONS FROM THE APPROVED SCOPE OF WORK

No deviations from the approved scope of work were encountered during the course of the investigation.

2.0 SITE DESCRIPTION

2.1 SITE LOCATION AND SETTING

The Teters Floral Property site is located at 912 South Church Avenue in Louisville, Winston County, Mississippi 39339. The facility is located in Section 4, Township 14 North, Range 12 East of the Choctaw, Mississippi Meridian. More specifically, the site is located at 33° 06' 00.11" North latitude and 89° 03' 31.70" West longitude. Site location is depicted in **Figure 1, Site Location Map, Appendix A, Figures.**

The property is located south of downtown Louisville in a mixed-use area that includes industrial, commercial, and residential properties. The surrounding properties currently consist of commercial properties to the west including an animal clinic, a storage facility, a construction material yard, and a small restaurant. An industrial plywood facility is located to the northeast beyond Hughes Creek, and multi-family residential property is located to the south. Historically, the surrounding land use consisted of residential and agricultural land until the early 1970s when developments in the vicinity of the subject property began to resemble what is present today.

Currently, the property is an approximately 400,000-square-foot brick and metal building that houses multiple businesses. Occupants of the building include Taylor Defense, Taylor Machine Works, Hardwire, SuperGrip, and Birmingham Fasteners. Site features are included in **Figure 2, Site Map.**

2.2 GEOLOGY AND HYDROGEOLOGY

According to the *Geologic Map of Mississippi, 1985*, the site is located within the Wilcox Formation. The Mississippi Geological Survey describes the Wilcox Formation as irregularly bedded fine to coarse sand, more or less lignitic clay, and lignite; which includes bauxite bearing Fearn Springs Sand member at the base. The Wilcox Formation is underlain by the Naheola Formation which is described as fine to coarse micaceous sand, kaolin, and bauxitic clay. The *Mississippi State Geological Survey, Bulletin 52, Choctaw County Mineral Resources, 1943*, describes the Wilcox series as being comprised of two formations: the Holly Springs Formation, and the Ackerman Formation. The Holly Springs Formation is described as sand, sandstone, clay-shale, clay, silt, lignite, silty limonite, and siderite. The sand is normally coarse to fine, and commonly colored by iron oxide. The estimated maximum thickness of the Holly Springs Formation is 300 feet. The Ackerman Formation is described as sand, sandstone, clay-shale, clay, silt, lignite, and iron ore. The estimated maximum thickness of the Ackerman Formation is 300 feet.

Groundwater within the Wilcox Formation is abundant within the first 100 feet of the subsurface. Domestic water wells were routinely installed to shallow depths within the first 100 feet to utilize the water source. Municipal water supply wells were installed to greater depths in order to obtain groundwater from the Eutaw Formation, which is 1,600 to 1,800 feet below ground surface. In general, groundwater flow near the surface mimics the surface topography, and can vary in direction, as the region has numerous hills.

The Louisville South Quadrangle 7.5-Minute USGS topographic map (**Figure 1**) shows the property to have an approximate elevation of 500 feet above mean sea level (AMSL).

3.0 FIELD ACTIVITIES

3.1 VAPOR INTRUSION MITIGATION ACTIONS

PPM and Snyder Environmental mobilized to the site on April 14, 2022, to execute the MDEQ-approved Vapor Intrusion Mitigation Plan. Snyder Environmental sealed

approximately 22 lf of concrete cracks located in the entry doorway into the former degreasing area using an epoxy concrete crack sealant. Four approximately 4-inch diameter floor drains were sealed by first installing plumber's putty into the drain to form a plug followed by filling the remaining void space above the plug with concrete to surface grade. Two of the floor drains were located in the maintenance/wiring loom storage room, and two of the floor drains were located in an electrical utility room south of the maintenance/wiring loom storage room. One 1.25-inch diameter metallic pipe fitting was sealed using a Fernco rubber fitting and a test well plug. The threads of the metallic pipe were damaged where the pipe protruded from the wall, thereby preventing the use of threaded pipe fittings to seal the pipe. An approximately 60-foot long by 1-foot wide by 10-inch deep trench was filled to surface grade with 3,000 pounds per square inch (psi) concrete provided by Bakers Ready Mix and Construction, LLC. Snyder used two cubic yards (cy) of concrete to fill the trench and the floor drains.

Additionally, PPM requested Taylor Power Systems to rehabilitate an existing roof-top fan present in the former degreasing area in an attempt to increase air exchange within the impacted area.

3.2 INDOOR AIR SAMPLING

Prior to the indoor air sampling, PPM noted aerosol cans of ZEP Aerosolv II manufactured by Acuity Specialty Products Group, Inc. containing approximately 90 percent to 100 percent by weight of trichloroethylene (TCE), aerosol cans of Dry Graphite manufactured by ZEP Inc. containing approximately 50 percent to 70 percent by weight of TCE, and cans of brake parts cleaner manufactured by Berryman Products, Inc. containing approximately five percent to 15 percent by weight of PCE remained within the building and are identified as potential background indoor air sources used in current manufacturing processes within the facility.

On May 24, 2022, five canisters (IA-1 through IA-5) were placed in different locations around the interior of the facility and one was placed at the plant exterior entrance as an ambient air sample. After the initial pressure of the canisters was recorded, the valves to the canisters were opened. The valves were opened, allowing the canisters to collect the sample, for eight hours. After eight hours, the valves were closed, and the final canister pressure was recorded. The initial pressures of the canisters ranged from 28 inches of mercury (in./Hg) to 30 in./Hg. The final pressures in eight of the canisters ranged from 3 in/Hg to 7 in/Hg. The sample locations of the indoor air and ambient air samples are depicted in **Figure 2, Site Map.**

3.3 LABORATORY ANALYSIS

The five indoor air samples were submitted to Pace Analytical Services, LLC, of Minneapolis, MN, and analyzed for the site-specific target list (trichloroethylene, tetrachloroethylene, cis-1,2 dichloroethene, and vinyl chloride) of VOCs per EPA Method TO-15.

4.0 RESULTS

4.1 INDOOR AIR RESULTS

A total of five indoor air samples and one ambient air sample were collected on May 24, 2022, and submitted to a laboratory for VOC analysis. VOCs were detected in three of the five indoor samples submitted. VOCs were also detected in the ambient air sample
(AA-1). The indoor air samples were evaluated against the USEPA VISLs utilizing a commercial worker scenario, a Hazard Quotient of 1, and an acceptable Target Risk of 10^6.

The VOCs cis-1,2-dichloroethene, tetrachloroethylene, and trichloroethylene were detected in one or more of the indoor air samples and the ambient air sample submitted for laboratory analysis.

Cis-1,2-dichloroethene was detected in indoor air samples IA-1 (9.75 µg/m^3) and IA-3 (0.995 µg/m^3). There is not a commercial VISL screening value assigned to cis-1,2-dichloroethene for indoor air.

Tetrachloroethylene was detected in indoor air samples IA-1 (1.66 µg/m^3), IA-2 (2.56 µg/m^3), and IA-3 (3.34 µg/m^3). Tetrachloroethylene was also detected in the ambient air sample AA-1 at a concentration of 1.38 µg/m^3.

Trichloroethylene was detected in indoor air samples IA-1 (161 µg/m^3), IA-2 (7.02 µg/m^3), and IA-3 (5.63 µg/m^3). Trichloroethylene was also detected in the ambient air sample AA-1 at a concentration of 1.51 µg/m^3.

Indoor air analytical results are summarized in **Table 1, Summary of Indoor Air Analytical Results – Detected Constituents** in **Appendix B, Tables,** and depicted in **Figure 3, Site Map with Concentrations** in **Appendix A, Figures.** The laboratory

analytical report is included in **Appendix C, Laboratory Analytical Report**. The material safety data sheets for chemicals utilized at the facility, known to contain perchloroethylene and trichloroethene are included in **Appendix D, Material Safety Data Sheets.**

5.0 FINDINGS AND CONCLUSIONS

The findings of this assessment are summarized as follows:

- Cis-1,2-dichloroethene was detected in indoor air samples IA-1 (9.75 µg/m^3), and IA-3 (0.995 µg/m^3). There is not a commercial VISL screening value assigned to cis-1,2-dichloroethene for indoor air.
- Tetrachloroethylene was detected in indoor air samples IA-1 (1.66 µg/m^3), IA-2 (2.56 µg/m^3), and IA-3 (3.34 µg/m^3). Tetrachloroethylene was also detected in the ambient air sample AA-1 at a concentration of 1.38 µg/m^3. A brake parts cleaner manufactured by Berryman Products, Inc. containing tetrachloroethylene at approximately five to 15 percent by weight was confirmed to be present and currently utilized within the facility. The detected tetrachloroethylene concentrations were all below the commercial VISL screening value of 47.2 µg/m^3 and the Occupational Safety and Health Administration (OSHA) permissible exposure limits (PEL) of 678,000 µg/m^3.
- Trichloroethylene was detected in indoor air samples IA-1 (161 µg/m^3), IA-2 (7.02 µg/m^3), and IA-3 (5.63 µg/m^3). Trichloroethylene was also detected in the ambient air sample AA-1 at a concentration of 1.51 µg/m^3. ZEP Aerosolv II and Dry Graphite manufactured by Acuity Specialty Products Group, Inc. containing trichloroethylene at approximately 90 to 100 percent by weight was confirmed to be present and currently utilized within the facility. The detected trichloroethylene concentrations were above the commercial screening VISL value of 2.99 µg/m^3, with the exception of AA-1, but significantly below the OSHA (PELof 537,000 µg/m^3.
- Indoor air concentrations exceed EPA VISL screening values within some areas of the building but remain significantly below OSHA worker safety PELs. The VISL screening values are used to help determine if further evaluation should take place. The concentrations of TCE remaining within the former degreasing area of the northwestern corner of the existing on-site structure after pre-emptive mitigation

efforts were complete, indicate that further mitigation actions are required for the facility.

- This is the first time since indoor air sampling began at the site that VOCs were detected in the ambient air sample. The detected VOCs may be attributed to the swirling winds/gust occurring ahead of strong thunderstorms that occurred as the sampling event concluded. The thunderstorms approached the site from the west, with a bearing of east to northeast. The swirling winds/gusts associated with the storms have the potential to induce down-wind conditions at AA-1 from the exhaust of the operating roof-top fan during portions of the sampling duration. Further sampling events will be used to determine if VOC concentrations within the ambient air sample were anomalous or if there is an unknown outdoor source of VOCs.
- The operating roof-top fan is not achieving its goal of reducing concentrated vapor associated with vapor intrusion within the former degreaser area. In fact, the observed effects may suggest that the operating fan is inducing a negative pressure gradient, consequently worsening indoor air conditions.

6.0 RECOMMENDATIONS

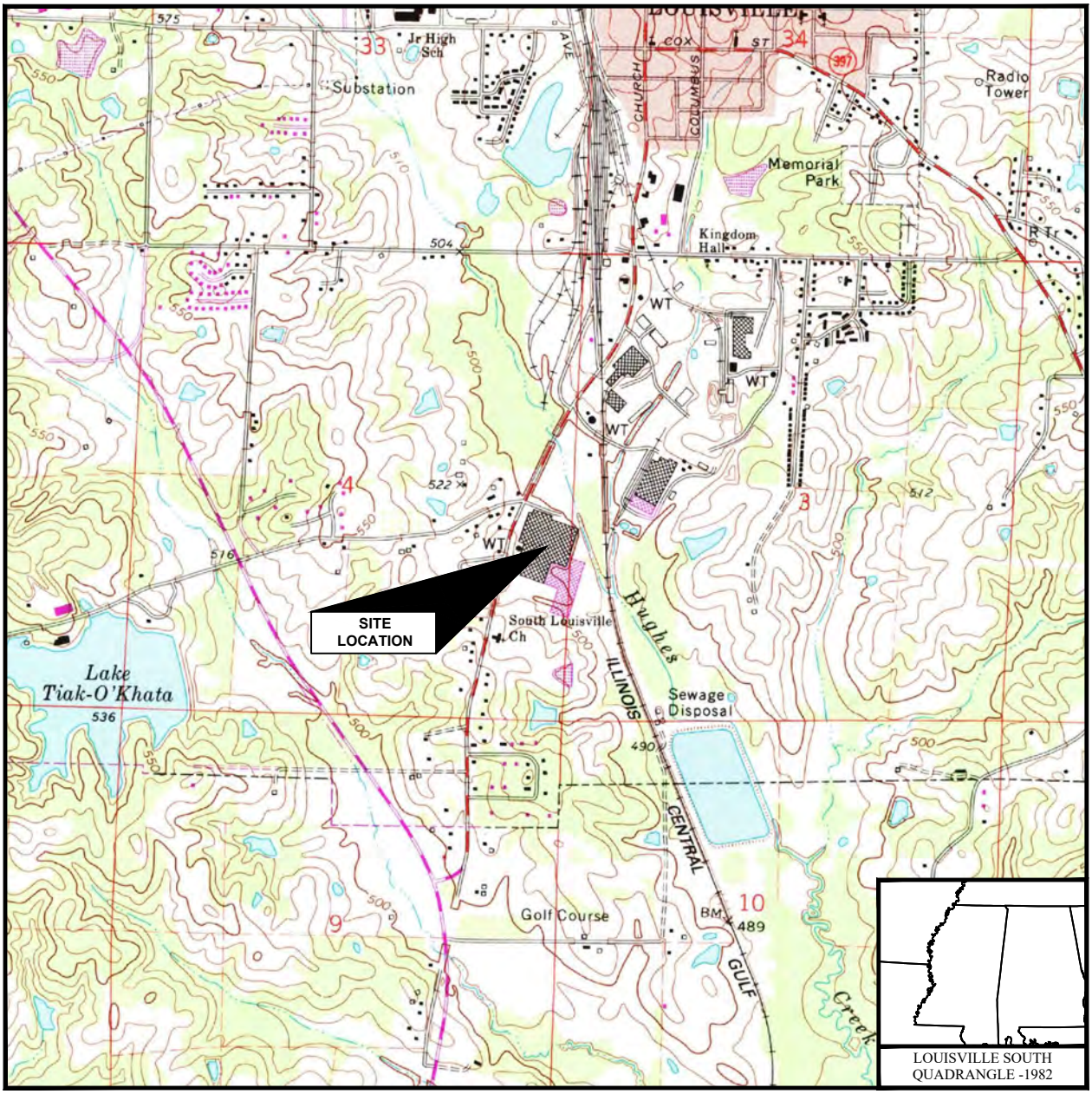
Based on the findings and conclusions of this report, PPM recommends the development of a pilot test to determine sizing requirements of a sub-slab-depressurization system for the former degreasing area. Upon completion of the pilot test, a corrective action plan should be developed and implemented within the former degreasing area of the northwestern corner of the existing on-site structure.

Additionally, the roof-top fan that is currently operating as part of the vapor mitigation actions should be deactivated in order to cease the observed induction of vapors into the building.

The former degreasing area was observed to be used for forklift cab storage and personnel was not present unless they were loading/unloading forklift cabs for installation in another area of the facility. The presence of personnel within the former degreasing area should remain limited and brief until a corrective action plan is implemented and shown to mitigate the vapor concerns of the facility.

APPENDICES

APPENDIX A – FIGURES



SCALE: 1 : 24,000

1 .5 0 1 MILES

1000 0 1000 5000 10,000 FEET

1 0 1 2 KILOMETER

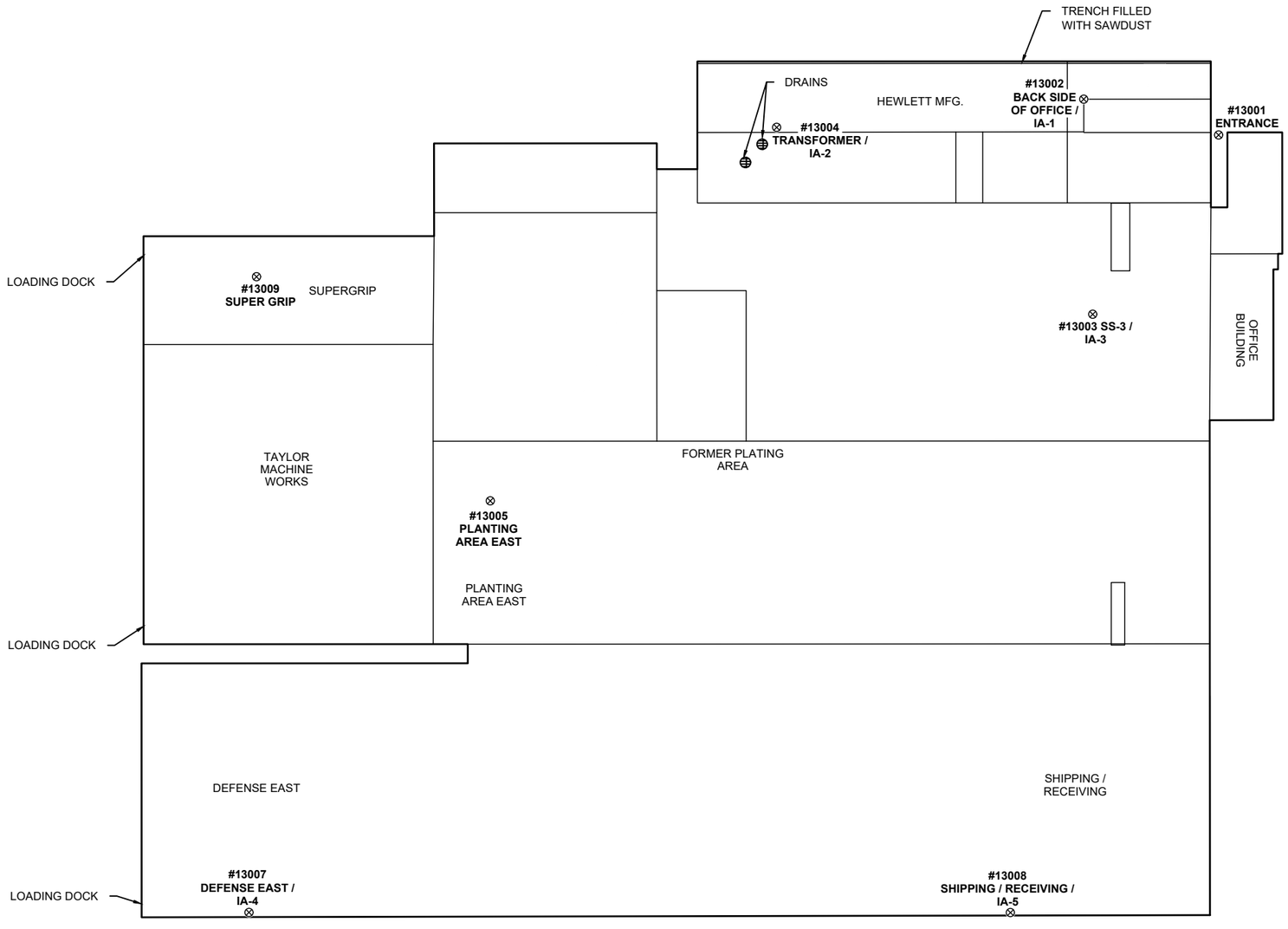
1000 0 1000 2000 METER

PPM CONSULTANTS, INC. www.ppmco.com		WINSTON COUNTY ECONOMIC DEVELOPMENT PARTNERSHIP **FORMER TETERS FLORAL PROPERTY** 912 SOUTH CHURCH STREET LOUISVILLE, MISSISSIPPI	SITE LOCATION MAP	FIGURE NUMBER 1
DRAWN BY: JCP	DRAWN DATE: 6/7/22			
PROJECT NUMBER: 30128306	PHASE: MIT			

N

0 50 100

SCALE:1"=100'
(Approximate)



LEGEND:

⊗ INDOOR AIR SAMPLING LOCATION

PPM CONSULTANTS, INC. www.ppmco.com		WINSTON COUNTY ECONOMIC DEVELOPMENT PARTNERSHIP **FORMER TETERS FLORAL PROPERTY** 912 SOUTH CHURCH STREET LOUISVILLE, MISSISSIPPI	SITE MAP
DRAWN BY: JCP	DRAWN DATE: 6/7/22		FIGURE NUMBER 2
PROJECT NUMBER: 30128306	PHASE: MIT		

N

0 50 100

SCALE:1"=100'
(Approximate)

#13004 TRANSFORMER / IA-2	05/24/22
CIS-1,2-DICHLOROETHENE (µg/m³)	<0.793
TETRACHLOROETHENE (µg/m³)	2.56
TRICHLOROETHENE (µg/m³)	7.02

#13002 BACK SIDE OF OFFICE / IA-1	05/24/22
CIS-1,2-DICHLOROETHENE (µg/m³)	9.75
TETRACHLOROETHENE (µg/m³)	1.66
TRICHLOROETHENE (µg/m³)	161

#13001 ENTRANCE / AMB	05/24/22
CIS-1,2-DICHLOROETHENE (µg/m³)	<0.793
TETRACHLOROETHENE (µg/m³)	1.38
TRICHLOROETHENE (µg/m³)	1.51

TRENCH FILLED WITH SAWDUST

DRAINS

HEWLETT MFG.

LOADING DOCK

#13009 SUPER GRIP

SUPERGRIP

OFFICE BUILDING

TAYLOR MACHINE WORKS

FORMER PLATING AREA

#13005 PLANTING AREA EAST

PLANTING AREA EAST

#13003 SS-3 / IA-3	05/24/22
CIS-1,2-DICHLOROETHENE (µg/m³)	0.995
TETRACHLOROETHENE (µg/m³)	3.34
TRICHLOROETHENE (µg/m³)	5.63

LOADING DOCK

#13007 DEFENSE EAST / IA-4	05/24/22
CIS-1,2-DICHLOROETHENE (µg/m³)	<0.793
TETRACHLOROETHENE (µg/m³)	<1.36
TRICHLOROETHENE (µg/m³)	<1.07

DEFENSE EAST

SHIPPING / RECEIVING

#13008 SHIPPING / RECEIVING / IA-5	05/24/22
CIS-1,2-DICHLOROETHENE (µg/m³)	<0.793
TETRACHLOROETHENE (µg/m³)	<1.36
TRICHLOROETHENE (µg/m³)	<1.07

LOADING DOCK

LEGEND:

⊗	INDOOR AIR SAMPLING LOCATION
(µg/m³)	MICROGRAMS PER CUBIC METER
161	GREEN TEXT INDICATES VALUES ABOVE THE USEPA VISLs (COMMERCIAL) HQ-0.1 AND TR-10*

PPM CONSULTANTS, INC.
www.ppmco.com

DRAWN BY:	DRAWN DATE:
JCP	6/7/22
PROJECT NUMBER:	PHASE:
30128306	MIT

WINSTON COUNTY ECONOMIC DEVELOPMENT PARTNERSHIP
FORMER TETERS FLORAL PROPERTY
912 SOUTH CHURCH STREET
LOUISVILLE, MISSISSIPPI

SITE MAP WITH CONCENTRATIONS

FIGURE NUMBER
3

APPENDIX B – TABLES

TABLE 1
SUMMARY OF INDOOR AIR ANALYTICAL RESULTS - DETECTED CONSTITUENTS
TETER'S FLORAL
912 SOUTH CHURCH AVENUE
LOUISVILLE, MISSISSIPPI

		VOCs (µg/m3)		
SAMPLE I.D.	**DATE**	**CIS-1,2-DICHLOROETHENE**	**TETRACHLOROETHENE**	**TRICHLOROETHENE**
#13001 Entrance/AMB	1/30/2021	<1.2	<1.0	<0.80
	1/2/2022	<0.793	<1.36	<1.07
	5/24/2022	<0.793	1.38	1.51
#13002 Back Side of Office/IA-1	1/30/2021	2.00	2.60	**38.6**
	1/2/2022	2.19	1.91	**37.6**
	5/24/2022	9.75	1.66	**161**
#13004 Transformer/IA-2	1/30/2021	2.00	3.50	**23.8**
	1/2/2022	3.03	2.83	**32.8**
	5/24/2022	<0.793	2.56	**7.02**
#13003 SS-3/IA-3	1/30/2021	<1.2	<0.99	**6.3**
	1/2/2022	1.99	2.84	**21.1**
	5/24/2022	0.995	3.34	**5.63**
#13005 Planting Area East	1/30/2021	<1.2	<1.0	1.2
#13007 Defense East/IA-4	1/30/2021	<1.2	<1.0	0.94
	1/2/2022	<0.793	<1.36	<1.07
	5/24/2022	<0.793	<1.36	<1.07
#13008 Shipping/Receiving/IA-5	1/30/2021	<1.2	<1.0	<0.80
	5/24/2022	<0.793	<1.36	<1.07
#13009 Super Grip	1/30/2021	<1.2	<1.0	<0.81
USEPA VISLs		NA	**47.2**	**2.99**

Notes: µg/m^3 *- micrograms per cubic meter* *PPM Consultants, Inc.*
Volatile Organic Compounds analyzed per EPA Method TO-15
Values in ***Bold*** *font are above the USEPA VISLs (COMMERCIAL), HQ-1 and TR-10^{-6}*
No Duplicate sample was collected.

Source(s): PPM Consultants, Inc.

APPENDIX C – LABORATORY ANALYTICAL REPORTS

ANALYTICAL REPORT

June 03, 2022

Revised Report

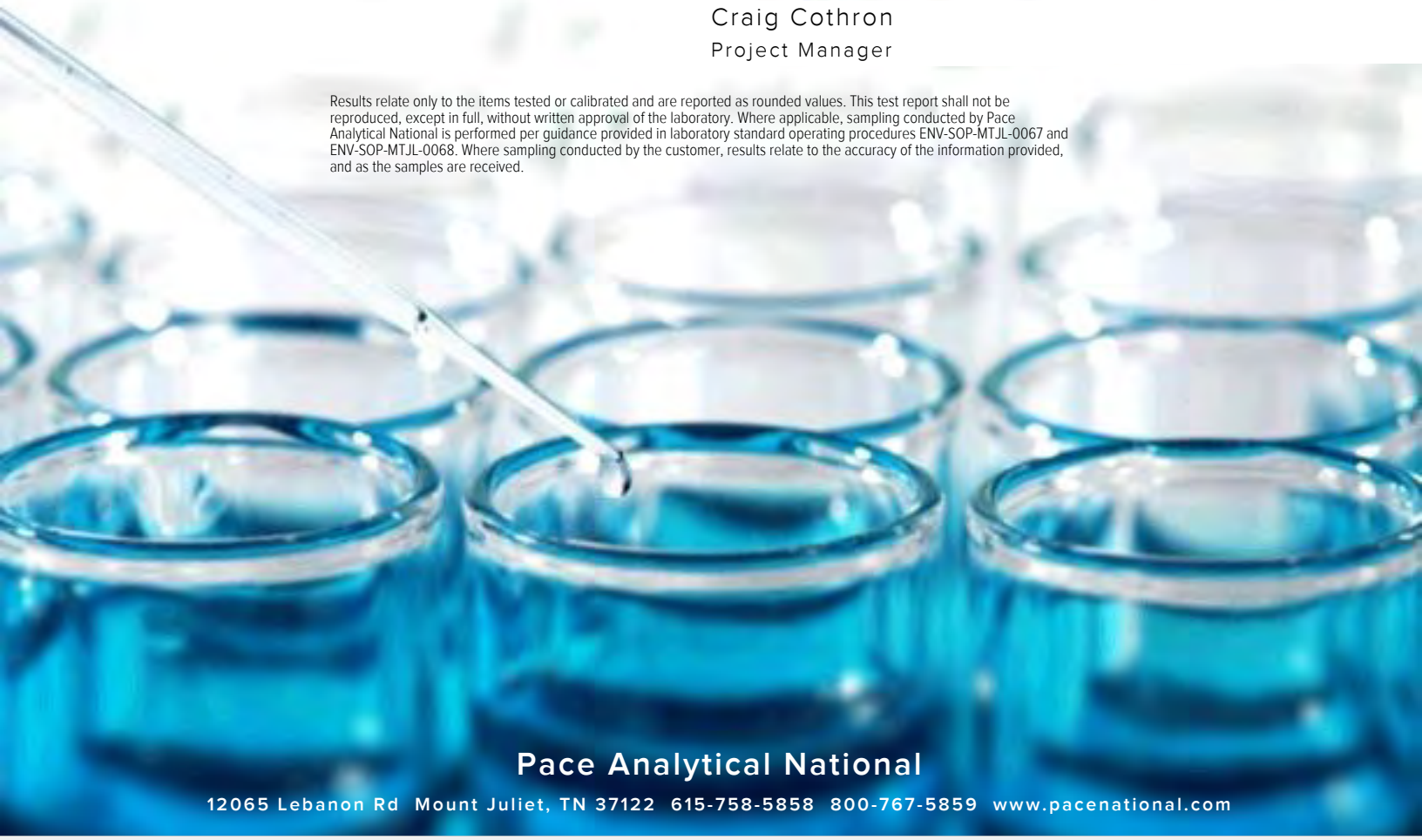
PPM Consultants - MS

Sample Delivery Group:	L1498417
Samples Received:	05/26/2022
Project Number:	30128305
Description:	
Site:	TETERS FLORAL
Report To:	Mr. Ben Lightsey 289 Commerce Park Drive, Suite D Ridgeland, MS 39157

Entire Report Reviewed By:

Craig Cothron
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



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IA-1 L1498417-01 Air

Collected by: Ben Lightsey | Collected date/time: 05/24/22 15:25 | Received date/time: 05/26/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1872016	1	05/31/22 14:35	05/31/22 14:35	FKG	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1872607	10	06/01/22 22:02	06/01/22 22:02	CEP	Mt. Juliet, TN

IA-2 L1498417-02 Air

Collected by: Ben Lightsey | Collected date/time: 05/24/22 15:26 | Received date/time: 05/26/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1872016	1	05/31/22 15:14	05/31/22 15:14	FKG	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1872607	10	06/01/22 22:44	06/01/22 22:44	CEP	Mt. Juliet, TN

IA-3 L1498417-03 Air

Collected by: Ben Lightsey | Collected date/time: 05/24/22 15:28 | Received date/time: 05/26/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1872016	1	05/31/22 15:54	05/31/22 15:54	FKG	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1872607	20	06/01/22 23:25	06/01/22 23:25	CEP	Mt. Juliet, TN

IA-4 L1498417-04 Air

Collected by: Ben Lightsey | Collected date/time: 05/24/22 15:33 | Received date/time: 05/26/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1872016	1	05/31/22 16:33	05/31/22 16:33	FKG	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1872607	1	06/01/22 16:26	06/01/22 16:26	CEP	Mt. Juliet, TN

IA-5 L1498417-05 Air

Collected by: Ben Lightsey | Collected date/time: 05/24/22 15:30 | Received date/time: 05/26/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1872016	1	05/31/22 17:13	05/31/22 17:13	FKG	Mt. Juliet, TN

AA-1 L1498417-06 Air

Collected by: Ben Lightsey | Collected date/time: 05/24/22 15:20 | Received date/time: 05/26/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1872016	1	05/31/22 17:53	05/31/22 17:53	FKG	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Craig Cothron
Project Manager

Report Revision History

Level II Report - Version 1: 06/02/22 12:12
Level II Report - Version 2: 06/02/22 15:53

Project Narrative

6/2/22 - updated rerpoting list

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	2.46	9.75		1	WG1872016
Tetrachloroethylene	127-18-4	166	0.200	1.36	0.245	1.66		1	WG1872016
Trichloroethylene	79-01-6	131	0.200	1.07	30.0	161		1	WG1872016
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1872016
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*99.5*				WG1872016
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*99.0*				WG1872607

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1872016
Tetrachloroethylene	127-18-4	166	0.200	1.36	0.377	2.56		1	WG1872016
Trichloroethylene	79-01-6	131	0.200	1.07	1.31	7.02		1	WG1872016
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1872016
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*100*				WG1872016
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*98.8*				WG1872607

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	0.251	0.995		1	WG1872016
Tetrachloroethylene	127-18-4	166	0.200	1.36	0.492	3.34		1	WG1872016
Trichloroethylene	79-01-6	131	0.200	1.07	1.05	5.63		1	WG1872016
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1872016
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*100*				WG1872016
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*99.4*				WG1872607

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1872016
Tetrachloroethylene	127-18-4	166	0.200	1.36	ND	ND		1	WG1872016
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1872016
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1872016
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*98.7*				WG1872016
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*97.4*				WG1872607

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1872016
Tetrachloroethylene	127-18-4	166	0.200	1.36	ND	ND		1	WG1872016
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1872016
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1872016
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*100*				WG1872016

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1872016
Tetrachloroethylene	127-18-4	166	0.200	1.36	0.203	1.38		1	WG1872016
Trichloroethylene	79-01-6	131	0.200	1.07	0.281	1.51		1	WG1872016
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1872016
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*99.1*				WG1872016

Method Blank (MB)

(MB) R3798089-3 05/31/22 09:04

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
cis-1,2-Dichloroethene	U		0.0784	0.200
Tetrachloroethylene	U		0.0814	0.200
Trichloroethylene	U		0.0680	0.200
Vinyl chloride	U		0.0949	0.200
(S) 1,4-Bromofluorobenzene	*98.9*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3798089-1 05/31/22 07:46 • (LCSD) R3798089-2 05/31/22 08:25

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
cis-1,2-Dichloroethene	3.75	4.36	4.27	116	114	70.0-130			2.09	25
Tetrachloroethylene	3.75	4.20	4.11	112	110	70.0-130			2.17	25
Trichloroethylene	3.75	4.19	4.15	112	111	70.0-130			0.959	25
Vinyl chloride	3.75	4.26	4.20	114	112	70.0-130			1.42	25
(S) 1,4-Bromofluorobenzene				*98.9*	*98.5*	*60.0-140*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
	The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
PPM Consultants - MS

289 Commerce Park Drive, Suite D
Ridgeland, MS 39157

Billing Information:
Accounts Payable
289 Commerce Park Drive, Suite D
Ridgeland, MS 39157

Report To:
Mr. Ben Lightsey

Email To:
ben.lightsey@ppmco.com

Project Description:

City/State Collected: Louisville, MS

Please Circle: PT MT (CT) ET

Phone: **601-956-8233**

Client Project # **30128305**

Lab Project # **PPMCONMS-BEN**

Collected by (print): Ben Lightsey

Site/Facility ID # Teters Floral

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Three Day
___ Next Day ___ Five Day
___ Two Day

Date Results Needed

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE
MT JULIET, TN
12065 Lebanon Road Mt Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1498417
C178

Acctnum: **PPMCONMS**
Template: **T208045**
Prelogin: **P919873**
PM: 034 - Craig Cothron
PB: CSL 04/28/22
Shipped Via: **FedEx Ground**

Sample ID	Can #	Flow Cont. #	Collection Date	Collection Time	Canister Pressure/Vacuum Initial	Canister Pressure/Vacuum Final	Analysis: TO-15 Summa	Rem./Contaminant	Sample # (lab only)
IA-1	11993	9566	5/24/22	1525	30 in/Hg	4 in/Hg	X		-01
IA-2	11016	20137	5/24/22	1526	28 in/Hg	3 in/Hg	X		-02
IA-3	9378	6638	5/24/22	1528	29 in/Hg	4 in/Hg	X		-03
IA-4	8764	10055	5/24/22	1533	30 in/Hg	3 in/Hg	X		-04
IA-5	8000	21391	5/24/22	1530	29 in/Hg	10 in/Hg	X		-05
AA-1	9321	6337	5/24/22	1520	28 in/Hg	7 in/Hg	X		-06
							X		

Sample Receipt Checklist (MP)
COC Seal Present/Intact: Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
RAD Screen <0.5 mR/hr: Y N
If Applicable
VOA Zero Headspace: Y N
Pres.Correct/Check: Y N

Remarks:

Samples returned via: __ UPS __ FedEx __ Courier __ _____
Tracking #
Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/25/2022	1700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) D. Ramsey	Date: 5-26-22	Time: 900

Condition: (lab use only) OK
COC Seal Intact: ___ Y ___ N ✓ NA
NCF:

APPENDIX D – SAFTEY DATA SHEETS

ZEP Inc.
11627 178th Street
Edmonton, Alberta T5S 1N6
1-877-I-BUY-ZEP (428-9937)
www.zep.com

Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

Product name AEROSOLVE II

Product use Aerosol Solvent Degreaser

Product code 0181

Date of issue 04/14/14 **Supersedes** 05/30/11

Emergency Telephone Numbers

For MSDS Information:
Technical Services Group
Telephone (780) 453-8100
(Business Hours 8:00am - 5:00pm)

For Medical or Transportation Emergency
CANUTEC (24 Hours)
(613) 996-6666 - Call Collect

Prepared By
Technical Services Group
11627 178th Street
Edmonton, Alberta T5S 1N6

Section 2. Hazards Identification

Emergency overview

WARNING

VAPOR HARMFUL. CONTENTS UNDER PRESSURE. CAUSES EYE, SKIN AND RESPIRATORY TRACT IRRITATION.

Do not breathe vapor or mist. Contains material that may cause target organ damage, based on animal data. Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

NOTE: MSDS data pertains to the product as delivered in the original shipping container(s). Risk of adverse effects are lessened by following all prescribed safety precautions, including the use of proper personal protective equipment.

Acute Effects **Routes of Entry** Dermal contact. Eye contact Inhalation.

Eyes Causes eye irritation. Inflammation of the eye is characterized by redness, watering and itching.

Skin Causes skin irritation. Skin inflammation is characterized by itching, scaling, reddening or, occasionally, blistering.

Inhalation Avoid inhalation of vapor, spray or mist. Over-exposure by inhalation may cause respiratory irritation. Can cause central nervous system (CNS) depression. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and, in extreme cases, loss of consciousness.

Ingestion Aspiration hazard if swallowed. Can enter lungs and cause damage. Harmful if swallowed.

Chronic effects Repeated or prolonged exposure to the substance can produce damage to central nervous system, peripheral nervous system, kidneys, liver and heart. May cause hearing impairment or change. Prolonged skin contact may cause dermatitis with drying and cracking of skin.

Additional Information: See Toxicological Information (Section 11)

Section 3. Composition/Information on Ingredients

Name of Hazardous Ingredients	CAS number	% by Weight
TRICHLOROETHYLENE; acetylene trichloride; 1-chloro-2,2-dichloroethylene	79-01-6	60 - 100
CARBON DIOXIDE	124-38-9	1 - 5

Section 4. First Aid Measures

Eye Contact Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Skin Contact Wash affected area with soap or mild detergent and water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Wash clothing before reuse. Get medical attention if irritation develops.

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Section 5. Fire Fighting Measures

Flash Point Not applicable.

Flammable Limits Not applicable.

Flammability Non-flammable. (CSMA)

Auto-ignition Temperature

Fire-Fighting Procedures Use dry chemical or CO_2. Cool closed containers exposed to fire with water. Wear special protective clothing and positive pressure, self-contained breathing apparatus.

Fire hazard CONTENTS UNDER PRESSURE. Container explosion may occur under fire conditions or when heated. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.

Products of Combustion carbon oxides (CO, CO_2) Hydrogen chloride (HCl). Chlorine. and Phosgene gas.

Explosion hazard

Section 6. Accidental Release Measures

Spill Clean up Large spills are unlikely due to packaging.

Section 7. Handling and Storage

Handling Put on appropriate personal protective equipment (see Section 8). Avoid contact with eyes, skin and clothing. Do not breathe vapor or mist. Use only with adequate ventilation. Watch for accumulation in low confined areas.

Storage Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Do not store above the following temperature: 49°C (120.2°F). Do not puncture or incinerate container. Keep out of the reach of children.

Section 8. Exposure Controls/Personal Protection

Product name | **Exposure limits**

No exposure limit value known.

Personal Protective Equipment (PPE)

Eyes Recommended: Safety glasses.

Hands and Body Recommended: Chemical-resistant gloves. Viton®

Respiratory Use with adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

Section 9. Physical and Chemical Properties

Physical State Liquid. (Aerosol.)

pH Not applicable.

Boiling Point 87.22°C (189°F)

Specific Gravity 1.46

Solubility Insoluble in the following materials: cold water and hot water.

Color Clear. Colorless.

Odor Mild. Solvent.

Vapor Pressure Not available.

Vapor Density Not available.

Evaporation Rate <1 (Carbon tetrachloride = 1)

Freezing Point

VOC (Consumer) 96.9% 11.78 (lb/gal) 1412 (g/l).

Section 10. Stability and Reactivity

Stability and Reactivity The product is stable.

Incompatibility Reactive or incompatible with the following materials: oxidizing materials, metals and alkalis.

Hazardous Polymerization Will not occur.

Hazardous Decomposition Products Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological Information

Carcinogenicity

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
trichloroethylene	LC50 Inhalation Vapor	Rat	140700 mg/m³	1 hours
	LD50 Dermal	Rabbit	10000 mg/kg	-
	LD50 Oral	Mouse	2402 mg/kg	-
	LD50 Oral	Rat	4920 mg/kg	-
	LD50 Oral	Rat	4920 mg/kg	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Section 12. Ecological Information

Aquatic Ecotoxicity

trichloroethylene	-	Acute EC50 95000 µg/l Marine water	Algae - Diatom - Skeletonema costatum	96 hours
	-	Acute EC50 36.5 mg/l Fresh water	Algae - Green algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
	-	Acute LC50 20 mg/l Marine water	Crustaceans - Australian Barnacle - Elminius modestus	48 hours
	-	Acute LC50 18000 µg/l Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	-	Acute LC50 3100 µg/l Fresh water	Fish - Flagfish - Jordanella floridae - Juvenile (Fledgling, Hatchling, Weanling)	96 hours
	-	Chronic EC10 12.3 mg/l Fresh water	Algae - Green algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
	-	Chronic NOEC 1.384 mg/l Fresh water	Daphnia - Water flea - Daphnia magna	21 days

Section 13. Disposal Considerations

Waste Information

Waste must be disposed of in accordance with applicable regulations. Consult your local or regional authorities for additional information.

Waste Stream Code: D040, U228
Classification: - [Hazardous waste.]
Origin: - [RCRA waste.]

Section 14. Transport Information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	1950	Aerosols, non-flammable	2.2			**Explosive Limit and Limited Quantity Index** 1
IMDG Class						

NOTE: DOT classification applies to most package sizes. For specific container size classifications or for size exceptions, refer to the Bill of Lading with your shipment. Limited Quantity: Small quantities of controlled goods are not regulated as Dangerous Goods according to TDG regulations.

PG* : Packing group

Section 15. Regulatory Information

Canada

WHMIS (Canada)

Class A: Compressed gas.
Class D-1B: Material causing immediate and serious toxic effects (Toxic).
Class D-2B: Material causing other toxic effects (Toxic).

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

Section 16. Other Information

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Material Safety Data Sheet

Section 1 – Product and Company Identification

Product Name: Brake Parts Cleaner
Product Synonym: 5C-4
Product Number: 1420
Product Description: Automotive brake cleaner (aerosol)

Manufacturer: Berryman Products, Inc.
3800 E Randol Mill Rd
Arlington, TX 76011
(800) 433-1704 within USA
(817) 640-2376 outside USA
www.BerrymanProducts.com

Emergency Contact: Infotrac, Inc., (800) 535-5053

Section 2 – Hazards Identification

Emergency Overview: Contents under pressure. Vapor harmful. Eye and skin irritant. Possible carcinogen.

Routes of Exposure: Ingestion, inhalation, eye contact, skin contact

Possible Health Hazards

Eyes: May cause moderate to severe irritation and result in conjunctivitis, blurred vision, and corneal injury.

Skin: May cause mild to moderate irritation of the skin. Prolonged or repeated contact may dry the skin and result in severe irritation, dermatitis, and effects similar to those of chronic overexposure by way of inhalation.

Inhalation: Acute overexposure may rapidly result in respiratory tract irritation, headache, dizziness, nausea, vomiting, unconsciousness, irregular heartbeat, and death. Chronic overexposure or intentional abuse may adversely affect the liver, kidneys, lungs, blood, central nervous system, and hearing and result in death. May aggravate asthma, emphysema, and bronchitis and cause cancer.

Ingestion: Accidental ingestion and subsequent aspiration of even small quantities may cause severe lung damage, aspiration pneumonitis, cyanosis, and death. Ingestion of larger amounts may also include gastrointestinal effects, such as abdominal discomfort, pain, nausea, and vomiting.

Supplemental Information: See "Section 11 – Toxicological Information" for additional information.

Section 3 – Composition / Information on Ingredients

Ingredient	CAS Number	Weight
Dichloromethane	75-09-2	60-70%
Tetrachloroethylene	127-18-4	5-15%
Toluene	108-88-3	20-30%

Section 4 – First Aid Measures

Eye Contact: Immediately flush eyes with water for at least 15 minutes, holding the eyelids apart at regular intervals to ensure complete irrigation. Dispose of contaminated contact lenses. Seek medical attention immediately.

Skin Contact: Remove contaminated clothing, and wash affected areas of body thoroughly with soap and water. Allow clothing to air dry, and launder before reuse. Seek medical attention if irritation persists.

Inhalation: If breathing difficulties occur, immediately remove source of exposure or move victim to fresh air and administer oxygen, if necessary. Do ***not*** administer epinephrine (or "epipen"), if possible. If symptoms persist, seek immediate medical attention. If breathing stops, give artificial respiration and seek immediate medical attention.

Ingestion: Do ***not*** induce vomiting unless otherwise directed by a medical professional. Dilute stomach contents by drinking 1-2 cups of milk or water. Seek medical attention immediately.

Section 5 – Firefighting Measures

Flash Point and Method: none by Setaflash closed-cup tester
Flammability Limits (composite): Lower – N/A Upper – N/A

Suitable Extinguishing Media: Water fog, foam, dry chemical, and carbon dioxide
Unsuitable Extinguishing Media: Use water spray with caution as product is substantially insoluble.

Protective Equipment: Employ SBCA and full protective gear, including shield, as product is self-pressurized and may vent, rupture, or explode violently at elevated temperatures.
Specific Procedures: Product is self-pressurized and may present explosion hazards at elevated temperatures. Remove product from area if possible without risk of injury. Use water spray to cool containers.

Section 6 – Accidental Release Measures

General Remediation Overview: Vapor dangerous and intoxicating! Thoroughly ventilate area!

Personal Precautions: Avoid unnecessary contact with product. See "Section 8" for recommended protective equipment.
Environmental Precautions: Prevent further loss of product if safely possible.

Methods for Containment: Use booms or other barriers as necessary to prevent further loss.
Methods for Cleaning Up: Clean-up ***must*** be in compliance with §29 CFR 1910.1026 and 1052. For small spills, quickly mop up or absorb with inert material, such as corn cob, cellulose, or vermiculite. For large spills, ensure thorough ventilation of the local area to prevent the accumulation of dangerous and intoxicating vapors. Pump or transfer material into containers for recovery and use absorbent material for collection of unrecoverable product.

Section 7 – Handling and Storage

Handling: Avoid contact with skin and eyes. Wash hands thoroughly after use.
Storage: Store in cool, dry location. Do not leave in direct sunlight inside vehicle. Do not store in aluminum containers.

Section 8 – Exposure Controls / Personal Protection

Ingredient	Exposure Limit	Source
Dichloromethane	25 ppm	OSHA
Tetrachloroethylene	25 ppm	ACGIH
Toluene	20 ppm	ACGIH

Engineering Controls: This product contains methylene chloride ("dichloromethane") and ***must*** be used in accordance with §29 CFR 1910.1052. If possible, use outside with positive cross-ventilation in order to reduce accumulation of vapor and minimize exposure.
Respiratory Protection: If necessary, use respiratory protection sufficient to reduce exposure to permissible limits.
Eye Protection: Use of safety glasses with wrap-around lens or goggles is recommended.
Skin Protection: Employment of impermeable gloves is recommended.
Other Protection: For industrial settings, combination safety shower with eye wash station is recommended.

Section 9 – Physical and Chemical Properties

Physical State: Liquid
Appearance: Clear, colorless liquid
Odor: Moderate, sweet, aromatic

Freezing Point: <10°F (approximate)
Boiling Range: 104-250°F (approximate)
Specific Gravity: 1.20-1.22 at 68°F
pH: N/A, as supplied
Solubility in Water: Negligible
Volatile Content: 100%
Evaporation Rate: Faster than water

Vapor Density: Heavier than air
Vapor Pressure: 80-100 PSI at 68°F
VOC Content: 22% by weight (260 g/L) (by EPA Method 24)
VOC Composite Partial Pressure, PP_c: 8 mm Hg at 68°F (as calculated by SCAQMD Rule 1171(B)(57))

Section 10 – Stability and Reactivity

Chemical Stability: Stable under normal conditions
Incompatible Materials: Strong acids, oxidizers, and powered zinc, aluminum, magnesium, and sodium
Hazardous Decomposition Products: None under normal conditions of use. Thermal decomposition may yield hydrocarbons, oxides of carbon and chlorine, organic oxygenates, chlorine, hydrogen chloride, and phosgene.
Possibility of Hazardous Reactions: Low if kept from "Incompatible Materials"

Section 11 – Toxicological Information

General Information: This formulated product has not been evaluated for toxicological properties. Used responsibly, acute and chronic toxicity are expected to be low to moderate, but intentional abuse may cause cancer or be fatal.

Acute Toxicity: No specific data available on blend **Chronic Toxicity:** No specific data available on blend

Carcinogenicity: Dichloromethane increases the incidence of tumors in rodents. However, it has not demonstrated tumorgenic responses in other animals or human epidemiological studies.
Teratogenicity: Case studies suggest maternal abuse of toluene may increase the chances of birth defects.
Mutagenicity: N/A

Supplemental Information: See "Section 2 – Hazards Identification" of this MSDS for additional information.

Section 12 – Ecological Information

Ecotoxicity: This product is not anticipated to be ecologically significant in small amounts.
Persistence and Degradability: Not readily biodegradable. May be environmentally persistent.
Bioaccumulation Potential: Minimal

Section 13 – Disposal Considerations

Disposal Instructions: None specific. Dispose of waste in accordance with applicable regulations.

Section 14 – Transportation Information

US Department of Transportation (DOT): When shipped by ground, this product is eligible for a "Limited Quantity" exception per §49 CFR 173.306. Otherwise, it should bear the following shipping description:

UN1950, Aerosols, 2.2, 6.1

International Air Transportation Association (IATA): When shipped by air, this product may be eligible for a "Limited Quantity" exception. Otherwise, it should bear the following shipping description:

UN1950, Aerosols, 2.2, 6.1

International Maritime Dangerous Goods (IMDG): Contains the following marine pollutant: Tetrachloroethylene

Section 15 – Regulatory Information

FEDERAL CONSIDERATIONS

SARA Title III, Section 302 – Extremely Hazardous Substances: Neither this product nor any of its components appear on the list of extremely hazardous substances (EHS) found in §40 CFR 355 Appendices A and B and are not subject to the emergency planning (EPCRA) requirements of §40 CFR 355.30 or the reportable quantity (RQ) and threshold planning quantity (TPQ) requirements of §40 CFR 355 Appendices A and B.

SARA Title III, Section 304 – Hazardous Substances: This product contains the following components found in the list of hazardous substances of §40 CFR Table 302.4: Dichloromethane (CAS # 75-09-2); Tetrachloroethylene (CAS # 127-18-4); Toluene (CAS # 108-88-3)

SARA Title III, Sections 311/312 – Hazard Classes: This product contains one or more ingredients that are classified into the following hazard categories outlined in §40 CFR 370.40: sudden release of pressure; immediate (acute) health; delayed (chronic) health

SARA Title III, Section 313 – Toxic Chemicals: This product contains the following chemicals listed in the table of §40 CFR 372.65 exceeding the ***de minimis*** concentration reporting requirements of §40 CFR 372.38: Dichloromethane (CAS # 75-09-2); Tetrachloroethylene (CAS # 127-18-4); Toluene (CAS # 108-88-3)

Section 15 – Regulatory Information (continued)

FEDERAL CONSIDERATIONS (continued)

Clean Air Act, Section 183(e) – Consumer and Commercial Products: This product complies with the National Volatile Organic Compound Emission Standards for Consumer Products regulations found in §70 FR 69759.

Toxic Substances Control Act (TSCA): All chemicals known to be present in this product are either listed on the TSCA inventory or are not required to be per §15 USC 2601 et seq.

Occupation Safety and Health Administration (OSHA): This material safety data sheet is provided for compliance with applicable regulations of the Hazard Communication Standard (HCS) found in §29 CFR 1910.1200(g). Federal law requires persons receiving this document to study it carefully and become aware of the hazards of this product. Notify all employees, visitors, agents, and contractors of the information on this sheet.

Consumer Product Safety Commission (CPSC): This product is regulated under the Federal Hazardous Substances Act, is subject to the labeling requirements of 16 CFR 1500, and must include the following cautionary statements: Danger! Harmful or fatal if swallowed. Vapor Harmful. Contents under pressure. Possible cancer agent based on test with laboratory animals. Keep out of the reach of children.

REGIONAL CONSIDERATIONS

Lake Michigan Air Directors Consortium (LADCO): Complies with category VOC requirement
Ozone Transport Commission (OTC): Complies with category VOC requirement

STATE CONSIDERATIONS

California: This product is ***not*** compliant with the category VOC requirements of §94509 of Subchapter 8.5 Article 2 of the Air Resource Board's "Regulation for Reducing Emissions from Consumer Products" and is not suitable for sale as a ***consumer product***.

This product is subject to the labeling requirements of "Proposition 65 – Safe Drinking Water and Toxic Enforcement Act of 1986" ("Prop 65") and must product bear the cautionary statement "WARNING: This product contains chemicals known to the state of California to cause cancer and birth defects or other reproductive harm."

New Jersey: This product is ***not*** compliant for sale per NJAC 7:27-24.4(r).

Section 16 – Other Information

Hazardous Materials Identification System (HMIS)

HMIS Hazard Rating	
Health	2
Flammability	0
Reactivity	0
Protective Equipment	X

HMIS Hazard Index	
Least	- 0
Slight	- 1
Moderate	- 2
High	- 3
Extreme	- 4

Index of Abbreviations

ACGIH – American Council of Governmental and Industrial Hygienists
N/A – not applicable
NE – not established
NIOSH – National Institute for Occupational Safety and Health
PEL – Permissible Exposure Limit (as required by OSHA)
SCBA – Self-Contained Breathing Apparatus
TLV – Threshold Limit Value (as recommended by ACGIH)

Date of Issuance: 9-7-2012
Date of Previous Revision: 7-23-2012
Primary Revision Change(s): updated "Section 8 – Exposure Controls / Personal Protection"; "Section 14 – Transportation Information"; and "Section 15 – Regulatory Information"
Applicability: This document only applies to part number 1420 manufactured on or after March 7, 2011.

Prepared By: Dan Nowlan

Legal Disclaimer: The information contained in this document is, to the best of Berryman Products, Inc.'s knowledge, complete and accurate but is not warranted. All materials may present unknown hazards and should be used with caution. It is the responsibility of the user to evaluate the information in a prudent manner and to use it in a manner consistent with its intended purpose. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Material name : A07314 ZEP DRY GRAPHIT 016401_12CS 20N18

Material number : 000000000000016401

Manufacturer or supplier's details

Company : Zep Inc.

Address : 350 Joe Frank Harris Parkway, SE
Emerson, GA 30137

Telephone : 404-352-1680

Emergency telephone numbers

For SDS Information	:	Compliance Services 1-877-428-9937
For a Medical Emergency	:	877-541-2016 Toll Free - All Calls Recorded
For a Transportation Emergency	:	CHEMTREC: 800-424-9300 - All Calls Recorded. In the District of Columbia 202-483-7616

Recommended use of the chemical and restrictions on use

Recommended use : Lubricant

Note: This product is labeled as a consumer product in accordance with the United States Consumer Product Safety Commission regulations. The warnings presented below in this Safety Data Sheet (SDS) comply with the 2012 OSHA Hazard Communication Standard (GHS - Globally Harmonized System of Classification and Labeling). The requirements for the labeling and warnings of consumer products may differ from those required for GHS based hazard communication.

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	Aerosol containing a liquefied gas
Colour	dark grey
Odour	solvent-like

GHS Classification

Flammable aerosols : Category 2
Gases under pressure : Liquefied gas
Skin irritation : Category 2
Eye irritation : Category 2A
Carcinogenicity : Category 1B
Specific target organ toxicity - single exposure : Category 3 (Central nervous system)

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H223 Flammable aerosol.
H280 Contains gas under pressure; may explode if heated.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H350 May cause cancer.

Precautionary statements : **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P211 Do not spray on an open flame or other ignition source.
P251 Pressurized container: Do not pierce or burn, even after use.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor 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.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
Storage:
P410 + P412 Protect from sunlight. Do not expose to temperatures exceeding 50 °C/ 122 °F.
P403 Store in a well-ventilated place.
Disposal:
P501 Dispose of contents/container in accordance with local regulation.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration [%]
trichloroethylene	79-01-6	>= 50 - < 70
propane	74-98-6	>= 10 - < 20

butane	106-97-8	>= 10 - < 20
propan-2-ol	67-63-0	>= 5 - < 10
graphite	7782-42-5	>= 1 - < 5

The exact percentages of disclosed substances are withheld as trade secrets.

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled : Consult a physician after significant exposure.
If unconscious, place in recovery position and seek medical advice.

In case of skin contact : If skin irritation persists, call a physician.
Wash off immediately with plenty of water for at least 15 minutes.
Remove contaminated clothing and shoes.
Wash contaminated clothing before re-use.

In case of eye contact : Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

If swallowed : Keep respiratory tract clear.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.
DO NOT induce vomiting unless directed to do so by a physician or poison control center.

Most important symptoms and effects, both acute and delayed : Effects are immediate and delayed.
Symptoms may include irritation, redness, pain, and rash.
Chronic effects are delayed and symptoms may not be observed during an exposure.
Effects are dependent on exposure (dose, concentration, contact time).
Causes skin irritation.
Suspected of causing cancer.
Review section 2 of SDS to see all potential hazards.
Causes serious eye irritation.

Notes to physician : Treat symptomatically. Symptoms may be delayed.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Alcohol-resistant foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media	:	High volume water jet
Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Carbon dioxide (CO2) Carbon monoxide Smoke Chlorine compounds
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Sweep up or vacuum up spillage and collect in suitable container for disposal. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

SECTION 7. HANDLING AND STORAGE

Advice on safe handling	:	Do not breathe vapours or spray mist. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges.

Provide sufficient air exchange and/or exhaust in work rooms.
Always replace cap after use.
Dispose of rinse water in accordance with local and national regulations.

Conditions for safe storage : BEWARE: Aerosol is pressurized. Keep away from direct sun exposure and temperatures over 50 °C. Do not open by force or throw into fire even after use. Do not spray on flames or red-hot objects.
No smoking.
Keep in a dry, cool and well-ventilated place.
Observe label precautions.
Electrical installations / working materials must comply with the technological safety standards.

Materials to avoid : Oxidizing agents

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
trichloroethylene	79-01-6	TWA	10 ppm	ACGIH
		STEL	25 ppm	ACGIH
		TWA	100 ppm	OSHA Z-2
		CEIL	200 ppm	OSHA Z-2
		Peak	300 ppm	OSHA Z-2
		TWA	50 ppm 270 mg/m3	OSHA P0
		STEL	200 ppm 1,080 mg/m3	OSHA P0
		STEL	100 ppm 537 mg/m3	CAL PEL
		C	300 ppm	CAL PEL
		PEL	25 ppm 135 mg/m3	CAL PEL
propane	74-98-6	TWA	1,000 ppm	ACGIH
		TWA	1,000 ppm 1,800 mg/m3	NIOSH REL
		TWA	1,000 ppm 1,800 mg/m3	OSHA Z-1
		TWA	1,000 ppm 1,800 mg/m3	OSHA P0
		PEL	1,000 ppm 1,800 mg/m3	CAL PEL
butane	106-97-8	TWA	800 ppm 1,900 mg/m3	NIOSH REL
		TWA	800 ppm 1,900 mg/m3	OSHA P0
		PEL	800 ppm 1,900 mg/m3	CAL PEL
propan-2-ol	67-63-0	TWA	200 ppm	ACGIH

		STEL	400 ppm	ACGIH
		TWA	400 ppm 980 mg/m3	NIOSH REL
		ST	500 ppm 1,225 mg/m3	NIOSH REL
		TWA	400 ppm 980 mg/m3	OSHA Z-1
		TWA	400 ppm 980 mg/m3	OSHA P0
		STEL	500 ppm 1,225 mg/m3	OSHA P0
		PEL	400 ppm 980 mg/m3	CAL PEL
		STEL	500 ppm 1,225 mg/m3	CAL PEL
graphite	7782-42-5	TWA (Respirable)	2.5 mg/m3	NIOSH REL
		TWA (Dust)	15 Million particles per cubic foot	OSHA Z-3

Biological occupational exposure limits

Component	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
TRICHLOROETHENE	79-01-6	Trichloroacetic acid	Urine	End of shift at end of workweek	15 mg/l	ACGIH BEI
TRICHLOROETHENE		Trichloroethanol	In blood	End of shift at end of workweek	0.5 mg/l	ACGIH BEI
TRICHLOROETHENE		Trichloroethylene	In end-exhaled air	End of shift at end of workweek		ACGIH BEI
PROPAN-2-OL	67-63-0	Acetone	Urine	End of shift at end of workweek	40 mg/l	ACGIH BEI

Engineering measures : effective ventilation in all processing areas

Personal protective equipment

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

Hand protection
Material : Protective gloves
Remarks : The suitability for a specific workplace should be discussed

with the producers of the protective gloves.

Eye protection	:	Safety glasses Access to clean water to rinse eyes must be available, options include: eye wash stations or showers, or eye wash bottles with pure water.
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Aerosol containing a liquefied gas
Colour	:	dark grey
Odour	:	solvent-like
Odour Threshold	:	No data available
pH	:	Not applicable
Melting point/freezing point	:	not determined
Boiling point	:	82.2 - 87.8 °C
Flash point	:	Not applicable
Evaporation rate	:	> 1 n-Butyl Acetate = 1.0
Flammability (solid, gas)	:	Flammable aerosol.
Upper explosion limit	:	No data available
Lower explosion limit	:	No data available
Vapour pressure	:	No data available
Density	:	1.32 g/cm3
Solubility(ies)		
Water solubility	:	insoluble
Solubility in other solvents	:	not determined
Partition coefficient: n-octanol/water	:	No data available
Auto-ignition temperature	:	not determined
Thermal decomposition	:	No data available
Viscosity		

Viscosity, kinematic	:	No data available
Heat of combustion	:	> 20 kJ/g

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Stable
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Vapours may form explosive mixture with air. No decomposition if stored and applied as directed.
Conditions to avoid	:	Heat, flames and sparks. Extremes of temperature and direct sunlight.
Incompatible materials	:	Oxidizing agents
Hazardous decomposition products	:	Phosgene Hydrogen chloride gas Chlorine Carbon oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Potential Health Effects

Aggravated Medical Condition	:	None known.
Symptoms of Overexposure	:	Effects are immediate and delayed. Symptoms may include irritation, redness, pain, and rash. Chronic effects are delayed and symptoms may not be observed during an exposure. Effects are dependent on exposure (dose, concentration, contact time).

Carcinogenicity:

IARC	Group 1: Carcinogenic to humans	
	trichloroethylene	79-01-6
ACGIH	Suspected human carcinogen	
	trichloroethylene	79-01-6
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.	
NTP	Known to be human carcinogen	
	trichloroethylene	79-01-6

Acute toxicity

Product:

Acute oral toxicity	:	Acute toxicity estimate : > 5,000 mg/kg Method: Calculation method

Components:

trichloroethylene:

Acute oral toxicity	:	LD50 Oral Rat: 4,920 mg/kg
Acute inhalation toxicity	:	LC50 Mouse: 8450 ppm Exposure time: 4 h
Acute dermal toxicity	:	LD50 Dermal Rabbit: > 20,000 mg/kg

propan-2-ol:

Acute oral toxicity	:	LD50 Oral Rat: 4,396 mg/kg Method: Calculation method

Skin corrosion/irritation

Product:

Remarks: Irritating to skin.

Serious eye damage/eye irritation

Product:

Remarks: Irritating to eyes.

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Aspiration toxicity

No data available

Further information

Product:

Remarks: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting., Concentrations substantially above the TLV value may cause narcotic effects., Solvents may degrease the skin.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

No data available

Persistence and degradability

No data available

Bioaccumulative potential

Product:

Partition coefficient: n-octanol/water	:	Remarks: No data available

Components:

trichloroethylene :

Partition coefficient: n-octanol/water	:	log Pow: 2.29

butane :

Partition coefficient: n-octanol/water	:	Pow: 2.89

Mobility in soil

No data available

Other adverse effects

No data available

Product:

Regulation	40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks	This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information	:	No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	The product should not be allowed to enter drains, water courses or the soil.

Do not contaminate ponds, waterways or ditches with chemical or used container.
Dispose of in accordance with local regulations.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

SECTION 14. TRANSPORT INFORMATION

Transportation Regulation: 49 CFR (USA):
UN1950, AEROSOLS, FLAMMABLE, 2.1, - Limited quantity

Transportation Regulation: IMDG (Vessel):
UN1950, AEROSOLS, FLAMMABLE, 2.1, - Limited quantity

Transportation Regulation: IATA (Cargo Air):
UN1950, AEROSOLS, FLAMMABLE, 2.1, - Limited quantity

Transportation Regulation: IATA (Passenger Air):
UN1950, AEROSOLS, FLAMMABLE, 2.1, - Limited quantity

Transportation Regulation: TDG (Canada):
UN1950, AEROSOLS, FLAMMABLE, 2.1, - Limited quantity

The product as delivered to the customer conforms to packaging requirements for shipment by road under US Department of Transportation (DOT) regulations. Additional transportation classifications noted above are for reference only, and not a certification or warranty of the suitability of the packaging for shipment under these alternative transport regulations.

SECTION 15. REGULATORY INFORMATION

TSCA list : No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
trichloroethylene	79-01-6	100	159

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
Gases under pressure
Skin corrosion or irritation
Serious eye damage or eye irritation
Carcinogenicity
Specific target organ toxicity (single or repeated exposure)

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

trichloroethylene	79-01-6	62.8498 %

California Prop. 65

WARNING: This product can expose you to chemicals including trichloroethylene, which is/are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

The components of this product are reported in the following inventories:

DSL	All components of this product are on the Canadian DSL
TSCA	On TSCA Inventory

For information on the country notification status for other regions please contact the manufacturer's regulatory group.

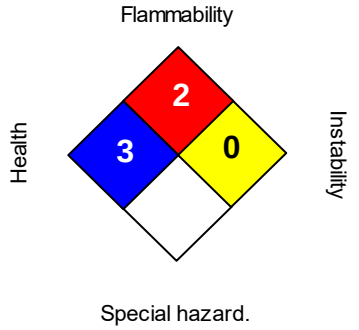
Inventory Acronym and Validity Area Legend:

TSCA (USA), DSL (Canada), NDSL (Canada)

SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS III:

HEALTH	3*
FLAMMABILITY	2
PHYSICAL HAZARD	2

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

OSHA - GHS Label Information:

Hazard pictograms :

Signal word : **Danger:**

Hazard statements : Flammable aerosol. Contains gas under pressure; may explode if heated. Causes skin irritation. Causes serious eye irritation. May cause drowsiness or dizziness. May cause cancer.

Precautionary statements :

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. No smoking. Do not spray on an open flame or other ignition source. Pressurized container: Do not pierce or burn, even after use. Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. Wash skin thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response: IF ON SKIN: Wash with plenty of soap and water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Get medical advice/ attention. If skin irritation occurs: Get medical advice/ attention. If eye irritation persists: Get medical advice/ attention. Take off contaminated clothing and wash before reuse.

Storage: Protect from sunlight. Do not expose to temperatures exceeding 50 °C/ 122 °F. Store in a well-ventilated place.

Disposal: Dispose of contents/container in accordance with local regulation.

Version:	2.0
Revision Date:	02/21/2018
Print Date:	01/24/2022

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind. The information in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. Users should make their own investigations to determine the suitability and applicability of the information for their particular purposes. This SDS has been prepared by the Compliance Services organization supporting this manufacturer, supplier or distributor.

Zep Inc. markets products under well recognized and established brand names such as Zep®, Zep Commercial®,Zep Professional®, Enforcer®, National Chemical™, Selig™, Misty®, Next Dimension™, Petro®, i-Chem®, TimeMist®, TimeWick™, MicrobeMax®, Country Vet®, Konk®, Original Bike Spirits®, Blue Coral®, Black Magic®, Rain-X®, Niagara National™, FC Forward Chemicals®,Rexodan®, Mykal™, and a number of private labeled brands.

ZEP MANUFACTURING COMPANY
Acuity Specialty Products Group, Inc.
P.O. BOX 2015
ATLANTA, GA 30301
1- 877- I - BUY- ZEP

Material Safety Data Sheet
and Safe Handling and Disposal Information

Section 1. Chemical Product and Company Identification

Product name	**ZEP AEROSOLV II**
Product Use	Solvent Degreaser
Product Code	**0181**
Date of issue	**06/11/03** **Supersedes 04/21/00**
Emergency Telephone Numbers	**For MSDS Information:** Acuity Specialy Products Group, Inc. **Compliance Services 1-877-I-BUY-ZEP** **For Medical Emergency:** INFOTRAC **(877) 541-2016 Toll Free - All Calls Recorded** **For a Transportation Emergency:** CHEMTREC **(800) 424-9300 - All Calls Recorded** **In the District of Columbia (202) 483-7616**
Printing date: 06/13/03	**Prepared by** Compliance Services Group Acuity Specialty Products Group 1420 Seaboard Industrial Blvd. Atlanta, GA 30318

Section 2. Composition, Information on Ingredients

Name of Hazardous Ingredients	CAS #	% by Weight	Exposure Limits
Trichloroethylene	79-01-6	90-100	**ACGIH TLV (United States, 1989).** TWA: 50 ppm STEL: 100 ppm **OSHA PEL (United States, 1989).** TWA: 50 ppm STEL: 200 ppm

Section 3. Hazards Identification

HMIS	
Health	2
Fire Hazard	0
Reactivity	0
Personal Protection	B

Acute Effects **Routes of Entry** Absorbed through skin. Inhalation. Ingestion.

Skin Hazardous in case of skin contact (irritant, permeator). Non-sensitizer for skin. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Eyes Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching.

Inhalation Hazardous in case of inhalation (lung irritant). May cause irritation of respiratory tract, coughing, shortness of breath. Exposure to high concentrations can cause dizziness, lightheadness, headache, nausea, and blurred vision. Higher levels may cause unconsciousness. Severe over-exposure can result in death. Medical Conditions Aggravated by Overexposure: Respiratory and Heart (Cardiac).

Ingestion Hazardous in case of ingestion. Aspiration hazard if swallowed- can enter lungs and cause damage. May be harmful if swallowed.

Carcinogenic Effects Classified 2A (Probable for human.) by IARC, 2 (Reasonably Anticipated To Be Human Carcinogens.) by NTP [Trichloroethylene].

Chronic Effects The substance may be toxic to kidneys, liver, peripheral nervous system, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Defatting to the skin. Prolonged skin contact may cause dermatitis with drying and cracking of skin.

See Toxicological Information (section 11)

Section 4. First Aid Measures

Eye Contact Flush with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin Contact Wash contaminated skin with soap and water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention if irritation develops.

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion Aspiration hazard if swallowed- can enter lungs and cause damage. Do NOT induce vomiting unless directed to do so by medical personnel. If vomiting occurs, keep head lower than hips to help prevent aspiration. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Section 5. Fire Fighting Measures

Flash Point	Not applicable.
Flammable Limits	LOWER: 8% UPPER: 10.5%
Flammability	Non combustible. Vapor may cause flash fire.
Fire Hazard	Cool closed containers exposed to fire with water.
Fire-Fighting Procedures	Use DRY chemicals, CO2, water spray or foam. Wear special protective clothing and positive pressure, self-contained breathing apparatus.

Section 6. Accidental Release Measures

Spill Clean up Put on appropriate personal protective equipment (see Section 8). Absorb with an inert material and put the spilled material in an appropriate waste disposal. To clean the floor and all objects contaminated by this material, use detergent. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Section 7. Handling and Storage

Handling Avoid contact with eyes, skin and clothing. Avoid breathing vapors or spray mists. Use only with adequate ventilation. Watch for accumulation in low confined areas. Wash thoroughly after handling. Wash contaminated clothing before reusing.

Storage Keep container in a cool, well-ventilated area. Keep away from heat and direct sunlight. Keep away from incompatibles. Keep out of the reach of children. Store between 40°F - 120°F (4.4°C - 49°C).

Section 8. Exposure Controls, Personal Protection

	Personal Protection	Protective Clothing (Pictograms)
Eyes	Splash goggles.	
Body	Chemical resistant gloves. (Viton)	
Respiratory	Use with adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Wear appropriate respirator when ventilation is inadequate. Approved/certified respirator with organic vapor cartridges.	

Section 9. Physical and Chemical Properties

Physical State	Liquid.	Color	Clear. Colorless.
pH	Not applicable.	Odor	Chlorinated hydrocarbon. (Strong.)
Boiling Point	87.2°C (189°F)	Vapor Pressure	8 kPa (60 mmHg) (at 20°C)
Specific Gravity	1.45 (Water = 1)	Vapor Density	4.5 (Air = 1)
Solubility	Insoluble in cold water.	Evaporation Rate	3.1 compared to Ether (anhydrous).
		VOC (Consumer)	1458 (g/l). (100%)

Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Incompatibility	Reactive with oxidizing agents, metals, alkalis.
Hazardous Polymerization	Will not occur.
Hazardous Decomposition Products	Carbon Dioxide, Carbon Monoxide, Hydrogen Chloride (HCl), Chlorine and Phosgene Gas.

Section 11. Toxicological Information

Toxicity to Animals **Trichloroethylene**:

ORAL (LD50): Acute: 4920 mg/kg [Rat]. 2402 mg/kg [Mouse].

DERMAL (LD50): Acute: 29800 mg/kg [Rabbit].

Section 12. Ecological Information

Ecotoxicity	Not available.
Biodegradable/OECD	Not available.

Section 13. Disposal Considerations

Waste Information Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Waste Stream Code: U228 - Unused Product
Classification: - (Hazardous waste.)
Origin: - (RCRA waste.)

Consult your local or regional authorities.

Section 14. Transport Information

Proper shipping name	None ORM-D Other regulated materials		
DOT Classification	ORM-D	UN number	Not available.

Section 15. Regulatory Information

U.S. Federal Regulations

SARA 313 toxic chemical notification and release reporting: Trichloroethylene
Clean Water Act (CWA) 311: Trichloroethylene
Clean air act (CAA) 112 regulated toxic substances: Trichloroethylene

State Regulations

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Trichloroethylene

MATERIAL SAFETY DATA SHEET

NOTICE

Thank you for your interest in, and use of, this product. Acuity Specialty Products Group is pleased to be of service to you by supplying this Material Safety Data Sheet for your files. Acuity Specialty Products Group is concerned for your health and safety. This product and all others supplied by Acuity Specialty Products Group companies can be used safely with proper protective equipment and proper handling practices consistent with label instructions and the MSDS. Before using any this product, be sure to read the complete label and the Material Safety Data Sheet.

As a further word of caution, Acuity Specialty Products Group wishes to advise that serious accidents have resulted from the misuse of "emptied" containers. "Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, or other sources of ignition; they may explode or develop harmful vapors and possibly cause injury or death. Clean empty containers by triple rinsing with water or an appropriate solvent. Empty containers must be sent to a drum reconditioner before reuse.

TERMS AND ABBREVIATIONS
Listed Alphabetically by Section

SECTION II: HAZARDOUS INGREDIENTS

CAR: Carcinogen - A chemical listed by the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC) or OSHA as a definite or possible human cancer causing agent.
CAS#: Chemical Abstract Services Registry Number - A universally accepted numbering system for chemical substances.
CBL: Combustible - At temperatures between 100°F and 200°F chemical gives off enough vapor to ignite if a source of ignition is present as tested with a closed cup tester.
CNS: Central Nervous System depressant that reduces the activity of the brain and spinal cord.
COR: Corrosive - Causes irreversible injury to living tissue (e.g. burns).
DESIGNATIONS: Chemical and common names of hazardous ingredients.
EIR: Eye Irritant Only - Causes reversible reddening and/or inflammation of eye tissues.
EXPOSURE LIMITS: The time weighted average (TWA) airborne concentration at which most workers can be exposed without any expected adverse effects. Primary sources include ACGIH TLVs, and OSHA PELs.
- **ACGIH:** American Conference of Governmental Industrial Hygienists
- **CEILING:** "The concentration that should not be exceeded in the workplace during any part of the working exposure." Source, ACGIH
- **OSHA:** Occupational Safety and Health Administration.
- **PEL:** Permissible Exposure Limit - A set of time weighted average exposure values, established by OSHA, for a normal 8-hour day and a 40-hour workweek.
- **PPM:** Parts per million - unit of measure for exposure limits.
- **(S) SKIN:** Skin contact with substance can contribute to overall exposure.
- **STEL:** Short Term Exposure Limit - Maximum concentration for a continuous 15-minute exposure period.
- **TLV:** Threshold Limit Value - A set of time weighted average exposure limits, established by the ACGIH, for a normal 8-hour day and a 40-hour workweek.

FBL: Flammable - At temperatures under 100°F, chemical gives off enough vapors to ignite if a source of ignition is present as tested with a closed cup tester.
HAZARDOUS INGREDIENTS: Chemical substances that are determined to be potential health or physical hazards based on the criteria established in the OSHA Hazard Communication Standard - 29 CFR 1910.1200
HTX: Highly toxic - the probable lethal dose for a 70 kg (150 lb.) man, which may be approximated as less than 6 teaspoons (2 tablespoons)
IRR: Irritant - Causes reversible effects in living tissues (e.g. inflammation) - primarily skin and eyes.
N/A: Not Applicable - Category is not appropriate for this product.
N/D: Not Determined - Insufficient information to make a determination for this item.
RTECS#: Registry of Toxic Effects of Chemical Substances - an unreviewed listing of published toxicology data on chemical substances.
SARA: Superfund Amendment and Reauthorization Act - Section 313 designates certain chemicals for possible reporting for the Toxic Chemical Release Inventory.
SEN: Sensitizer - Causes allergic reaction after repeated exposure.
TOX: Toxic - The probable lethal dose for a 70 kg (150 kg) man is one ounce (2 tablespoons) or more.

SECTION III: HEALTH HAZARD DATA

ACUTE EFFECT: An adverse effect on the human body from a single exposure with symptoms developing almost immediately after exposure or within a relatively short time.
CHRONIC EFFECT: Adverse effects that are most likely to occur from repeated exposure over a long period of time.
EST'D PEL/TLV: This estimated, time-weighted-average, exposure limit, developed by using a formula provided by the ACGIH, pertains to airborne concentrations from the product as a whole. This value should serve as guide for providing safe workplace conditions to nearly all workers.
HMIS CODES: Hazardous Material Identification System - a rating system developed, by the National Paint and Coating Association for estimating the hazard potential of a chemical under normal workplace conditions. These risk estimates are indicated by a numerical rating given in each of three hazard areas (Health/ Flammability/Reactivity) ranging from a low of zero to a high of 4. The presence of a chronic hazard is indicated by a "YES". Consult HMIS training guides for Personal Protection letter codes, which indicate necessary protective equipment.
PRIMARY ROUTE OF ENTRY: The way one or more hazardous ingredients may enter the body and cause a generalized systemic or specific-organ toxic effect.
- **ING:** Ingestion - A primary route of exposure through swallowing of material.
- **INH:** Inhalation - A primary route of exposure through breathing of vapors.
- **SKIN:** A primary route of exposure through contact with the skin.

SECTION IV: SPECIAL PROTECTION INFORMATION

Where respiratory protection is recommended, use only MSHA and NIOSH approved respirators and dust masks.
MSHA: Mine Safety and Health Administration
NIOSH: National Institute for Occupational Safety and Health.

SECTION V: PHYSICAL DATA

EVAPORATION RATE: Refers to the rate of change from the liquid state to the vapor state at ambient temperature and pressure in comparison to a given substance (e.g. water).
pH: A value representing the acidity or alkalinity of an aqueous solution (Highly Acidic pH = 1; Neutral pH = 7; Highly Alkaline pH = 14)
VOC CONTENT: The percentage or amount in pounds per gallon of the product that is regulated as a Volatile Organic Compound under the Clean Air Act of 1990 and various state jurisdictions.
SOLUBILITY IN WATER: A description of the ability of the product to dissolve in water.

SECTION VII: REACTIVITY DATA

HAZARDOUS DECOMPOSITION: Breakdown products expected to be produced upon product decomposition by extreme heat or fire.
INCOMPATIBILITY: Keep product away from listed substances or conditions to prevent hazardous reactions.
POLYMERIZATION: Indicates the tendency of the product's molecules to combine with themselves in a chemical reaction releasing excess pressure and heat.
STABILITY: Indicates the susceptibility of the product to decompose spontaneously and dangerously.

SECTION VIII: SPILL AND DISPOSAL PROCEDURES

RCRA WASTE NOs: RCRA (Resource Conservation and Recovery Act) waste codes (40 CFR 261) applicable to the disposal of spilled or unusable product from the original container.

SECTION X: TRANSPORTATION DATA

CWA: Clean Water Act - Federal law that regulates chemical releases to bodies of water.
RQ: Reportable Quantity - The amount of the specific ingredient that, when spilled to the ground and, can enter a storm sewer or natural watershed, must be reported to the National Response Center, and other regulatory agencies.
TSCA: Toxic Substances Control Act - A federal law requiring all commercial chemical substances to appear on an inventory maintained by the EPA.

DISCLAIMER

All statements, technical information, and recommendations contained herein are based on available scientific tests or data that we believe to be reliable. The accuracy and completeness of such data are not warranted or guaranteed. We cannot anticipate all conditions under which this information and our products, or the products of other manufacturers in combination with our products, may be used. Acuity Specialty Products Group assumes no liability or responsibility for loss or damage resulting from the improper use or handling of our products, from incompatible product combinations, or from the failure to follow instructions, warnings, and advisories in the product label and Material Safety Data Sheet

(rev 06/02)

Section 16. Other Information

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

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

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